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2050 Regional Transportation Plan

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2050 Regional Transportation Plan

October 2011

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2050 Regional Transportation Plan

The 2050 RTP is the blueprint for a regional transportation system that further enhances our quality of life, promotes sustainability, and offers more mobility options for people and goods.

San Diegans love where they live. From the terrific weather to the stunning natural landscapes of the coast, inland valleys, mountains, and desert, our region has a lot to offer. But sometimes it can be tough to get around. Commutes often are congested, and many people have limited access to public transit. Residents want an improved transportation system.

The 2050 Regional Transportation Plan (RTP or the Plan) is the blueprint for a regional transportation system that further enhances our quality of life, promotes sustainability, and offers more mobility options for people and goods. Looking 40 years ahead, another 1.25 million residents will live in our region. We will create half a million new jobs and build nearly 400,000 new homes. The Plan envisions most of these new jobs and homes situated in environmentally sustainable communities that are more conducive to walking and bicycling. They also will have more access to public transit.



How can our transportation system support our economy and promote more sustainable growth in an equitable and healthy environment? How will we get around for work, school, shopping, healthcare, and recreation? Imagine new north-south and east-west light rail lines that provide convenient access to job centers in Chula Vista, downtown San Diego, Kearny Mesa, Mission Valley, UTC, Sorrento Mesa, and Mira Mesa; or taking the Trolley or SPRINTER to our universities; or catching the new SPRINTER Express between Oceanside and Escondido. Carpoolers, high-tech buses, and solo drivers who pay a fee share new express lanes on our major freeways. More children walk or bike to school. More people work from home a few days a week.

Read on. Building on our current transportation system with funding anticipated over the next 40 years, the 2050 RTP outlines projects for transit, rail and bus services, express or managed lanes, highways, local streets, bicycling, and walking. The result will be an integrated, multimodal transportation system by mid-century.

The Chapters in this document, including the Sustainable Communities Strategy (SCS) in Chapter 3 and all of the appendices, constitute the Plan.

A New Mandate, a Better Future

The vision for our region's future has evolved, changing from one that pictured steady expansion to the east, to one that placed a greater value on protecting open space, to one that now focuses on a compact urban core where more people live and use fewer resources. Local governments have been working toward this vision for decades.

The 2050 RTP contains a robust transportation network, with a diversity of projects that will provide residents and visitors with a variety of travel choices. The regional transportation network, in conjunction with how local jurisdictions develop land, will provide additional opportunities for walking, biking, getting to work, going to school, shopping, and playing. This Plan, more than

previous ones, improves our region's network for public transit. It provides more transit choices for today's and tomorrow's riders, by improving the existing system and by introducing new access to other areas.

In 2006, Assembly Bill 32 (AB 32) was signed into law. It requires California to lower statewide greenhouse gas emissions to 1990 levels by 2020. Passed in 2008, Senate Bill 375 (SB 375) supports the implementation of AB 32 by encouraging planning practices that create sustainable communities. SB 375 also charged the California Air Resources Board (CARB) with setting regional targets for reducing greenhouse gas emissions by 2020 and by 2035. It also calls for California Metropolitan Planning Organizations (MPOs), such as the San Diego Association of Governments (SANDAG), also must prepare a SCS. The SCS must show how the region will meet its goals for reducing greenhouse gas emissions from automobiles and light trucks.

The 2050 RTP and its SCS show that our region will meet or exceed these targets by using land in ways that make developments more compact, conserving open space, and investing in a transportation network that gives residents alternatives to driving alone.

A Vision for Mid-Century

The vision for the 2050 RTP describes a transportation system that:

- Supports a prosperous economy; promotes a healthy and safe environment, including climate change protection; and provides a higher quality of life for all San Diego County residents
- Better links jobs, homes, and major activity centers by enabling more people to use transit and to walk and bike; efficiently transports goods; and provides fast, convenient, and effective transportation options for all people

A Strategy for More Sustainable Communities

The 2050 RTP and its SCS seek to guide the San Diego region toward a more sustainable future by integrating land use, housing, and transportation planning to create communities that are more sustainable, walkable, transit-oriented, and compact. Planning for future patterns of density, how people get around, and how land is used is really driven by one goal: creating great places to live, work, and play. The path toward living more sustainably is clear: focus housing and job growth in urbanized areas where there is existing and planned transportation infrastructure, protect sensitive habitat and open space, invest in a transportation network that provides residents and workers with transportation options that reduce greenhouse gas emissions, and implement the Plan through incentives and collaboration.

Although SB 375 went into effect recently, the building blocks of the SCS have formed the foundation of transportation planning in the San Diego region for many years. This planning effort is now focused more sharply on promoting sustainability as our region strives to meet new requirements mandated by SB 375. The building blocks of the SCS include:

- A land use pattern that accommodates our region's future employment and housing needs, and protects sensitive habitats and resource areas
- A transportation network of public transit, managed lanes and highways, local streets, and bikeways and walkways built and maintained with reasonably expected funding

The 2050 RTP and its SCS seek to guide the San Diego region toward a more sustainable future by integrating land use, housing, and transportation planning to create communities that are more sustainable, walkable, transit-oriented, and compact.

- Managing demands on the transportation system (also known as Transportation Demand Management, or TDM) in ways that reduce or eliminate traffic congestion during peak periods of demand
- Managing the transportation system (also known as Transportation System Management, or TSM) through measures that maximize the efficiency of the transportation network
- Innovative pricing policies and other measures designed to reduce vehicle miles traveled and traffic congestion during peak periods of demand

Ensuring Social Equity on the Road to Sustainability

Achieving social equity in the development of a comprehensive transportation system is a major regional goal.

Roads, freeways, public transit, and other transportation infrastructure can significantly influence the quality of life for a region's residents by shaping access to housing, jobs, services, and recreational opportunities. Achieving social equity in the development of a comprehensive transportation system is a major regional goal. It requires making investments that provide all residents – regardless of age, race, color, national origin, income, or physical ability – with opportunities to work, shop, study, be healthy, and play.

Without proper planning and development, transportation systems can degrade the quality of life in communities. The construction of roads, freeways, and rail-transit systems has sometimes placed burdens on many lower income and minority communities. At times, new transportation projects have physically divided communities, resulting in long-lasting social and economic costs. It is important to understand the impacts of transportation investments on our most vulnerable communities in order to better plan for the future.

Promoting social equity and environmental justice in transportation planning requires involvement from a wide variety of communities and stakeholders. To continue improving transportation planning, SANDAG conducted a significantly more robust, regionwide environmental justice analysis for the 2050 RTP. From the beginning, it engaged affected communities in the planning process. SANDAG incorporated their issues and concerns into the design and decision-making process, as well as in the definition of affected communities and the development of indicators to measure the performance of the transportation system. These efforts ensured that low income and minority communities will share in the benefits of transportation investments without bearing a disproportionate burden from the system. The 2050 RTP includes metrics and performance measures to assess how well the Plan's improvements are distributed in these communities (Chapter 4, Social Equity: Title VI and Environmental Justice).

Paying for the Vision

The Plan is based on current and reasonably available financial resources projected out to 2050. These resources are applied to the estimated capital, operating, maintenance, and rehabilitation costs of the region's transportation system through 2050. Total revenues estimated for the 2050 RTP are about $213.8 billion (escalated to the year that dollars are expended), including future California High Speed Rail funds. Local funds make up 55 percent of the total revenue, with state and federal funds providing 28 percent and 17 percent, respectively. Revenues are phased in by decade. Projects that are listed in the initial years of the 2050 RTP are the same as those that are either already programmed in the five-year Regional Transportation Improvement Program (RTIP) through FY 2015, or are anticipated to be included in

future near-term updates of the RTIP. The RTIP is a multi-billion, five-year capital listing of all major highway, arterial, transit, bikeway, and *TransNet* Program projects.

Offering More Travel Choices

Over the past several decades our region has made substantial investments in Trolley, COASTER, SPRINTER, and local bus networks, in addition to investing in our regional highway system. As our region continues to grow, the 2050 RTP considers several new developments. They include the requirement to reduce greenhouse gas emissions; our region's aging population; increasing patterns of infill and redevelopment in the western third of the region; and the growing emphasis on walking, bicycling, and other forms of active transportation on public health.

The Plan envisions an ambitious and far-reaching transit network that significantly expands the role that transit plays in meeting our region's needs for mobility. The goal is to create the kind of public transit infrastructure and services offered by "world-class" transit systems.

The Plan's network for public transit is strengthened by reinforcing and upgrading existing transit services in key urban corridors, and by pursuing new transit projects in the most urbanized areas of our region with a broad combination of transit modes (Figure 1.1).

These improvements include:

- Double tracking the coastal rail corridor to enable more frequent and reliable service on the COASTER and Amtrak
- Double tracking the SPRINTER rail lines to increase the frequency of service and add limited-stop express services
- Enhancements to the existing Trolley system, including a tunnel in downtown San Diego, to increase the frequency of service and add limited-stop, commuter express services
- Adding new Trolley and Bus Rapid Transit (BRT) lines to provide high-quality regional transit connections along high-demand corridors
- Developing a system of high-speed Rapid Bus services in key arterial corridors to supplement local bus services
- Creating a system of high-frequency services on many of the existing local bus routes in urban core areas
- Reintroducing streetcar and/or shuttle/circulator services to improve mobility within downtown areas

The 2050 RTP also assumes the development of the California High Speed Rail corridor, which will link San Diego to Northern California via the Inland Empire.

As shown in Figure 1.1, new Trolley/SPRINTER lines would connect to more communities. Among the improvements:

- SPRINTER service would be extended to south Escondido
- A north-south Trolley corridor would be developed along the I-805 corridor that would connect University City, Kearny Mesa, Mission Valley, Mid-City, southeastern San Diego, National City, Chula Vista, and San Ysidro
- Intersecting this I-805 Trolley corridor would be three new east-west Trolley lines between University City and Mira Mesa, from Pacific Beach to East County via Kearny Mesa and Mission Valley, and from downtown San Diego to San Diego State

The Plan envisions an ambitious and far-reaching transit network that significantly expands the role that transit plays in meeting our region's needs for mobility.

University (SDSU) via the Mid-City communities

BRT services would complement the regional Trolley/SPRINTER services by providing regional connections along the I-15 corridor between Escondido and downtown San Diego via Kearny Mesa and Mid-City; the SR 52 corridor between East County and Kearny Mesa/University City; and the south I-805 corridor between Otay Mesa/Otay Ranch and downtown San Diego, as well as between Otay Mesa/Otay Ranch/San Ysidro and Kearny Mesa/University City.

Often the biggest impediment to using transit is the challenge of getting to and from a transit stop or station. Potential steps to promote Safe Routes to Transit include first-mile/last-mile solutions. These can include enhanced pedestrian crosswalks near transit stations, bicycle lanes that connect to transit and bike parking at transit stations, feeder-distributor bus/shuttle routes, car sharing/station cars, and ridesharing.

There are additional plans to offer travelers station amenities, real-time scheduling information, comfortable vehicles, and Wi-Fi connections.

The Goods Movement Strategy of the 2050 RTP considers the growing importance of freight and goods movement to our region's economic prosperity, and it seeks to balance regional and national freight priorities.

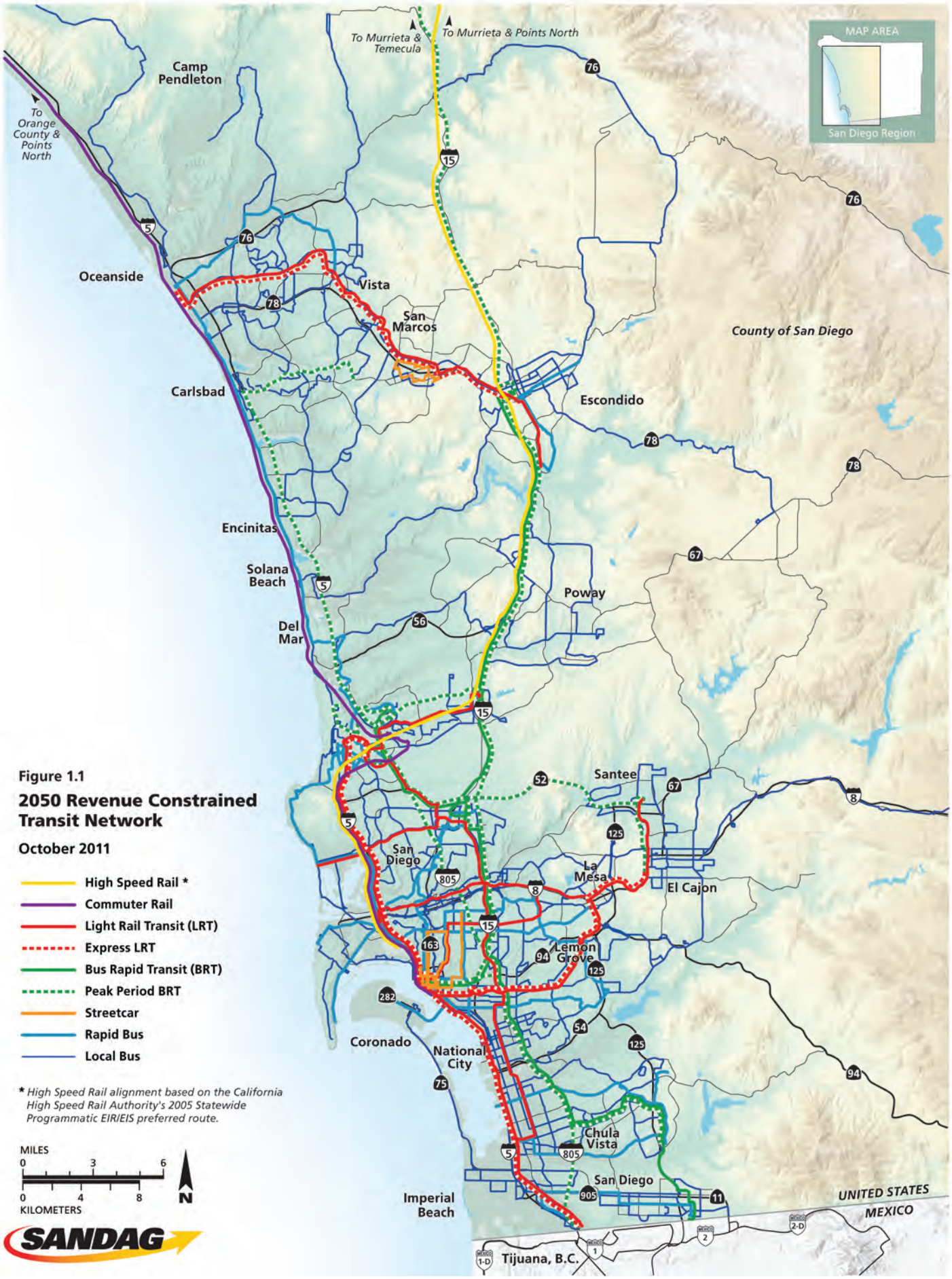


In recent RTPs, the region's vision for a flexible highway system has been refined. This system serves multiple purposes and different types of travel. It accommodates buses and other transit vehicles, automobiles, the movement of freight, and bicycles. Most of the highway improvements included in the 2050 RTP offer new express or managed lanes that support carpooling, vanpooling, and BRT services. Express lanes also accommodate fee-paying patrons (similar to the FasTrak® system, in which fees support transit services along the I-15 corridor). Figure 1.2 illustrates the Plan's highway network.

The 2050 RTP also recognizes that the smooth flow of traffic on local streets and on arterials is needed to improve mobility on highways and regional arterial networks. This is especially true where public transit and other alternatives are not as feasible as they are in our region's urban areas.

Regional facilities and services connect to larger transportation systems beyond the San Diego region's boundaries (freeways and rail networks in other parts of the state and nation), as well as to local systems of streets, roads, and transit services in our communities.

Freight also is moved on the regional transportation network, and it requires good access and connectivity to local logistics centers and terminals to ensure the efficient movement of goods onto and off the network. The Goods Movement Strategy of the 2050 RTP considers the growing importance of freight and goods movement to our region's economic prosperity, and it seeks to balance regional and national freight priorities (Chapter 6, Systems Development). Although the majority of goods are moved by truck, the San Diego region relies on air cargo, maritime, pipeline and rail systems, intermodal centers, and international border crossings.


To Murrieta & Temecula
To Murrieta & Points North
MAP AREA
San Diego Region
Camp Pendleton
To Orange County & Points North
Oceanside
Vista
San Marcos
County of San Diego
Carlsbad
Escondido
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 1.1
2050 Revenue Constrained Transit Network
October 2011
High Speed Rail *
Commuter Rail
Light Rail Transit (LRT)
Express LRT
Bus Rapid Transit (BRT)
Peak Period BRT
Streetcar
Rapid Bus
Local Bus
* High Speed Rail alignment based on the California High Speed Rail Authority's 2005 Statewide Programmatic EIR/EIS preferred route.
MILES
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KILOMETERS
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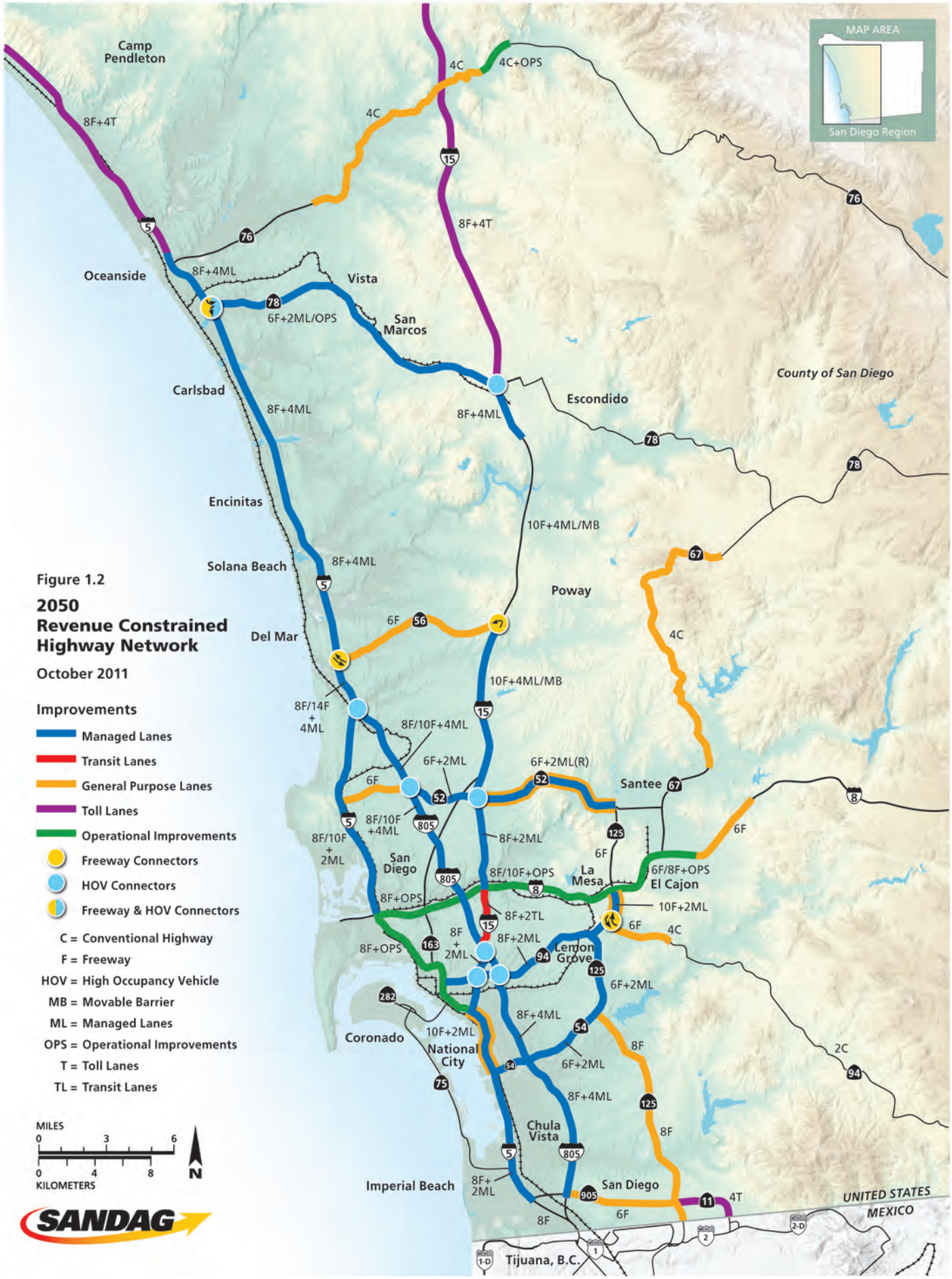
SANDAG


MAP AREA
San Diego Region
Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
County of San Diego
Encinitas
Solana Beach
Poway
Del Mar
Santee
San Diego
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
San Diego
Tijuana, B.C.
UNITED STATES
MEXICO
8F+4T
4C
4C+OPS
8F+4ML
6F+2ML/OPS
10F+4ML/MB
6F
8F/14F + 4ML
8F/10F+4ML
6F+2ML
6F+2ML(R)
8F/10F +4ML
8F/10F + 2ML
8F+2ML
8F/10F+OPS
6F/8F+OPS
10F+2ML
8F+OPS
8F+2TL
8F + 2ML
8F+4ML
6F+2ML
8F
2C
4T
Figure 1.2
2050
Revenue Constrained Highway Network
October 2011
Improvements
Managed Lanes
Transit Lanes
General Purpose Lanes
Toll Lanes
Operational Improvements
Freeway Connectors
HOV Connectors
Freeway & HOV Connectors
C = Conventional Highway
F = Freeway
HOV = High Occupancy Vehicle
MB = Movable Barrier
ML = Managed Lanes
OPS = Operational Improvements
T = Toll Lanes
TL = Transit Lanes
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG

Making bicycling and walking viable options for everyday travel can increase mobility, reduce greenhouse gases, and improve public health.

The Plan also includes a multimodal strategy to improve airport access for cars, shuttles, trucks, and other surface transportation. The goal is to maximize the efficiency and effectiveness of existing and planned aviation facilities by using all the transportation infrastructure available.

Making bicycling and walking viable options for everyday travel can increase mobility, reduce greenhouse gases, and improve public health. Implementing the Regional Bicycle Plan (Riding to 2050, The San Diego Regional Bicycle Plan) and the bicycle and pedestrian master plans of local jurisdictions will help in this effort. The 2050 RTP also includes the Safe Routes to School Strategy, which supports communities and schools that promote walking and bicycling to school (see Chapter 6, Systems Development).

Planning in the San Diego region has traditionally been considered as bounded by San Diego County. However, over the years, our perceived borders have expanded. San Diego County has increasingly close ties to its neighboring counties, and to the Republic of Mexico. This challenges us to think of our region as extending beyond our borders. We also are home to 17 tribal governments, each of which is a sovereign nation within our region. Our region's distinct characteristics present a variety of opportunities and challenges for coordinating transportation planning along our interregional and binational borders.

Making Better Use of What We Have

Reducing traffic congestion, travel times, and air pollution depend on effectively managing the region's transportation system. Known as Transportation Systems Management, or TSM, the effort is a core component of the 2050 RTP and its SCS. Its goal is to smooth the flow of traffic on streets and highways, eliminate bottlenecks, and enhance public transit. TSM investments in the 2050 RTP enhance today's transportation network and ensure that future improvements realize their full potential.

Successful management of the transportation system depends on implementing several techniques and incorporating advanced technologies. On-ramp lights that meter the flow of traffic onto freeways, timing traffic signals on key arterial and local streets, tracking public transit vehicles, and keeping travelers informed with message signs on roadways and updates on the Web and telephone all help keep traffic flowing. Transportation planners also are exploring new strategies that employ cutting-edge technology, such as wireless sensors and detection.



Incentives for the Path Less Traveled

The transportation system in the San Diego region faces many challenges. In the past, steady population growth; the dispersion of homes, jobs, schools, and services; increased interregional commuting; and the expanded

movement of goods all have led to mounting congestion on our roadways. These trends challenged our ability to keep pace with growing travel demands and to operate a reliable transportation system.

Improvements to transportation infrastructure require many years and significant resources to complete. However, managing the demand for various forms of transportation, also known as Transportation Demand Management, or TDM, can provide flexible and cost-effective solutions. Typical TDM programs include ridesharing initiatives such as carpooling, vanpooling, and buspooling; promoting alternative work schedules and teleworking; and promoting bicycling, walking, and the use of public transit. These programs reduce the overall amount of travel, making more efficient use of our existing roadways and maximizing the movement of people and goods.

A Public Plan, With Public Input

SANDAG implemented a comprehensive public outreach and involvement program to support the development of the 2050 RTP and its SCS. The 2050 RTP Public Involvement Plan is based on the SANDAG Public Participation Plan, which was adopted by the SANDAG Board of Directors in 2009.

The 2050 RTP Public Involvement Plan outlined specific activities for communicating with the public throughout the development of the RTP and its SCS. SANDAG prepared the Public Involvement Plan with input from the general public, the Regional Planning Stakeholders Working Group (SWG), the Policy Advisory Committees, and the Board of Directors. Parallel to this effort, a tribal consultation work plan was developed.

To engage low income and minority communities early in the planning process, SANDAG established a mini-grant program to focus the SWG directly on their concerns in a timely and meaningful way, and to provide resources so community collaboratives could reach out to their constituents throughout the process.

The goals, strategies, and tactics outlined in the Public Involvement Plan and provided in Chapter 9 and Technical Appendix 6 have guided outreach efforts. These efforts have built awareness of the regional transportation planning process, and identified opportunities for stakeholders to shape our region's future.

Built with contributions for a wide range of stakeholders and a broad cross section of the public, the 2050 RTP sets a course for how our region can be a healthier, more livable, and more equitable place to live. How we move from place to place – to work, to shop, and to play – shapes much of our quality of life. Let's implement this Plan for a San Diego region where that quality remains high.

Efforts have built awareness of the regional transportation planning process, and identified opportunities for stakeholders to shape our region's future.



Chapter 2

A Vision for Mid-Century: Welcoming More People While Improving the Quality of Life for All

Chapter Contents

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2050 Regional Transportation Plan

The 2050 RTP is built on an integrated set of public policies, strategies, and investments to maintain, manage, and improve the transportation system so it meets the diverse mobility needs of our changing region through 2050.

The 2050 Regional Transportation Plan (RTP or the Plan) is the blueprint for keeping pace with the mobility and sustainability challenges in our growing region. Meeting our region's transportation needs requires a comprehensive plan that coordinates how we use land and how we get around. In short, the Plan develops an integrated, multimodal transportation system. This long-range Plan is built on a set of integrated public policies, strategies, and investments to maintain, manage, and improve the transportation system so it meets the diverse mobility needs of our changing region through 2050. The Plan's vision for transportation supports our region's comprehensive strategy to promote smarter, more sustainable growth.

A New Mandate and New Opportunities for a Better Future: How We'll Get to Work and School, Shop, and Play

The 2050 RTP contains a robust transportation network, with a diversity of projects that will provide residents and visitors with a variety of travel choices. The regional transportation network, in conjunction with how local jurisdictions develop land, will provide additional opportunities for walking, biking, getting to work, going to school, shopping, and playing. This Plan, more than previous ones, improves our region's public transit network. It provides more transit choices for today's and tomorrow's riders by improving the existing system and by introducing new access to more areas.



Assembly Bill 32, Senate Bill 375, and the State's Goals for Reducing Greenhouse Gas Emissions

In 2006, the California Legislature passed and former Governor Arnold Schwarzenegger signed into law Assembly Bill 32 (AB 32), which requires California to lower statewide greenhouse gas emissions to 1990 levels by 2020. The bill directed the California Air Resources Board (CARB) to develop specific early actions to reduce greenhouse gas emissions, and to establish a scoping plan that identifies the best ways to reach the 2020 mandate. In 2008, Senate Bill 375 (SB 375) was signed into law. It supports the implementation of AB 32 by encouraging planning practices that create sustainable communities. SB 375 also charged CARB with setting regional targets for reducing greenhouse gas emissions by the years 2020 and 2035. Each of the California Metropolitan Planning Organizations (MPOs) also must prepare a Sustainable Communities Strategy (SCS) that demonstrates how their regions will meet their goals for reducing greenhouse gas emissions from automobiles and light trucks. Central to our region's SCS are explanations for how our region will grow while improving the quality of life.

A Vision for Mid-Century: The 2050 RTP Vision

The Board of Directors for the San Diego Association of Governments (SANDAG) began developing the 2050 RTP by adopting a vision statement, goals, and policy objectives.

The vision describes a transportation system that:

- Supports a prosperous economy
- Promotes a healthy and safe environment, which includes climate change protection
- Provides a higher quality of life for all San Diego County residents

The transportation system should better link jobs, homes, and major activity centers by enabling more people to use transit, walk, and bike. The system also should efficiently transport goods. Overall, it should provide fast, convenient, and effective transportation choices for all people.

The 2050 RTP goals are structured into two overarching themes: Quality of Travel & Livability, and Sustainability. Quality of Travel & Livability relates to how the transportation system functions from the customers' perspective. Sustainability relates to making progress simultaneously in each of the Three "Es" (Social Equity, Healthy Environment, and Prosperous Economy) from a regional perspective. The SANDAG Board of Directors discussed these goals during the development of the 2050 RTP, and it considered them all related and equally important.

Quality of Travel & Livability

Mobility: The transportation system should provide the general public and those who move goods with convenient travel options. The system also should operate in a way that maximizes productivity. It should reduce the time it takes to travel and the costs associated with travel.

Reliability: The transportation system should be reliable. Travelers should expect relatively consistent travel times, from day to day, for the same trip and mode of transportation.

System Preservation & Safety: The transportation system should be well maintained to protect the public's investments in transportation. It also is critical to ensure a safe regional transportation system.

Sustainability

Sustainability is defined in the Regional Comprehensive Plan as "simultaneously meeting our current economic, environmental, and community needs, while also ensuring that we aren't jeopardizing the ability of future generations to meet their needs." Social equity, a healthy environment, and a prosperous economy are described as the "Three Es" of sustainability.

Social Equity: The transportation system should be designed to provide an equitable level of transportation services to all segments of the population.

Healthy Environment: The transportation system should promote environmental sustainability and foster efficient development patterns that optimize travel, housing, and employment choices. The system should encourage growth away from rural areas and closer to existing and planned development.

Prosperous Economy: The transportation system should play a significant role in raising the region's standard of living.

Policy objectives that will help the region achieve the Plan's goals are shown in Table 2.1.

The vision describes a transportation system that:

Supports a prosperous economy

Promotes a healthy and safe environment, which includes climate change protection

Provides a higher quality of life for all San Diego County residents

Measuring the Plan's Success

A number of performance measures are used to allow us to gauge our progress toward meeting the Plan's policy goals and objectives. Technical Appendix 3 includes the methodology for estimating these performance indicators. The performance of the Revenue Constrained Network is compared with 2008 conditions (which is the base year for the 2050 RTP and reflects the start of the 42-year period covered by the growth forecast), and with a future scenario that assumes projected increases in population and employment in 2050 but no additional expansion of the regional transportation network (a No Build alternative), as shown in Table 2.2. Due to differences in requirements, there are different base years for the RTP and the Environmental Impact Report (EIR). The 2005 base year for analysis of meeting the greenhouse gas reduction targets was set by CARB. The 2010 baseline year for the EIR is pursuant to California Environmental Quality Act (CEQA) Guidelines, which state that the EIR must include a description of the environmental conditions at the time the notice of preparation (NOP) was published. The NOP was published in April 2010.

The Plan vs. No Build

Compared with the 2050 No Build alternative, the Plan would result in a transportation network that improves travel conditions and air quality, while also promoting an equitable distribution of benefits.

With the implementation of the Plan, trips to work and to colleges and universities will be quicker and more efficient. A higher percentage of these trips will last no more than 30 minutes, even during peak periods of demand when most people are commuting. Seven out of ten trips are expected to take 30 minutes or less, whether driving alone or carpooling. About 14 percent of public transit trips to work and higher education will last 30 minutes or less, compared with only 8 percent under the No Build alternative.



The 2050 RTP includes a network that integrates many modes of transportation, with a mix of projects and a wide variety of transportation choices distributed across the region. This is expected to promote a substantial increase in carpooling, demands for public transit, and bicycling and walking for work trips both during peak hours and at other times.

Carpooling, expressed as a percentage of all modes of transportation used to get to work, would increase by 48 percent. The percentage of work trips made by walking, bicycling, and taking public transit would slightly more than double. Nearly one out of three commutes would be made using modes of transportation other than driving alone. By contrast, fewer than one out of five trips in the No Build alternative would turn away from driving alone. Vehicle miles per capita also would be reduced by 5 percent, while daily travel by transit would double.

The Plan's transportation investments will create an estimated 35,600 jobs each year over the course of the Plan, compared with 17,100 annual jobs under the No Build alternative. These jobs are projected to generate an additional gross regional product of $4.4 billion annually, and increase payroll regionwide by $1.8 billion annually. The Plan's transportation infrastructure also will help reduce congestion for autos, trucks, and public transit. The percentage of peak period auto travel occurring during congested periods is projected to drop from 27.7 percent under the No Build alternative to 17.2 percent under the Plan. Similarly, congested conditions for peak period transit travel are projected to drop by nearly half, from 9.1 percent in the No Build alternative to 5.1 percent under the Plan. The number of hours of delay per day for trucks also would cut in half, from 32,300 hours under the No Build alternative to 16,000 hours with the implementation of the 2050 RTP.

Regional air quality also is expected to improve in the future. Cleaner fuels and new vehicle technologies will help reduce the majority of smog-forming pollutants.

The 2050 RTP contains the largest investment in bicycle and pedestrian infrastructure of any San Diego RTP to date. These investments would result in significant increases in bicycle and walking trips (a 120 percent increase, compared with the No Build scenario).

Table 2.1 – 2050 RTP Goals and Policy Objectives

Goal	Policy Objectives
Mobility	
The transportation system should provide the general public and those who move goods with convenient travel options. The system also should operate in a way that maximizes productivity. It should reduce the time it takes to travel and the costs associated with travel.	Tailor transportation improvements to better connect people with jobs and other activities
	Provide convenient travel choices including transit, intercity and high speed trains, driving, ridesharing, walking, and biking
	Preserve and expand options for regional freight movement
	Increase the use of transit, ridesharing, walking and biking in major corridors and communities
	Provide transportation choices to better connect the San Diego region with Mexico, neighboring counties, and tribal nations
Reliability	
The transportation system should be reliable. Travelers should expect relatively consistent travel times, from day to day, for the same trip and mode of transportation.	Employ new technologies to make travel more reliable and convenient
	Manage the efficiency of the transportation system to improve traffic flow
System Preservation and Safety	
The transportation system should be well maintained to protect the public's investments in transportation. It also is critical to ensure a safe regional transportation system.	Keep the region's transportation system in a good state of repair
	Reduce bottlenecks and increase safety by improving operations
	Improve emergency preparedness within the regional transportation system
Social Equity	
The transportation system should be designed to provide an equitable level of transportation services to all segments of the population.	Create equitable transportation opportunities for all populations regardless of age, ability, race, ethnicity, or income
	Ensure access to jobs, services, and recreation for populations with fewer transportation choices
Healthy Environment	
The transportation system should promote environmental sustainability and foster efficient development patterns that optimize travel, housing, and employment choices. The system should encourage growth away from rural areas and closer to existing and planned development.	Develop transportation improvements that respect and enhance the environment
	Reduce greenhouse gas emission from vehicles and continue to improve air quality in the region
	Make transportation investments that result in healthy and sustainable communities
Prosperous Economy	
The transportation system should play a significant role in raising the region's standard of living.	Maximize the economic benefits of transportation investments
	Enhance the goods movement system to support economic prosperity

Table 2.2 – 2050 RTP Comparison of Regional Performance Measures

Performance Measures		Existing (2008)	No Build (2050)	Revenue Constrained (2050)
	System Preservation and Safety			
1.	Percentage of transportation investments toward maintenance and rehabilitation	N/A	N/A	29%
2.	Percentage of transportation investments toward operational improvements			
	Mobility			
3.	Average work trip travel time (in minutes)	26	28	28
4.	Average work trip travel speed by mode (In m.p.h.)			
	Drive alone	34	28	31
	Carpool	35	30	32
	Transit	10	10	13
5.	Percentage of work and higher education trips accessible within 30 minutes in peak periods, by mode			
	Drive alone	73%	68%	70%
	Carpool	74%	69%	72%
	Transit	7%	8%	14%
6.	Percentage of non work-related trips accessible within 15 minutes, by mode			
	Drive alone	71%	67%	67%
	Carpool	72%	68%	68%
	Transit	4%	4%	8%
7.	Out-of-pocket user costs per trip	$2.06	$2.24	$2.28
	Prosperous Economy			
8.	Benefit/Cost Ratio*	N/A	N/A	2.1
9.	Economic impacts*			
	Job impacts (average number per year)	N/A	17,100	35,600
	Output impacts (gross regional product in millions - average amount per year)	N/A	$2,000	$4,400
	Payroll impacts (in millions - average amount per year)	N/A	$900	$1,800

Table 2.2 – 2050 RTP Comparison of Regional Performance Measures (Continued)

	Performance Measures	Existing (2008)	No Build (2050)	Revenue Constrained (2050)
	Reliability			
10.	Congested Vehicle Miles of Travel (VMT)			
	Percentage of total auto travel in congested conditions (peak periods)	13.4%	27.7%	17.2%
	Percentage of total auto travel in congested conditions (all day)	6.3%	17.9%	10.8%
	Percentage of total transit travel in congested conditions (peak periods)	5.2%	9.1%	5.1%
	Percentage of total transit travel in congested conditions (all day)	4.8%	8.2%	4.8%
11.	Daily vehicle delay per capita (minutes)	3	9	5
12.	Daily truck hours of delay	5,900	32,300	16,000
	Healthy Environment			
13.	Smog-forming pollutants for all vehicle types (daily pounds per capita)*	0.08	0.02	0.02
14.	Systemwide VMT (all day) for all vehicle types per capita	25.64	26.69	25.23
15.	Transit passenger miles (all day) per capita	0.48	0.39	0.83
16.	Percent of peak period trips within 1/2 mile of a transit stop	75%	71%	76%
17.	Percent of daily trips within 1/2 mile of a transit stop	78%	73%	78%
18.	Work trip mode share (peak periods)			
	Drive alone	80.8%	82.5%	68.9%
	Carpool	11.0%	10.3%	15.3%
	Transit	5.8%	4.9%	11.0%
	Bike/Walk	2.4%	2.3%	4.8%
	Healthy Environment			
19.	Total bike and walk trips	510,000	610,000	1,340,000
20.	CO_2 emissions for all vehicle types (daily pounds per capita)	28.0	19.9	18.8

Table 2.2 – 2050 RTP Comparison of Regional Performance Measures (Continued)

Performance Measures		Existing (2008)	No Build (2050)	Revenue Constrained (2050)
	Social Equity			
21.	Percentage of work trips accessible within 30 minutes during peak periods by mode			
	Low income Community of Concern			
	Drive alone	79%	71%	74%
	Carpool	80%	72%	75%
	Transit	15%	15%	23%
	Non-low income population			
	Drive alone	72%	67%	69%
	Carpool	73%	69%	71%
	Transit	5%	5%	11%
	Minority Community of Concern			
	Drive alone	75%	70%	72%
	Carpool	76%	71%	74%
	Transit	9%	10%	17%
	Non-minority population			
	Drive alone	72%	66%	68%
	Carpool	73%	68%	70%
	Transit	5%	6%	11%
22.	Percentage of homes within 1/2 mile of a transit stop			
	Low income Community of Concern	93%	90%	91%
	Non-low income population	59%	56%	60%
	Minority Community of Concern	81%	78%	80%
	Non-minority population	55%	54%	57%
23.	Distribution of RTP expenditures per capita			
	Low income Community of Concern	N/A	$6,100	$18,500
	Non-low income population	N/A	$6,100	$14,700
	Minority Community of Concern	N/A	$6,100	$16,300
	Non-minority population	N/A	$6,000	$15,100

* Notes:

8: The No Build Alternative is the base case against which the Revenue Constrained Scenario is compared.

9: Economic impacts for entire RTP investments (2010-2050). For economic impacts by phasing periods, see Table TA 3.1 in Technical Appendix 3.

13: Values based on 2050 SANDAG Transportation Model outputs using 2040 Emission Factors from 2007 EMFAC. No emission factors are available for 2050. Smog-forming pollutants include ROG and NOx.

Social Equity

The 2050 RTP strives to improve mobility and transportation choices for everyone in the region. The Plan's performance measures contain a number of metrics to assess how well improvements are distributed in low income and minority communities (also known as LIM communities), and in communities with limited mobility and little civic or community engagement by residents. The Plan projected the extent to which it would shorten travel times and improve access to transit stops, schools, healthcare, the San Diego International Airport (SDIA), and parks or beaches. A detailed analysis in Chapter 4 describes how the Plan promotes equity and environmental justice throughout our region.

SANDAG analyzed the 2050 RTP to determine whether it conforms with requirements of Title VI of the Civil Rights Act or other applicable social equity laws. These laws require that the benefits and burdens of projects detailed in the Plan be distributed equitably between the LIM and non-LIM populations. SANDAG studied specifically whether the Plan (compared with the No Build alternative) would offer LIM and non-LIM populations the same level of benefits.



SANDAG concluded that there would be no difference in average travel times between the two populations. However, LIM populations would receive slightly greater improvements in their commute to and from work, compared with non-LIM populations. SANDAG measures these improvements according to the percentage of work trips that take 30 minutes or less during periods of peak congestion. The Plan also would result in a higher percentage of households situated within a half-mile of a transit stop for both LIM and non-LIM populations.

SANDAG also examined how well the 2050 RTP would distribute proposed expenditures. The Plan would result in larger investments per capita for low income populations, compared with non-low income populations. However, the rate of increase in per capita expenditures is projected to be higher for non-minority populations (104 percent) than for minority populations (101 percent). Overall, the Plan would result in a higher rate of growth in investments per capita for LIM populations, compared to non-LIM populations.

The data for all social equity performance measures show that the Plan will not create a statistically significant disparity between LIM and non-LIM populations. Although the analyses show slightly more improvement for non-LIM populations in some areas, they also show more improvement for LIM populations in other areas. Overall, the Plan distributes its benefits equitably. The Plan is designed to allocate investments and distribute projects widely, to ensure that both benefits and burdens are equitably distributed among all populations in the region.

SB 375: Regional Targets for Reducing Greenhouse Gas Emissions

To comply with SB 375, the 2050 RTP must include a Sustainable Communities Strategy. This strategy guides the San Diego region toward meeting the state's regional targets for reducing greenhouse gas emissions from cars and light trucks. The state's targets for the San Diego region are a 7 percent reduction, per capita, in greenhouse gas emissions from automobiles and light trucks by 2020 (compared with a 2005 baseline); and a 13 percent reduction by 2035. These targets were set by the CARB on September 23, 2010. The 2050 RTP for the San Diego region would result in greenhouse gas emission reductions that exceed the state's targets for 2020 and meet them for 2035. It would result in a 14 percent reduction in emissions by 2020, and a 13 percent reduction by 2035. This achievement is at the core of the Plan's bold vision for a more sustainable region.

Current Conditions vs. The Plan

The Plan is expected to significantly improve the quality of life in the region, compared with the No Build alternative and compared with current conditions. Air quality will improve, and on a per capita basis greenhouse gas emissions will fall and less transportation fuel will be consumed. More than half the region will be maintained as open space and there will be more housing and transportation choices for current and future residents.

Implementing the Plan also will result in dramatic shifts in how we get to work, and how long it will take. By 2050, the percentage of commutes in which people drive alone during peak periods will fall from 81 percent to 69 percent. Also by that year, 15 percent of commuters will carpool, compared with 11 percent in 2008. The percentage of commuters who use public transit will nearly double, from 6 percent in 2008 to 11 percent in 2050. Meanwhile, the percentage of

Implementing the Plan also will result in dramatic shifts in how we get to work, and how long it will take.



commuters who bicycle or walk to work will double, from 2.4 percent to 4.8 percent. These shifts in how we will get to work during peak periods may seem small, but they can significantly reduce congestion and make travel faster.

Monitoring Performance

The success of the 2050 RTP will be measured through a system that tracks how well our transportation system is functioning. Also, it will identify opportunities for near-term improvements, and provide the ability to better identify and prioritize transportation projects by tracking and evaluating their impact on travel over time. By tracking these impacts, the system will help the region refine how individual transportation projects are selected and funded. By continually monitoring how well the Plan is progressing, SANDAG can ensure that investments support regional policies. The California Department of Transportation (Caltrans), the North County Transit District, the Metropolitan Transit System, cities around the region, the county, and other agencies already collect significant amounts of data related to how well transportation systems are performing. Caltrans and local jurisdictions, for example, regularly collect data on the volume of traffic on roadways. Meanwhile, data on average daily traffic regionwide and on transit ridership (which includes individual route reports, on-time performance, and other information) are available online through the SANDAG Web site.



The biggest challenge of monitoring the performance of a transportation system is to evaluate a wide range of data and regularly report how the system is performing — in a way that is easy to understand for decision-makers and the general public.

Automating Our Systems

In cooperation with U.C. Berkeley, Caltrans has developed a Performance Measurement System (PeMS) that uses urban freeway data. This program provides ongoing data on freeway volumes and speeds that can be displayed graphically and exported to other monitoring applications. For several years, SANDAG has worked with Caltrans and U.C. Berkeley to extend the capabilities of PeMS. Efforts have included the addition of historical San Diego data and the development of a ramp metering interface. The interface provides the ability to analyze, monitor, and report ramp metering volumes.

Planned improvements to PeMS were recently initiated by SANDAG in coordination with Caltrans, regional transit agencies, and local jurisdictions. These enhancements will allow PeMS to measure the performance of multiple modes of transportation throughout the San Diego region. An improved PeMS will supplement the SANDAG Performance Monitoring Program by gathering, tracking, and analyzing real-time transit and arterial data. It also will support ongoing efforts by SANDAG to help transportation operators manage the transportation network using real-time data.

A Plan for Improved Mobility

The 2050 RTP is developed around five primary components: a Sustainable Communities Strategy, Social Equity and Environmental Justice, Systems Development, Systems Management, and Demand Management. Each component has a unique yet interdependent role in creating a sustainable transportation system that improves mobility, reduces greenhouse gases, and increases travel choices for everyone in the San Diego region through 2050. The following chapters highlight the projects, programs, and strategies included in the Plan that address each component.

Chapter 3

Forging a Path Toward More Sustainable Living: A Sustainable Communities Strategy

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2050 Regional Transportation Plan

Achieving sustainability will require living and working in ways that protect and sustain our region's vital social, environmental, and economic resources.

The 2050 Regional Transportation Plan (RTP) and its Sustainable Communities Strategy (SCS) seek to guide the San Diego region toward a more sustainable future by integrating land use, housing, and transportation planning to create communities that are more sustainable, walkable, transit oriented, and compact. Planning for future patterns of density, how people get around, and how land is used is really driven by one goal: creating great places to live, work, and play.

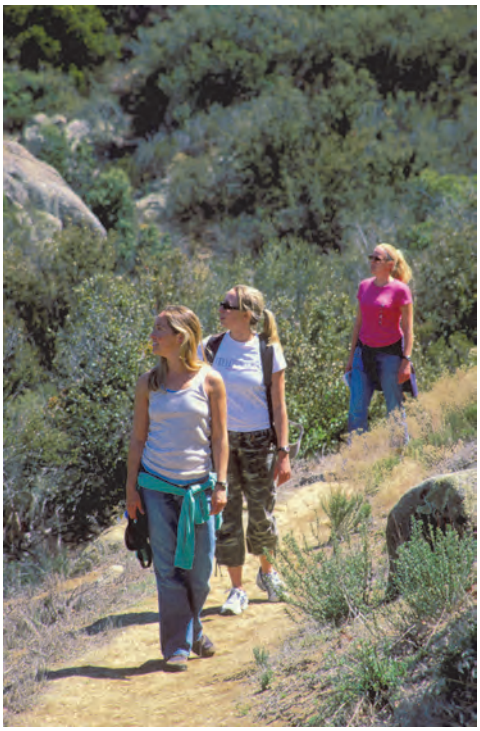
Senate Bill 375 (SB 375), which went into effect in 2009, added statutes to the California Government Code to encourage planning practices that create sustainable communities. It calls for each metropolitan planning organization to prepare an SCS as an integrated element of the Regional Transportation Plan. This new element shows how integrated land use and transportation planning can lead to lower greenhouse gas (GHG) emissions from autos and light trucks.

Government Code sections are referenced throughout the SCS to show how the region is meeting the requirements of SB 375. In addition, Appendix D includes a matrix that specifies the page number of the SCS or other sections of the 2050 RTP where each of the requirements of SB 375 can be found.

A Sustainable Strategy for the San Diego Region

"Each metropolitan planning organization shall prepare a sustainable communities strategy." (Government Code Section 65080(b)(2)(B))

Achieving sustainability will require living and working in ways that protect and sustain our region's vital social, environmental, and economic resources.



The strategy for the San Diego region is to use existing and reasonably expected funding to achieve our region's transportation and housing needs, while also respecting, and enhancing our natural resources.

The path toward living more sustainably is clear: focus housing and job growth in urbanized areas where there is existing and planned transportation infrastructure, protect sensitive habitat and open space, invest in a transportation network that provides residents and workers with transportation options that reduce GHG emissions, and implement the plan through incentives and collaboration.

Although SB 375 went into effect recently, the building blocks of the SCS have formed the foundation of transportation planning in the San Diego region for many years. For example, regional habitat planning efforts began in the 1990s. The Regional Comprehensive Plan (RCP), which integrates transportation, land use and housing planning

to create a more sustainable region, was adopted by SANDAG in 2004.

The RCP was built on the principles of sustainability and smart growth. Sustainability is defined in the RCP as "simultaneously meeting our current economic, environmental, and community needs, while also ensuring that we aren't jeopardizing the ability of future generations to meet their needs." A prosperous economy, a healthy environment, and social equity are described as the "Three Es" of sustainability.

The RCP set forth our regional vision which is being furthered through the 2050 RTP and its SCS. That vision is:

"To preserve and enhance the San Diego region's unique features – its vibrant and culturally-diverse communities, its beaches, deserts, mountains, lagoons, bluffs, canyons, and its international setting – and promote sustainability, economic prosperity, and an outstanding quality of life for everyone."

The 2050 RTP and its SCS build on these ongoing planning efforts, with the added focus on reducing GHG emissions as the region strives to meet new requirements mandated by SB 375.

"Prior to adopting a sustainable communities strategy, the metropolitan planning organization shall quantify the reduction in greenhouse gas emissions projected to be achieved by the sustainable communities strategy." (Government Code Section 65080(b)(2)(H))

As part of its mandate under SB 375, in 2010, the California Air Resources Board (CARB) set specific targets for reducing GHG emissions for cars and light trucks for each of the state's regions from a 2005 base year. The GHG targets set for the San Diego region call for a 7 percent per capita reduction by 2020, and a 13 percent per capita reduction by 2035.

As shown in Table 3.1 our region will meet or exceed these targets by, among other means, using land in ways that make developments more compact, conserving open space, and investing in a transportation network that gives residents transportation options.

It is important to note that the 2050 RTP addresses GHG and vehicle miles traveled from a broader range of vehicles – such as public transit buses, heavy duty trucks, and school buses – than those addressed in SB 375. This chapter focuses only on the requirements of SB 375 which call for GHG reductions for the specific vehicle classes, cars and light trucks. Other performance metrics related to GHG emissions are addressed in the balance of the 2050 RTP chapters where appropriate. A further discussion of how the targets are met and the relationship to VMT and GHG emissions is provided later in this chapter in the Meeting Targets for Lowering GHG Emissions section.

The 2050 RTP horizon year extends well beyond the target years of 2020 and 2035 outlined in SB 375. So what happens beyond 2035? While growth will continue in the region, after the urbanized areas have been developed according to current local general plans, development could gradually move toward more remote areas where fewer transportation options are available if local plans are not changed. The growth forecast shows this happening simply because most local general plans have a horizon year prior to 2050. Although, it is expected that local plans will be updated and revised between now and 2050 to reflect more development in the urbanized areas of the region, based on current plans, the projected growth beyond 2040 would likely result in an increased demand for driving. The results now shown

Sustainability is defined in the RCP as "simultaneously meeting our current economic, environmental, and community needs, while also ensuring that we aren't jeopardizing the ability of future generations to meet their needs."

Table 3.1 – 2050 RTP – Results of Greenhouse Gas Emissions and Vehicle Miles Traveled Reductions

Average Weekday Per Capita CO2 and VMT Reductions for Cars and Light Trucks from 2005			
Target Year	**CARB Target**	**GHG**	**VMT**
2020	7%	14%	12%
2035	13%	13%	10%
2050	N/A	10%	7%

Source: SANDAG and CARB

Thousands of residents, community leaders, academics, business leaders, elected officials, and representatives from underrepresented groups have participated in the development of the 2050 RTP and its SCS.

for 2050 are best estimates based on historical and current empirical observations in the region and do not reflect future attitude changes about transportation and where people will choose to live and work as a result of significant investments in transportation options.

In addition, the GHG modeling for 2050 uses emission factors for the year 2040 (EMFAC 2007 includes emissions factors through 2040 only) and assumes no technological improvements to vehicles or fuels in the final ten years of the plan (This is due to the lack of accepted published data beyond 2040).

In accordance with SB 375, the building blocks of the SCS include:

- A land use pattern that accommodates our region's future employment and housing needs, and protects sensitive habitats and resource areas
- A transportation network of public transit, managed lanes and highways, local streets, bikeways and walkways built and maintained with reasonably expected funding
- Managing demands on our transportation system (also known as Transportation Demand Management or TDM) in ways that reduce or eliminate traffic congestion during peak periods of demand
- Managing our transportation system (also known as Transportation System Management, or TSM) through measures that maximize the efficiency of the transportation network
- Innovative pricing policies and other measures designed to reduce vehicle miles traveled and traffic congestion during peak periods of demand

The key difference between past and current regional planning efforts is a sharper focus on reducing GHG emissions from cars and light trucks. For these vehicles, the state has developed a three-tiered approach to reducing GHG emissions. In addition to the regional land use policies and transportation investments contained in the 2050 RTP, the state has enacted laws to increase vehicle fuel efficiency and to increase the use of alternative, lower carbon transportation fuels. SANDAG, and other regional stakeholders, are supporting infrastructure planning for alternative fuels, which is addressed later in this chapter.

SCS Public Involvement Activities

"The metropolitan planning organization shall conduct at least two informational meetings in each county within the region for members of the board of supervisors and city councils on the sustainable communities strategy." (Government Code Section 65080(b)(2)(E))

Involving the public in the development of the SCS was a major priority in the San Diego region. On October 8, 2010, SANDAG conducted an informational meeting on the SCS at the SANDAG Board of Directors meeting. Pursuant to Government Code Section 65080(b)(2)(E), only one informational meeting is required if it is attended by the county board of supervisors and city councilmembers who represented a majority of the cities with a majority of the population in the incorporated areas of the county. The minutes and attendance by jurisdiction for this meeting can be found in Technical Appendix 6, entitled 2050 RTP and SCS Public Outreach Program. These documents show that the meeting was attended by all jurisdictions within San Diego County. SANDAG has exceeded the statutory requirement by holding discussions concerning the SCS at several other public meetings of the Board of Directors since October 2010. The documentation from these meetings also is included in Technical Appendix 6.

"Each metropolitan planning organization shall adopt a public participation plan, for development of the sustainable communities strategy." (Government Code Section 65080(b)(2)(F)

Through an extensive public outreach program, thousands of residents, community leaders, academics, business leaders, elected officials, and representatives from underrepresented groups have participated in the development of the 2050 RTP and its SCS. The 2050 RTP Public Involvement Plan (PIP) established a process and outlined specific activities for communicating with, and obtaining input from, the public throughout the RTP development process. The PIP is based on the SANDAG Public Participation Plan adopted by the Board of Directors on December 18, 2009.



SANDAG's efforts to involve the public in the development of the 2050 RTP and its SCS have been tracked and recorded to chronicle the large number, and wide range of activities organized and held by SANDAG. This record shows that SANDAG exceeded the public involvement requirements, including informational meetings mandated by SB 375 and federal regulations. The details of these activities are included in Chapter 9 and Technical Appendix 6.

Drawing a Closer Connection to How Land Is Used, and How We Get Around: the Land Use and Transportation Connection

For some time, SANDAG has been drawing an increasingly closer connection between how land is used, and how we get around. Since the late 1990s, the principles that guide our vision for the future have deepened and matured. The cities and County of San Diego have begun to integrate local and regional plans for accommodating the region's growing population, preserving open space, and reducing GHG emissions. This holistic approach to planning is referred to as "smart growth."

The Regional Comprehensive Plan sets forth a regional strategy to promote smarter growth, focusing on locating higher density and mixed-use development close to existing, and planned transportation infrastructure.

Acting individually and collectively, local jurisdictions have taken and are continuing to take significant steps to protect the environment. These include creating plans for conserving valuable natural habitats, better protecting watersheds, conserving energy, and reducing reliance on petroleum.

Some of the region's largest initiatives to protect natural habitats include the Multiple Species Conservation Program (MSCP) and the Multiple Habitat Conservation Program (MHCP). Adopted in 1997 and 2003, respectively, the MSCP and MHCP span the region. Collectively, these initiatives establish a "greenprint" for the region.

The Regional Comprehensive Plan (RCP), adopted by the SANDAG Board of Directors in 2004, serves as a blueprint for the region's future growth and development. It sets forth a regional strategy to promote smarter growth, focusing on locating higher density and mixed-use development close to existing, and planned transportation infrastructure. This strategy focuses particularly on elevating the role of public transit in people's daily lives. The RCP is based upon three themes:

- Improving the connections between land use and transportation plans by using smart growth principles
- Using land use and transportation plans to guide decisions about environmental and public facility investments
- Focusing on collaboration and incentives to achieve regional goals and objectives

The RCP and RTP planning processes are iterative, each informing the other. Upon adoption of this RTP, SANDAG will begin work to update the RCP to reflect its SCS.

Shortly after the adoption of the 2004 RCP, SANDAG worked closely with the 18 cities and the County of San Diego to develop the regional Smart Growth Concept Map (accepted in 2006, and updated in 2008). This map illustrates where smart growth development exists or could occur in our region. The map was used to prioritize transportation investments in the 2030 RTP, and to identify locations for *TransNet* Smart Growth Incentive Program funding. It also has been used by local jurisdictions as a tool for local plan updates and the development of specific plans that locate more housing and employment near transit stations and along major (high frequency) bus routes. Many of these land use plan changes have occurred over the past five or six years and some are still in progress. These plan changes are reflected in the land use pattern of the SCS. The Smart Growth Concept Map is included in Technical Appendix 9 entitled, Additional SCS Background Material. Because the Smart Growth Concept Map has not been updated since 2008, it does not include some of the concepts and recommended actions that are contained in the 2050 RTP and its SCS. Therefore, SANDAG plans to update the map to reflect the changes that have been made to local land use plans (and are contained in the SCS), and the regional transportation network after the adoption of the 2050 RTP.



A Sustainable Land Use Pattern

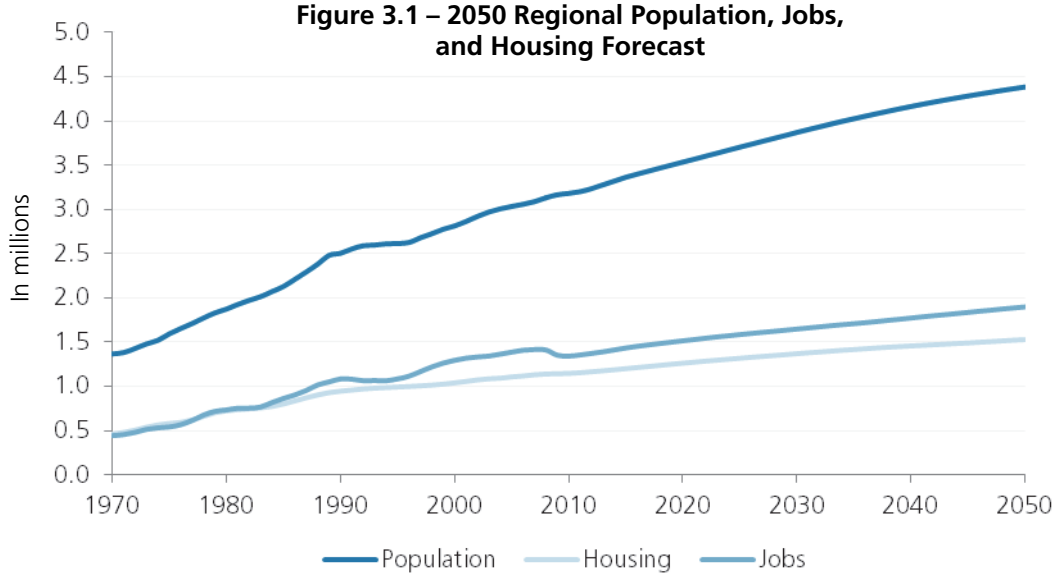
"Each metropolitan planning organization shall prepare a sustainable communities strategy, subject to the requirements of Part 450 of Title 23 of, and Part 93 of Title 40 of, the Code of Federal Regulations, including the requirement to utilize the most recent planning assumptions considering local general plans, and other factors." (Government Code Section 65080(2)(B))

"Identify the general location of uses, residential densities, and building intensities within the region." (Government Code Section 65080(b)(2)(B)(i))

In 2008, the San Diego region included about 3.1 million people, 1.1 million homes, and 1.5 million jobs. Most of the homes and jobs are located within the western third of the region, and in areas served by public transit. The 2050 Regional Growth Forecast projects that the region will grow by another 1.25 million people by 2050. Nearly 400,000 new homes and 500,000 new jobs will be added during this time frame (Figure 3.1). The base year for the 2050 RTP is 2008, the year the data collection effort began to prepare the regional growth forecast (2008-2050). The San Diego region has made great strides in planning for more compact, higher density, and walkable development located near transit and in the incorporated areas of the region already served by water, sewer, and other public facilities. Evidence of the region's success can be found in the 2050 Regional Growth Forecast, which is the foundation of the SCS land use pattern. The SCS land use pattern accommodates 79 percent of all housing and 86 percent of all jobs within the Urban Area Transit Strategy Study Area where the greatest investments in public transit are being made (see Urban Area Transit Strategy Study Area Map in Technical Appendix 7). About 80 percent of new housing in the region will be attached multifamily. The SCS land use pattern also protects and preserves about 1.3 million acres of land, more than half the region's land area. These open space lands include habitat conservation areas, parks, steep slopes, floodplains, and wetlands. This information is documented in Table 3.2.

The 2050 Regional Growth Forecast projects that the region will grow by another 1.25 million people by 2050. Nearly 400,000 new homes and 500,000 new jobs will be added during this time frame.

Figure 3.1 – 2050 Regional Population, Jobs, and Housing Forecast



Source: SANDAG 2050 Regional Growth Forecast

Table 3.2 – 2050 Regional Growth Forecast Projections

					2008 to 2050 Change	
	2008	**2020**	**2035**	***2050***	**Numeric**	**Percent**
Total Population	**3,131,552**	**3,535,000**	**4,026,131**	***4,384,867***	**1,253,315**	**40%**
Household Population	3,033,985	3,405,068	3,873,175	*4,210,591*	1,176,606	39%
Group Quarters Population	97,567	129,932	152,956	*174,276*	76,709	79%
Jobs	**1,501,080**	**1,619,615**	**1,813,372**	***2,003,038***	**501,958**	**33%**
Civilian Jobs	1,411,811	1,515,346	1,709,103	*1,898,769*	486,958	34%
Military Jobs	89,269	104,269	104,269	*104,269*	15,000	17%
Total Housing Units	**1,140,654**	**1,262,488**	**1,417,520**	***1,529,090***	**388,436**	**34%**
Single Family	692,382	728,566	755,477	*761,699*	69,317	10%
Multiple Family	405,023	493,243	624,419	*732,832*	327,809	81%
Mobile Homes	43,249	40,679	37,624	*34,559*	-8,690	-20%
Households	**1,074,896**	**1,200,966**	**1,357,084**	***1,467,026***	**392,130**	**36%**
Vacancy Rate	**5.8%**	**4.9%**	**4.3%**	***4.1%***	**0.0**	**-29%**
Household Size	**2.82**	**2.84**	**2.85**	***2.87***	**0.05**	**2%**
Total Acres	**2,727,197**	**2,727,197**	**2,727,197**	**2,727,197**	**0**	**0%**
Residential	335,895	403,440	544,868	634,498	298,603	89%
Employment	88,177	91,286	95,610	99,905	11,728	13%
Parks and Constrained Lands	1,539,657	1,540,164	1,540,966	1,541,314	1,656	0%
Vacant Land	386,266	327,972	209,005	136,183	-250,083	-65%

Distribution of Projected Housing Growth

	2008	**2020**	**2035**	**2050**	**Percent of Regional Change 2008-2050**	**Numeric Regional Change 2008-2050**
Region	1,140,654	1,262,488	1,417,520	1,529,090	100%	388,436
Urban Area Transit Strategy	900,342	989,075	1,108,835	1,205,613	79%	305,271

Distribution of Projected Job Growth

	2008	**2020**	**2035**	**2050**	**Percent of Regional Change 2008-2050**	**Numeric Regional Change 2008-2050**
Region	1,501,080	1,619,615	1,813,372	2,003,038	100%	501,958
Urban Area Transit Strategy	1,301,242	1,394,320	1,554,630	1,712,639	82%	411,397

Note: The 2050 Regional Growth Forecast represents a combination of economic and demographic projects, existing land use plans and policies, as well as potential land use plan changes that may occur in the region between 2030 and 2050 (data shown in italics). In general, growth between 2008 and 2030 is based on adopted land use plans and policies, and growth between 2030 and 2050 includes alternatives that may, in some cases, reach beyond existing adopted plans.

Source: SANDAG 2050 Regional Growth Forecast



2050 Regional Growth Forecast and Establishing the SCS Land Use Pattern

Our region's 2050 Regional Growth Forecast is the foundation of the SCS land use pattern, and it was used to plan the 2050 RTP transportation network. This forecast extends to 2050, allowing our region to incorporate all transportation projects and programs that voters approved in the *TransNet* Ordinance.

The Ordinance authorizes a half-cent sales tax, and the 40-year extension (2008 to 2048) was approved by San Diego region voters in 2004 to help pay for important transportation improvements in the region. The growth forecast is based on economic and demographic projections out to 2050, existing local land use plans and policies, and reasonably anticipated changes to local plans and policies. It estimates how much and where future growth is likely to occur, and it serves as the land use pattern for the SCS.

The 2050 Regional Growth Forecast was the result of a collaborative effort among demographers, planners, and policy makers. A multi-step process was followed that involved the input and review of a wide range of local, regional, and subject-area experts.

The first step in the forecast process was to develop growth projections for the region's population, jobs, housing, and other demographic and economic characteristics. These projections were developed using the Demographic and Economic Forecasting Model (DEFM). DEFM uses demographic assumptions including age and ethnicity-specific birth rates, death rates, and migration trends (domestic and international). It also uses economic assumptions including labor force participation, labor productivity, and unemployment rates. Input, assumptions, and results from DEFM were reviewed twice by a panel of subject-area experts, including representatives from local universities, economic and workforce development agencies, resource providers, public sector partners, and key industries. The panel represented several areas of expertise ranging from economic and demographic trends to housing and resource issues. Further details about DEFM can be found in the 2050 Regional Growth Forecast Process and Model Documentation in Technical Appendices 2 and 15, respectively.

These regionwide projections were then used to develop neighborhood level growth forecasts that distributed population, housing, and employment growth projections among the 19 jurisdictions. The neighborhood level growth forecasts also considered local land use data, which was developed through



extensive collaboration between SANDAG and the region's 18 cities and the County of San Diego, as well as with other land use agencies such as tribal governments and the Department of Defense. The local land use data incorporated information on existing development, general plans, constraints to development (e.g., flood plains, steep slopes, habitat preserves, historic districts, building height restrictions, and zoning), and permitted projects in the development pipeline.

SANDAG has prepared maps that identify the general location of land uses in the region. The maps also show residential densities and commercial development types (Figures 3.2, 3.3, and 3.4 for 2020, 2035, and 2050, respectively). The maps for 2020 and 2035 also are provided at a subregional level in Appendix D.

Neighborhood level growth forecasts take into consideration a neighborhood's proximity to existing job centers (along with travel time estimates and information on local commuting choices) as well as historical development patterns. How land in a neighborhood is used today, how it's expected to be developed, how close the neighborhood is to job centers, and historical patterns of land use all offer clues to how a neighborhood is expected to grow.

For the last step, each jurisdiction's staff reviewed model results. The final forecast was adjusted based on local feedback to ensure that the most current land use information and assumptions including types of use, densities, and intensities were correctly identified and included. In addition to working with local jurisdiction staff, SANDAG conducted workshops and made presentations to city councils and the County Board of Supervisors to obtain input on the land use assumptions used in the subregional forecast. This latest growth forecast looks out 40 years to 2050. This is further into the future than any previous forecast and extends two years beyond the life of the *TransNet* Extension Ordinance.



Figure 3.2

2020 Land Use

October 2011

Residential

- Spaced Rural Residential*
- Single Family Residential
- Mobile Home Park
- Multi-Family Residential

Mixed Use, Commercial, and Industrial

- Mixed Use
- Commercial and Office
- Heavy and Light Industry

Public Facilities and Utilities

- Transportation, Communications, Utilities
- Education and Institutions
- Public/Semi-Public
- Military

Open Space Parks and Recreation

- Open Space Parks
- Recreation

Agriculture

- Agriculture

Indian Reservations

- Indian Reservations

Other

- Vacant

*Low density, single family, approximately one housing unit per 1-10 acres

MILES
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KILOMETERS

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SANDAG

Orange County
Riverside County
San Diego County
Imperial County
UNITED STATES
MEXICO

Figure 3.3

2035 Land Use

October 2011

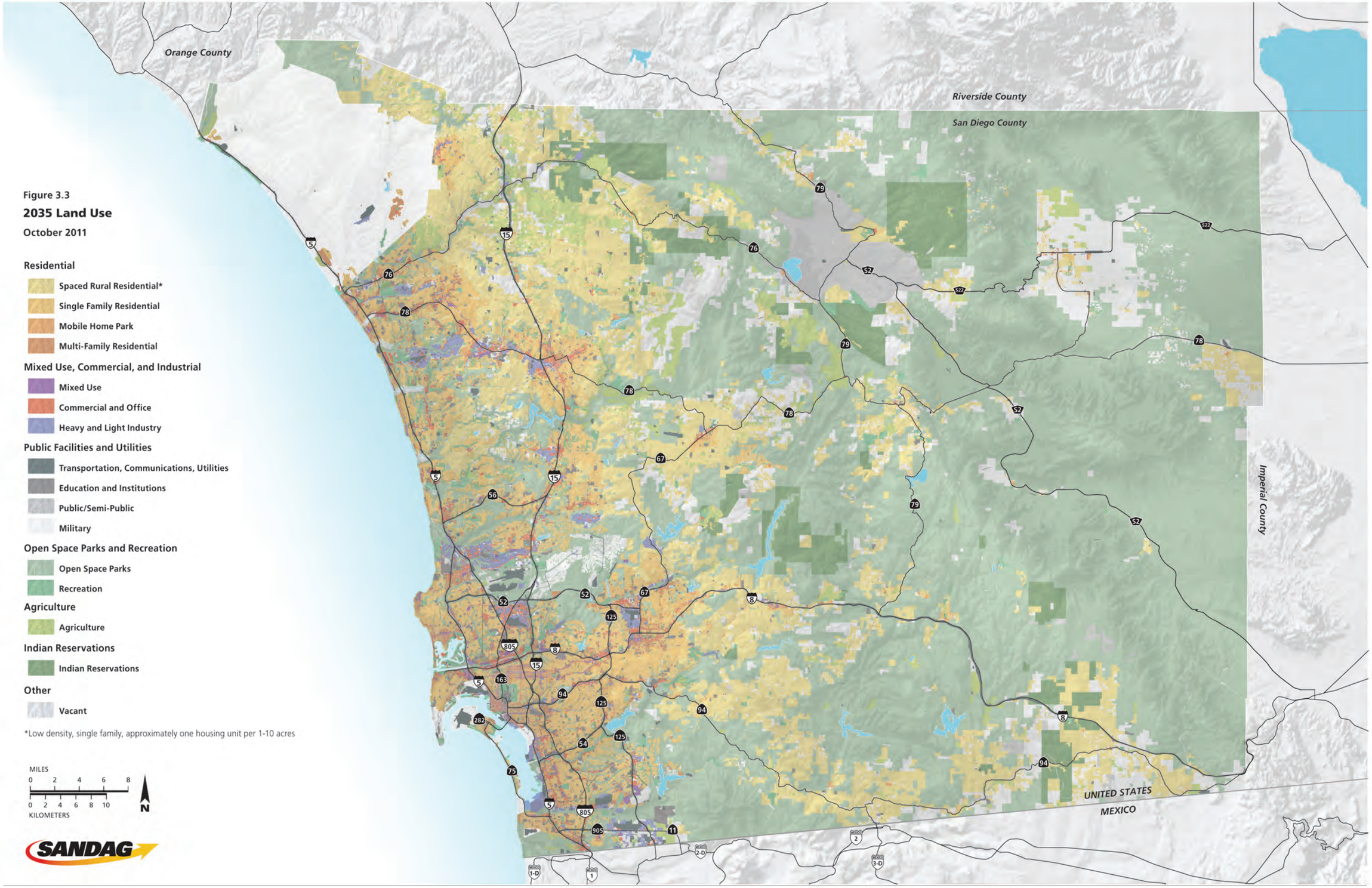
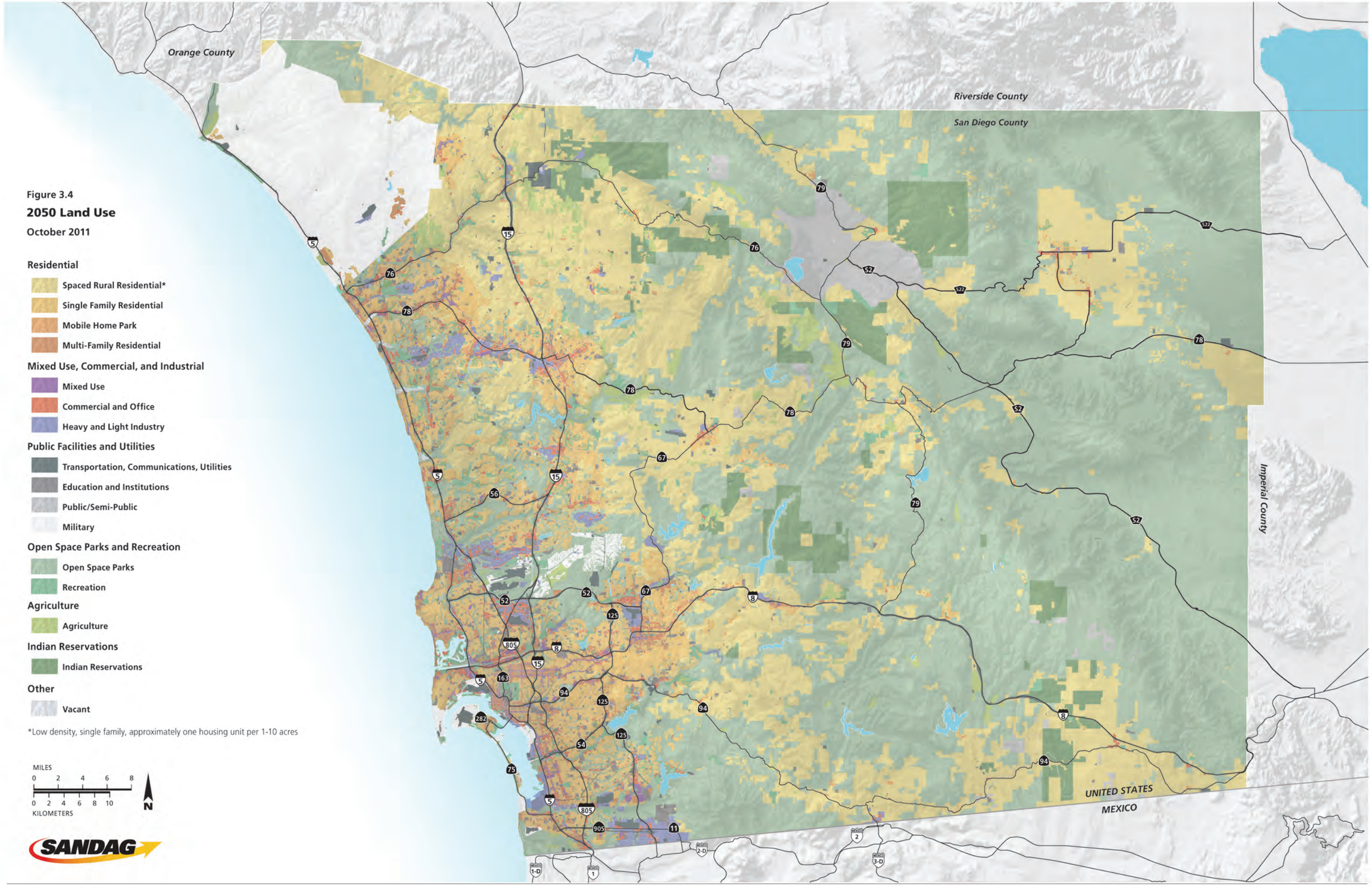


Figure 3.4

2050 Land Use

October 2011



During the past ten years, development patterns and local plans have aligned more closely with the goals and objectives of the RCP, which include focusing more on urban infill and redevelopment and improving accessibility to jobs, housing, education and recreation opportunities. Thus, the SCS land use pattern for the San Diego region contributes to reducing GHG emissions, meeting our GHG targets, and reducing VMT.

Figures 3.5, 3.6, and 3.7 depict the 2050 Regional Growth Forecast and SCS land use pattern by showing population densities of the region (persons per by acre) in 2020, 2035, and 2050, respectively. Together the maps show that population growth will be concentrated in the western third of the region and along major transportation corridors. The maps also show the extensive system of habitat areas, open space, and parkland that the region is preserving for the future. These natural resources are described in more detail later in this chapter.

Table 3.2 provides detailed numerical information about the 2050 Regional Growth Forecast, which shows the projected changes in population, housing, and employment between 2008 (the base year), 2020, 2035, and 2050. It shows a breakdown of how many acres are planned for residential, employment, parks and preserved open spaces.

The SCS land use pattern for the San Diego region contributes to reducing GHG emissions, meeting our GHG targets and reducing VMT.



Orange County

Riverside County

San Diego County

Imperial County

UNITED STATES

MEXICO

Figure 3.5

2020 Population Density

October 2011

Persons per Acre

- 4 or Fewer
- 4 - 10
- 10 - 25
- 25 - 50
- Over 50
- Parks and Open Space

MILES

0 3 6 9 12

0 4 8 12 16

KILOMETERS

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SANDAG

Orange County

Riverside County

San Diego County

Imperial County

UNITED STATES

MEXICO

Figure 3.6

2035 Population Density

October 2011

Persons per Acre

- 4 or Fewer
- 4 - 10
- 10 - 25
- 25 - 50
- Over 50
- Parks and Open Space

MILES

0 3 6 9 12

0 4 8 12 16

KILOMETERS

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SANDAG

Figure 3.7

2050 Population Density

October 2011

Persons per Acre

- 4 or Fewer
- 4 - 10
- 10 - 25
- 25 - 50
- Over 50
- Parks and Open Space

MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS

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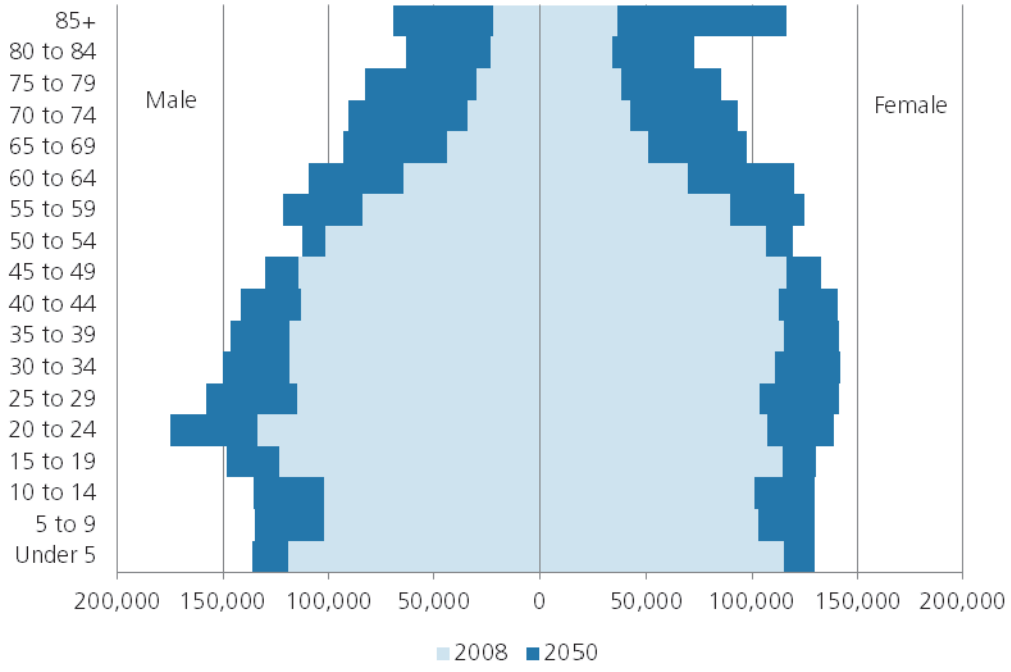
SANDAG

Figure 3.8 shows the aging of the region's population between 2008 and 2050. The number of people aged 65 and older is expected to increase by 143 percent. The number of people older than 85 is projected to increase by 214 percent. The aging of the population is a significant demographic trend, and the 2050 RTP/SCS places more attention on transportation for seniors, people with limited means, and individuals with disabilities. These specialized services are coordinated with transit services. The 2050 RTP/SCS includes an expansion of the Senior Mini-Grant program and other specialized transportation grant programs to meet this need.

Figure 3.9 shows that the number of homes located within one half-mile of public transit services will increase from 45 percent in 2008 to 64 percent in 2050. This increase is based on new transit services, detailed in Chapter 6 and also on the fact that approximately 80 percent of new growth will be in the urban areas. Figure 3.10 shows the changes in housing capacity that have occurred over time in the SANDAG growth forecasts. The projected increase in housing capacity is dramatic for areas with densities between 20 and 39.9 dwelling units per acre and 40-plus dwelling units per acre. The increases reflect extensive work by local jurisdictions to update general and specific plans to accommodate future growth and development in the urbanized areas of the region where existing and planned public transit is located.

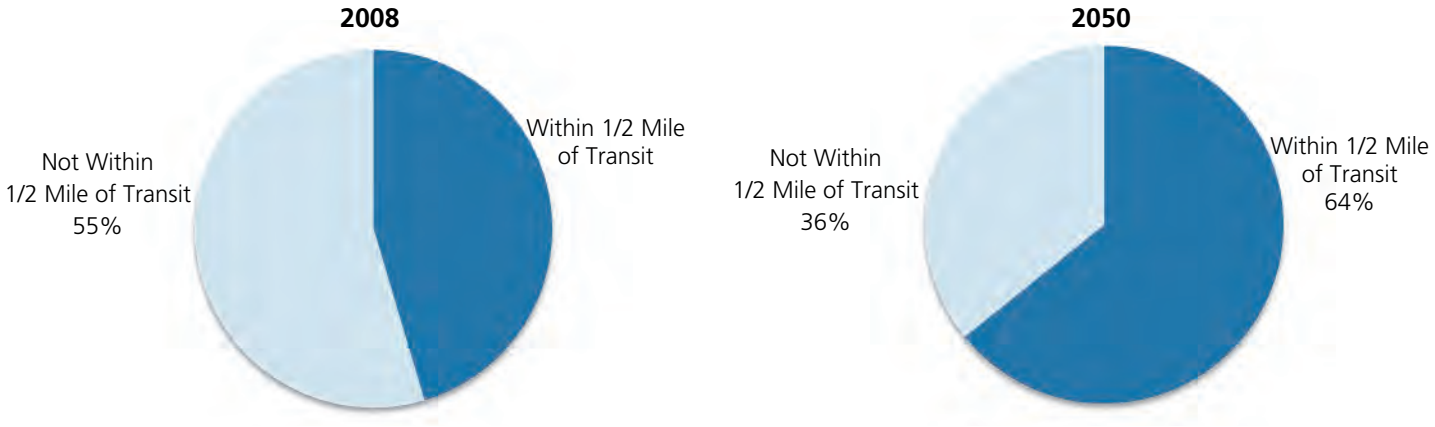
Figure 3.8 – Population by Age
2008 and 2050



Source: SANDAG 2050 Regional Growth Forecast

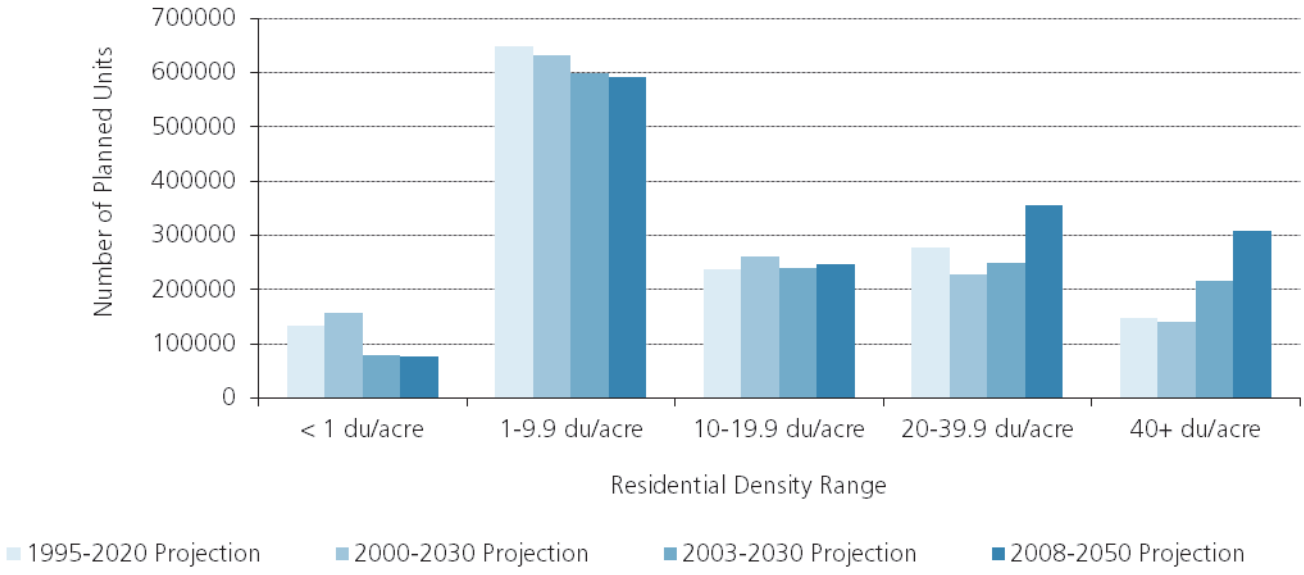
Figures 3.11 through 3.13 (employment density) and Figures 3.14 through 3.16 (housing density) show that most growth in housing and employment is expected to occur in incorporated cities in the western third of the region in the years 2020, 2035, and 2050, respectively. The California Transportation Commission's Regional Transportation Plan Guidelines (Guidelines) provide that density and clustering of land uses are "typically measured by the number of dwelling units, shops, and/or employees per acre or square mile, floor area ratio (FAR), and other similar measures." (Guidelines, p. 134) In order to identify intensity for non-residential land uses, SANDAG has relied upon the best available information, which is employment density or jobs per acre.

Figure 3.9 – Housing Near Public Transit



Source: SANDAG 2050 Regional Growth Forecast

Figure 3.10 – Housing Capacity
(Number of Existing Plus Additional Housing Units Planned)



Source: SANDAG Regional Growth Forecasts

Orange County

Riverside County

San Diego County

Imperial County

UNITED STATES

MEXICO

Figure 3.11

2020 Employment Density

October 2011

Jobs per Acre

- 3 or Fewer
- 3 – 10
- 10 – 25
- 25 – 75
- Over 75
- Parks and Open Space

MILES 0 3 6 9 12

KILOMETERS 0 4 8 12 16

N

SANDAG

Orange County

Riverside County

San Diego County

Imperial County

UNITED STATES

MEXICO

Figure 3.12

2035 Employment Density

October 2011

Jobs per Acre

- 3 or Fewer
- 3 - 10
- 10 - 25
- 25 - 75
- Over 75
- Parks and Open Space

MILES

0 3 6 9 12

0 4 8 12 16

KILOMETERS

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SANDAG

Figure 3.13

2050 Employment Density

October 2011

Jobs per Acre

- 3 or Fewer
- 3 - 10
- 10 - 25
- 25 - 75
- Over 75
- Parks and Open Space

MILES
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KILOMETERS

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SANDAG

Orange County

Riverside County

San Diego County

Imperial County

UNITED STATES

MEXICO

Figure 3.14

2020 Housing Density

October 2011

Dwelling Units per Acre

- 2 or Fewer
- 2 – 5
- 5 – 10
- 10 – 20
- 20 – 100
- Over 100
- Parks and Open Space

MILES
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0 4 8 12 16
KILOMETERS

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SANDAG

Figure 3.15

2035 Housing Density

October 2011

Dwelling Units per Acre

- 2 or Fewer
- 2 – 5
- 5 – 10
- 10 – 20
- 20 – 100
- Over 100
- Parks and Open Space

MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS

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SANDAG

Figure 3.16

2050 Housing Density

October 2011

Dwelling Units per Acre

- 2 or Fewer
- 2 - 5
- 5 - 10
- 10 - 20
- 20 - 100
- Over 100
- Parks and Open Space

MILES
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0 4 8 12 16
KILOMETERS

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SANDAG

Welcoming Everyone Who Chooses to Live Here: Housing the Region's Projected Growth in Population

"Identify areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period of the regional transportation plan taking into account net migration into the region, population growth, household formation and employment growth." (Government Code Section 65080(b)(2)(B)(ii))

The SCS land use pattern accommodates the estimated 388,000 new homes that will be needed regionwide over the next 40 years to serve a projected growth in population of 1.25 million people.

After the 2030 RTP and 2030 Regional Growth Forecast were adopted, changes to local general plans resulted in a significant increase in residential capacity regionwide. The 2030 Regional Growth Forecast projected a shortfall of nearly 100,000 homes by the year 2030 (which was addressed by projecting significant interregional commuting between San Diego County and Riverside, Orange, and Imperial Counties, as well as Baja California, Mexico). But the 2050 Regional Growth Forecast and SCS land use pattern contain sufficient residential capacity (more than 435,000 housing units) to accommodate the region's projected growth in population of 1.25 million people. The 2050 Regional Growth Forecast and SCS estimate that interregional commuting will be minimal, driven only by the proximity of neighboring regions to some job centers, and personal choices. It is estimated that an additional 15,000 households will include residents who commute into the region for work. Nearly half of these households will be located in Baja California, Mexico and much of the remainder will be in Riverside County.

The SCS land use pattern addresses the needs of all economic segments of the population. About 84 percent of the projected 388,000 new homes to be built by 2050 will be attached, multifamily units – with a planned capacity of more than 225,000 units at 30 or greater dwelling units per acre, and almost 75,000 units with a housing density of 20 to 29 dwelling units per acre. This capacity for planned housing development, particularly for multifamily development, will help the region accommodate the projected housing needs for residents of all income levels.

Accommodating the Eight-year Regional Housing Needs Assessment

"Identify areas within the region sufficient to house an 8-year projection of the regional housing need for the region." (Government Code Section 65080(b)(2)(B)(iii))

"Consider the state housing goals." (Government Code Section 65080(b)(2)(B)(vi))

The SCS land use pattern accommodates the estimated 388,000 new homes that will be needed regionwide over the next 40 years to serve a projected growth in population of 1.25 million people.



SANDAG is required by state law to complete a Regional Housing Needs Assessment (RHNA) in consultation with the California Department of Housing and Community Development (HCD), in order to determine the region's housing needs in four income categories – very low, low, moderate, and above moderate. This process occurs before each housing element cycle, which SB 375 changed from a five-year to an eight-year cycle.

In the past, the RHNA was completed separately from the RTP. SB 375 now links the RHNA and RTP processes to better integrate housing, land use, and transportation planning. Integrating both processes helps ensure that the state's housing goals are met.

The San Diego region received its RHNA Determination from the California Department of Housing and Community Development for the fifth housing element cycle (2013-2020), as shown in Table 3.3, following consultation with SANDAG.

SANDAG worked with the local jurisdictions to identify RHNA allocation options that meet the four goals of housing element law as described below. The reports including background information regarding the RHNA are included in Appendix D.

1. Increasing the housing supply and the mix of housing types, tenure, and affordability in all cities and counties within the region in an equitable manner, which shall result in all jurisdictions receiving an allocation of units for low- and very low-income households.

It allocates RHNA numbers in all four income categories to each of the region's 19 jurisdictions, thus addressing the objective of promoting socioeconomic equity throughout the region. Table 3.4 demonstrates the mix of housing types planned for in the region by jurisdiction and subregion in four density categories.

2. Promoting infill development and socioeconomic equity, the protection of environmental and agricultural resources, and the encouragement of efficient development patterns.

It utilizes the forecasted pattern of development from the 2050 Regional Growth Forecast, which incorporates policies in local plans that call for higher density housing to be concentrated in urbanized areas adjacent to transit and that protect environmental and agricultural resources. It also demonstrates that the region's local land use plans have significantly increased the region's multifamily housing capacity and ability to accommodate the housing needs of all income levels during the next housing element cycle and out to the horizon year of the 2050 RTP. Table 3.4

Table 3.3 – RHNA Determination by Income Category January 1, 2010 – December 31, 2011 (RHNA Projection Period)

Income Categories	%	Units
Very Low	22.5%	36,450
Low	17.1%	27,700
Moderate	18.9%	30,610
Above Moderate	41.5%	67,220
Total	100 %	161,980

Source: California Department of Housing and Community Development (HCD)

demonstrates the significant housing capacity, particularly in the 20 dwelling units per acre or greater density range, for which local jurisdictions have planned in the future.

3. Promoting an improved intraregional relationship between jobs and housing.

It promotes an intraregional relationship between jobs and housing because the 2050 Regional Growth Forecast distributes housing and employment growth at a jurisdiction level using a model that considers proximity to job centers, travel times, and commuting choices, as well as land use plans. Figure 3.23: 2050 Transit Network and Higher Density Land Uses, shows the relationship of higher density land uses (residential, employment, and mixed use) to planned high quality transit corridors in the 2050 RTP/SCS. This map also is included in Chapter 3 of the 2050 RTP/SCS.

4. Allocating a lower proportion of housing need to an income category when a jurisdiction already has a disproportionately high share of households in that income category, as compared with the most recent decennial United States census.

It also moves toward improving the current distribution of lower-income households in the region to reduce over-concentration. Appendix D includes a comparison of the RHNA very low and low income allocations considered during the RHNA process and the regional (40 percent) and jurisdiction percentages of existing lower income households based on U.S. Census data (Column (a)). Column (c) is the RHNA allocation of lower income housing by jurisdiction as a percentage of their total RHNA. It shows that the RHNA moves most jurisdictions closer to the regional percentage of lower income households with the exception of the city of Del Mar and the Unincorporated area of the County. The small size of Del Mar (population just over 4,000) and the rural nature and lack of infrastructure in the Unincorporated area of the County resulted in RHNA allocations with a lower percentage of lower income housing than the regional percentage of lower income households.

The RHNA also moves toward improving the current distribution of lower income households in the region. This is shown in Appendix D, (RHNA Report Table 4).

The RHNA Plan allocates the RHNA Determination by jurisdiction. Based on the RHNA Plan each jurisdiction will need to identify adequate sites to address its RHNA allocations in the four income categories when updating its housing element. Housing elements are due no later than 18 months after the SANDAG Board adopts the 2050 RTP, or April 27, 2013.

Table 3.4 shows that the region has more than enough housing capacity in a variety of density ranges to accommodate the RHNA allocations as well as the population projections to 2050. This table provides housing capacity information based on the 2050 Regional Growth Forecast for the City of San Diego, the Unincorporated County, and each city grouped by subregion. In addition to housing capacity based on local general plans, the housing capacity in the 2050 growth forecast includes projected changes to adopted general plans in some jurisdictions. This "stretch" or "visionary" capacity was based on input from the local jurisdictions and partner agencies for the period of 2035 to 2050 (beyond the time period for the RHNA). Local land use inputs for the 2035 to 2050 period include draft plan updates, rezoning, future redevelopment (based on existing plans), mixed-use development at transit stations, and redevelopment within Smart

The region has more than enough housing capacity in a variety of density ranges to accommodate the RHNA allocations as well as the population projections to 2050.

Growth Opportunity Areas shown on the Smart Growth Concept Map (See Technical Appendix 9).

SB 375 requires consistency between the RHNA and SCS – that is, that the SCS land use pattern can accommodate the RHNA Determination for the fifth housing element cycle.

Any changes to land use plans or zoning that occur during the updates of housing elements by local jurisdictions as a result of the RHNA will be reflected in the next regional growth forecast and RTP. This will ensure that land use changes resulting from the RHNA and the housing element process will be considered in future updates of these two key planning documents. The goal is to ensure consistency between future land use and transportation plans through an iterative process.



Table 3.4 – 2050 Growth Forecast Estimated Housing Capacity By Jurisdiction and Subregion

	Dwelling Units Per Acre				
	<10	**10-19**	**20-29**	**30+**	**Total**
City of San Diego	**10,671**	**22,084**	**51,266**	**149,784**	**233,805**
Unincorporated	**53,938**	**5,314**	**1,179**	**5,223**	**65,654**
North County Coastal	**8,655**	**3,961**	**3,654**	**4,415**	**20,685**
Carlsbad	3,968	1,528	885	720	7,101
Del Mar	31	28	10	2	71
Encinitas	1,578	838	899	394	3,709
Oceanside	2,992	1,528	1,452	3,299	9,271
Solana Beach	86	39	408	0	533
North County Inland	**7,230**	**2,672**	**3,146**	**15,773**	**28,821**
Escondido	2,543	783	493	3,550	7,369
Poway	1,563	13	0	353	1,929
San Marcos	2,292	944	2,049	882	6,167
Vista	832	932	604	10,988	13,356
East County	**2,181**	**2,476**	**1,337**	**22,940**	**28,934**
El Cajon	-772	1,352	504	12,721	13,805
La Mesa	231	220	159	7,862	8,472
Lemon Grove	135	176	190	1,220	1,721
Santee	2,587	728	484	1,137	4,936
South Bay	**4,373**	**8,586**	**14,155**	**30,158**	**57,272**
Chula Vista	4,189	7,347	9,354	13,738	34,628
Coronado	12	6	148	122	288
Imperial Beach	5	745	378	1,406	2,534
National City	167	488	4,275	14,892	19,822
Total	**87,048**	**45,093**	**74,737**	**228,293**	**435,171**

Source: SANDAG 2050 Regional Growth Forecast

Protecting Resource Areas and Farmland: A key element of the Sustainable Communities Strategy

"Gather and consider the best practically available scientific information regarding resource areas and farmland in the region." (Government Code Section 65080(b)(2)(B)(v))

The SCS land use pattern identifies protected parklands and open space, natural resource areas, and farmland in the region.

San Diegans share a strong attachment to the region's open spaces. When asked what they like most about the San Diego region, natives and newcomers alike consistently cite the enviable climate, beaches, bays, urban canyons, local mountains, and deserts.

In addition to identifying areas where development is projected to occur, the SCS land use pattern identifies protected parklands and open space, natural resource areas, and farmland in the region. These parklands and open space, natural resource areas, and farmland were identified using the best practically available scientific information. This includes the SANDAG Land Information System database, SANDAG Conserved Lands database, San Diego Geographic Information Source (SanGIS) database, Multiple Species Conservation Program (MSCP), and the North County Multiple Habitat Conservation Program (MHCP).

Of the 2.7 million acres within the San Diego region, about half (50.6 percent) have been conserved as parks or open space (see Table 3.5). These acres are included in the SCS land use pattern. These lands range from public use parks, such as Mission Bay and Anza Borrego State Park, to rural open space such as the Otay Mountain Wilderness Area and U.S. Forest Service Lands. These areas do not include military areas such as Camp Pendleton and Marine Corps Air Station Miramar, which contain undeveloped land that is not accessible to the public and not considered conserved as open space. Figures 3.14 through 3.16 (housing density) show the location of these parks and open space lands.

The natural environment in the San Diego region includes three general geographic areas: the coast, the mountains, and the desert. Most people live and work in the western portion of the region. Although nearly 24 percent of the western portion of the region is not in its original natural state (about 19 percent is developed, 4 percent is in



Table 3.5 – Park Land and Open Space in the San Diego Region

Ownership	Type	Acreage
Public	Designated Park	996,170
	Public Open Space	278,673
Private	Conserved Lands	92,013
Total:		**1,366,828**

Source: SANDAG 2050 Regional Growth Forecast and SANDAG Conserved Lands Database

agricultural production and 1 percent is disturbed habitat), the remaining 76 percent is made up of natural habitats. Of these, 30 percent are covered by chaparral, 8 percent by coastal sage scrub, 5 percent by grasslands, and 33 percent by other types of vegetation (including those found in dunes, marshes, oak and eucalyptus woodlands, riparian scrub, and coniferous forests), as shown in Figure 3.17 (San Diego Regional Generalized Vegetation).

Protecting the Region's Natural Habitats

The San Diego region has conserved natural habitats for the last two decades. Regional planners have focused considerable effort on four habitat conservation plans (HCP): the Multiple Species Conservation Program (MSCP) South, finalized in 1998; the Multiple Habitat Conservation Program (MHCP), finalized in 2003; the North County MSCP, anticipated for completion in 2012; and the East County MSCP, which is expected to begin after the North County MSCP is adopted. The SCS land use pattern incorporates finalized habitat plans as well as the conservation of other sensitive resource lands such as steep slopes, wetlands, and floodplains as reflected in plans by local jurisdictions. These local and regional plans shown on Figure 3.18 ensure the conservation of plant and animal species, and natural habitats through low density zoning, conservation easements, and land purchases.

Six jurisdictions (the cities of Carlsbad, Chula Vista, La Mesa, Poway, San Diego, and the southern portion of the County of San Diego), have approved habitat conservation plans and signed implementing agreements that collectively cover 20 percent of our region. Seven jurisdictions (the cities of Encinitas, Escondido, Oceanside, San Marcos, Santee, Vista, and the northern portion of the County of San Diego) are working on agreements that cover another 73 percent of our region.

Seven jurisdictions (the cities of Coronado, Del Mar, El Cajon, Imperial Beach, Lemon Grove, National City, and Solana Beach), which collectively cover slightly more than 1 percent of our region, are not pursuing agreements because they have limited natural habitats within their boundaries. The remaining 6 percent of our region is military land conserved by Integrated Natural Resource Management Plans, which are developed under voluntary, cooperative agreements among a Department of Defense installation, the U.S. Fish and Wildlife Service, and the California Department of Fish and Game.

As part of the SANDAG participation in planning for the conservation of regional habitats, SANDAG developed a database of conserved lands in 2010 (SANDAG Conserved Lands database, 2010). This database, which is regularly updated and available to the public, serves as the basis for monitoring habitat conservation (http://www.sandag.org/resourcemaps).

Figure 3.17

San Diego Region Generalized Vegetation

October 2011

- Chaparral (779,519 ac)
- Coastal Sage Scrub (213,579 ac)
- Coniferous Forest (70,429 ac)
- Desert Chaparral (86,205 ac)
- Desert Dunes (888 ac)
- Desert Scrub (437,164 ac)
- Dry Wash Woodland (33,573 ac)
- Grassland (135,492 ac)
- Marsh (6,121 ac)
- Meadow and Seep (12,136 ac)
- Oak Forest (11,162 ac)
- Other Woodlands (101,253 ac)
- Pinyon Juniper Woodlands (54,023 ac)
- Playas/Badlands/Mudhill Forbs (47,779 ac)
- Riparian (53,640 ac)
- Southern Foredunes or Beach or Saltpan or Mudflats (1,973 ac)
- Urban, Disturbed Habitat, Agriculture, Eucalyptus (677,585 ac)
- Water

Data Source: AECOM 2011

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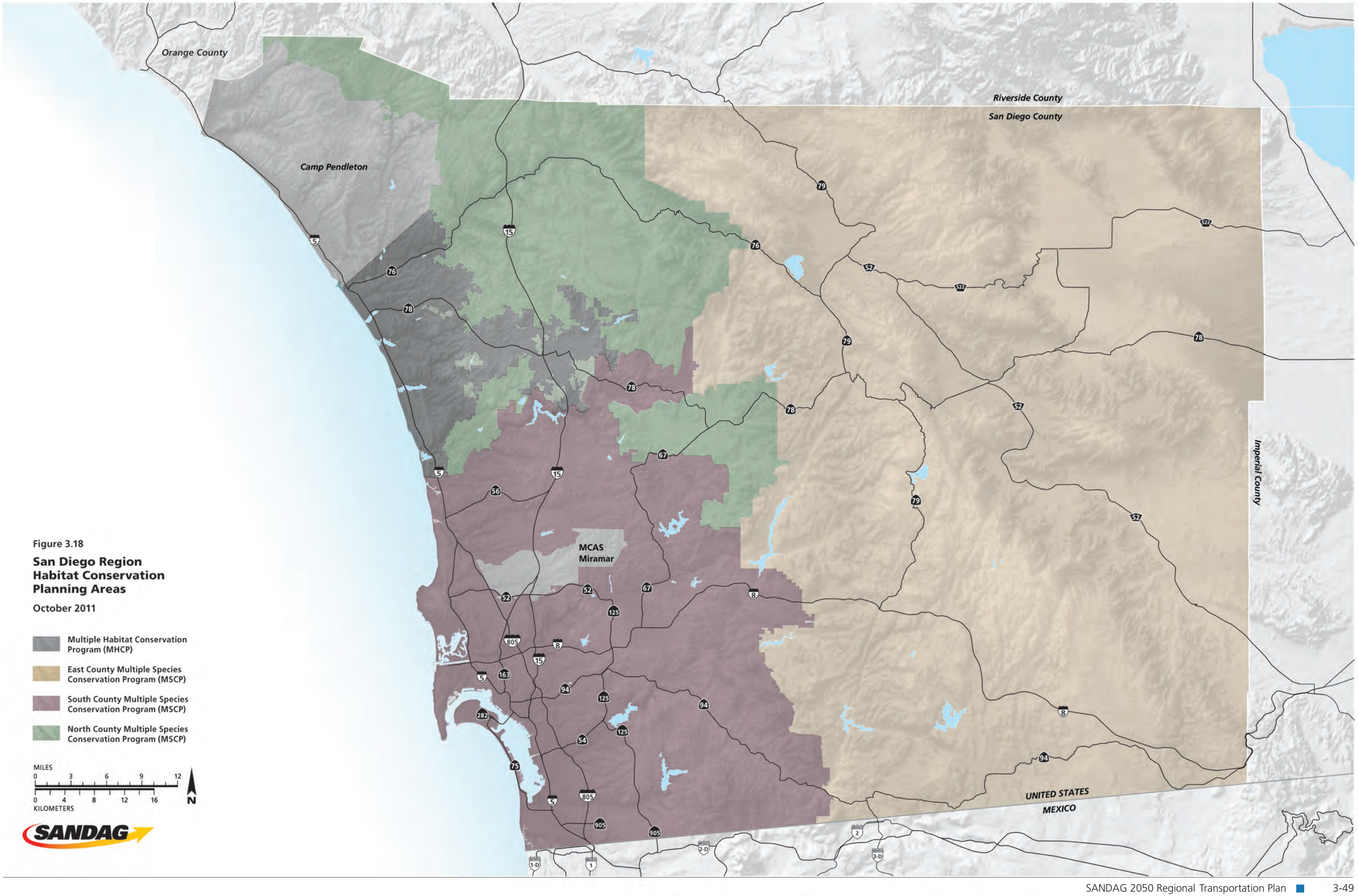


Figure 3.18

San Diego Region Habitat Conservation Planning Areas

October 2011

- Multiple Habitat Conservation Program (MHCP)
- East County Multiple Species Conservation Program (MSCP)
- South County Multiple Species Conservation Program (MSCP)
- North County Multiple Species Conservation Program (MSCP)

Conserved habitat lands and land proposed for habitat conservation totals 61 percent of the region, as shown in Figures 3.19 and 3.20. This includes lands in each of the habitat conservation areas (Figure 3.18). It is anticipated that all conserved lands would be protected by the year 2030 in accordance with the approved conservation plans and signed implementing agreements. Figure 3.21 illustrates wetlands in our San Diego region.

The regional habitat conservation plans in the San Diego region are designed to provide an umbrella of protection for multiple species by conserving their habitats and the linkages that allow them to travel between habitats. The HCPs were designed under the State's Natural Communities Conservation Planning program. Even though the umbrella protection was afforded to most species and habitats, additional protections are required to cover species not included in the regional habitat plans (e.g., Tidewater goby (Eucyclogobius newberryi)). These additional protections also are needed while experts continue to study whether the habitat plans adequately protect species (e.g., Hermes copper butterfly (Lycaena thornei)). In most cases, the distribution and abundance of these species are unknown. While conservation, management, and monitoring efforts provided under the regional HCPs are expected to help these species, additional regulatory protections exist for them. An analysis of project impacts to all biological resources is still required under the California Environmental Quality Act (CEQA) for sensitive species, sensitive habitat (including wetlands), and wildlife movement.

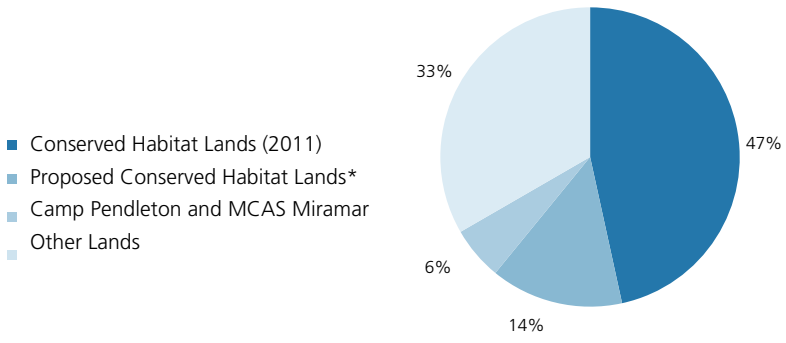
Federal or state permits also may be required under the Clean Water Act, the California Fish and Game Code, and/or the Porter-Cologne Water Quality Act based upon the project-specific impact analysis. In addition, local jurisdictions may have their own mitigation requirement for species (also known as species-specific mitigation) that are not included in the HCPs. Regional HCPs, therefore, provide an umbrella of protection through regional habitat conservation without taking away existing protection by other local, state, or federal regulations.

TransNet Environmental Mitigation Program

"The metropolitan planning organization shall consider financial incentives for cities and counties that have resource areas or farmland." (Government Code Section 65080(b)(4)(C))

In 1987, San Diego County voters approved *TransNet*, a half-cent sales tax to fund a variety of transportation improvements throughout the region. The initial 20-year, $3.3 billion program expired in 2008. However, in November 2004, 67 percent of the region's voters supported the extension of *TransNet* for another 40 years to 2048. The extension is expected to generate an additional $14 billion for highway, transit, and local road projects, as well as other transportation improvements.

Figure 3.19 – Land Conserved



* Lands in North and East County Multiple Species Conservation Plan (MSCP) are in the planning process and not adopted.

The Environmental Mitigation Program (EMP) was created as part of the *TransNet* Extension Ordinance, and it goes beyond traditional mitigation programs. ("Mitigation" is the effort to compensate for the loss of native habitat – which is disturbed by new development – through the preservation and/or restoration of another native habitat. Mitigation occurs after all methods to avoid and/or minimize impacts have been exhausted.)

SANDAG employs the EMP to help fill the mitigation needs resulting from major transportation infrastructure improvement projects and programs identified in the RTP.

SANDAG intends to satisfy the mitigation requirements for these projects comprehensively, rather than on a project by project basis, to maximize opportunities for acquiring land early and restoring habitats. In turn, this funding enables SANDAG to help implement regional habitat conservation plans by targeting key acquisition areas for conservation, management and monitoring. As of September 2011, about 1,393 acres have been acquired using EMP funds.

Additional Protection for Rare, Threatened, Endangered, and CEQA-Sensitive Species

CEQA Guidelines Appendix G requires an evaluation of the potential impacts to sensitive species, sensitive habitats, wetlands including riparian habitats, wildlife movement and migration, and the impacts to adopted regional habitat conservation plans. This includes the Natural Communities Conservation Plan and other local policies and plans for biological conservation. Prior to the development of any native habitat in the San Diego region, a biological impact assessment is required by all local jurisdictions subject to the CEQA. The purpose of the assessment is to determine consistency with the regional HCPs and assess any impacts to species and habitats not covered by these plans. This includes wetland resources such as U.S. waters.

Protecting the Region's Farmlands

The Farmland Mapping and Monitoring Program (FMMP), administered by the Division of Land Resource Protection at the California Department of Conservation, produces maps and statistical data to analyze impacts to California's agricultural resources. To characterize existing and potential farmland, agricultural lands are rated according to soil quality and irrigation status. FMMP maps are updated every two years using aerial photographs, a geographic information system, public review, and field reconnaissance. Lands important for agriculture are placed in one of four categories of productivity established by the United States Department of Agriculture (USDA). These lands are evaluated according to the specific qualities of the soil, slope of the land, degree of wetness, flooding hazards and other factors. The FMMP identifies about 223,000 acres of land as "Important Agricultural Lands," as shown in Figure 3.22 and described in Table 3.6.

These lands also are reflected in the SCS land use pattern, and they are not threatened because of low-density zoning, or the purchase of land for conservation easements. In the SCS land use pattern, 95 percent of the region's existing agricultural land is expected to remain available for agriculture. Thirty-three percent of the region's agricultural land is planned for agricultural use only, and 62 percent is planned as low-density, rural residential land that allows and often encourages agricultural use. Figure 3.22 includes agricultural preserves such as the San Pasqual Valley in the City of San Diego and areas under Williamson Act contracts. The California Land Conservation Act

commonly referred to as the Williamson Act enables local governments to enter into contracts with private landowners to restrict specific parcels of land to agricultural or related open space use.

Considering Mineral Resource Areas

The California State Mining and Geology Board has designated some lands to be areas of statewide or regional significance for construction aggregate resources. Aggregate materials include sand, gravel, and crushed stone. They are key ingredients in concrete and asphalt, as well as for constructing and maintaining the physical framework of buildings and infrastructure. According to the California Geologic Survey, aggregate supply sources in the San Diego region have dropped from 48 mines in 1980 to 27 mines in 1995. The number of significant and active mines has since declined to only 16. The California Geologic Survey projects a 40 percent shortfall in the statewide supply of aggregate material needed to meet demand over the next 50 years and an 83 percent shortfall in the region's supply of aggregate material. As supplies decrease, importing aggregate from other regions or countries will increase.

SANDAG, in cooperation with Caltrans District 11, completed the San Diego Region Aggregate Supply Study in January 2011 to examine the supply issues related to aggregate. (The study is available at www.sandag.org/aggregate.) The purpose of the study was to provide background information, as well as the tools necessary to begin developing a framework to address future projected shortfalls of this important resource. The California Department of Conservation classifies lands into four Mineral Resource Zones (MRZs). MRZ-1 includes areas where no significant mineral deposits are present, or where there is little likelihood they are present. MRZ-2 includes areas where geologic information indicates that significant mineral deposits are present, or where there is a high likelihood they are present. MRZ-3 includes areas that contain mineral deposits, but where their significance to the region or state cannot be evaluated because detailed data is lacking. MRZ-4 includes areas where geologic information does not rule out the presence or absence of mineral resources. Areas with the greatest potential for aggregate sources (MRZ-2 classified) are largely designated in local general plans as Military, Open Space and Industrial, and have been considered as such in the SCS land use pattern. Information contained in the San Diego Region Aggregate Study will be used by planners to help manage the region's aggregate resources.

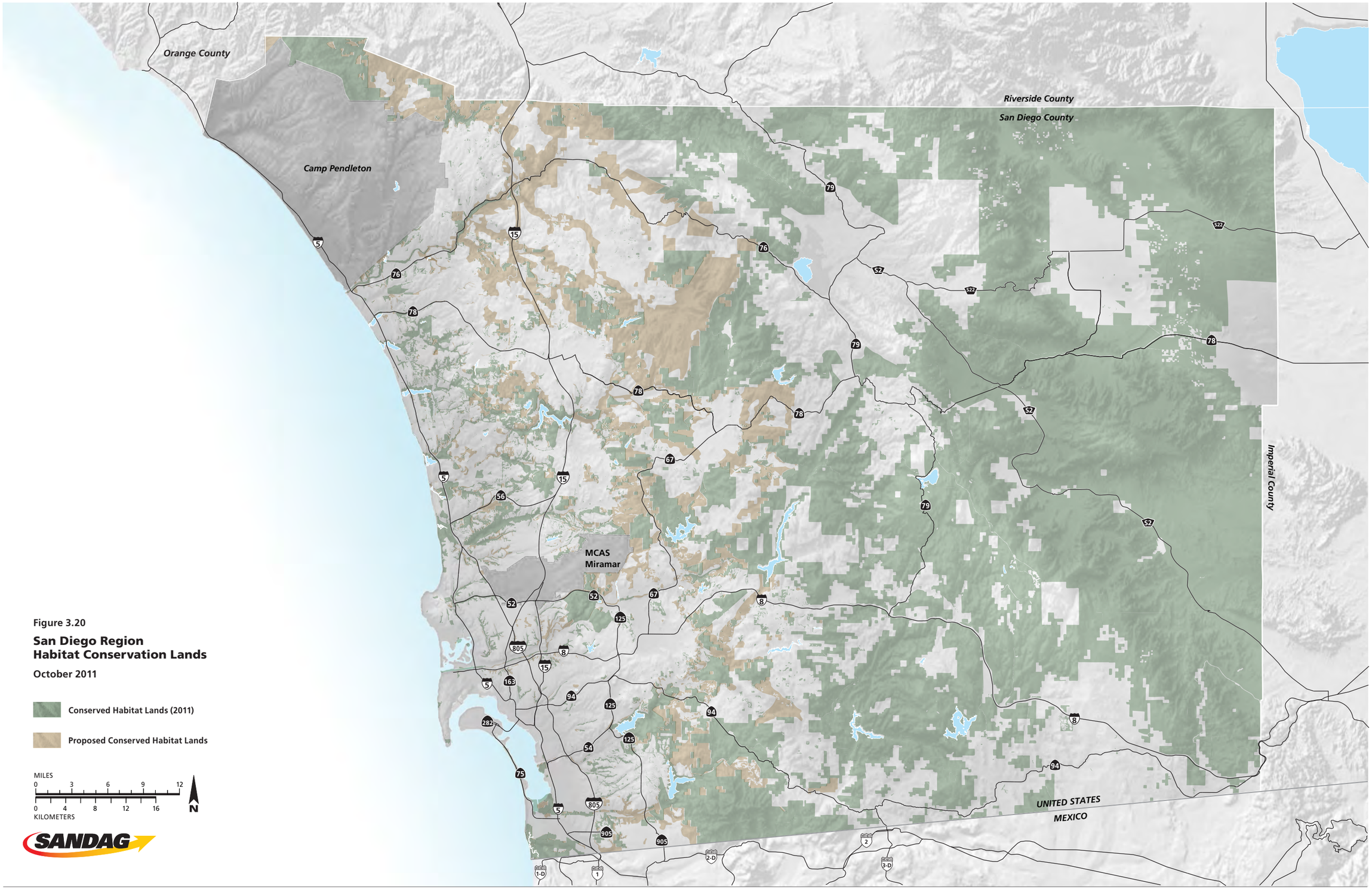


Figure 3.20

San Diego Region
Habitat Conservation Lands

October 2011

Conserved Habitat Lands (2011)

Proposed Conserved Habitat Lands

MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N

SANDAG

Table 3.6 – USDA Important Farmland Acreage

USDA Important Farmland Category	2008 Acreage
Prime Farmland Land with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.	**7,754**
Farmland of Statewide Importance Land similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the last FMMP mapping date.	**10,411**
Unique Farmland Land of lesser quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.	**51,975**
Farmland of Local Importance Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee. In San Diego County, this category is defined as land that meets all the characteristics of Prime and Statewide, with the exception of irrigation. They are farmlands not covered by the above categories but are of significant economic importance to the county. They have a history of good production for locally adapted crops. The soils are grouped in types that are suited for truck crops (such as tomatoes, strawberries, cucumbers, potatoes, celery, squash, romaine lettuce, and cauliflower) and soils suited for orchard crops (avocados and citrus).	**153,186**
Important Farmland Total:	**223,326**

Source: U.S. Department of Agriculture



Orange County

Riverside County

San Diego County

Imperial County

UNITED STATES

MEXICO

Figure 3.21

San Diego Region Wetlands

October 2011

Vegetated Wetland (60,767 acres)

Water Bodies (59,956 acres)

MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS

N

SANDAG

Figure 3.22

San Diego Region
Important Agricultural Lands

October 2011

USDA Farmland Category

- Agriculture Preserve Land Williamson Act (2007)
- Farmland of Local Importance (153,186 acres)
- Prime Farmland (7,754 acres)
- Farmland of Statewide Importance (10,411 acres)
- Unique Farmland (51,975 acres)

MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS
N

SANDAG

Orange County
Riverside County
San Diego County
Imperial County
UNITED STATES
MEXICO

Investing in a Transportation Network that Provides Residents and Workers with Transportation Options that Reduce Greenhouse Gas Emissions: The 2050 RTP Transportation Network

"Identify a transportation network to service the transportation needs of the region." (Government Code Section 65080(b)(2)(B)(iv))

The 2050 RTP and its SCS are based upon four pillars of transportation planning to serve the transportation needs of our region.

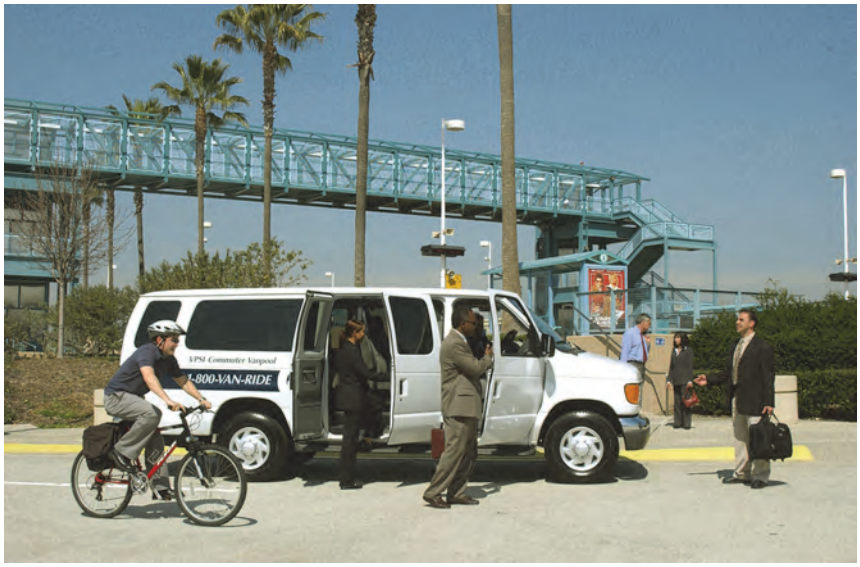
They are a Revenue Constrained Transportation Network (that is, a network funded by financial resources expected between now and 2050); Transportation Demand Management (TDM) measures; Transportation System Management (TSM) measures; and pricing measures. Taken together, these four pillars will provide residents and workers with alternatives to driving alone, and they will help the region meet or exceed its state-mandated targets for reducing GHG emissions. Each of these four components is explained in detail in the following chapters: transportation network (Chapter 6), TDM (Chapter 8), TSM (Chapter 7), and pricing (Chapters 6 and 7).

The GHG emissions reductions per capita shown in Tables 3.1 and 3.7 do not include the use of alternative fuels. Also, they do not consider the benefits of California's low carbon fuel standard program, which calls for a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. They also do not consider the benefits due to increases in vehicle efficiency ("Pavley" regulations that reduce GHG emissions in new passenger vehicles). Although SANDAG is not able to take credit for these transportation measures toward meeting the state-mandated GHG emissions targets for the region pursuant to SB 375, SANDAG recognizes the role that regional and local governments can play in accelerating the deployment of alternative fuel vehicles and fueling and recharging stations. Therefore, SANDAG has been active in this area, which in turn helps the state meet its overall reduction target for greenhouse gases.

An important part of the Revenue Constrained Transportation Network, which is described more fully in Chapter 6, Table 6.3, is a significant investment in public transit (rail and bus), as well as facilities that encourage walking and bicycling as forms of active transportation. The aim of these investments is to significantly increase the attractiveness of public transit, walking, and bicycling – particularly in areas that are planned for more compact and mixed-use development. Investments in our local streets and roads, including access to regional airports; goods movement projects; and TDM and TSM projects and programs also are integral to the overall transportation network.

An important part of the Revenue Constrained Transportation Network is a significant investment in public transit (rail and bus), as well as facilities that encourage walking and bicycling as forms of active transportation.

The overarching goal of the public transit investments detailed in the 2050 RTP (Chapter 6) is to create a world-class transit



system for the San Diego region by 2050 that connects our homes to the region's major employment centers and other destinations. Achieving this vision means making public transit a more appealing option for many trips and reducing the impact of vehicle travel on the environment and on public health. Specific goals include:

- Making public transit more time-competitive with automobile travel
- Maximizing the role of public transit within the broader transportation system
- Reducing vehicle miles traveled and lowering greenhouse gas emissions throughout our region

Investments that promote bicycling and walking also are an important part of the Revenue Constrained Transportation Network.

Investments that promote bicycling and walking also are an important part of the Revenue Constrained Transportation Network. A regional bicycle network, estimated to cost about $419 million (in 2010 dollars) is part of the San Diego Regional Bicycle Plan, approved by the SANDAG Board on May 28, 2010. It is included in the 2050 RTP. The Plan can be found in Technical Appendix 13 and at www.sandag.org/bicycle.This Plan provides a vision for a diverse regional bicycle system of interconnected bicycle corridors, support facilities, and programs to make bicycling more practical and desirable to a wider cross-section of people in our region. This vision is intended to guide the development of the regional bicycle system through the year 2050. In addition, funding estimated at $1.789 billion is included in the 2050 RTP for local bicycle and local and regional pedestrian projects. An additional $700 million is included for a Safe Routes to Transit program to ensure safe pedestrian and bicycle access to transit stations. The Active Transportation Program and the nearly $600-million Smart Growth Incentive Program, total nearly $3.1 billion (in 2010 dollars) in the 2050 RTP.

Providing for a range of transportation options in the region's transportation network will be greatly facilitated by adopting a "Complete Streets" approach to the project development. The complete streets approach affords policy makers, planners and engineers with the opportunity to carefully evaluate and accommodate the needs motorists, pedestrians, cyclists, transit vehicles and transit users, the young and old, and the able-bodied and physically challenged through the entire project development process. This ensures that the needs of all users of the public right of way are properly accommodated based on informed decisions about existing and future demand, and that proper accommodations are designed into the project from the outset.

The Complete Streets Act of 2008 requires local jurisdictions in California to plan for the needs of all transportation system users with every major revision to general plan local circulation elements, and the region's *TransNet* Extension Ordinance requires accommodation of bicyclists and pedestrians in most *TransNet* funded projects. Changes to local policies and project development procedures will be necessary to comply with these requirements, and SANDAG can support this process through incentives and technical assistance. In combination with the smart growth development and urban design practices supported by the RTP and RCP, this will make it easier for the public to choose a means of travel that reduces vehicle miles traveled and greenhouse gas emissions.

Considering *TransNet* Projects in the SCS

"Nothing in this section requires projects programmed for funding on or before December 31, 2011, to be subject to the provisions of this paragraph if they (iii) were specifically listed in a ballot measure prior to December 31, 2008, approving a sales tax

increase for transportation projects." (Government Code Section 65080(b)(2)(L))

The *TransNet* Extension Ordinance as it was approved by the voters in November 2004 includes specific transportation projects. Based upon this provision of SB 375, the projects identified in *TransNet* need not be variables in reaching the GHG targets established by CARB. These *TransNet* projects have been identified in the Revenue Constrained Transportation Network detailed in Chapter 6, Table 6.3.

Transportation Demand Management Measures

TDM measures are important in helping the region reduce GHG emissions by improving the efficiency of our transportation system. These measures help reduce or eliminate vehicle trips during peak periods of demand. They typically offer programs and incentives to encourage the use of modes of transportation other than driving alone, or to encourage people to shift their trips to times when demand on the transportation system is low. Examples of current TDM measures are employer-sponsored transportation benefits, regional transit and vanpool subsidies, and carpool and biking incentives.

The TDM measures that complement the 2050 RTP transportation network (see Chapter 8) include:

- Expanded marketing of the SANDAG iCommute program
- Expanded vanpool and carpool incentive programs
- New resources for teleworking
- Expanded bike locker program and new bike stations
- New bike sharing and carsharing programs



- Expanded SchoolPool programs
- New buspool program in coordination with regional military bases

Transportation System Management Measures

TSM measures also help reduce GHG emissions by helping to maximize the efficiency of existing and future transportation facilities. A combination of programs – including signal and ramp metering coordination and optimization; improved performance monitoring; and advanced vehicle and roadside communication platforms – will increase the ability of operators to monitor the performance of the transportation system, manage our system better, and improve efficiency. TSM measures that complement the 2050 RTP transportation network (see Chapter 7) include expanded:

- Traveler information services
- Improvements to the timing of traffic signals
- Ramp metering

- Management of arterials, freeways, and transit/Trolley corridors
- Bottleneck/auxiliary lane projects
- Incident management (e.g., Freeway Service Patrol)

Pricing Measures

Pricing strategies also are used to reduce the demand on our transportation system. The long-established strategy of varying prices within corridors with Managed Lanes, such as the managed or express lanes in the I-15 Corridor, is included in the 2050 RTP. These High Occupancy Toll (HOT) lanes are operated in ways that incentivize the use of public transit and sharing rides, both of which contribute to reducing greenhouse gas emissions.

Meeting Targets for Reducing Greenhouse Gas Emissions

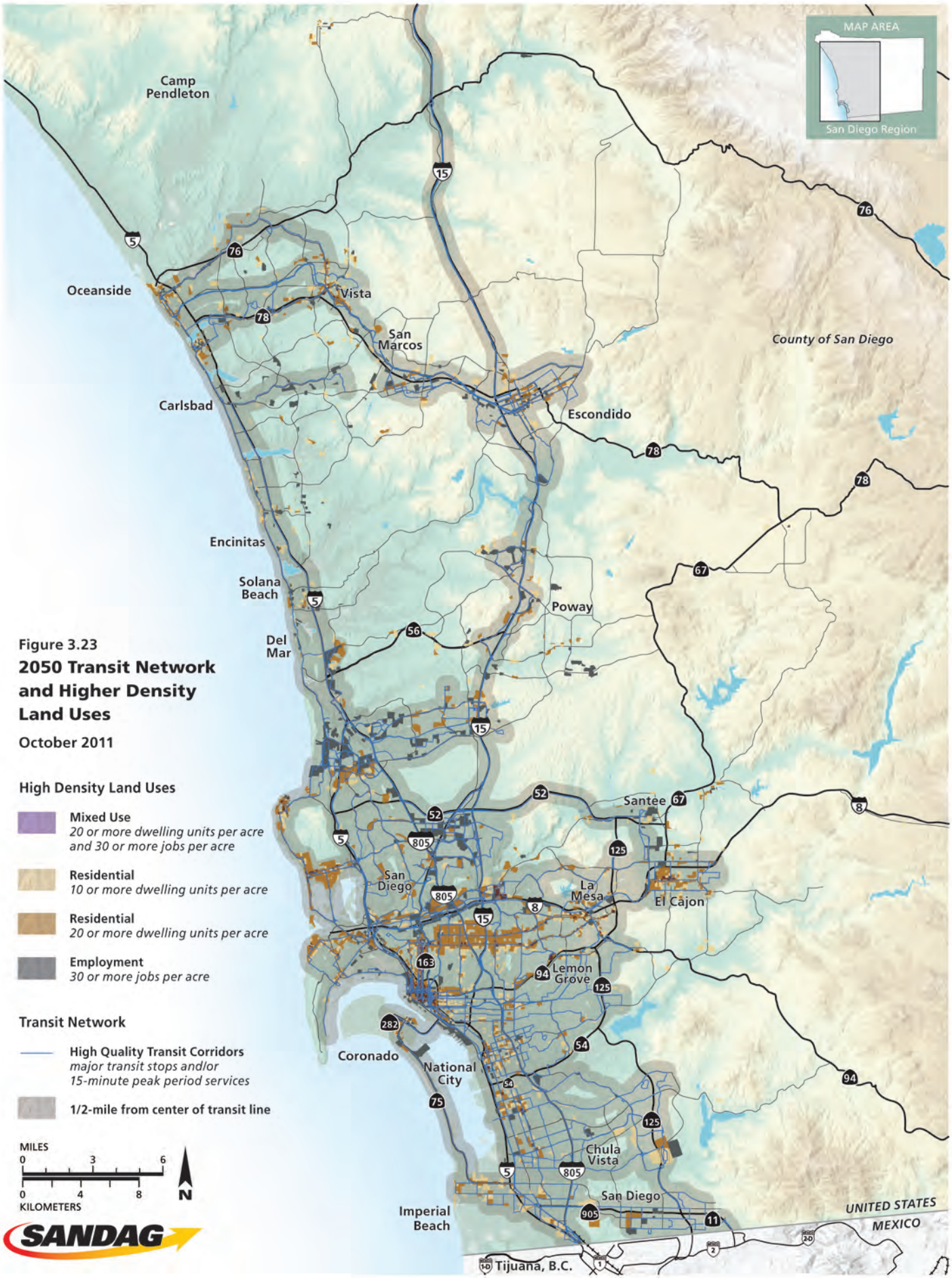
"Set forth a forecasted development pattern for the region, which, when integrated with the transportation network, and other transportation measures and policies, will reduce greenhouse gas emissions from automobiles and light trucks to achieve, if there is a feasible way to do so, the greenhouse gas emission reduction targets approved by the state board." (Government Code Section 65080(b)(2)(B)(vi))

On September 23, 2010, CARB set targets for lowering greenhouse gas emissions in the San Diego region. They call for a 7 percent reduction, per capita, in greenhouse gas emissions from passenger vehicles by 2020 (compared with 2005); and a 13 percent reduction by 2035 through land use and transportation planning.

The San Diego region will meet these targets, shown in Table 3.1, by focusing housing and employment growth in urbanized areas; protecting sensitive habitat and open space; and investing in a transportation system that provides residents and workers with transportation options. The determination that SANDAG will meet the CARB GHG reduction target is based upon modeling methodology which is described further below.

The process to develop the plan was based upon modeling and the use of smart growth and sustainable development principles that have been standard planning practice in the region for some time along with an extensive public outreach process.

Figure 3.23, shows the 2050 RTP transit network and the areas of the region with the highest residential, employment and mixed-use densities as well as the planned open space areas. The land use data illustrated on this map were used to identify the most appropriate locations for public transit investments to support the higher density development assumed in the SCS land use pattern. This figure also illustrates that more than half the region's land area remains in open space.


MAP AREA
San Diego Region
Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
County of San Diego
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 3.23
2050 Transit Network and Higher Density Land Uses
October 2011
High Density Land Uses
Mixed Use
20 or more dwelling units per acre and 30 or more jobs per acre
Residential
10 or more dwelling units per acre
Residential
20 or more dwelling units per acre
Employment
30 or more jobs per acre
Transit Network
High Quality Transit Corridors
major transit stops and/or 15-minute peak period services
1/2-mile from center of transit line
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG

In evaluating the performance of the RTP/SCS, SANDAG used an enhanced four-step transportation model. Four-step models have been the standard in transportation modeling since the late 1950s, and they are used by nearly every Metropolitan Planning Organization (MPO) in the United States for the development of transportation plans, corridor studies, Federal Transit Administration New Starts proposals, and air quality analyses. The traditional four steps of this model are:

1. Trip generation
2. Trip distribution
3. Mode choice
4. Traffic (route) assignment

Output from the four-step model includes total vehicle miles traveled in the region and other GHG factors such as vehicle speed and congestion. The model outputs take into account the forecasted land use pattern, the revenue constrained multimodal transportation network, and the implementation of telework programs. These outputs are converted into total GHG emissions in the region using the CARB Emission Factors (EMFAC 2007) model.

The regional transportation model inputs include the land use, motorized network, TSM, and TDM assumptions in the SCS. All of the SCS inputs interact and fuse with one another in the transportation model, which makes it difficult to identify the individual contribution of each component to the overall GHG reductions. For example, modeling each component individually and summing results will yield a different result than modeling the components collectively due to the mutual benefits of the components working together.

SANDAG includes reductions in GHG emissions using off-model factors to account for the following programs: Safe Routes to School; regional vanpool, carpool, and buspool programs; and pedestrian and bicycle network improvements. Unlike the transportation model that combines various factors into one summarized output, the off-model measures are calculated separately.

Each off-model strategy was developed with its own unique calculation methodology based on a review of best practices across the country. Documentation of this methodology is included in Technical Appendix 15. SANDAG also contracted with a consultant to validate the methodology of the off-model calculations.

The off-model GHG reduction benefits are then subtracted from the model GHG outputs to determine the projected GHG emissions for the region. Per capita emissions are calculated using total projected GHG emissions divided by the regional population. For this analysis, and to determine if the SCS achieves the GHG targets pursuant to SB 375, only emissions from four CARB vehicle classifications are included in this calculation. They are: Light Duty Auto, Light Duty Truck 1, Light Duty Truck 2, and Medium Duty Truck.

The SANDAG transportation model also evaluates VMT and CO_2 emissions for all vehicles, which include passenger vehicles covered under SB 375 as well as heavy duty trucks, public buses, and motorcycles. Table 3.7 below provides additional model output information to further explain the emission reductions (tons per capita) for SB 375 vehicle classes and all vehicle classes and for the horizon years of 2020, 2035 and 2050. SB 375 requires that SANDAG demonstrate how emission reduction targets will be met for 2020 and 2035, not 2050.

Table 3.7 – Results of GHG Emissions and VMT Reductions – 2050 SANDAG Regional Transportation Plan

Vehicle Miles Traveled Per Capita						
			Change from 2005		Change from 2008	
	SB 375[1]	All[2]	SB 375[1]	All[2]	SB 375[1]	All[2]
2005	25.4	27.6	-	-	-	-
2008	24.4	25.6	-4%	-7%	-	-
2020	22.3	23.6	-12%	-14%	-9%	-8%
2035	22.8	24.3	-10%	-12%	-7%	-5%
2050	23.6	25.2	-7%	-8%	-3%	-2%
Carbon Dioxide (CO_2) - Tons Per Capita						
			Change from 2005		Change from 2008	
	SB 375[1]	All[2]	SB 375[1]	All[2]	SB 375[1]	All[2]
2005	26.0	31.3	-	-	-	-
2008	24.9	28.0	-4%	-10%	-	-
2020	22.4	25.8	-14%	-18%	-10%	-8%
2035	22.6	26.7	-13%	-15%	-9%	-5%
2050	23.5	27.8	-10%	-11%	-6%	-1%

[1] Cars and light duty trucks only

[2] All vehicles

Source: SANDAG Travel Demand Model

So why do GHG reductions decrease over time? There are several factors that cause this decrease. First, in the early years of the RTP, the region makes significant investments in the transportation network, including major transit investments, during a recessionary economic cycle when fewer people are driving to jobs and more people choose to use other transportation options. As a result, there are higher initial reductions from the 2005 base year. By 2020 and 2035 it is assumed that the economy improves and more residents are driving to jobs. Additionally, in the later years of the plan, after the urbanized areas have been developed according to local general plans, development will gradually move toward more remote areas where fewer transportation options are available. This growth is likely to result in an increased demand for driving.

The results shown for 2050 are best estimates based on historical and current empirical observations in the region and do not reflect attitude changes about transportation. Such changes may occur as a result of significant investments in other transportation options and changes to local land use plans that could result in greater densification of our urban areas.

In addition, the GHG modeling for 2050 uses emission factors for the year 2040 (EMFAC 2007 includes emissions factors through 2040 only) and assumes no technological

The opportunities for affordable housing and access to public transit are intended to reduce housing and transportation cost burdens on lower income individuals and families.

improvements to vehicles or fuels in the final ten years of the plan.

As part of each RTP update (every four years) SANDAG prepares a new regional growth forecast and continues to update modeling tools and assumptions to reflect the latest information available. Should the likely future development pattern change, this would be reflected in the next regional growth forecast and SCS land use pattern. SANDAG also will continue to improve modeling capabilities and update modeling assumptions to reflect the most recent published and accepted data regarding changes in travel behavior and technological advances.

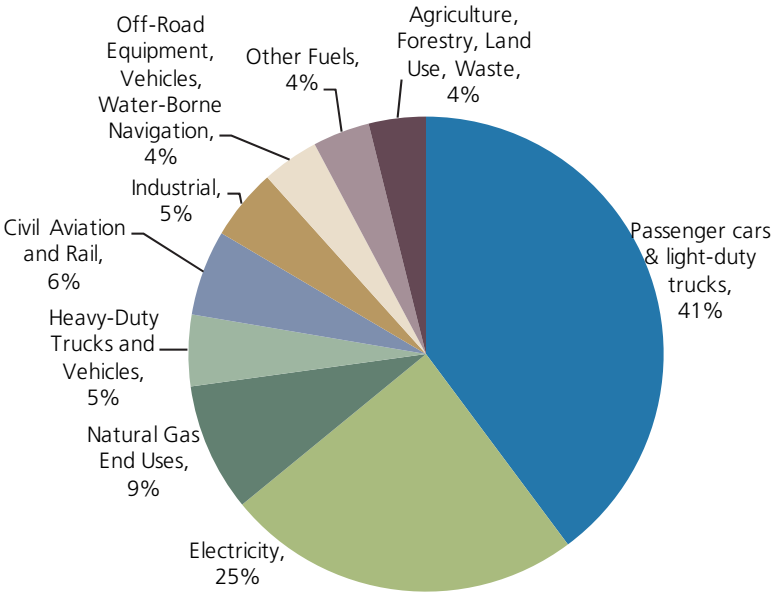
Considering Social Equity in the SCS

Equity is essential to our region's economic sustainability. How our region uses land and organizes its transportation system significantly influences the quality of life for its residents. It is vitally important to plan housing and invest in a transportation network that provides all residents with equal opportunities to live, work, shop, study, be healthy, and play in our region – regardless of their age, race, color, national origin, income, or physical capabilities.

The SCS land use pattern accommodates the estimated 388,000 new homes needed to serve projected growth (1.25 million more people) within our region, including all economic segments of the population, during the RTP planning period. Most of these new housing units are proposed at the higher densities that provide the greatest opportunity for affordable housing to be built. Additionally, a majority of the planned higher density homes are located within one half-mile of existing or planned public transit. Taken together, the opportunities for affordable housing and access to public transit are intended to reduce housing and transportation cost burdens on lower income individuals and families.

More detailed information and analysis of social equity considerations is included in Chapter 4.

Figure 3.24 – San Diego County Greenhouse Gas Emissions by Category (2006)



Source: Energy Policy Initiatives Center (EPIC)

Considering Energy Consumption and Cutting Greenhouse Gas Emissions in the SCS

The transportation of people and goods in cars, trucks, buses, and on motorcycles is the single largest source of greenhouse gas emissions in our region. It accounts for 46 percent of total emissions, with passenger cars and light-duty trucks alone responsible for 41 percent. Heavy-duty trucks and vehicles represent about five percent of greenhouse gas emissions. Civil aviation and rail (passenger and freight) account for 6 percent, and additional emissions result from electricity

that powers the Trolley. Figure 3.24 shows greenhouse gas emissions in the San Diego region by category.

The levels of fuel consumption and greenhouse gas emissions result from our region's reliance on petroleum-based gasoline and diesel fuels, as well as the average fuel efficiency of vehicles. The region's need for gasoline and diesel is projected to decline from about 4.5 million gallons per day in 2008 to about 4.2 million gallons per day by 2050. The projected reduction in fuel consumption is due in large part to state fuel efficiency standards for vehicles and state mandated increases in the supply and use of alternative transportation fuels.

California adopted a low carbon fuel standard that will require a reduction in the carbon intensity of California's transportation fuels by at least ten percent by 2020. This will be achieved by offering a variety of fuel options for personal vehicles that include electricity, natural gas, propane, and biofuels. SANDAG has taken strides to assess what regional infrastructure is needed to accommodate more alternative fuel choices across the region. It also has supported the development of publicly accessible electric charging stations.

In 2009, SANDAG and other regional entities began contributing to the Electric Vehicle (EV) Project for the San Diego region. The EV Project is a nationally-sponsored program to install electric vehicle chargers throughout a handful of major metropolitan areas in the United States. The San Diego region was selected as one of those first markets, so several local governments, universities, SANDAG, the California Center for Sustainable Energy and SDG&E have collaborated with Ecotality on local infrastructure planning and installation considerations. Through the EV Project, more than 1,400 plug-in electric vehicle chargers will have been installed around San Diego by early 2012, as well as about 1,000 home chargers at residences and fleet locations in San Diego County. Supporting alternative fuel efforts are addressed in greater detail in the following SANDAG reports: Regional Energy Strategy; Climate Action Strategy; and

The transportation of people and goods in cars, trucks, buses, and on motorcycles is the single largest source of greenhouse gas emissions in our region.



Regional Alternative Fuels, Vehicles, and Infrastructure Report for the San Diego Region.

Meeting Federal Air Quality Requirements

"Allow the regional transportation plan to comply with the federal Clean Air Act." (Government Code Section 65080(b)(2)(B)(viii))

SANDAG and the U.S. Department of Transportation (DOT) must make a determination that the RTP and the Regional Transportation Improvement Program (RTIP) conform to the state implementation plan (SIP) for air quality. Conformity to the SIP means that transportation activities will not create new air quality violations, worsen existing violations, or delay the attainment of the national ambient air quality standards. Analyses for Carbon Monoxide, and for Reactive Organic Gases and Nitrogen Oxides as precursors to Ozone, were conducted for the 2050 RTP. These analyses demonstrate that the 2050 RTP conforms to the SIP. This process is documented in Appendix B.

Climate Change Impacts and Adaptation

The transportation sector has been identified as a key contributor of greenhouse gases, but also is threatened by the impacts of continued climate change. The climate of the San Diego region is expected to change, even under the most optimistic scenarios for reducing greenhouse gas emissions. Potential impacts include more frequent and intense heat waves, more frequent and intense wildfires, degraded air quality, fresh water shortages, rising sea levels and higher storm surges, the loss of native plant and animal species, and a higher demand for electricity during peak periods. Developing and implementing measures to help the region adapt to these potential changes will be critical in protecting the regional transportation network.

More frequent hot days and prolonged periods of extreme heat would increase the risk of buckling highways and railroad tracks. This could lead to increased and more frequent maintenance costs, premature deterioration, or even the failure of transportation infrastructure. More frequent and severe wildfires that are followed by rainfall would increase the risk of mudslides. This could disrupt major infrastructure such as roadways and rail lines. Rising sea levels and stronger storm surges would likely impact high-density urban areas, ports, airports, and other vital lines of coastal transportation. Existing fortifications may need to be enhanced as sea levels rise and storm surges intensify, and areas not previously considered at risk may need to be protected. Preparing transportation infrastructure for climate change impacts is a new priority as future projects are designed and our current system is maintained.

The tools and methodologies for evaluating and adapting to such impacts are still in the early stages of development and will require ongoing monitoring.

Considering Public Health in the SCS

According to the U.S. Centers for Disease Control and Prevention (CDC), the percentage of Californians that is obese increased from less than 10 percent in 1985 to nearly 25 percent in 2008. The San Diego County Health and Human Services Agency (HHSA) reports that in 2007, 33 percent of county residents were overweight and nearly 22 percent were obese.

Evidence suggests that land use and transportation planning policies affect public health. Epidemiological studies have shown that people who live in compact, mixed-use communities have more opportunities to walk and they are less likely to be obese and hypertensive, compared with people who live in communities in which automobiles are primarily used to get around. Land use patterns in many communities today make driving a necessity, and they discourage walking and bicycling. A decrease in walking and bicycling results in a decrease in daily physically activity. This contributes significantly to the epidemic in obesity, especially among children. Childhood obesity in the U.S. more than tripled during the last 30 years. In our San Diego region, more than one in four children are obese. As with the adults, poor nutrition and a lack of physical activity are cited as the primary causes.

In light of growing evidence that links land use patterns and transportation infrastructure with public health outcomes, community planners and public health practitioners in San Diego and around the country have begun to collaborate to develop strategies that improve health and wellness through smarter development. The SCS land use pattern is moving our San Diego region toward a healthier future by focusing on improving the connection between land use and transportation. The result is more walkable communities, more people bicycling, and more people using public transit.

Strategies related to public health are described in more detail in Social Equity and Environmental Justice (Chapter 4), in Systems Development (Chapter 6), and Demand Management (Chapter 8).



Promoting Sustainability through Incentives and Collaboration: SANDAG Policies and Programs that Support the SCS

"Neither a sustainable communities strategy nor an alternative planning strategy regulates the use of land, nor, except as provided by subparagraph (J), shall either one be subject to any state approval. Nothing in a sustainable community's strategy shall be interpreted as superseding the exercise of land use authority of cities and counties within the region." (Government Code Section 65080(b)(2)(K))

This SCS does not regulate or supersede the exercise of land use authority of the region's cities or the County of San Diego. SANDAG has adopted a number of policies and programs that support the SCS and provide information and funding to assist local jurisdictions in planning for and monitoring sustainability in their communities.

Policies, programs, and guidelines that SANDAG has adopted over the past few years that support the SCS include:

- Regional Comprehensive Plan: Sets forth a regional strategy for smart growth and sustainable development in the San Diego region
- Smart Growth Concept Map: Identifies existing, planned, and potential smart growth opportunity areas in our region
- *TransNet* Smart Growth Incentive Program: Provides funds to local jurisdictions that are engaged in smart growth planning and smart growth capital investments
- *TransNet* Environmental Mitigation Program: Provides funding for mitigating local and regional transportation projects, as well as additional funding for acquiring, managing, and monitoring natural habitats in ways that support our region's habitat conservation programs
- *TransNet*/Transportation Development Act Active Transportation Program: Provides funding for bicycle, pedestrian, and traffic calming planning and capital improvement projects
- Healthy Works: Provides grant funding from the American Recovery and Reinvestment Act (ARRA) through the Centers for Disease Control (CDC) and County of San Diego to help local jurisdictions and non-profit organizations plan healthy communities by integrating public health considerations into planning efforts and promoting Safe Routes to School programs and strategies
- Supplemental Funding Potential: A collaborative effort led by a Quality of Life Steering Committee and Working Group to identify the needs and possible funding mechanisms for four infrastructure areas: habitat conservation, shoreline preservation, water quality enhancement, and public transit
- Climate Action Strategy: A guide to help policymakers consider climate change as they make decisions to meet the varied needs of our region's growing population, maintain and enhance the region's quality of life, and promote economic stability
- Regional Energy Strategy: An energy policy guide for policymakers and staff of member agencies as the region strives to meet the energy needs of a growing population and expanding housing stock while also enhancing our region's quality of life and economic stability
- Regional Alternative Fuels, Vehicles, and Infrastructure Report for the San Diego Region: A guide to help local governments and other regional stakeholders make informed decisions regarding alternative fuel and vehicle technologies for a variety of fleet applications, and to identify regional and local government actions that can support alternative fuel vehicles
- Smart Growth Design Guidelines: These guidelines address the importance of design in maintaining and enhancing community character and in creating great public places
- Trip Generation for Smart Growth and Parking Strategies for Smart Growth: These studies identify trip generation rates and parking demands associated with smart growth developments
- RCP Performance Monitoring: A mechanism used to track progress in the implementation of the RCP

Consultation with the Local Agency Formation Commission

"In preparing a sustainable communities strategy, the metropolitan planning organization shall consider spheres of influence that have been adopted by the local agency formation commissions within its region." (Government Code Section 65080(b)(2)(G))

SANDAG considered spheres of influence that have been adopted by the Local Agency Formation Commission (LAFCO) within our region during the development of the SCS. A sphere of influence is defined as a plan for the probable physical boundaries and service area of a local government agency, as determined by LAFCO. All territory proposed for annexation to an incorporated city is required to be included in the city's sphere of influence and be located within the city's general plan.

LAFCO is responsible in our region for assisting the state legislature with promoting orderly development and growth while fulfilling many regional priorities. These include: accommodating growth within or through the expansion of local agency boundaries, extending necessary government services, preserving open space and prime agricultural lands, and promoting the provision of housing for residents of all incomes.

LAFCO also is a member of the Regional Planning Technical Working Group, which provides coordination on regional planning issues among member agencies. Members of the working group include the planning or community development director from each of the 18 cities and the County of San Diego, as well as representatives from other single-purpose regional agencies.

In the development of the 2050 Regional Growth Forecast, LAFCO and SANDAG consulted regularly and exchanged written correspondence regarding sphere of influence determinations, impacts of proposed jurisdictional changes, and factors considered in the review of proposals. The 18 incorporated cities and the County of San Diego were asked about sphere of influence issues during the 2050 Regional Growth Forecast land use input process. Adjustments were made to sphere-area land use inputs requested by the local jurisdictions and confirmed by the County of San Diego.

Reducing Government Regulations: Streamlining the Process for the California Environmental Quality Act (CEQA)

Provisions in SB 375 include opportunities for streamlining the CEQA process, when certain conditions are met, as an incentive for implementing projects that are consistent with this SCS. Generally, there are two types of projects for which CEQA requirements can be streamlined, once the MPO adopts an RTP and SCS that meet the greenhouse gas targets established by the California Air Resources Board:

- Residential/mixed use projects streamlining (Public Resources Code Section 21159.28)
- Transit priority projects streamlining (Public Resources Code Sections 21155-21155.3)

SB 375 includes specific requirements for the CEQA streamlining. The discussion below provides a general outline of the requirements.

Residential/Mixed-Use Projects Consistent with the SCS

If a residential or mixed use project is consistent with the land use designation, density, building intensity, and other

applicable policies assumed for the SCS, the lead agency for the project would still be required to conduct an environmental review pursuant to CEQA. But reviews for those projects would not be required to repeat growth inducing impacts analyses or the discussion of how cars and light trucks could increase greenhouse gas emissions, because that discussion was already included in the environmental impact report (EIR) for the 2050 RTP and SCS. Similarly, if an EIR were being prepared for a residential/mixed use project, the alternatives section of that EIR would not be required to include a reduced density alternative to reduce greenhouse gas emissions. For purposes of this provision, a residential/mixed use project is defined as a project in which at least 75 percent of the square footage is devoted to residential uses.

Transit Priority Projects

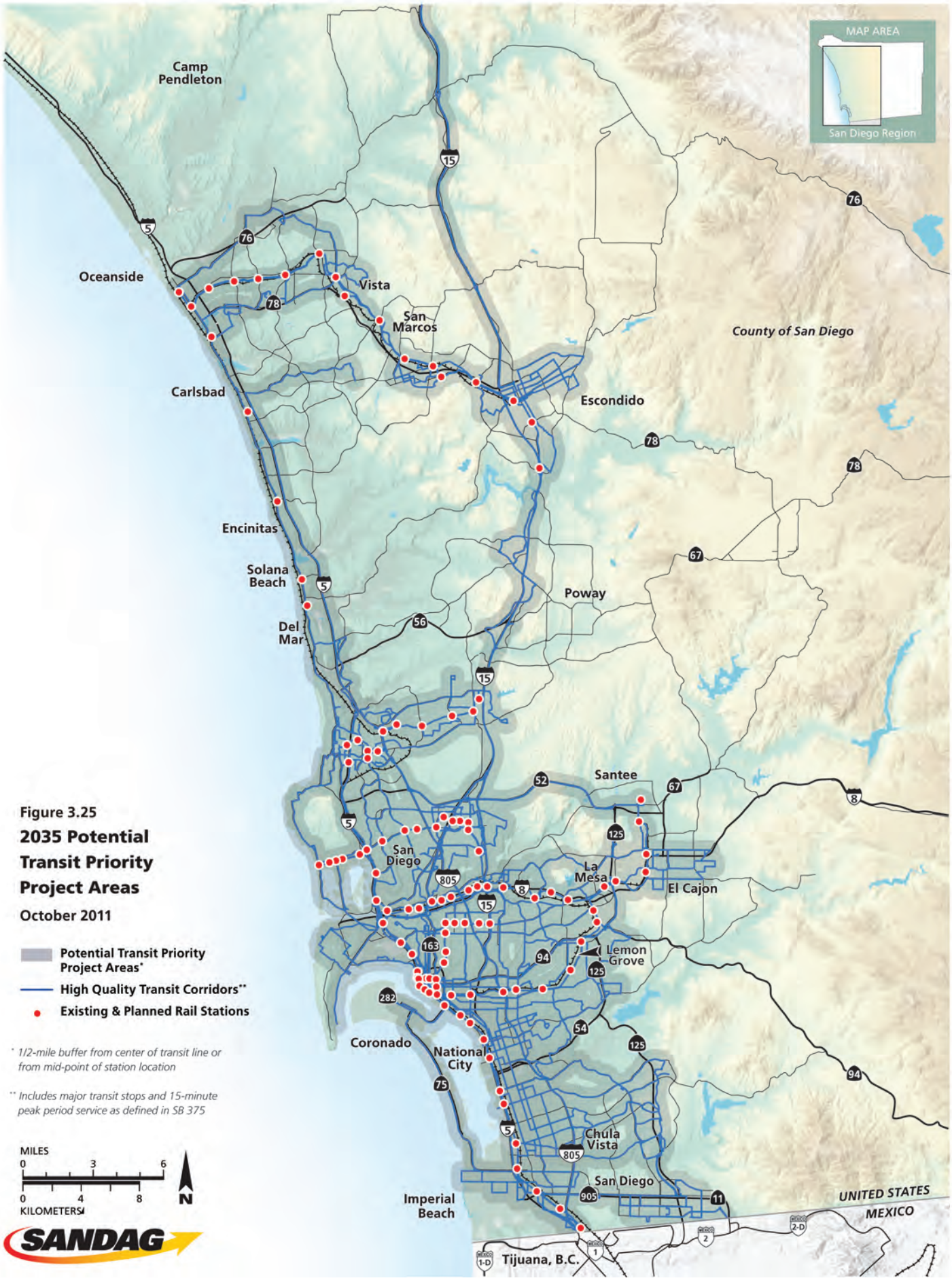
The second type of CEQA streamlining is for Transit Priority Projects. A Transit Priority Project (TPP) is eligible for CEQA streamlining provisions if it meets certain criteria. It would be up to the local agency to determine if a project qualifies as a TPP. For a local jurisdiction to determine that a project is a TPP, the project must be consistent with the general use designation, density, building intensity, and applicable policies identified in an approved SCS. In addition, a TPP that is eligible for CEQA streamlining also must be: 1) 50 percent residential, 2) with a minimum density of 20 dwelling units per acre, and 3) within a half-mile of a major transit stop or high-quality transit corridor (defined as having 15-minute frequencies during peak periods) that is included in the 2050 RTP. Figure 3.25 indicates the areas where CEQA streamlining may be available for Transit Priority Projects if the other two criteria listed above also can be demonstrated for a proposed project.

If a project meets these criteria, it may be analyzed under a new environmental document created by SB 375, called the Sustainable Communities Environmental Assessment (SCEA), or through an EIR for which the content requirements have been reduced as described below:

- The SCEA, which is similar to a Mitigated Negative Declaration (MND), would need to include an analysis of all significant environmental effects, as well as mitigation measures to reduce those impacts to an insignificant level
- If an EIR were prepared for a TPP, the document would not need to include an analysis of cumulative impacts, or of greenhouse gas emissions from cars and light duty trucks. In addition, project alternatives – as required in EIRs – need not address reduced density or off-site location alternatives

If additional criteria can be met, a TPP may be eligible for a new CEQA exemption created with the adoption of SB 375. Projects that meet all the required criteria are known as sustainable communities projects. This new exemption is intended to provide CEQA relief for TPP projects that are consistent with the SCS. A sustainable communities project (as defined in SB 375), must meet the criteria outlined above for TPP projects, and it also must generally comply with an extensive list of conditions in the law. These are detailed in Appendix D.

It is not known how many projects in the San Diego region would meet the criteria to qualify for the CEQA exemption. It would be up to the local agency to determine if a project qualifies for the exemption at the time it is proposed.


MAP AREA
San Diego Region
Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
County of San Diego
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
San Diego
Tijuana, B.C.
UNITED STATES
MEXICO
Figure 3.25
2035 Potential Transit Priority Project Areas
October 2011
Potential Transit Priority Project Areas*
High Quality Transit Corridors**
Existing & Planned Rail Stations
* 1/2-mile buffer from center of transit line or from mid-point of station location
** Includes major transit stops and 15-minute peak period service as defined in SB 375
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It should also be noted that proponents of these types of projects are still required to pay development fees or in-lieu fees, as specified in SB 375. However, another new provision of SB 375/SB 575 enables a local jurisdiction to adopt a uniform set of traffic mitigation measures for transit priority projects (Public Resources Code Section 21155.3). These are detailed in Appendix D.

Conclusion

Achieving sustainability will require living and working in ways that protect and sustain the region's vital social, environmental, and economic resources. The 2050 RTP and its SCS will guide the San Diego region toward a more sustainable future by focusing housing and job growth in urbanized areas, protecting sensitive habitat and open space, and investing in a transportation network that provides residents and workers with transportation options that will help reduce greenhouse gas emissions. Implementing this plan will require close collaboration among and between SANDAG, local jurisdictions, member agencies and regional stakeholders. It is anticipated that with each RTP (every four years) there will be new opportunities to help reduce GHG emissions.

Key achievements of the 2050 RTP/SCS are summarized below:

- Meets state greenhouse gas reduction targets
- $214 billion in transportation investments planned
- $4.4 billion annually in projected regional output
- Creates 35,600 jobs per year in the San Diego region
- Accommodates projected population growth in San Diego County
- Preserves more than half of our land as open space, parkland and habitat
- Provides 156 new miles of trolley service
- New trolley tunnel in downtown San Diego
- Expands and speeds up COASTER service in the North Coast Corridor
- More than double transit service miles, increased transit frequency in key corridors
- 130 miles of managed lanes to facilitate carpools, vanpools, and premium bus service
- $2.7 billion for regional and local bicycle and pedestrian projects and programs
- Creates new carpool and telework incentive programs to reduce solo driving
- Provides housing to meet projected population growth in San Diego County
- 84 percent of new housing units built in San Diego County will be multifamily
- Nearly three-quarters of multifamily housing will be built on redevelopment or infill sites
- Homes and jobs within one-half of a mile of transit nearly doubles
- Calls for equitable distribution of investment throughout the region

The following actions support the Plan's Forging a Path for More Sustainable Living Chapter recommendations:

The actions included in this chapter as well as those throughout the 2050 RTP will implement the SCS.

Actions	Responsible Parties
RCP Update	
1. Incorporate the concepts and recommended actions of the 2050 RTP into the next update of the RCP, including alternative land use scenarios.	SANDAG
2. Prepare a regional Transit Oriented Development strategy as part of the RCP update.	SANDAG
3. Refine indicators that are used to monitor progress toward the implementation of the RCP so they include additional measures that address sustainability, greenhouse gas reductions and public health considerations.	SANDAG
4. Continue to engage lower income and minority communities in regional planning and programming efforts.	SANDAG
5. Update the Smart Growth Concept Map to reflect the changes to local land use plans contained in the 2050 Regional Growth Forecast and to the regional transportation network.	SANDAG and local jurisdictions
6. Expand the smart growth strategy in the RCP to include climate change principles that emphasize petroleum reduction, energy efficiency, water efficiency, and renewable energy.	SANDAG and local jurisdictions
Smart Growth Tools and Model Enhancements	
7. Provide additional guidance on SB 375 CEQA streamlining provisions.	SANDAG and local jurisdictions
8. Use the updated Smart Growth Concept Map as a basis for allocating smart growth incentives, prioritizing transit service enhancements, and seeking additional smart growth funds.	SANDAG, MTS, NCTD and local jurisdictions
9. Refine the selection criteria for the *TransNet* Smart Growth Incentive Program so it reflects the 2050 RTP and its SCS.	SANDAG and local jurisdictions
10. Consider health principles in the evaluation criteria for existing grant programs, such as the Smart Growth Incentive Program and the Bicycle, Pedestrian, and Neighborhood Safety Program.	SANDAG and local jurisdictions
11. Consider greenhouse gas reductions/climate change principles in the evaluation criteria for existing grant programs, such as the Smart Growth Incentive Program.	SANDAG and local jurisdictions
12. Continue to make enhancements to travel demand models to improve GHG and VMT estimates.	SANDAG

Actions	Responsible Parties
Habitat	
13. Coordinate and cooperate throughout the region on the planning and implementation of future transportation infrastructure and habitat preserves.	SANDAG, MTS, NCTD, Caltrans, and local jurisdictions
14. Design future infrastructure projects in a way that protects wildlife corridors and habitat linkages in designated habitat conservation plans. In urban areas, design project to meet the needs of all potential users by following complete street development principles.	SANDAG, MTS, NCTD, Caltrans, and local jurisdictions
15. Continue to secure and distribute regional funding for acquiring habitats, and for ongoing land management and monitoring in accordance with the approved habitat plans.	SANDAG
16. Manage and monitor the *TransNet* Environmental Mitigation Program.	SANDAG and wildlife agencies
Transit Oriented Development	
17. Pursue joint development opportunities to promote the construction of sustainable housing and mixed-use projects at existing and planned transit stations.	SANDAG and local jurisdictions
Active Transportation/Public Health	
18. Continue to collaborate with the region's public health professionals to enhance how SANDAG addresses public health issues in its regional planning, programming, and project development activities.	SANDAG and County Health and Human Services Agency
Energy/Climate Adaptation	
19. Implement the Regional Energy Strategy and the Climate Action Strategy, in coordination with state and local jurisdiction efforts.	SANDAG and local jurisdictions
20. Support the increased use of clean, alternative fuels in SANDAG and local jurisdiction-owned vehicle fleets, and the vehicle and equipment fleets of contractors and funding recipients, such as the vehicle fleet for the SANDAG Vanpool Program or for local jurisdiction waste haulers.	SANDAG and local jurisdictions
21. Support planning and infrastructure development for alternative fueling stations and plug-in electric vehicle (EV) chargers.	SANDAG and local jurisdictions
22. Develop or facilitate a regional approach to long-term planning for alternative fuel infrastructure that includes the continued development of public-private strategic alliances.	SANDAG and local jurisdictions
23. Monitor research and independent assessments of the impact that increasing the use of clean, alternative fuels would have on gas tax revenues.	SANDAG
24. Integrate alternative fuel considerations into the development of the regional transportation network by, for example, integrating infrastructure for electric vehicle charging into regional park-and-ride lots and transit stations.	SANDAG, MTS, and NCTD
25. Work with San Diego Gas & Electric and other stakeholders to mitigate the potential impacts of electric vehicles on the electric grid.	SANDAG and local jurisdictions
26. To the extent possible, address climate adaptation issues in the design of new projects, and when improvements are made to existing infrastructure.	SANDAG, Caltrans, and local jurisdictions
27. Seek funding to develop healthy community or active design guidelines that integrate smart growth, sustainability, walking and bicycling, parking, and street design.	SANDAG

Actions	Responsible Parties
Infrastructure Funding	
28. Continue to refine the Quality of Life Funding Strategy and determine the appropriate time to seek voter approval.	SANDAG
Public Involvement	
29. Evaluate the feasibility of developing preliminary maps that identify transportation infrastructure that could be vulnerable to environmental changes to climate change, including precipitation, heat, and sea level rise.	SANDAG, Caltrans, Port of San Diego, and local jurisdictions
Legislation	
30. Support legislation that provides financial incentives for smart growth projects that provide more affordable housing near transit, and that addresses fiscal reform issues consistent with the SCS and smart growth principles in the RCP.	SANDAG, MTS, and NCTD
31. Through the development review process, continue to provide comments to local jurisdictions that encourage development patterns that promote walking, bicycling, and access to public transit in existing and potential smart growth areas and in or near major public facilities such as colleges and hospitals, and that encourage reconfiguration of the public right of way to create complete streets.	SANDAG, MTS, and NCTD

Chapter 4

Social Equity: Title VI and Environmental Justice

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Introduction

Roads, freeways, and other transportation infrastructure can have a significant effect on the quality of life for a region's residents by shaping access to housing, jobs, services, and recreational opportunities. Achieving social equity and environmental justice in the development of a comprehensive transportation system is a major regional goal. It requires making investments that provide all residents – regardless of age, race, color, national origin, income, or physical agility – with opportunities to work, shop, study, be healthy, and play.

Promoting social equity and environmental justice in transportation planning requires involvement from a wide variety of communities and stakeholders.

Without proper planning and development, transportation systems can degrade the quality of life in communities. The construction of roads, freeways, and rail transit systems has sometimes placed health burdens on many lower income and minority communities. At times, new transportation projects have physically divided communities, resulting in long-lasting social and economic costs. It is important to understand the impacts of transportation investments on our most vulnerable communities in order to better plan for the future.

Promoting social equity and environmental justice in transportation planning requires involvement from a wide variety of communities and stakeholders. Cities and communities with high concentrations of low income residents and minority populations in the San Diego region and federally recognized tribes have historically been underserved and underrepresented in the planning process.

In an effort to continually improve transportation planning, the San Diego Association of Governments (SANDAG) conducted a significantly more robust, regionwide social equity analysis for the 2050 Regional Transportation Plan (RTP or the Plan). From the beginning, SANDAG engaged affected communities in the planning process. SANDAG incorporated their issues and concerns into the design and decision-making process, as well as in the definition of affected communities and the development of performance measures. The goal of these efforts is for low income and minority (LIM) communities to share in the benefits of the transportation investments without bearing a disproportionate burden from the system.

Legal Framework

Over the last several decades, federal law and guidance have been created to ensure that the spirit and intent of Title VI of the Civil Rights Act are incorporated into the guiding principles and missions of federal, state, and local public agencies. Title VI of the Civil Rights Act states that "no person in the United States, shall, on the grounds of race, color or national origin be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance."

In 1994, Executive Order 12898 on Environmental Justice was issued, and it expanded social equity principles to cover low income as well as minority groups. Another group to more recently become recognized as a community that agencies such as SANDAG must focus on in order to implement social equity in regional planning is the segment of the population having limited English proficiency (LEP). Federal and state agencies have created guidance and implemented procedures to protect the interests of these various disadvantaged groups. These documents include, but are not limited to: U.S. Department of Transportation Order on Environmental Justice (1998); Federal Highway Administration/Federal Transit Administration (FHWA/FTA) Issue Memoranda on Implementing Title VI Requirements in Metropolitan and Statewide Planning (1999;

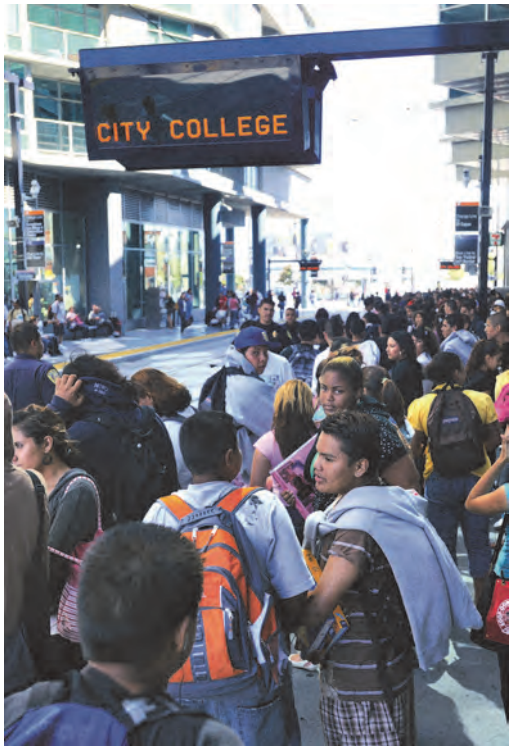
2007); Executive Order 13166 Improving Access to Services for Persons with Limited English Proficiency (2000); FTA Title VI Circular 4220.1A; and California's Environmental Justice Strategy AB 1553 (2001).

While Title VI prohibits discrimination, the concept of implementing environmental justice is discussed in Executive Order 12898 as the process of "identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of [an agency's] programs, policies, and activities on minority populations and low income populations." There are many definitions available of the concept of environmental justice and methods of implementation. The U.S. Department of Transportation's Order 5610.2 and FHWA's Order 6640.23 expand on Executive Order 12898 and describe the process for incorporating Environmental Justice into their respective departments' programs, policies, and activities.

California Government Code Section 65040.12(c) defines environmental justice in the context of city and county general plans as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies. In addition, Government Code 11135 states that no state agency or agency funded by the state shall deny full and equal access to benefits of any program or activity on the basis of race, national origin, ethnic group, religion, sex, sexual orientation, or disability.

In the context of transportation planning, the California Department of Transportation (Caltrans) considers environmental justice to be activities taken by a recipient of federal funding to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Fair treatment means that no group of people, including a racial, ethnic, or a socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or from the execution of federal, state, local, and tribal programs and policies.



Meaningful involvement means that: (1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; (2) the public's contribution can influence the regulatory agency's decision; (3) the concerns of all participants involved will be considered in the decision-making process; and (4) the decision-makers seek out and facilitate the involvement of those who are potentially affected.

The transportation system should be designed to provide an equitable level of transportation services for all populations.

SANDAG Board Policy Number 024, which is entitled Public Participation/Involvement Policy, incorporates concepts from federal and state laws, and guidance. The Policy states that social equity and environmental justice are meant to ensure the meaningful involvement of low income, minority, disabled, senior, and other traditionally underrepresented communities and it is a key component of SANDAG public participation activities. The Board Policy also states that social equity means ensuring that all people are treated fairly and are given equal opportunity to participate in the planning and decision-making process, with an emphasis on ensuring that traditionally disadvantaged groups are not left behind. It further provides that environmental justice means ensuring that plans, policies, and actions do not disproportionately affect low income and minority communities.

2050 RTP Goals/Objectives for Social Equity

In developing the RTP, SANDAG has used performance measures and anecdotal evidence to make decisions intended to ensure compliance with Title VI requirements and environmental justice principles. As pointed out by the National Cooperative Highway Research Program, however, "the fact that federal policy mandates consideration of environmental justice should not be the only driving force behind considering it; a more compelling argument is that it makes for good transportation planning" (National Cooperative Highway Research Program (NCHRP), Effective Methods for Environmental Justice Assessment. Report 532. Washington, DC: Transportation Research Board. 2004. pg. 5).

The SANDAG Board discussed the 2050 RTP vision and goals in fall 2009. The Board included the following Social Equity goal and policy objectives, among six goals for the 2050 RTP:

Social Equity Goal

The transportation system should be designed to provide an equitable level of transportation services for all populations.

Social Equity Policy Objectives

- Create equitable transportation opportunities for all populations regardless of age, ability, race, ethnicity, or income
- Ensure access to jobs, services, and recreation for populations with fewer transportation choices

The objectives of the Regional Housing Needs Assessment (RHNA), outlined in the Jobs/Housing "Fit" section of this chapter, complement the 2050 RTP Social Equity goal and policy objectives.

Social Equity in relation to land use is discussed in Chapter 3, Sustainable Communities Strategy (SCS). The SCS land use pattern accommodates the estimated 388,000 new homes needed to serve projected growth (1.25 million more people) within the region, including all economic segments of the population, during the RTP planning period. Most of these new housing units are proposed at higher densities that provide the greatest opportunity for affordable housing to be built. As discussed below, the opportunities for affordable housing and access to public transit are intended to reduce housing and transportation cost burdens on lower income individuals and families.

Process/Outreach

Decision-Making Process

A significant component of the SANDAG mission is a strong commitment to public participation and involvement in decision-

making regarding regional planning and transportation infrastructure. The SANDAG agencywide Public Participation Plan (PPP) describes the process for communicating with and obtaining input from the public concerning agency programs, projects, and program funding. The guidelines and principles outlined in the plan guide the agency's public outreach and involvement efforts for regional transportation projects; transit service and fare changes; smart growth, environmental, and other planning efforts; growth forecasts; RTP; Regional Transportation Improvement Program (RTIP); Regional Comprehensive Plan (RCP); Overall Work Program (OWP); tribal consultation; and other mandated or Board initiatives. The current PPP was adopted by the Board of Directors on December 18, 2009. (The PPP is available at www.sandag.org/ppp.)

The PPP reflects the SANDAG commitment to public participation and involvement to include all residents and stakeholders in the regional planning process. The PPP was developed in accordance with guidelines established by the FHWA for metropolitan transportation planning (23 CFR 450.316), addresses nondiscrimination requirements related to Title VI of the Civil Rights Act, and reflects the principles of social equity and environmental justice. Included in the PPP are procedures, strategies, and outcomes associated with the ten requirements listed in 23 CFR 450.316. The PPP also incorporates FTA's guidance on Public Involvement Techniques for Transportation Decision-Making.

To support the development of the 2050 RTP, a specific Public Involvement Plan (PIP) was created that outlined tactics and strategies to coordinate outreach, input, and communications efforts (See Chapter 9 and Technical Appendix 6). For the development of the 2050 RTP, this PIP included the establishment of a new Regional Planning Stakeholders Working Group (SWG) to provide input on the development of key work elements in the planning process, including the public participation plan itself. Many SANDAG working groups are comprised of representatives from local jurisdictions, appointed in their communities based on their positions (e.g., local planning directors make up the Regional Planning Technical Working Group). Another advisory group critical to this process is the Social Service Transportation Advisory Council (SSTAC), which developed the Coordinated Public Transit – Human Services Transportation Plan that is integrated into the 2050 RTP.

SANDAG placed a particular emphasis on communities that are not traditionally involved in regional planning.



The creation of the SWG for the 2050 RTP provided a unique opportunity for SANDAG to involve citizens with expertise in subjects of regional interest, as well as individuals who reflect the demographics of the region.

The creation of the SWG for the 2050 RTP provided a unique opportunity for SANDAG to involve citizens with expertise in subjects of regional interest, as well as individuals who reflect the demographics of the region. SANDAG placed a particular emphasis on communities that are not traditionally involved in regional planning. SANDAG further involved minority and low income communities in the planning process by tapping into the social capital of community collaboratives in the most vulnerable areas of the region to serve on the SWG. The SWG membership consisted of 27 people in two categories:

At-Large Citizen Representatives (19 members)

At-large citizen representatives with experience in various subjects provided input on a wide variety of areas through their individual experience in multiple types of organizations. These individuals did not represent a specific organization, but rather they offered their civic or professional expertise in subjects relevant to this planning process (e.g., transportation, housing, environmental health, economic prosperity, public health, and urban form). Participants included members who were affiliated with minority organizations that have countywide constituencies. This helped incorporate the issues and concerns of minority communities across the region in the planning process – one of the objectives of federal Title VI and environmental justice guidance.

Individuals from Community-based Networks (8 members)

A community-based network or collaborative is made up of a variety of social institutions, including social service providers, ethnic associations, schools, churches, chambers of commerce, and other community-based organizations within an identified low income/minority community.

SANDAG reached out to communities that met the following threshold for low income and minority. Communities were identified as "minority" if the Trip Distribution Zone (TDZ) population was at least 65 percent non-white. "Low income" communities were TDZs in which at least one-third of the households have income of less than half of the regional median ($30,000).

To engage these communities early in the planning process, SANDAG established a mini-grant program to focus the SWG directly on its concerns in a timely and meaningful way, and to provide resources so community collaboratives could reach out to their constituents throughout the process.

A number of methodologies were implemented by SANDAG to encourage a high diversity among applicants and maximize public participation at the meetings. For example, the SWG meetings were held at the offices of Caltrans District 11, which are situated across the street from a major transit center with access to buses, trolleys, and the COASTER. Another important change was to schedule the meeting time at the end of the work day (4 to 6 p.m.). This allowed people who work traditional hours to get off one hour early and come to meetings, rather than asking for an entire day off to attend them. The Caltrans site also had the advantage of an onsite daycare center, which was made available to participants. The meeting rooms were large and easily accessible by the disabled, and facilities for the hearing impaired were available. Meetings were open to the public. The Chair of the SWG was the first Vice Chairman of the SANDAG Board, who is now Chair of the Board. The purpose of having a member of the Board leadership serve as the Chair of the Working Group was to ensure that the issues and concerns of stakeholders would be heard directly and could be transmitted in a timely and

meaningful manner to the rest of the Board of Directors.

Community-Based Outreach Partnership Grants

To help ensure that all communities were meaningfully involved in the development of the 2050 RTP, including LEP portions of the population, SANDAG developed a partnership program with community collaboratives in vulnerable areas around the region, drawing on their leadership and knowledge of their communities, and providing resources to them to support their collaboration. As noted by the Chula Vista Collaborative, a community collaborative in the southern portion of San Diego County, community collaboratives are critical to empowering communities:

"Working together on a shared vision allows members to make decisions that incorporate the collective wisdom and resources of the group and accurately reflect the needs of the community."

Community collaboratives are critical to the ability of the regional planning agency to reach out to vulnerable communities that otherwise might not become involved in the process. Collaboratives, acting as forums for local institutions of all kinds, provide a culturally relevant structure for developing local protocols, crossing language barriers, and structuring meetings. If members of a collaborative make connections between their local concerns and regional planning efforts, they can begin to understand regional planning in a way that is relevant and meaningful to their communities.

To assess the region's most vulnerable communities, SANDAG developed a map that uses census data for low income and minority populations. The map was overlaid with Community Planning Areas. A competitive Request for Proposals (RFP) process was established, and extensive outreach was conducted to solicit grant applications from all of the areas identified. SANDAG received 13 applications and awarded eight grants. Table 4.1 lists the selected community-based partners and their focus populations. Six of the Community-Based Network Partners were geographically focused, serving a specific community. Two of the grant recipients were countywide, one advocated for the elderly, and the other advocated for people with disabilities. Each partner developed a work plan and outreach strategy pertinent to the needs and characteristics of their community, and served as a resource to their community by being a liaison to the SWG. The community involvement and outreach process progressed in two phases, based on the timeline for the development of the 2050 RTP, as indicated in Table 4.2.

Community collaboratives are critical to the ability of the regional planning agency to reach out to vulnerable communities that otherwise might not become involved in the process.



Table 4.1 – Community-Based Partners/Grantees

Regionwide Partners	
Able-Disabled Advocacy People with disabilities, veterans, and seniors through in-take centers throughout the region.	**Friends Of Adult Day Care Centers** Seniors, through networks of service providers for seniors throughout the region.
Community-Based Collaboratives	
All Congregations Together Low income African Americans, immigrants from the continent of Africa, Hispanic/Latinos, youth/young adults, and people with disabilities.	**El Cajon Collaborative** Seniors, Middle Eastern/Arabic speakers, youth, low income residents
Casa Familiar – San Ysidro/Border Low income Hispanics, immigrants from Latin America, youth.	**Linda Vista Collaborative** Low income seniors, people with disabilities, youth at risk, and immigrant groups (Vietnamese, Hmong, Mixteco, and Latin American)
Chula Vista Community Collaborative Low income communities in western Chula Vista, Latin American immigrants, Latinos, and seniors	**San Ysidro Business Association** Low income Hispanic residents of San Ysidro, small businesses, and members of the San Ysidro Collaborative

Table 4.2 – Phases for 2050 RTP Outreach with Grantee Partners

Phase I (September 2009 – September 2010)	Phase II (October 2010 – September 2011)
▪ An introduction of the RTP and its process	▪ Sustainable Communities Strategy/2050 RTP Revenue Constrained Transportation Network Scenario
▪ Urban Area Transit Strategy	▪ Community input on the Draft 2050 RTP
▪ The Network: Project Evaluation Criteria, Performance Measures, and the Unconstrained Networks	
▪ Sustainable Communities Strategy	
▪ Alternative Revenue Constrained Transportation Network Scenarios	

Demographics: Current and Future Conditions

As of 2008, no single race or ethnic group accounted for more than half of the region's population. Preliminary data from Census 2010, however, indicate that the region has become a "majority minority" county. As the region continues to grow, its ethnic composition will continue to change. Table 4.3 displays the projected regionwide changes in population from 2008 to 2050 for eight racial/ethnic groups: Hispanic, non-Hispanic White, Black, American Indian, Asian, Hawaiian/Pacific Islander, Other, and Two or More Races. Most notably, by 2050 the Hispanic population is expected to double, while the number of non-Hispanic Whites is expected to decline slightly.

By 2050, Hispanics are predicted to account for more than 42 percent of the total population. The percentage of non-Hispanic Whites is expected to decline, from 50 percent in 2008 to about 35 percent in 2050. It is estimated that there will be virtually no change between 2008 and 2050 in the percentage of the following groups: Black, Asian, Hawaiian/Pacific Islander, Other, or Two or More Races.

In addition to racial and ethnic changes, the region's population is forecast to age considerably by 2050 (See Figure 4.1). During the 42-year forecast period, the region's median age is expected to increase by more than 3 years, from 34.9 to 38.6, as the Baby Boom and Generation X generations live longer than previous generations. During the forecast period, the number of residents between 65 and 84 years old is expected to more than double, and the number of residents 85 years old and above is expected to more than triple. Ten percent of the region's population growth between 2008 and 2050 is expected to be in the oldest age group (85 and older). Therefore, by 2050 nearly 19 percent of the region's population will be 65 and older – a higher percentage than is seen today in the retirement-oriented state of Florida.

As the region continues to grow and evolve, transportation plans must adapt to support the needs of the region's changing population.

Identifying San Diego's Communities of Concern

To conduct a social equity analysis, it is necessary to identify people who are vulnerable or disadvantaged. Pursuant to Title VI, Executive Order 12898, and the 1999 Department of Transportation Memorandum "Implementing Title VI Requirements in Metropolitan and State Planning," SANDAG must provide information on the effects of the 2050 RTP on LIM populations. Figure 4.2 shows the projected distribution of LIM populations in the San Diego region in 2050, compared with the rest of the population. As stated above, SANDAG engaged the region's stakeholders from the beginning, working with them throughout the development of the 2050 RTP. SANDAG also engaged representatives from the Regional Planning SWG early on, to identify vulnerable segments of the population that should be considered in its analyses.

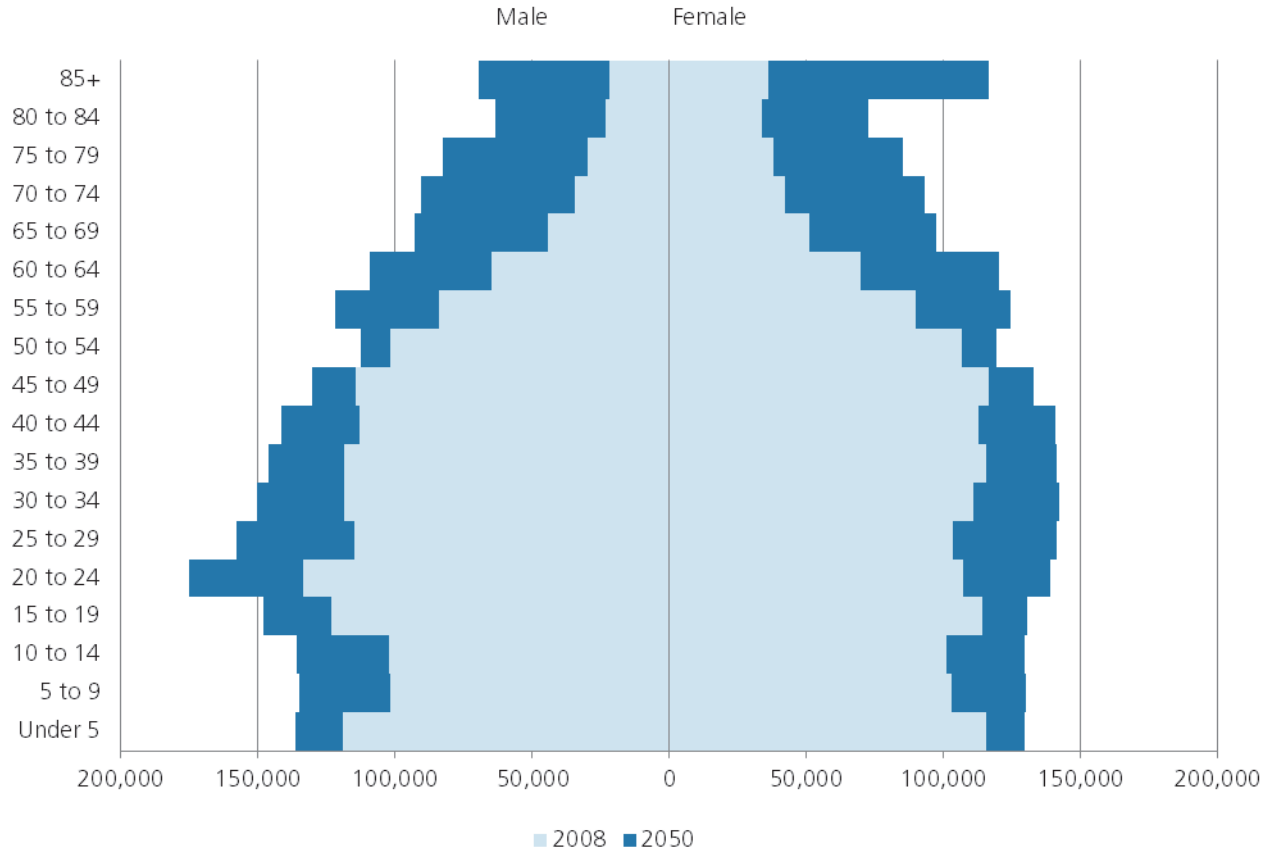
As the region continues to grow and evolve, transportation plans must adapt to support the needs of the region's changing population.

Table 4.3 – The Region's Race and Ethnic Mix Will Change

						Change 2008-2050	
	2008	2020	2030	2040	2050	Numeric	%
Total Population	3,131,552	3,535,000	3,870,000	4,163,688	4,384,867	1,253,315	40%
Hispanic	934,521	1,198,032	1,430,829	1,669,265	1,881,719	947,198	101%
White, non-Hispanic	1,576,085	1,606,817	1,622,176	1,600,571	1,549,069	-27,016	-2%
Black	164,931	191,395	208,693	221,376	229,860	64,929	39%
American Indian	16,218	17,464	17,438	16,866	15,906	-312	-2%
Asian	315,037	375,986	422,596	466,100	502,492	187,455	60%
Hawaiian/Pacific Islander	14,615	18,245	20,658	22,908	24,517	9,902	68%
Other	7,780	9,459	10,992	12,301	13,293	5,513	71%
2 or More Races	102,365	117,602	136,618	154,301	168,011	65,646	64%

Source: SANDAG, 2050 Regional Growth Forecast

Figure 4.1 – Population by Age



Source: SANDAG, 2050 Regional Growth Forecast

Several workshops were held in the beginning of the process to consider what demographic categories of populations would be analyzed, and what performance measures to use. Special workshops on Environmental Justice Analysis for the 2050 RTP were held. They included Session 1 – "Framework and Potential Indicators" on January 26, 2010, and Session 2 – "Selecting Communities of Concern" on March 1, 2010. Both of these were open to the public. The Environmental Justice subcommittee of the SWG met twice on June 25 and July 26, 2010 to provide input on the structure of the Environmental Justice chapter and the policy issues to be discussed for further analysis.

SANDAG worked with members of the SWG, as well as members of the public who were interested in social equity and environmental justice issues. The process resulted in the identification of four types of "Communities of Concern," as described below. Table 4.4 provides details of the definition of each type of community of concern, and the source data used to define the communities.

Low Income Community of Concern: any community in which 33 percent or more of households are low income, and/or 10 percent or more of the households are severely overcrowded, and/or 25 percent or more of the population is in poverty.

Minority Community of Concern: any community in which 65 percent or more of the population is non-White.

Low Mobility Community of Concern: any community in which 25 percent or more of households have no auto available, and/or 25 percent or more of the population is disabled, and/or 20 percent or more of the population is aged 75 or older.

Low Community Engagement Community of Concern: any community in which 20 percent or more of households do not speak English as a primary language and do not speak English well, and/or 20 percent or more of the population aged 25 and older have less than a high school education.

These four community types served as the basis for analyzing the performance of the Alternative Revenue Constrained Transportation Network Scenarios considered in the development of the 2050 RTP. Among other factors, the analysis considered the following forecasts for the year 2050 (these categories are not mutually exclusive):

- About 27 percent (1.2 million) is expected to live in a Low Income Community of Concern
- 51 percent (2.23 million) of the region's projected population (4.38 million) is expected to live in a Minority Community of Concern
- 27 percent (1.2 million) is expected to live in a Low Mobility Community of Concern
- 33 percent (1.45 million) is expected to live in a Low Community Engagement Community of Concern
- LIM populations are expected to make up 54 percent (2.38 million) of the population by 2050

Any one neighborhood may be classified as one or more of the community types. For example, a community may meet the threshold of a Low Income Community of Concern and a Low Mobility Community of Concern. Sixty-five percent of the county's overall population in 2050 (or 2.86 million people) is projected to live within one or more of the Communities of Concern.

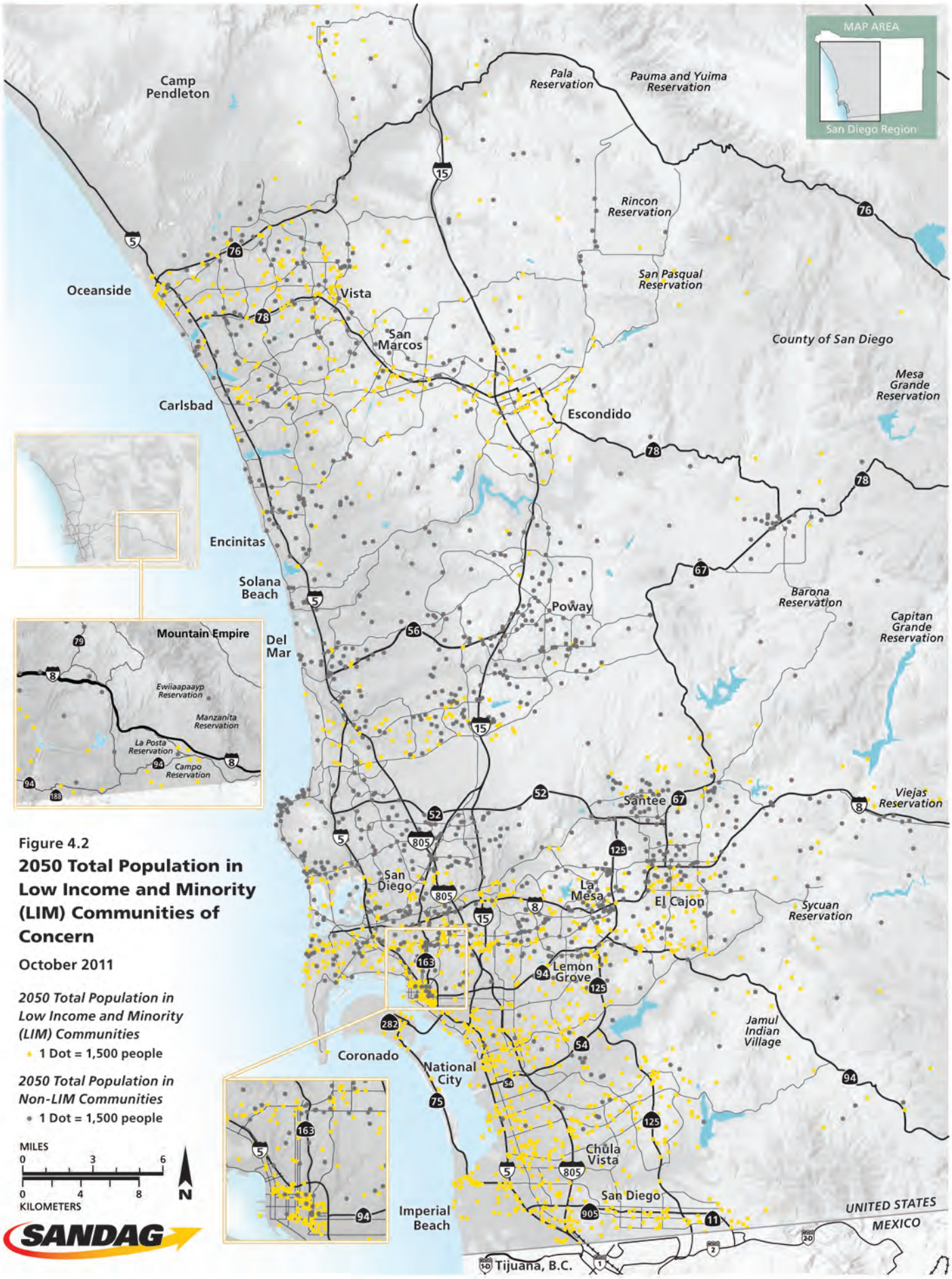


Figure 4.2

2050 Total Population in Low Income and Minority (LIM) Communities of Concern

October 2011

2050 Total Population in Low Income and Minority (LIM) Communities

- 1 Dot = 1,500 people

2050 Total Population in Non-LIM Communities

- 1 Dot = 1,500 people

Table 4.4 – Communities of Concern

Indicator	Definition	Threshold	Source
Low Income Communities of Concern			
Low Income	Household income less than $30,000 per year	33%	2050 Regional Growth Forecast 2008 Current Estimates
Severe Overcrowding	Percentage of households with 2 or more occupants per room	10%	Census 2000
Poverty 100%	Percentage of population living at or below 100% of the poverty level	25%	Census 2000
Minority Communities of Concern			
Minority Population	Communities in which minorities comprise at least 65% of the population	65%	2050 Regional Growth Forecast 2008 Current Estimates
Low Mobility Communities of Concern			
Zero-Car Households	Percentage of households that do not have access to a vehicle	25%	Census 2000
Disabled Population	Percentage of population suffering from one or more types of disability	25%	Census 2000
Population age 75 and over	Percentage of population aged 75+	20%	2050 Regional Growth Forecast 2008 Current Estimates
Low Community Engagement Communities of Concern			
Linguistic Isolation	Percentage of households where English is not the primary language and English is not spoken very well	20%	Census 2000
Educational Attainment	Percentage of population over age 25 that has not earned a high school diploma	20%	Census 2000

Data and Sources

The 2010 Census data, which was published for the San Diego Region at the end of June 2011, was not released in time to be used for the development of the 2050 RTP. Therefore, the information in this report relies upon a variety of sources, including the following:

U.S. Census Bureau

- 2000 Census

SANDAG

- 2008 Current Estimates (demographic/economic)
- 2050 Regional Growth Forecast

Wherever possible, SANDAG uses the smallest level of geographic detail available for analysis and mapping. In many cases, this is a Traffic Analysis Zone (TAZ), which is a geographic unit used for transportation modeling. A TAZ is smaller than a census tract and a Trip Distribution Zone (TDZ), which were the primary units of analysis for the previous 2030 RTP. The San Diego region is covered by 2,000 TDZs. Coverage in the urban areas is denser than in the eastern, rural portions of the region. A TAZ, therefore, provides a finer level of detail for analysis. In future years, this analysis will be much more robust and refined as the agency attains new analytical capacity through the adoption of new modeling programs, in particular the Activity Based Model to be used by SANDAG when the RTP is next updated.

Baseline Mapping

To create a point of reference for analyzing how the distribution of transportation investments detailed in the 2050 RTP may affect LIM populations, a set of baseline maps was created to aid discussions by stakeholders.

2050 RTP: Population Density for Each Community of Concern: In order to see the densities and locations of the Communities of Concern in relation to the rest of the population overlaid with the existing network, several maps were created. Figure 4.3 shows the distribution of population in Low Income Communities of Concern, Figure 4.4 shows the distribution of population in Minority Communities of Concern, Figure 4.5 shows the distribution of population in Low Mobility Communities of Concern, and Figure 4.6 shows the distribution of population in Low Community Engagement Communities of Concern.

2050 RTP: Higher Employment Density: Based on the 2050 Regional Growth Forecast, a map has been prepared to show LIM populations relative to planned higher employment intensity. Figure 4.7 shows the concentration of the employment centers that have 50 or more jobs per acre. The overlay of LIM population data shows how those communities are served by the 2050 RTP transportation network.

2050 RTP Scenario: Figures 4.8, 4.9, 4.10, and 4.11 show each of the Communities of Concern overlayed with the 2050 RTP transportation network. These maps show how the 2050 RTP would serve each Community of Concern. Figure 4.8 shows how the 2050 RTP projects would serve low income populations. Figure 4.9 shows how the 2050 RTP projects would serve minority populations. Figure 4.10 shows how the 2050 RTP projects would serve Low Mobility Communities of Concern. Figure 4.11 shows how the 2050 RTP projects would serve Low Community Engagement Communities of Concern.

Social Equity Analysis

SANDAG prioritized future projects detailed in the Unconstrained Transportation Network by using transportation project evaluation criteria approved by the Board of Directors. Based on revenue projections to 2050, staff developed a set of five alternative Revenue Constrained Transportation Network Scenarios. They showed a range of emphases on different transportation modes, based on possible flexible funding for prioritized projects and other considerations. A social equity analysis, using Board-approved performance measures, was conducted for all scenarios to make sure they were consistent with Title VI of the Civil Rights Act. On December 17, 2010, the Board accepted a Revenue Constrained Scenario from among the five scenarios it considered.

A social equity analysis was conducted for all scenarios to make sure they were consistent with Title VI of the Civil Rights Act.

Definitions of Social Equity Performance Measures

As stated earlier, several workshops were held to help identify performance measures for the 2050 RTP that focus on social equity. Input from affected communities was incorporated into the performance measures that ultimately were recommended to the SANDAG Board. Eight social equity indicators were approved by the SANDAG Board on July 23, 2010. They are defined as follows:

Average Travel Time: Travel time is measured as the average time per person per trip across all modes of transportation (drive alone, carpool, transit, bike/walk) and all types of trips (commuting to work, traveling to school, etc.). Data are reported for overall travel time as well as drive alone/SOV, carpool/vanpool, and transit.

Job Access: The percentage of work trips lasting up to 30 minutes during peak periods by driving alone, riding in a carpool, and taking public transit.

Access to Transit: Access to public transit is measured as the percentage of homes within half a mile of a transit stop, including Trolley and light rail stations, bus stops, etc. This measure shows the density and distribution of transit services throughout the region.

Access to Amenities: Percentage of Population within...

- **30 Minutes of Schools**: This measure of education access focuses on higher education, including universities, colleges, adult education facilities, and job training centers.
- **30 Minutes of the Airport**: Travel times are estimated to the San Diego International Airport.
- **15 Minutes of Healthcare**: Healthcare includes hospitals and community clinics. This definition does not consider emergency response times, but rather it measures access to basic health services.
- **15 Minutes of Parks or Beaches**: Parks and beaches are defined as federal, state, and county parks; beaches; and local parks (including campgrounds, open space areas, picnic areas, recreation centers, etc.), but it excludes small neighborhood parks. The reason for this exclusion is based on feedback from the SWG that, while there may be a neighborhood park in a Community of Concern, the quality and size of the park may be insufficient for the population it serves.

For access to amenities, travel time results show access based on auto and transit travel times. Transit travel assumes that the trip includes the time required to walk to a transit stop, time spent on public transportation vehicles, the time it takes to transfer to other transit, and the time it takes to walk from the transit stop to the destination. Auto time

assumes walking to a vehicle, driving, parking, and walking to the final destination.

Distribution of Proposed RTP Expenditures per Capita: The distribution of proposed RTP expenditures is calculated by assuming that populations within three miles of a highway and major transit infrastructure improvements (e.g., rail, rapid bus, and BRT lines), as well as populations within one mile of local bus improvements, will receive benefits from the investment. To calculate the measure, the estimated costs (in dollars) for a project are distributed per capita to all people living within the specified distance from the project. These investments are then summed up across all neighborhoods, and evaluated between Communities of Concern and other communities. Because there may be more or fewer people in a Community of Concern than in other communities, the results are displayed on a per-capita basis – taking the total amount of dollars planned for a Community of Concern and dividing by the total population in that Community of Concern.

Results for Social Equity Performance Measures

An analysis of the 2050 RTP Revenue Constrained Scenario was conducted to determine whether it would conform with requirements in Title VI of the Civil Rights Act and other applicable social equity laws that require that the benefits and burdens of the projects in the 2050 RTP be equitably distributed between LIM and non-LIM populations.

Tables 4.5 through 4.9 show results for Social Equity indicators for LIM and non-LIM populations. Additional social equity performance measures for Low Mobility and Low Community Engagement populations also are included. The next section provides a detailed description of the impact of each indicator on Communities of Concern, compared with the existing conditions (2008) and the 2050 No Build alternative. The baseline year of comparison used for development of the 2050 RTP is 2008, as this was the latest year that a full range of data was available for use in analyzing alternatives and impacts. Due to economic and other factors discussed more fully in other areas of the 2050 RTP, SANDAG believes significant changes in the data inputs used for modeling did not occur between 2008 and the development of the 2050 RTP.

In addition to analyzing the distribution of RTP expenditures per capita and the impact of the 2050 RTP on the Communities of Concern, maps were produced for each of the four categories of Communities of Concern (Low Income, Minority, Low Mobility, and Low Community Engagement). These maps provide a graphic display of the performance of the Revenue Constrained Scenario with regard to transit access to key amenities. They show the Revenue Constrained Scenario with transit travel time contours for access to schools and health care for each of the four categories of Communities of Concern (Figures 4.12-4.19). The crosshatched areas on the map represent the specified Community of Concern within each TAZ, while the shaded contours represent the varying levels of transit accessibility around a given amenity. Areas on the map that are shown as having better transit accessibility to an amenity are shaded darker than the areas with no accessibility. Shaded areas that also are crosshatched signify that the Community of Concern has access to that given amenity. A crosshatched area with no accessibility shading indicates that the Community of Concern does not have reasonable access to that given amenity. Accessibility contours are based upon average travel times from each TAZ to the closest TAZ where a specific amenity type is located. The TAZ to TAZ travel

times use an optimal route method where the fastest route, including transfers, is used to calculate average travel time.

A critical question, which is discussed further below, is whether the 2050 RTP Revenue Constrained Scenario will improve conditions for LIM populations, relative to the 2050 No Build alternative or existing conditions in 2008.

Investments per capita for LIM populations will more than double with the implementation of the 2050 RTP.

2050 No Build Analysis

The modeling results for the performance indicators referenced above show that the 2050 RTP will maintain or improve conditions for LIM populations, compared with the 2050 No Build alternative. Although referenced in the aggregate as "LIM populations" in some places in this chapter, SANDAG conducted separate analyses of low income and minority populations and modeled the impacts on these populations separately. The discussion in this chapter is merely a summary of the disaggregated data available in the appendices of the 2050 RTP.

LIM populations will have increased mobility and better accessibility to transportation alternatives with the investments proposed. Investments per capita for LIM populations will more than double with the implementation of the 2050 RTP, compared with the 2050 No Build alternative.



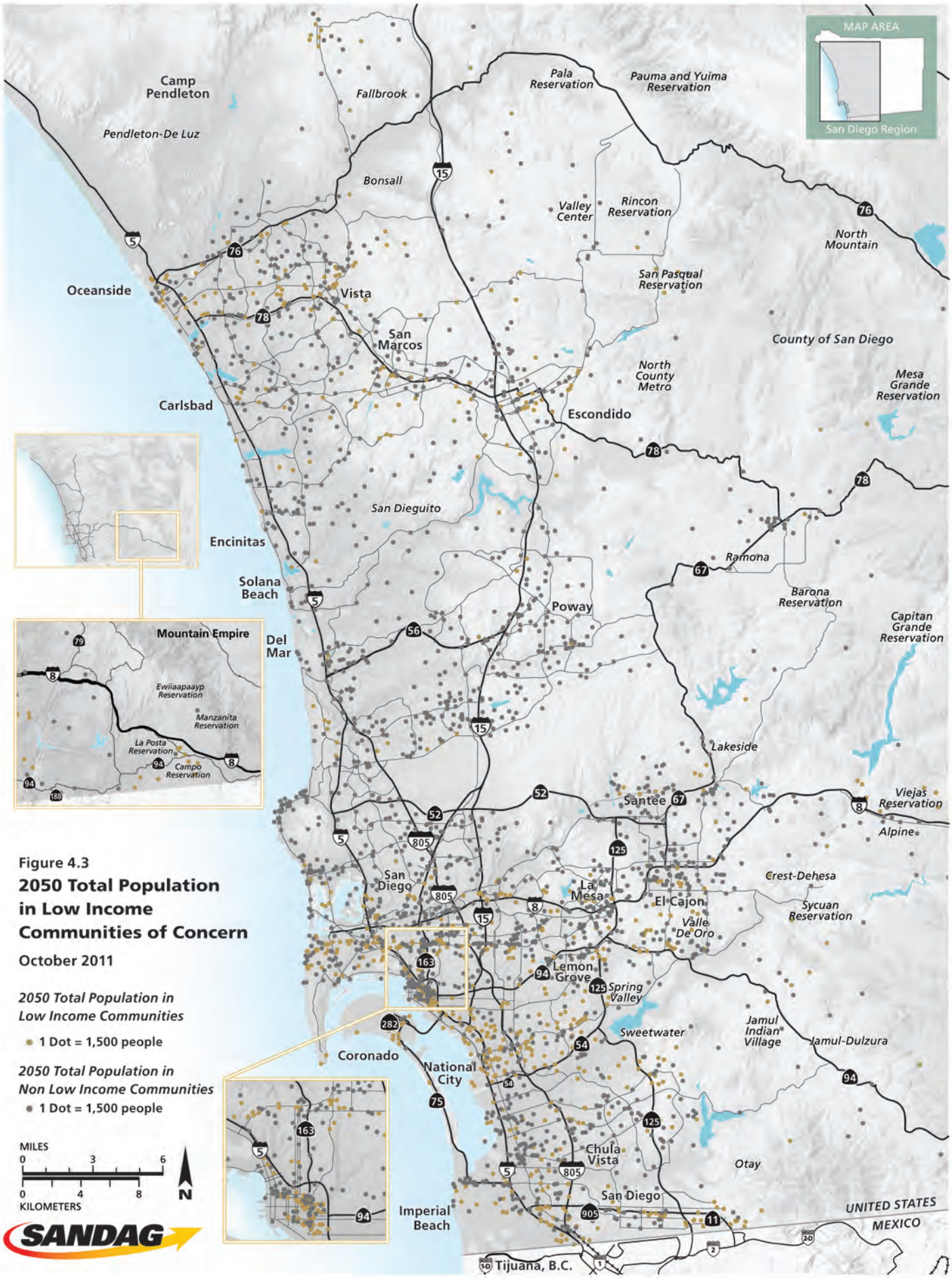


Figure 4.3
2050 Total Population in Low Income Communities of Concern
October 2011

2050 Total Population in Low Income Communities
- 1 Dot = 1,500 people

2050 Total Population in Non Low Income Communities
- 1 Dot = 1,500 people

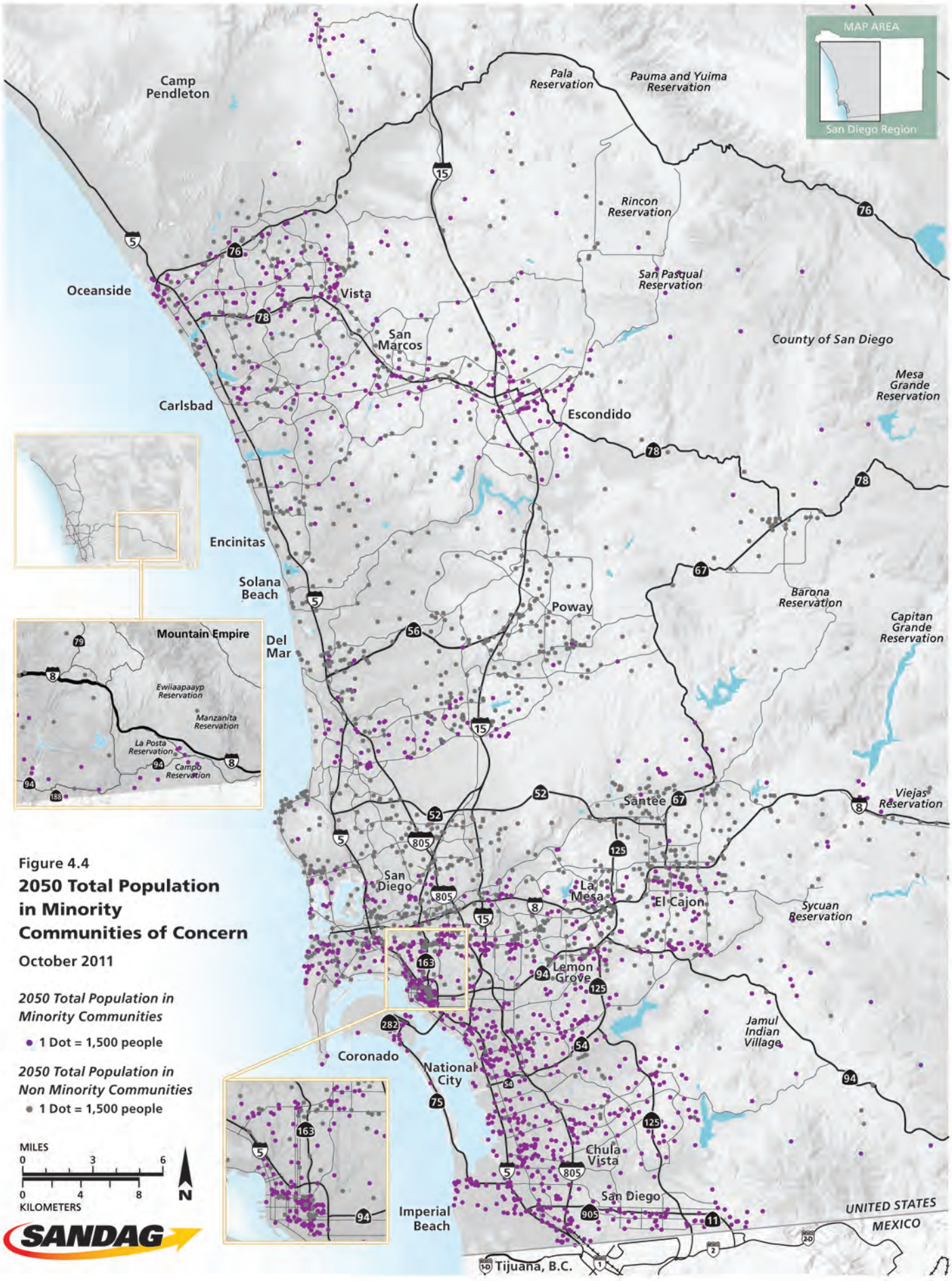
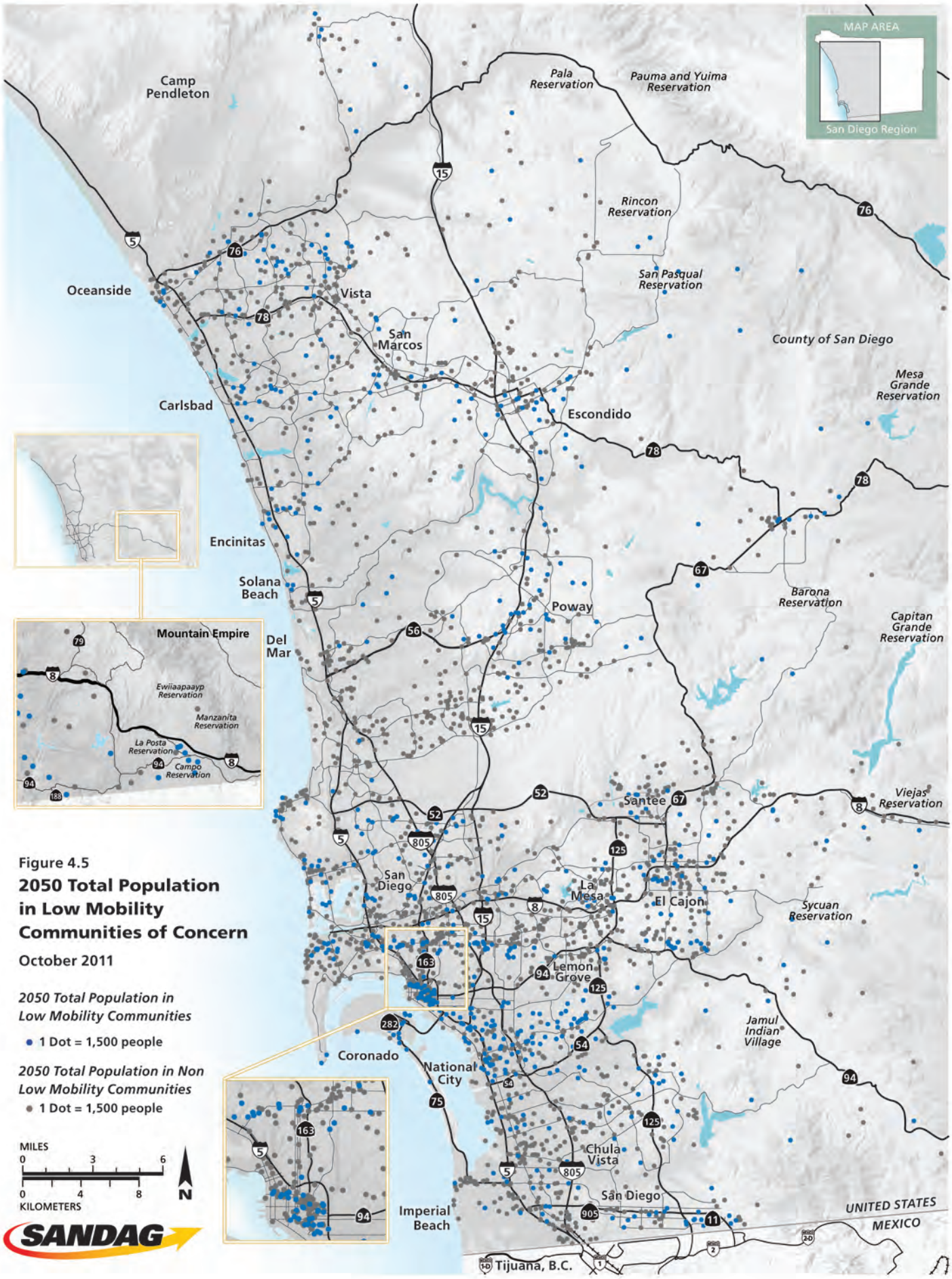


Figure 4.4
2050 Total Population in Minority Communities of Concern
October 2011

2050 Total Population in Minority Communities
● 1 Dot = 1,500 people

2050 Total Population in Non Minority Communities
● 1 Dot = 1,500 people


MAP AREA
San Diego Region
Camp Pendleton
Pala Reservation
Pauma and Yuima Reservation
Rincon Reservation
San Pasqual Reservation
County of San Diego
Mesa Grande Reservation
Oceanside
Vista
San Marcos
Carlsbad
Escondido
Encinitas
Solana Beach
Del Mar
Poway
Barona Reservation
Capitan Grande Reservation
Mountain Empire
Ewiiaapaayp Reservation
Manzanita Reservation
La Posta Reservation
Campo Reservation
Santee
Viejas Reservation
San Diego
La Mesa
El Cajon
Sycuan Reservation
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 4.5
2050 Total Population in Low Mobility Communities of Concern
October 2011
2050 Total Population in Low Mobility Communities
1 Dot = 1,500 people
2050 Total Population in Non Low Mobility Communities
1 Dot = 1,500 people
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG

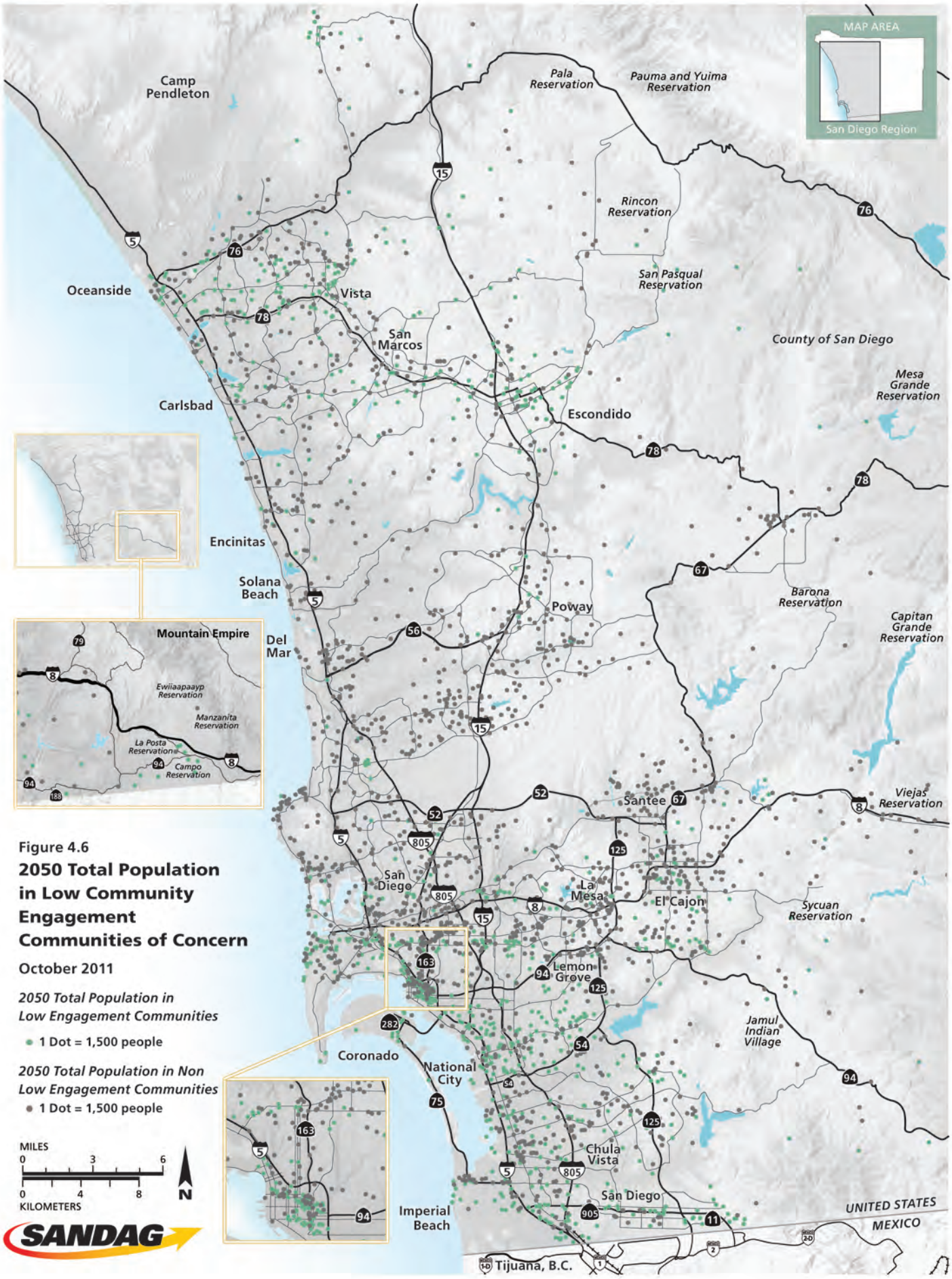


Figure 4.6

2050 Total Population in Low Community Engagement Communities of Concern

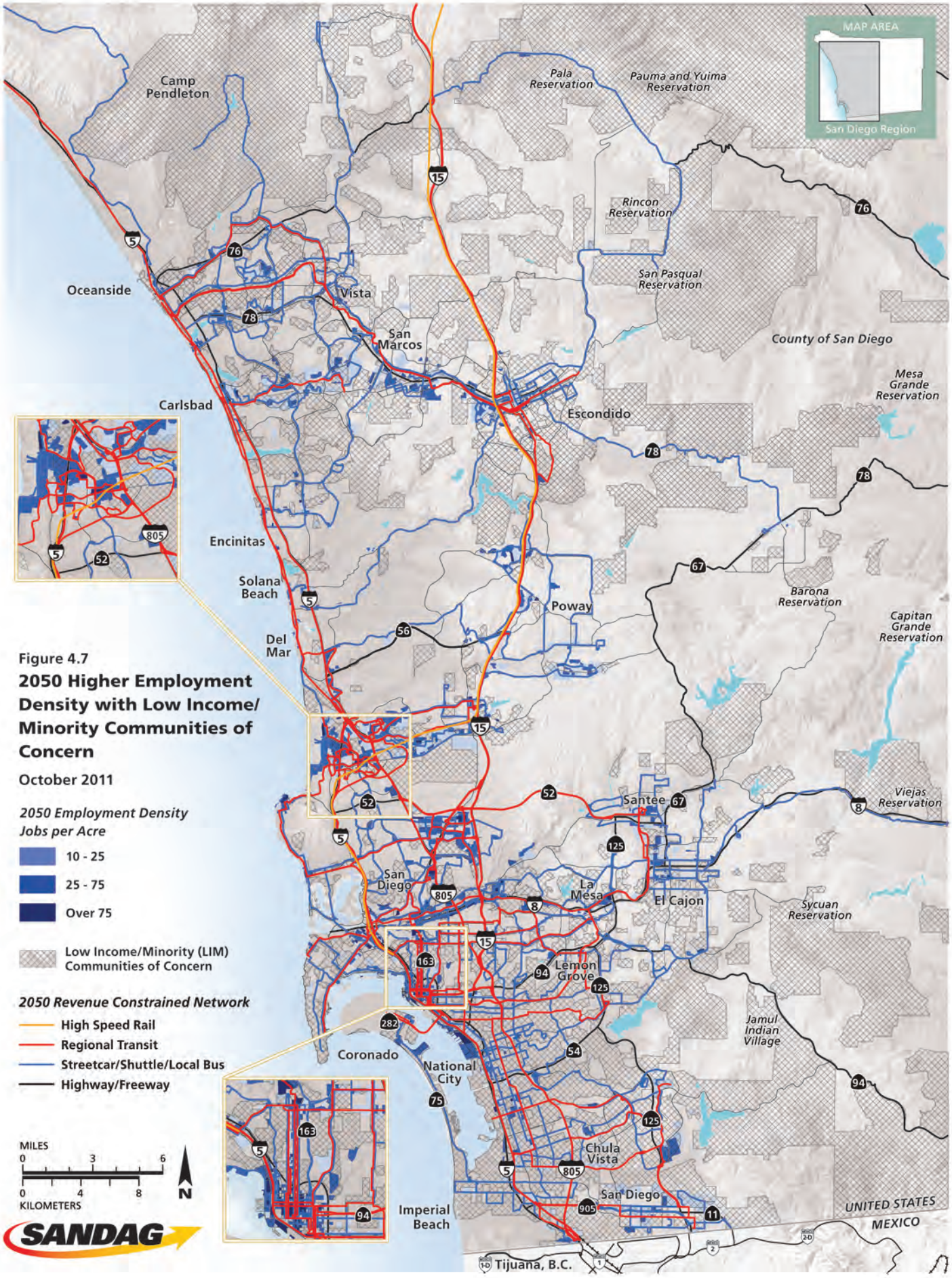
October 2011

2050 Total Population in Low Engagement Communities

- 1 Dot = 1,500 people

2050 Total Population in Non Low Engagement Communities

- 1 Dot = 1,500 people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Capitan Grande Reservation
Santee
Viejas Reservation
San Diego
La Mesa
El Cajon
Sycuan Reservation
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 4.7
2050 Higher Employment Density with Low Income/ Minority Communities of Concern
October 2011
2050 Employment Density
Jobs per Acre
10 - 25
25 - 75
Over 75
Low Income/Minority (LIM) Communities of Concern
2050 Revenue Constrained Network
High Speed Rail
Regional Transit
Streetcar/Shuttle/Local Bus
Highway/Freeway
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG

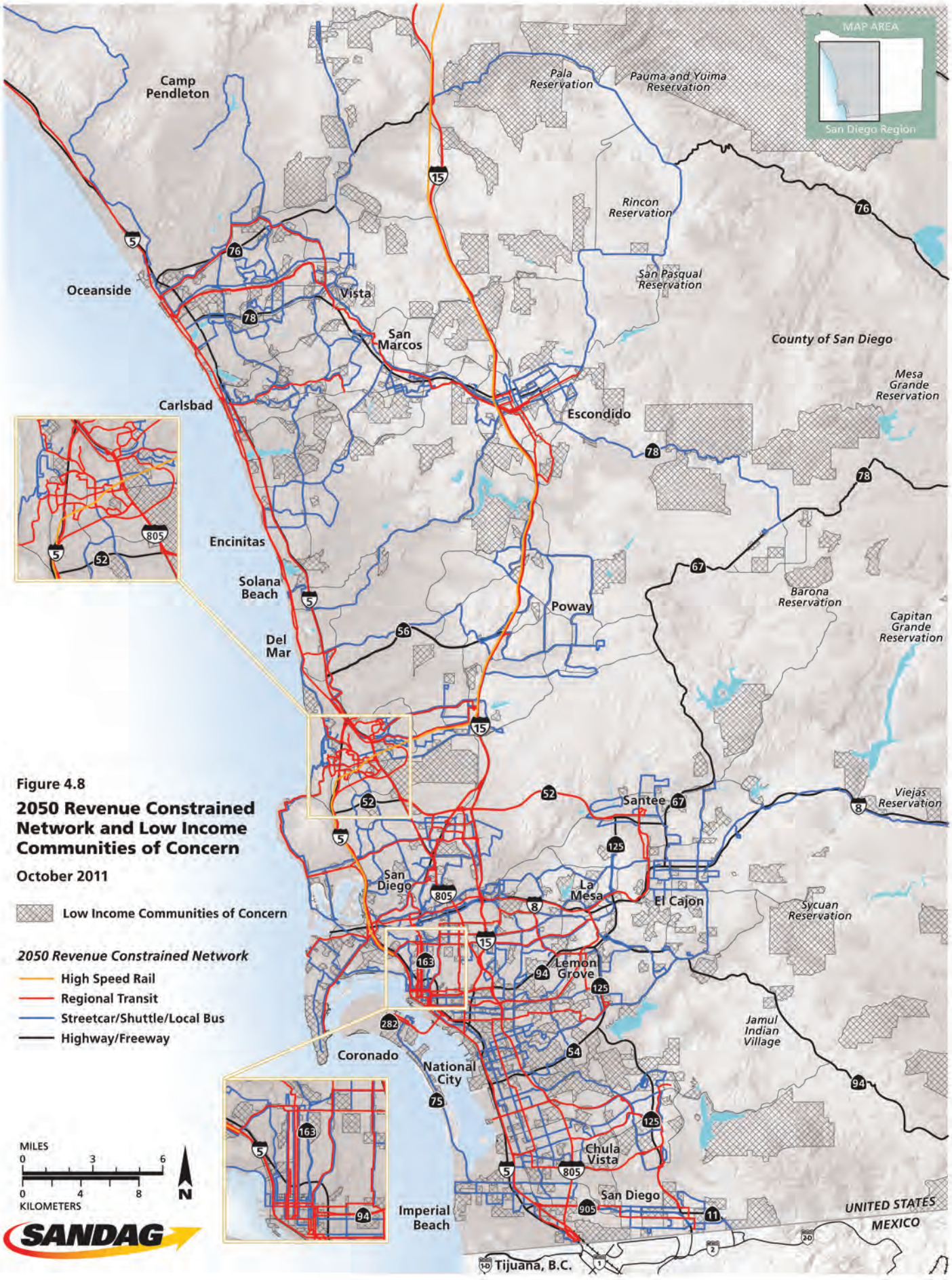
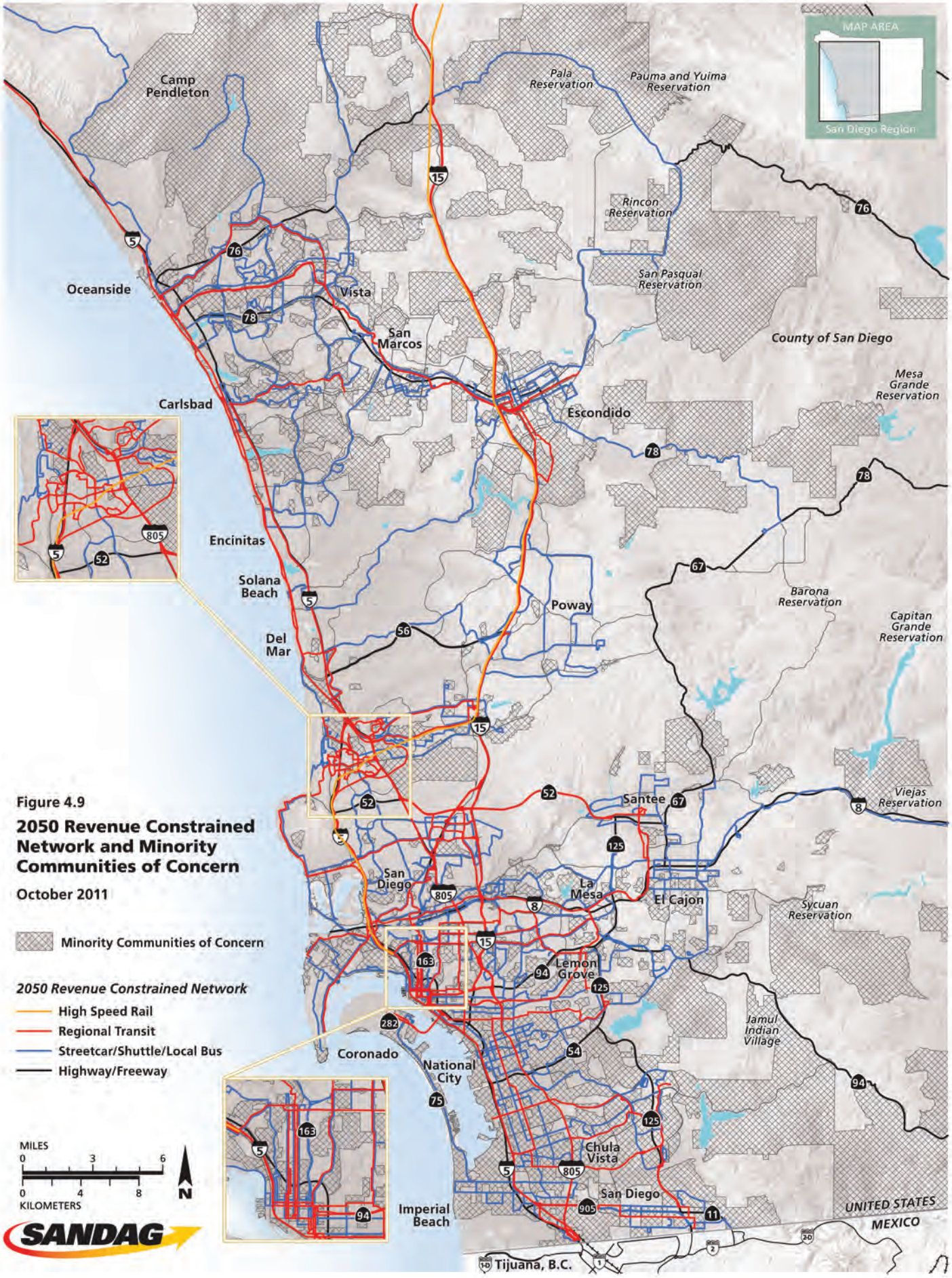


Figure 4.8

2050 Revenue Constrained Network and Low Income Communities of Concern

October 2011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Mesa Grande Reservation
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Vista
San Marcos
Carlsbad
Escondido
Encinitas
Solana Beach
Del Mar
Poway
Barona Reservation
Capitan Grande Reservation
Viejas Reservation
Santee
San Diego
La Mesa
El Cajon
Sycuan Reservation
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 4.9
2050 Revenue Constrained Network and Minority Communities of Concern
October 2011
Minority Communities of Concern
2050 Revenue Constrained Network
High Speed Rail
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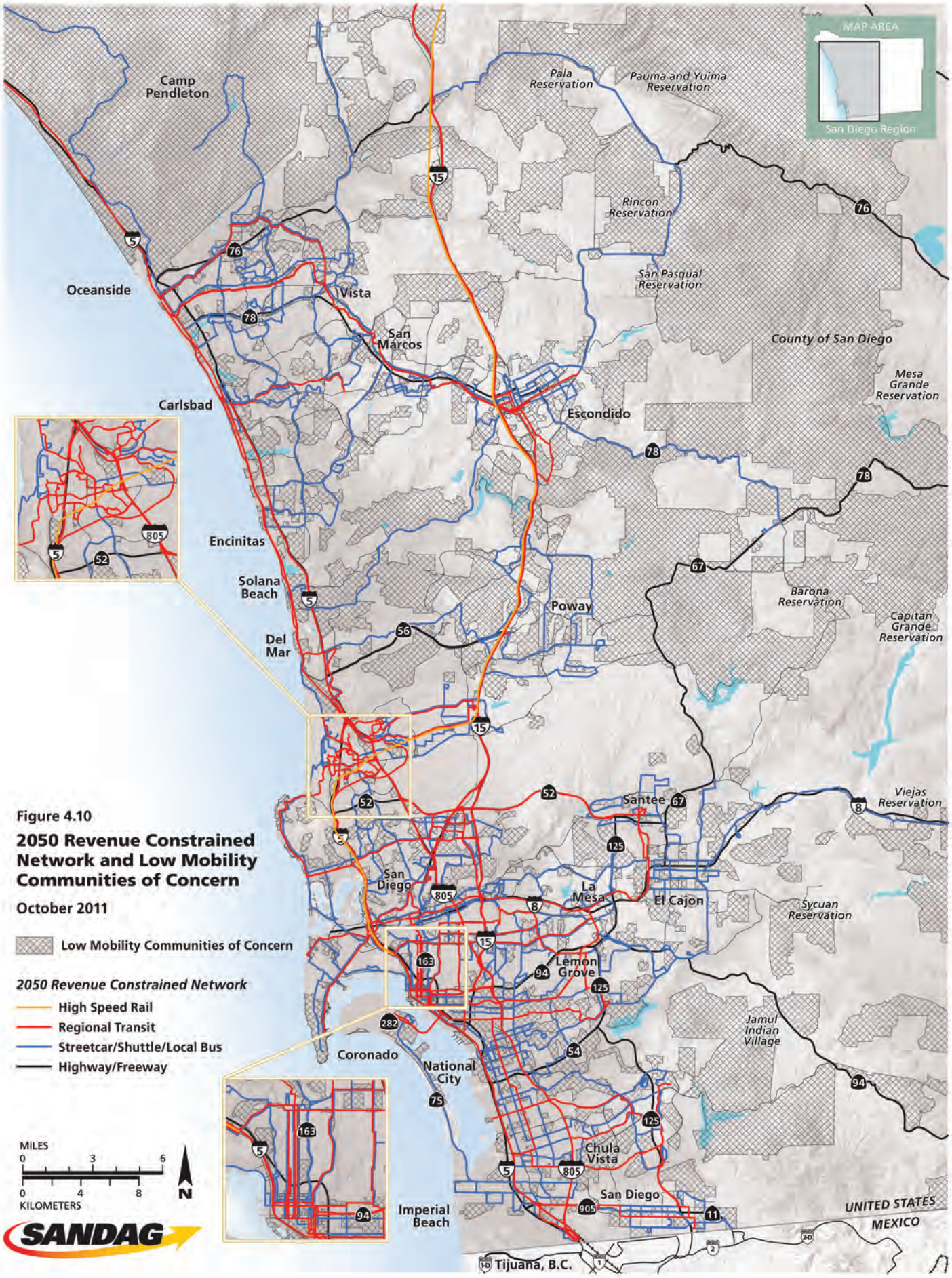
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Figure 4.10
2050 Revenue Constrained Network and Low Mobility Communities of Concern
October 2011
Low Mobility Communities of Concern
2050 Revenue Constrained Network
High Speed Rail
Regional Transit
Streetcar/Shuttle/Local Bus
Highway/Freeway
MILES
0 3 6
0 4 8
KILOMETERS
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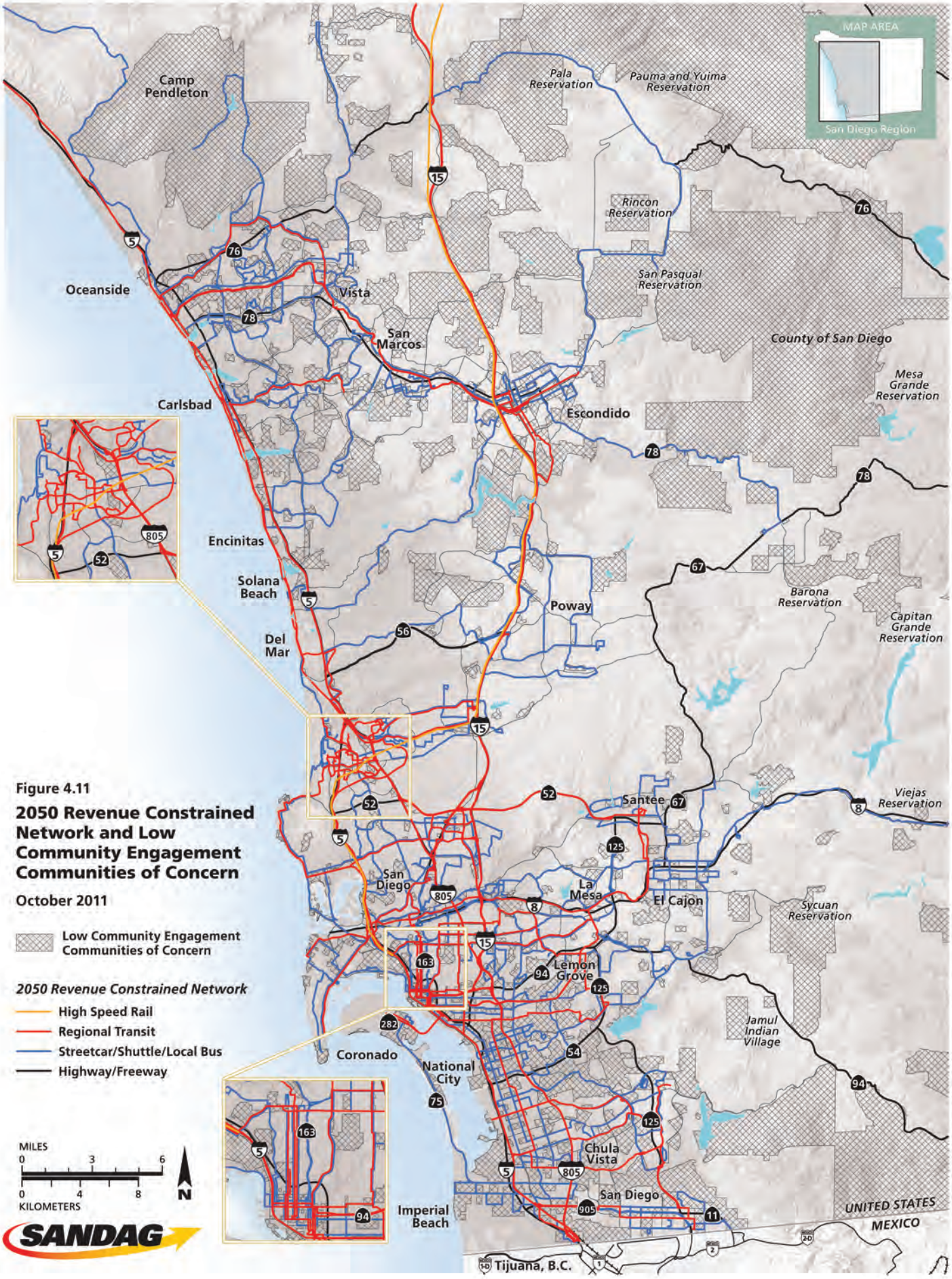
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UNITED STATES
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Figure 4.11
2050 Revenue Constrained Network and Low Community Engagement Communities of Concern
October 2011
Low Community Engagement Communities of Concern
2050 Revenue Constrained Network
High Speed Rail
Regional Transit
Streetcar/Shuttle/Local Bus
Highway/Freeway
MILES
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0 4 8
KILOMETERS
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Table 4.5 – Average Travel Time Per Person Trip

Performance Measure	Existing (2008)	2050 No Build	2020 Revenue Constrained	2035 Revenue Constrained	2050 Revenue Constrained
Average travel time per person trip – All Trip Types Combined (minutes)					
Low Income Community of Concern	15	17	15	16	17
Non-Low Income population	16	17	16	16	17
Minority Community of Concern	15	17	15	16	16
Non-Minority population	16	17	16	16	17
Low Mobility Community of Concern	16	18	16	17	17
Non-Low Mobility population	16	17	15	16	17
Low Community Engagement Community of Concern	15	17	15	16	17
Non-Low Community Engagement population	16	17	16	16	17
Average travel time per person trip – Auto, Drive Alone (minutes)					
Low Income Community of Concern	16	18	16	17	17
Non-Low Income population	17	18	16	17	17
Minority Community of Concern	16	18	16	16	17
Non-Minority population	17	18	16	17	18
Low Mobility Community of Concern	16	18	16	17	17
Non-Low Mobility population	16	18	16	17	17
Low Community Engagement Community of Concern	16	18	16	17	17
Non-Low Community Engagement population	17	18	17	17	18
Average travel time per person trip – Auto, Carpool (minutes)					
Low Income Community of Concern	13	14	12	13	14
Non-Low Income population	13	14	13	13	14
Minority Community of Concern	12	13	11	12	13
Non-Minority population	13	14	13	14	14
Low Mobility Community of Concern	13	14	12	13	14
Non- Low Mobility population	13	14	12	13	14
Low Community Engagement Community of Concern	12	14	12	13	13
Non-Low Community Engagement population	13	14	13	14	14

Table 4.5 – Average Travel Time Per Person Trip (Continued)

Performance Measure	Existing (2008)	2050 No Build	2020 Revenue Constrained	2035 Revenue Constrained	2050 Revenue Constrained
Average travel time per person trip - Transit (minutes)					
Low Income Community of Concern	53	55	54	50	48
Non-Low Income population	58	59	58	53	52
Minority Community of Concern	56	57	56	52	49
Non-Minority population	54	56	55	51	50
Low Mobility Community of Concern	54	56	55	50	49
Non-Low Mobility population	59	60	59	54	53
Low Community Engagement Community of Concern	57	58	57	53	51
Non-Low Community Engagement population	56	58	56	52	51

Table 4.6 – Commute Trips within 30 minutes and Percent of Homes within 1/2 Mile of a Transit Stop

Performance Measure	Existing (2008)	2050 No Build	2020 Revenue Constrained	2035 Revenue Constrained	2050 Revenue Constrained
Commute trips within 30 minutes					
Low Income Community of Concern					
SOV/Drove alone	79%	71%	80%	76%	74%
Carpool	80%	72%	83%	78%	75%
Transit	15%	15%	18%	22%	23%
Non Low Income population					
SOV/Drove alone	72%	67%	72%	69%	69%
Carpool	73%	69%	77%	71%	71%
Transit	5%	5%	7%	10%	11%
Minority Community of Concern					
SOV/Drove alone	75%	70%	77%	73%	72%
Carpool	76%	71%	81%	75%	74%
Transit	9%	10%	12%	16%	17%
Non-Minority population					
SOV/Drove alone	72%	66%	72%	69%	68%
Carpool	73%	68%	76%	71%	70%
Transit	5%	6%	8%	11%	11%
Low Mobility Community of Concern					
SOV/Drove alone	78%	71%	79%	75%	73%
Carpool	79%	72%	83%	77%	75%
Transit	12%	13%	15%	19%	20%
Non-Low Mobility population					
SOV/Drove alone	72%	67%	72%	69%	69%
Carpool	73%	69%	77%	71%	71%
Transit	6%	6%	8%	11%	12%
Low Community Engagement Community of Concern					
SOV/Drove alone	77%	70%	78%	74%	73%
Carpool	78%	71%	82%	76%	74%
Transit	12%	13%	15%	19%	21%
Non-Low Community Engagement population					
SOV/Drove alone	72%	67%	72%	69%	69%
Carpool	73%	69%	77%	71%	71%
Transit	5%	5%	8%	11%	11%

Table 4.6 – Commute Trips within 30 minutes and Percent of Homes within 1/2 Mile of a Transit Stop (Continued)

Performance Measure	Existing (2008)	2050 No Build	2020 Revenue Constrained	2035 Revenue Constrained	2050 Revenue Constrained
Percentage of Homes within 1/2 Mile of a Transit Stop					
Low Income Community of Concern	93%	90%	90%	90%	91%
Non-Low Income population	59%	56%	58%	59%	60%
Minority Community of Concern	81%	78%	79%	79%	80%
Non-Minority population	55%	54%	55%	56%	57%
Low Mobility Community of Concern	72%	72%	71%	73%	74%
Non-Low Mobility population	65%	62%	64%	64%	66%
Low Community Engagement Community of Concern	90%	86%	87%	86%	87%
Non-Low Community Engagement population	57%	55%	57%	58%	59%

Table 4.7 – Auto Travel Times to Amenities

Performance Measure	Existing (2008)	2050 No Build	2020 Revenue Constrained	2035 Revenue Constrained	2050 Revenue Constrained
Auto travel time					
Percentage of Population within 30 min of Schools (higher education, including vocational)					
Low Income Community of Concern	99%	99%	99%	99%	99%
Non-Low Income population	99%	99%	99%	99%	99%
Minority Community of Concern	99%	99%	99%	99%	99%
Non-Minority population	99%	99%	99%	99%	99%
Low Mobility Community of Concern	98%	97%	97%	97%	97%
Non-Low Mobility population	100%	99%	100%	100%	99%
Low Community Engagement Community of Concern	99%	99%	99%	99%	99%
Non-Low Community Engagement population	99%	99%	99%	99%	99%
Percentage of Population within 30 min of San Diego International Airport					
Low Income Community of Concern	75%	75%	76%	76%	75%
Non-Low Income population	71%	64%	72%	69%	67%
Minority Community of Concern	75%	74%	76%	75%	76%
Non-Minority population	70%	61%	70%	67%	62%
Low Mobility Community of Concern	71%	66%	71%	70%	67%
Non-Low Mobility population	73%	68%	73%	72%	70%
Low Community Engagement Community of Concern	70%	69%	70%	70%	69%
Non- Low Community Engagement population	74%	67%	74%	72%	69%
Percentage of Population within 15 min of Healthcare (hospitals, community clinics)					
Low Income Community of Concern	99%	99%	100%	99%	99%
Non-Low Income population	97%	96%	97%	97%	96%
Minority Community of Concern	99%	99%	99%	99%	99%
Non-Minority population	96%	95%	96%	96%	95%
Low Mobility Community of Concern	97%	96%	97%	97%	96%
Non-Low Mobility population	98%	97%	98%	98%	98%
Low Community Engagement Community of Concern	99%	99%	99%	99%	99%
Non-Low Community Engagement population	97%	96%	97%	97%	96%
Percentage of Population within 15 min of Parks and Beaches					
Low Income Community of Concern	100%	100%	100%	100%	100%
Non-Low Income population	99%	99%	99%	99%	99%
Minority Community of Concern	100%	100%	100%	100%	100%
Non-Minority population	99%	99%	99%	99%	99%
Low Mobility Community of Concern	100%	100%	100%	100%	100%
Non-Low Mobility population	99%	99%	99%	99%	99%
Low Community Engagement Community of Concern	100%	100%	100%	100%	100%
Non-Low Community Engagement population	99%	99%	99%	99%	99%

Table 4.8 – Transit Travel Times to Amenities

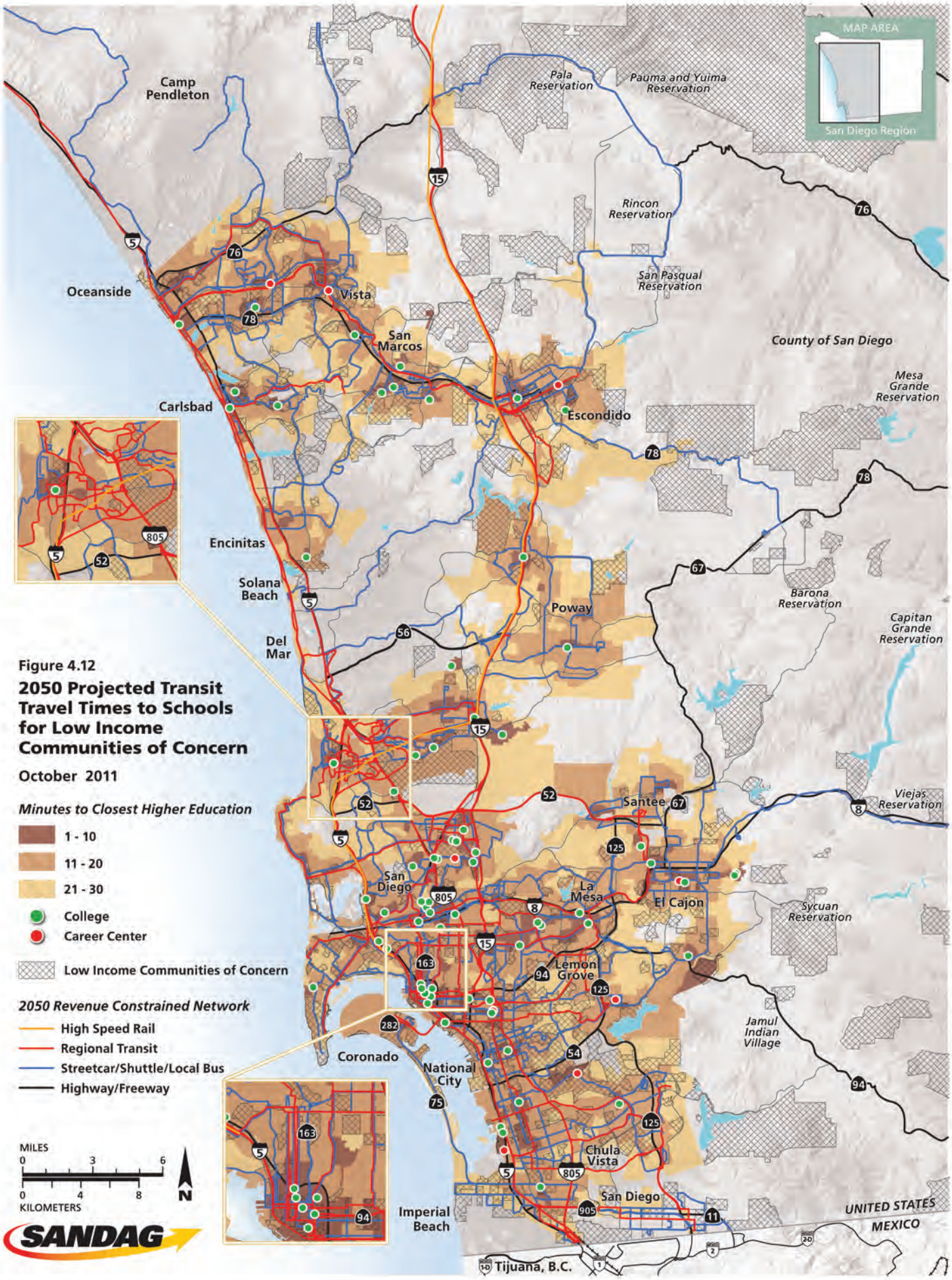
Performance Measure	Existing (2008)	2050 No Build	2020 Revenue Constrained	2035 Revenue Constrained	2050 Revenue Constrained
Transit Travel Time					
Percentage of Population within 30 min of Schools (Higher Education, including Vocational)					
Low Income Community of Concern	87%	87%	87%	87%	90%
Non-Low Income population	69%	68%	70%	71%	72%
Minority Community of Concern	85%	83%	85%	86%	87%
Non-Minority population	62%	63%	65%	65%	66%
Low Mobility Community of Concern	76%	77%	76%	77%	79%
Non-Low Mobility population	72%	72%	74%	75%	76%
Low Community Engagement Community of Concern	85%	85%	85%	85%	88%
Non-Low Community Engagement population	68%	67%	70%	70%	72%
Percentage of Population within 30 min of San Diego International Airport					
Low Income Community of Concern	4%	6%	6%	7%	10%
Non-Low Income population	5%	7%	7%	7%	8%
Minority Community of Concern	3%	5%	4%	4%	7%
Non-Minority population	7%	9%	9%	9%	11%
Low Mobility Community of Concern	5%	8%	8%	9%	12%
Non-Low Mobility population	5%	6%	6%	6%	7%
Low Community Engagement Community of Concern	3%	4%	4%	5%	8%
Non-Low Community Engagement population	6%	8%	7%	8%	9%
Percentage of Population within 15 min of Healthcare (Hospitals, Community Clinics)					
Low Income Community of Concern	72%	71%	71%	72%	73%
Non-Low Income population	24%	23%	23%	25%	27%
Minority Community of Concern	53%	50%	51%	52%	54%
Non-Minority population	21%	22%	21%	23%	25%
Low Mobility Community of Concern	50%	51%	49%	52%	56%
Non-Low Mobility population	32%	31%	31%	33%	34%
Low Community Engagement Community of Concern	65%	62%	64%	64%	66%
Non-Low Community Engagement population	23%	23%	23%	25%	27%

Table 4.8 – Transit Travel Times to Amenities (Continued)

Performance Measure	Existing (2008)	2050 No Build	2020 Revenue Constrained	2035 Revenue Constrained	2050 Revenue Constrained
Percentage of Population within 15 min of Parks and Beaches					
Low Income Community of Concern	67%	66%	67%	67%	68%
Non-Low Income population	54%	53%	55%	56%	58%
Minority Community of Concern	60%	58%	60%	61%	64%
Non-Minority population	56%	55%	56%	56%	57%
Low Mobility Community of Concern	60%	60%	61%	61%	63%
Non-Low Mobility population	57%	55%	57%	58%	60%
Low Community Engagement Community of Concern	61%	59%	61%	60%	62%
Non-Low Community Engagement population	56%	55%	57%	58%	60%

Table 4.9 – Distribution of RTP Expenditures per Capita

Performance Measure	Existing (2008)	2050 No Build	2020 Revenue Constrained	2035 Revenue Constrained	2050 Revenue Constrained
Low Income Community of Concern	N/A	$6,100	N/A	N/A	$18,500
Non-Low Income population	N/A	$6,100	N/A	N/A	$14,700
Minority Community of Concern	N/A	$6,100	N/A	N/A	$16,300
Non-Minority population	N/A	$6,000	N/A	N/A	$15,100
Low Mobility Community of Concern	N/A	$6,100	N/A	N/A	$17,400
Non-Low Mobility population	N/A	$6,100	N/A	N/A	$15,100
Low Community Engagement Community of Concern	N/A	$6,000	N/A	N/A	$17,100
Non-Low Community Engagement population	N/A	$6,100	N/A	N/A	$15,100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El Cajon
Sycuan Reservation
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Jamul Indian Village
Coronado
National City
Chula Vista
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Tijuana, B.C.
UNITED STATES
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Figure 4.12
2050 Projected Transit Travel Times to Schools for Low Income Communities of Concern
October 2011
Minutes to Closest Higher Education
1 - 10
11 - 20
21 - 30
College
Career Center
Low Income Communities of Concern
2050 Revenue Constrained Network
High Speed Rail
Regional Transit
Streetcar/Shuttle/Local Bus
Highway/Freeway
MILES
0 3 6
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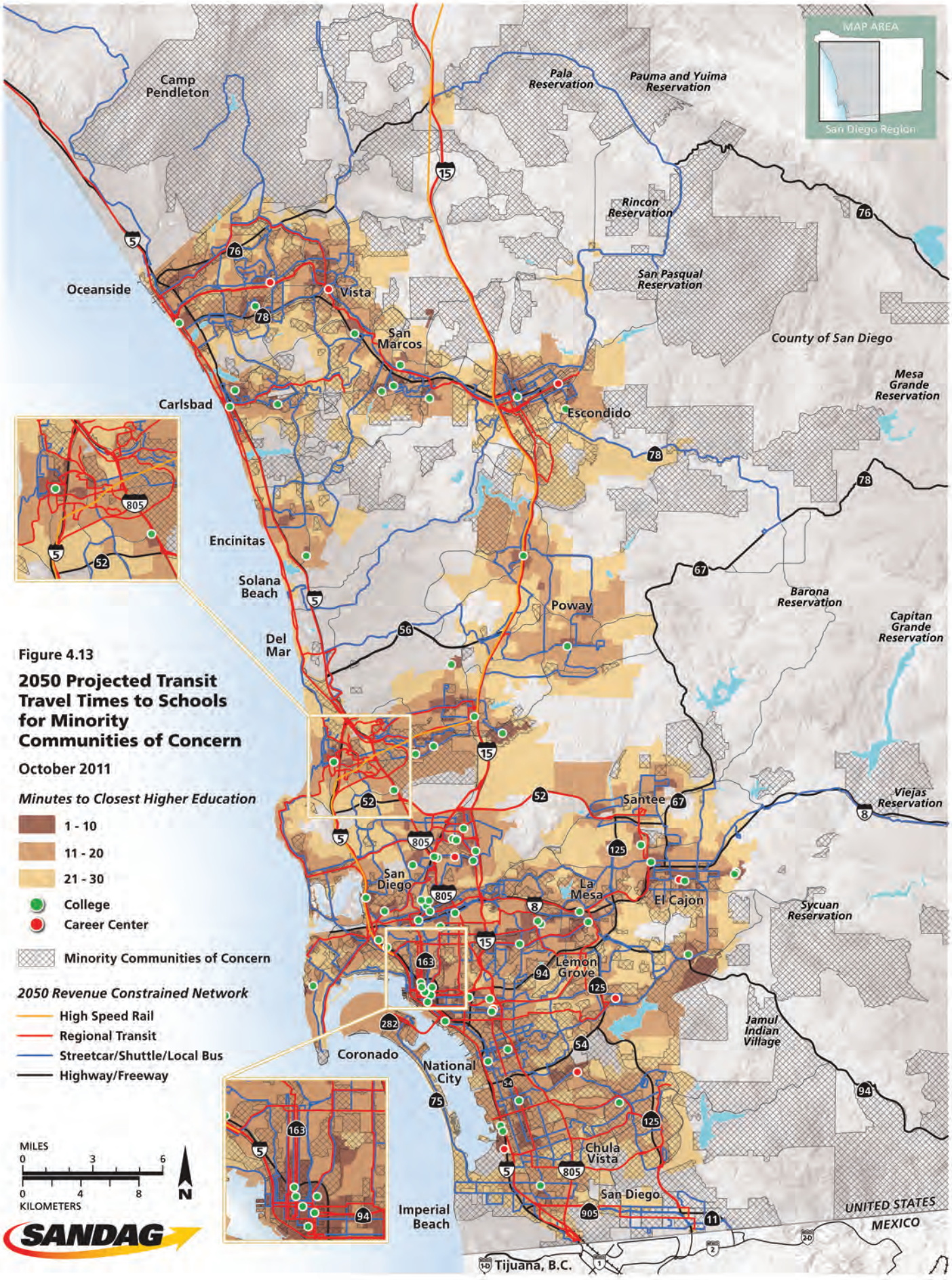
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Tijuana, B.C.
UNITED STATES
MEXICO
Figure 4.13
2050 Projected Transit Travel Times to Schools for Minority Communities of Concern
October 2011
Minutes to Closest Higher Education
1 - 10
11 - 20
21 - 30
College
Career Center
Minority Communities of Concern
2050 Revenue Constrained Network
High Speed Rail
Regional Transit
Streetcar/Shuttle/Local Bus
Highway/Freeway
MILES
0 3 6
0 4 8
KILOMETERS
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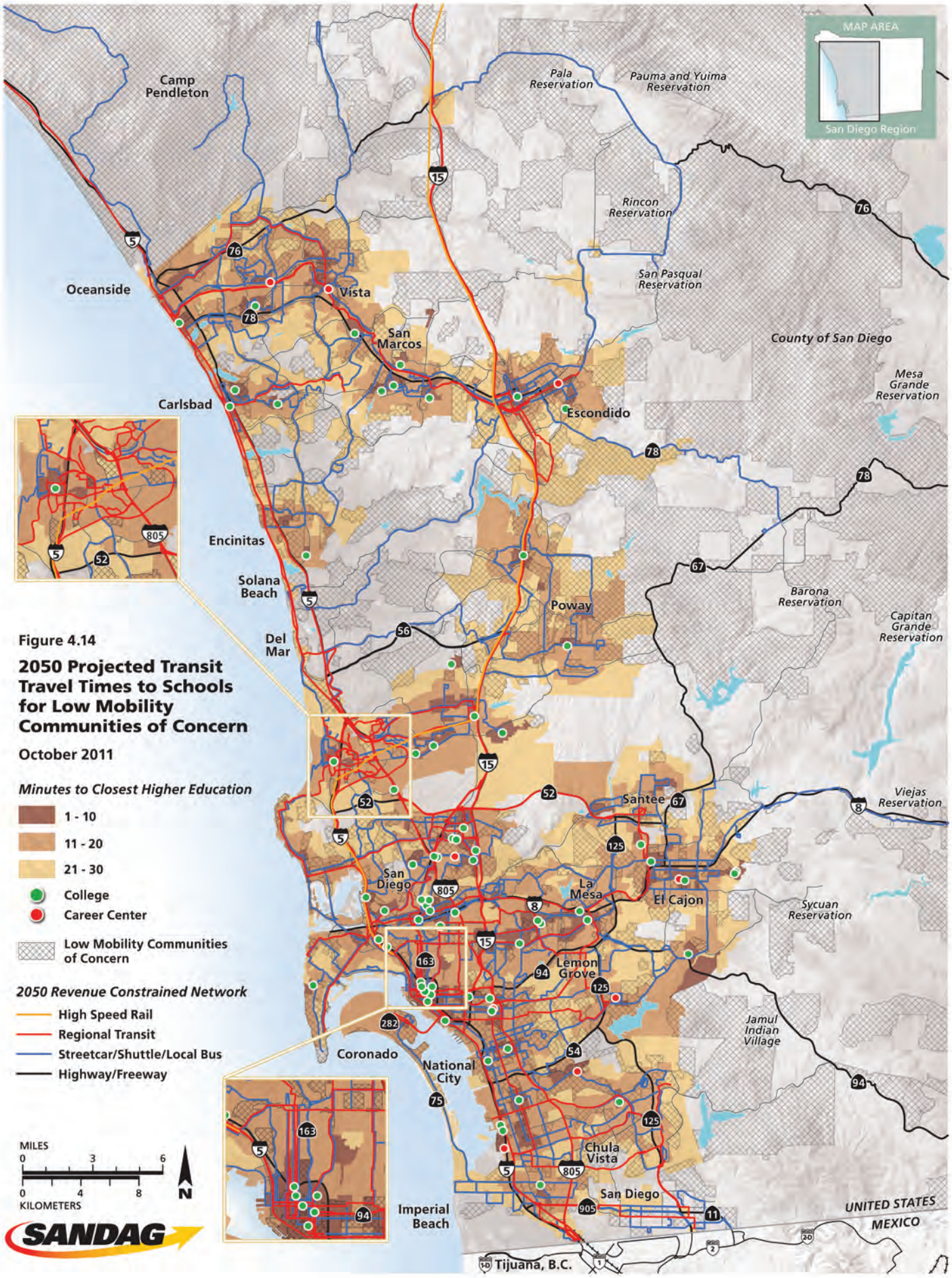
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Coronado
National City
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Tijuana, B.C.
UNITED STATES
MEXICO
Figure 4.14
2050 Projected Transit Travel Times to Schools for Low Mobility Communities of Concern
October 2011
Minutes to Closest Higher Education
1 - 10
11 - 20
21 - 30
College
Career Center
Low Mobility Communities of Concern
2050 Revenue Constrained Network
High Speed Rail
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Streetcar/Shuttle/Local Bus
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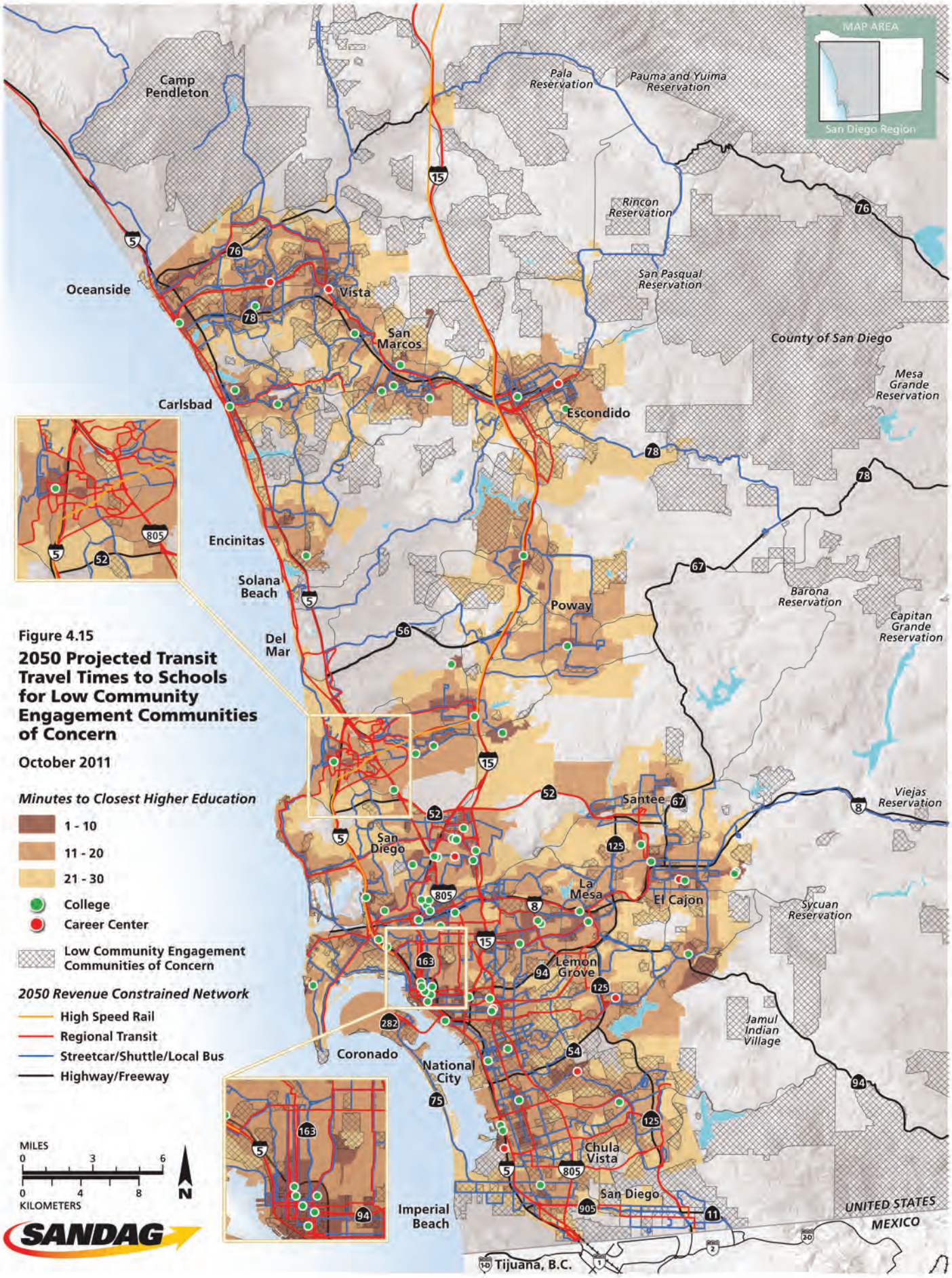
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MEXICO
Figure 4.15
2050 Projected Transit Travel Times to Schools for Low Community Engagement Communities of Concern
October 2011
Minutes to Closest Higher Education
1 - 10
11 - 20
21 - 30
College
Career Center
Low Community Engagement Communities of Concern
2050 Revenue Constrained Network
High Speed Rail
Regional Transit
Streetcar/Shuttle/Local Bus
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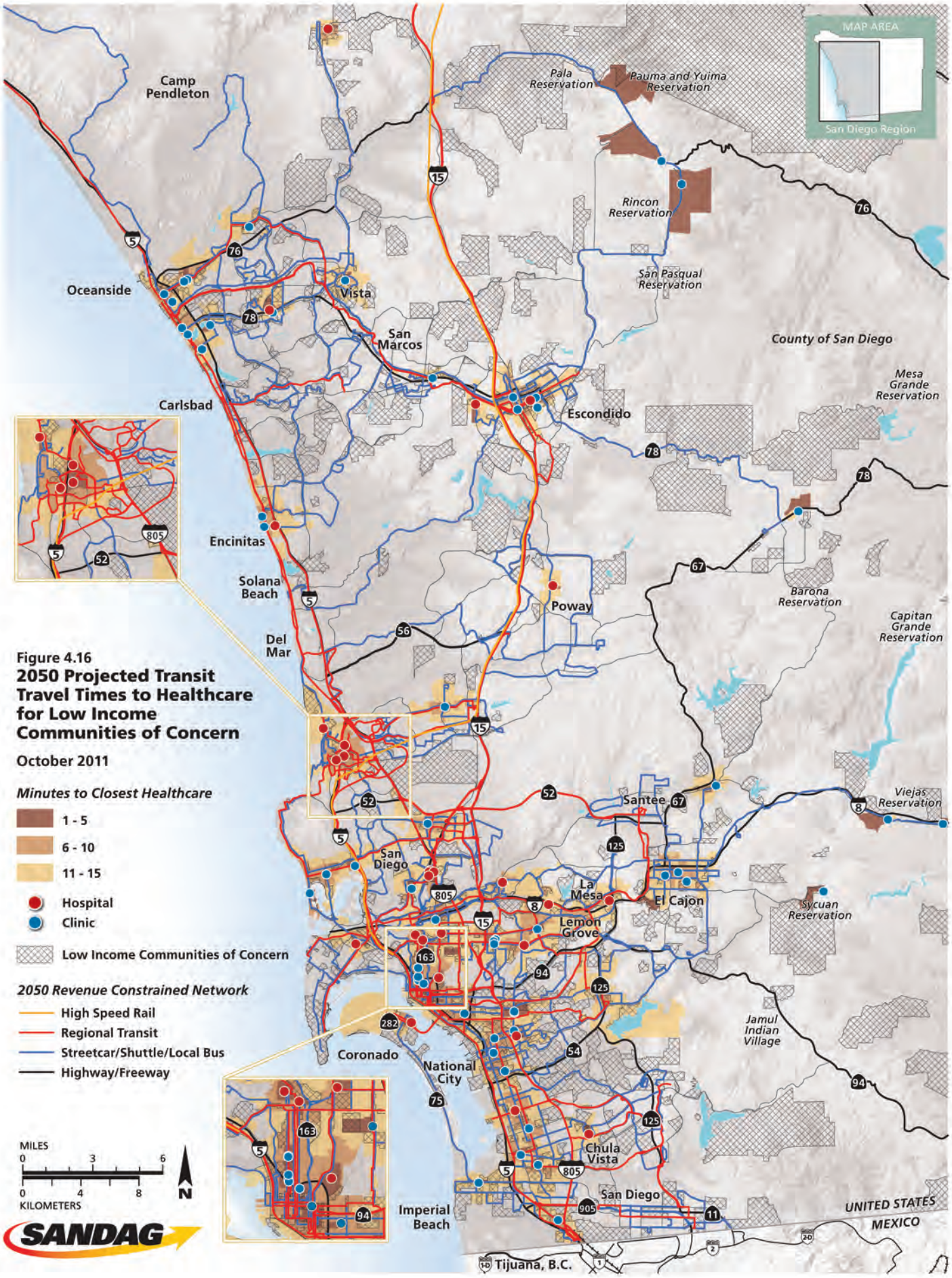
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Figure 4.16
2050 Projected Transit Travel Times to Healthcare for Low Income Communities of Concern
October 2011
Minutes to Closest Healthcare
1 - 5
6 - 10
11 - 15
Hospital
Clinic
Low Income Communities of Concern
2050 Revenue Constrained Network
High Speed Rail
Regional Transit
Streetcar/Shuttle/Local Bus
Highway/Freeway
MILES
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KILOMETERS
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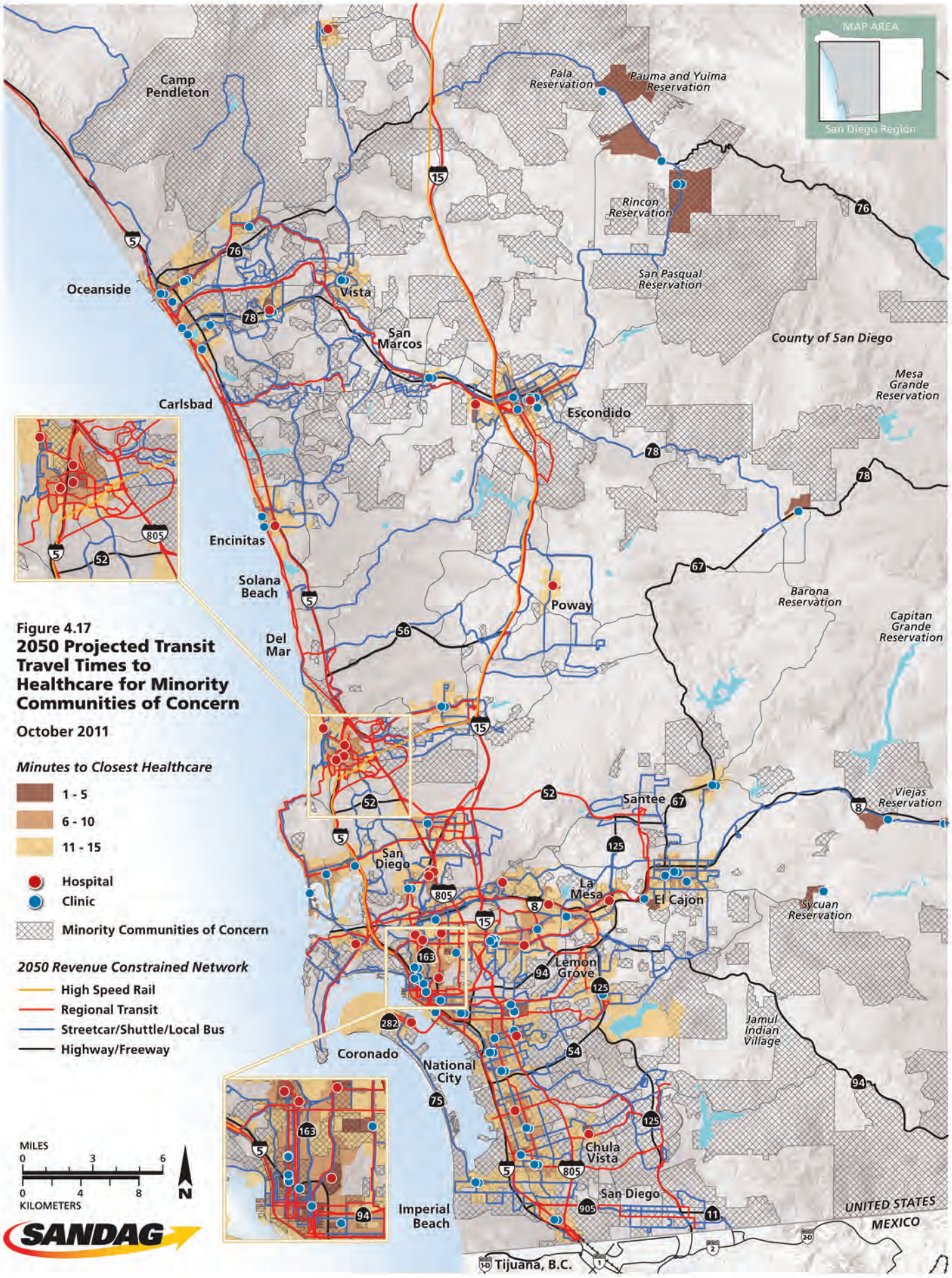
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Figure 4.17
2050 Projected Transit Travel Times to Healthcare for Minority Communities of Concern
October 2011
Minutes to Closest Healthcare
1 - 5
6 - 10
11 - 15
Hospital
Clinic
Minority Communities of Concern
2050 Revenue Constrained Network
High Speed Rail
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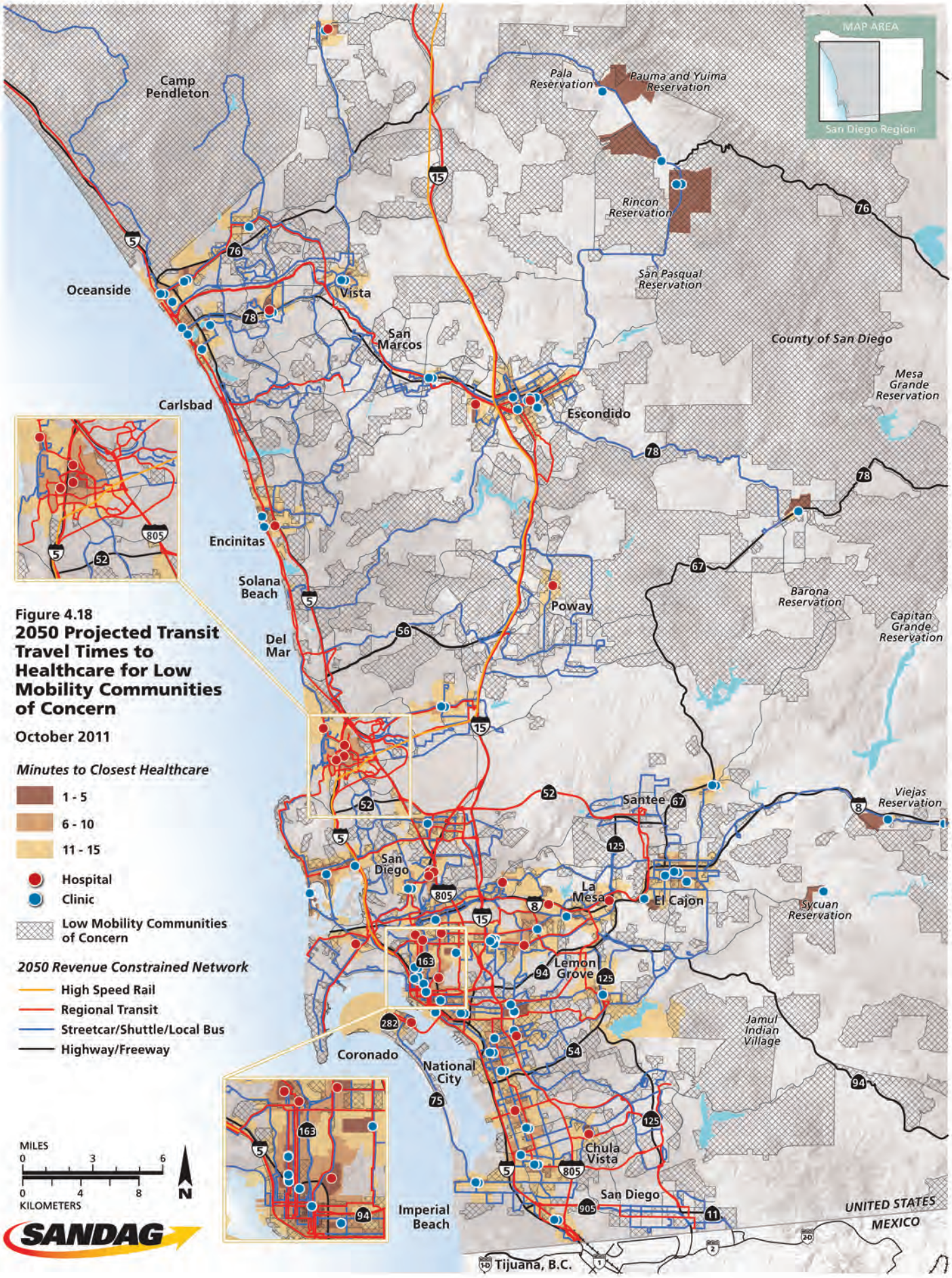
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Figure 4.18
2050 Projected Transit Travel Times to Healthcare for Low Mobility Communities of Concern
October 2011
Minutes to Closest Healthcare
1 - 5
6 - 10
11 - 15
Hospital
Clinic
Low Mobility Communities of Concern
2050 Revenue Constrained Network
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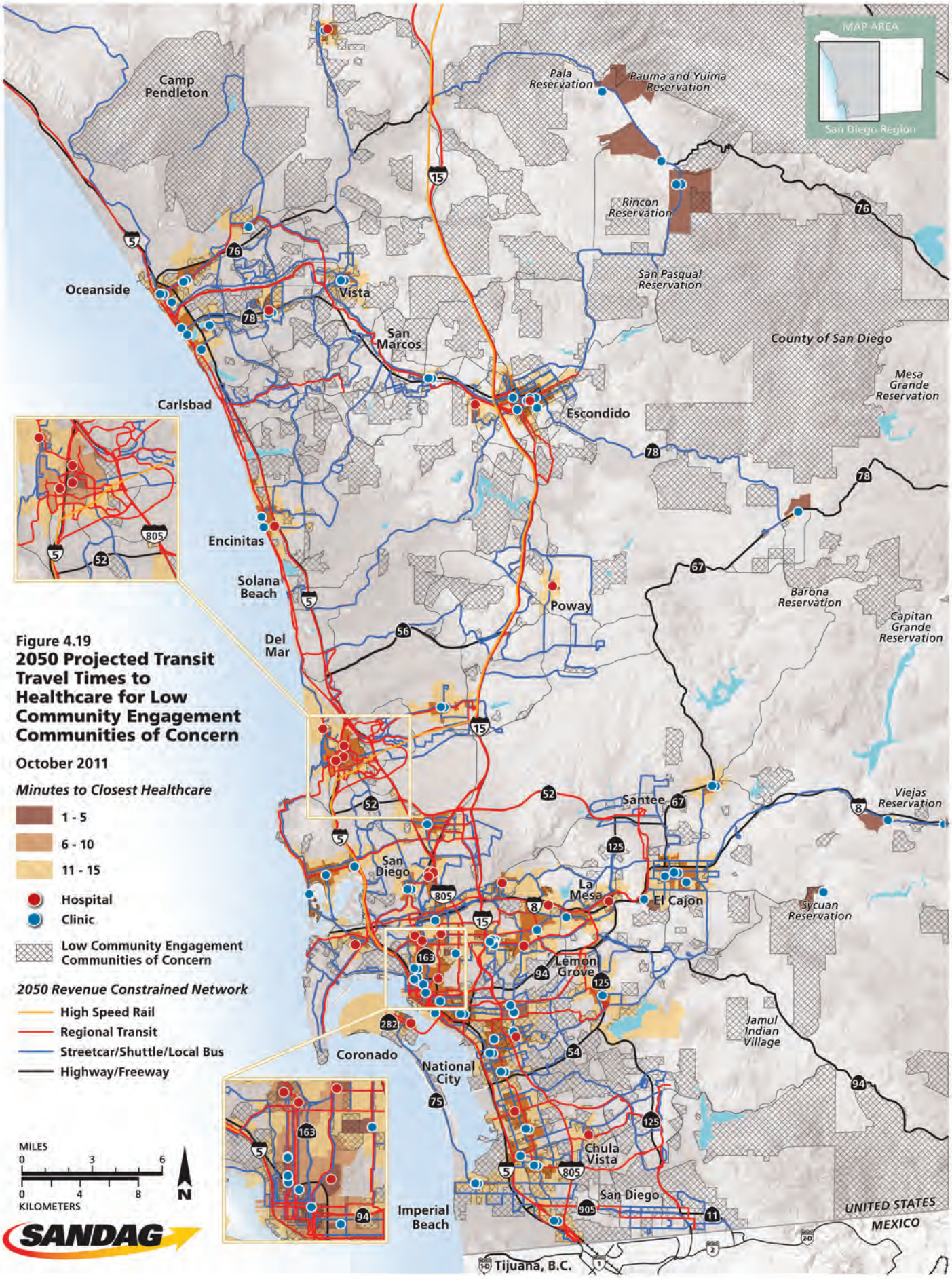
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San Pasqual Reservation
County of San Diego
Mesa Grande Reservation
Oceanside
Vista
San Marcos
Carlsbad
Escondido
Encinitas
Solana Beach
Del Mar
Poway
Barona Reservation
Capitan Grande Reservation
Santee
Viejas Reservation
San Diego
La Mesa
El Cajon
Sycuan Reservation
Lemon Grove
Jamul Indian Village
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 4.19
2050 Projected Transit Travel Times to Healthcare for Low Community Engagement Communities of Concern
October 2011
Minutes to Closest Healthcare
1 - 5
6 - 10
11 - 15
Hospital
Clinic
Low Community Engagement Communities of Concern
2050 Revenue Constrained Network
High Speed Rail
Regional Transit
Streetcar/Shuttle/Local Bus
Highway/Freeway
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG

The next question analyzed was whether LIM populations would receive a similar or greater benefit compared with non-LIMs under the 2050 RTP, relative to the No Build alternative. Key findings are discussed below:

Average Travel Time: The modeling results show no difference in average travel times between LIM and non-LIM populations in the 2050 RTP. The average travel time per person trip for LIM and non-LIM populations, as well as other Communities of Concern, is marginally higher in 2050 than it is today (increasing from 15-16 minutes to 16-17 minutes). There are substantial transit travel time improvements (6-8 minute travel time savings per trip) when compared with the No Build alternative. There are no significant differences in improvements for LIM and non-LIM populations (Table 4.5).

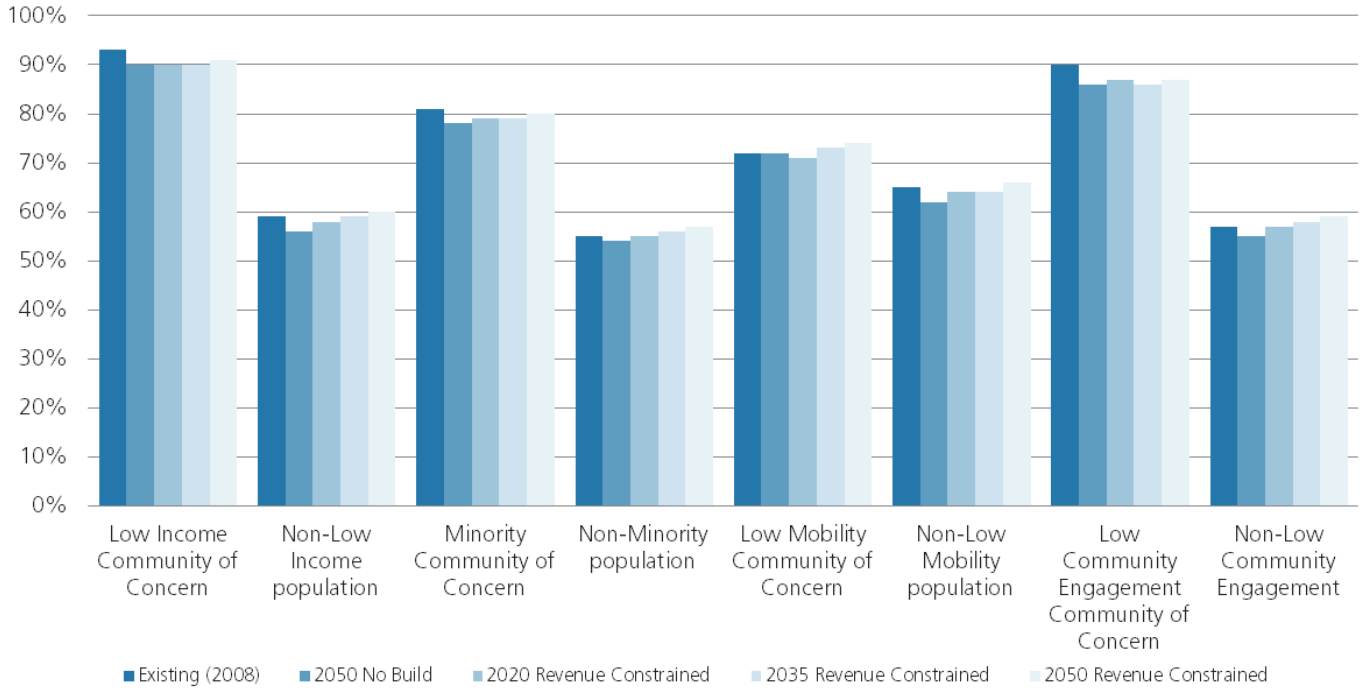
Job Access: LIM populations would receive slightly greater accessibility gains for peak period work trips lasting up to 30 minutes in which they drive alone, carpool, or take public transit, compared with non-LIM populations. When comparing job access (i.e., the proportion of jobs accessible within a 30-minute commute trip) between the No Build alternative and the 2050 RTP, there are moderate levels of improvement (2-3 percentage points) with the 2050 RTP for job access by auto (drive alone and carpool) for Communities of Concern and for other neighborhoods. The biggest gains are seen for people who use public transit to get to work. This improves by 7-8 percentage points for Communities of Concern, when comparing the 2050 RTP with the No Build alternative (Table 4.6).

Access to Transit: The percentage of homes within a half-mile of a transit stop will increase for LIM populations, but those gains are expected to be slightly higher for non-LIM populations. The 2050 RTP increases the percentage of homes served by transit in Low Income, Minority, Low Mobility, and Low Community Engagement Communities of Concern, compared with the No Build alternative. Accessibility gains are slightly higher for communities other than Communities of Concern, because the 2050 RTP Scenario extends some transit services to some higher-income areas not previously served by public transit (Table 4.6 and Figure 4.20).

Access to Schools: Ninety-nine percent of the LIM population has auto access to higher education facilities. Access to schools within a 30-minute drive is expected to remain virtually the same for both LIM and non-LIM populations. Access via public transit is expected to improve both for LIM and non-LIM populations, with slightly higher accessibility gains for non-LIM populations. Access to higher education via public transit shows substantial improvement with the 2050 RTP, compared with the No Build alternative. The 2050 RTP substantially improves access for Communities of Concern, and also maintains higher levels of access for Communities of Concern, compared with other communities (Tables 4.7 and 4.8).

Access to San Diego International Airport (SDIA): Access to SDIA within 30 minutes by driving is expected to be 76 percent for minority and 62 percent for non-minority populations, with marginally higher gains for minority populations relative to non-minority populations. Access to SDIA within 30 minutes via public transit is lower for minority populations but is expected to improve significantly with the 2050 RTP. Transit access to SDIA is expected to improve by 2-4 percentage points for Communities of Concern. Across all communities, the 2050 RTP maintains or improves auto access, compared with the No Build alternative. Slightly lower gains in accessibility for

Figure 4.20 – Percent of Homes within a 1/2 Mile of a Transit Stop



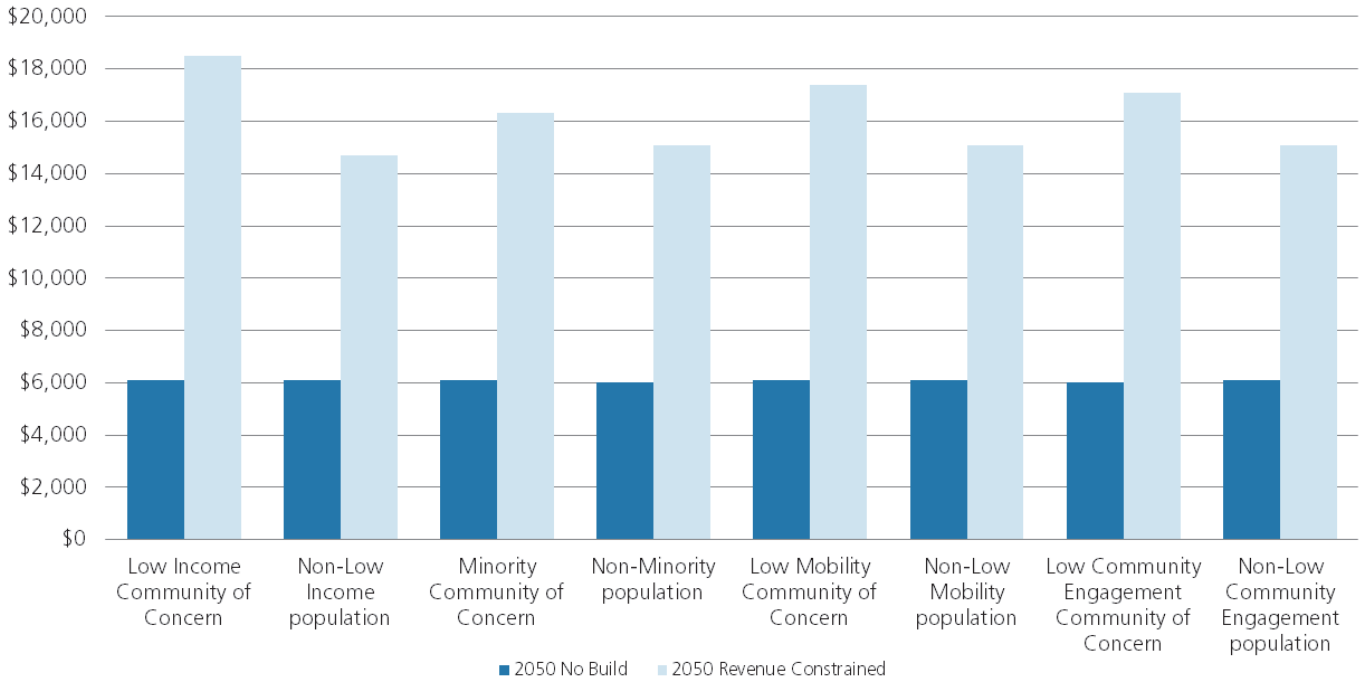
Communities of Concern is expected, compared with other communities. Low income populations, however, are expected to enjoy better auto access to SDIA than non-low income populations would in 2050 (Tables 4.7 and 4.8).

Access to Healthcare Facilities: Access to healthcare facilities within a 15-minute auto or transit travel time is projected to remain virtually the same for both LIM and non-LIM populations. Currently, access by auto to the region's major hospitals and community clinics is high for nearly all communities. Between 96-99 percent of the region's population can access a hospital or community clinic within a 15-minute drive. The 2050 RTP preserves this high level of access for Communities of Concern, compared with the No Build alternative. Access remains higher for LIM than for non-LIM populations in the future (Tables 4.7 and 4.8). Transit access to healthcare facilities, both under existing conditions and in 2050, is substantially higher for Communities of Concern, compared to other communities.

Access to Parks or Beaches: Under existing conditions, auto access to parks or beaches is high at 99 percent or greater for both LIM and non-LIM communities. There are considerable improvements in transit access in the 2050 RTP, compared with the No Build alternative. Access to parks or beaches by transit is expected to improve by 2 percentage points for low income populations and by 6 percentage points for minority populations over the No Build alternative. For low mobility and low community engagement populations, the expected improvement is 3 percentage points. The 2050 RTP provides streetcar services that also will enhance access to parks (Tables 4.7 and 4.8).

Distribution of Proposed RTP Expenditures per Capita: The analysis for low income populations shows that the 2050 RTP would result in higher increases in RTP investments per capita for low income populations, compared with higher income populations (Figure 4.21). The rate of increase in investments per capita is projected to be 203 percent for low income populations, compared with 141 percent for higher income populations.

Figure 4.21 – Distribution of RTP Expenditures per Capita



The 2050 RTP would result in a slightly higher growth rate in investment per capita for LIM populations, compared with non-LIM populations.

The analysis for minority populations, meanwhile, shows that the 2050 RTP would result in slightly higher increases in investments per capita for minority populations, compared with non-minority populations. The rate of increase in investments per capita is projected to be 167 percent for minority populations, compared with 152 percent for non-minority populations.

2008 Existing Conditions Analysis

The social equity performance measures outlined above for the 2050 RTP Transportation Network Scenario were compared with 2008 existing conditions to determine how mobility and accessibility indicators would change over time for LIM populations, compared with non-LIM populations (Tables 4.5 through 4.8). Data for 2008 investments per capita are not available for LIM and non-LIM populations; therefore, an analysis of this performance measure was not possible. Key findings for the other performance measures are outlined below:

Average Travel Time: The modeling results suggest that travel times for LIM and non-LIM populations will be similar. When comparing travel times by mode, there are substantial improvements in transit travel times (4-7 minute travel time savings per trip, on average, for both LIM and non-LIM) compared with existing conditions (Table 4.5).

Job Access: The percentage of peak period work trips taking up to 30 minutes, in which people drive alone or carpool to work, is expected to decline similarly for both LIM and non-LIM populations. Improvements using public transportation, however, are expected for both populations, with slightly higher gains for the LIM population. When compared with existing conditions (i.e., job access in 2008), some decreases in job access by auto (both for driving alone and carpooling) are expected. Although, with major public transit investments in the 2050 RTP, substantial improvements in job access by public transit are expected for Communities of Concern (8-9 percentage point improvement) and other areas (a 6 percentage point improvement) (Table 4.6).

Access to Transit: Most LIM homes (93 percent for Low Income and 81 percent for Minority) were within a half mile of a transit stop in 2008. With the 2050 RTP, the percentage of homes within a half mile of a transit stop would remain virtually the same for LIM populations. Slightly higher gains in accessibility are expected for non-LIM populations, when compared with LIM populations because of significant public transit investments (Table 4.6).

Access to Schools: Under existing conditions, between 98 and 99 percent of Communities of Concern live within a 30-minute drive from schools. This is expected to remain at similar levels for both LIM and non-LIM populations with the 2050 RTP. Access via public transit, however, is expected to improve slightly for all Communities of Concern. For example, low income, low mobility, and low community Engagement populations will see a 3 percentage point increase in accessibility, while minority populations will see a 2 percentage point increase. Communities of Concern are expected to experience nearly equal gains in accessibility to schools than other communities across all modes of transportation (driving alone/carpooling and using public transit) (Tables 4.7 and 4.8).

Access to SDIA: The percentage of the population within 30 minutes of SDIA is expected to remain at current levels for LIM populations for those who drive alone and carpool. However, access to SDIA by transit for the LIM population will increase substantially between 4-6 percentage points. People from non-LIM populations who drive alone or carpool to the airport are expected to experience a decline in accessibility. Under existing conditions, three quarters of LIM Communities of Concern, and about 70 percent of the low mobility and low community Engagement Communities of Concern, can get to San Diego International Airport (SDIA) within a 30-minute drive. Meanwhile, between three and seven percent of the region's population (both LIM and non-LIM populations) can get to the airport within 30 minutes using public transit. Under existing conditions, non-LIM populations have slightly lower access to the airport via auto, compared to LIM populations. Transit access also will increase significantly between 3-4 percentage points for the non-LIM populations (Tables 4.7 and 4.8).

Access to Healthcare Facilities: Ninety-nine percent of LIM populations live within a 15-minute drive of a healthcare facility. This is not expected to change significantly from today to 2050. Today, Communities of Concern enjoy higher levels of access by public transit to get to major hospitals and community clinics, compared with other communities. Between half and nearly three-quarters of Communities of Concern populations can get to a hospital or community clinic within 15 minutes using public transit (Tables 4.7 and 4.8).

Access to Parks or Beaches: Based on existing travel conditions and the existing distribution of parks (including federal, state, regional, and community parks) and beaches, virtually all of the region's population (99%-100%) can get to a park or beach within a 15-minute drive. That is expected to hold true in the future, under the 2050 RTP. Meanwhile, it takes much longer for many people to get to parks or beaches using public transit. Today about two-thirds of people who live in the region's Communities of Concern can get to a park within 15 minutes using public transit and, with the 2050 RTP, slight accessibility gains are expected (Tables 4.7 and 4.8).

Overall, infrastructure investments in the 2050 RTP will result in significant improvements for LIM populations. Under



the 2050 RTP, between 80 and 91 percent of homes within LIM communities are expected to be within a half mile of a transit stop. The percentage of commute trips within 30 minutes via transit will increase significantly for all Communities of Concern from existing conditions and the No Build alternative. For low income populations it will go from 15 percent to 23 percent. For minority populations, it will increase from 9 percent to 17 percent. Transit access to critical amenities such as schools will increase for all Communities of Concern between 2 and 3 percentage points from existing conditions, while transit access to healthcare will remain relatively constant. Transit access to parks or beaches for all Communities of Concern increases anywhere from 1 to 4 percentage points from existing conditions.

Policy Issues

While developing the framework for the 2050 RTP, stakeholders raised some issues that would require a policy-level discussion for future plans, including some that should be part of the social equity policy discussion for the next update of the RCP. In 2012, SANDAG will be compiling social equity best practices for consideration to identify possible improvements and creation of a comprehensive social equity program for SANDAG. This effort will include consideration of social equity in project rankings and modeling, and measurement of health impacts in communities of concern. The following is a set of policy issues that were raised by stakeholders for consideration in future RTP cycles and other planning efforts.

Voice in the Decision-Making Process

Stakeholders interested in social equity and environmental issues want to make sure that vulnerable populations have a meaningful voice in the decision-making process. Specific comments included:

- More permanent forums within Communities of Concern are needed to encourage ongoing communication and education about regional planning initiatives. In the absence of such forums, residents have only intermittent opportunities to express their concerns and opinions on such matters.
- The digital divide often means that computer-based tools are not always the best way to reach people. Residents should have more opportunities to communicate face-to-face with regional planners, to learn about the planning process and to make meaningful contributions to planning initiatives.
- SANDAG staff was praised for being enthusiastic and well informed in the Speakers' Bureau, but people in some communities and groups would have appreciated hearing from people who look like themselves and speak their language.

Public Health and Transportation

Stakeholders raised the issue of the importance of incorporating public health considerations in transportation planning. Federal transportation statutes require inclusion of quality-of-life factors in planning documents. (See, for example, 23 USC 135 (f)(1)(E)) Health issues often affect vulnerable populations disproportionately, when compared with the larger population. Vulnerable populations in the San Diego region include seniors, children, low income people, minorities, and people with disabilities. Recent reports from the U.S. Centers for Disease Control and Prevention show that the incidence of obesity is disproportionately high among vulnerable populations. From 2006 through 2008, blacks were 51 percent more likely and Hispanics were 21 percent more likely than non-Hispanic whites to be obese, according to the 2009 Behavioral Risk Factor Surveillance System report. In addition, the 2009 Pediatric Nutrition Surveillance System report shows that 14.6 percent of children aged 2-4 years from low income households are obese.

The social equity analysis conducted for the 2050 RTP evaluated the 2050 RTP transportation network for benefits and impacts of transportation investments on Communities of Concern in the San Diego region. The eight performance measures used for this analysis also are related to improved health outcomes in local communities. Improved access to parks, walking, bicycling amenities, and public transit service should lead to increased physical activity. Equitable investments in transportation infrastructure should improve mobility for the elderly, children, people with disabilities, and households without a car.

Affordability of Transit Fares

Many stakeholders in the Communities of Concern raised the issue of the affordability of public transportation, indicating an accessibility issue. Transit budgets, however, have experienced reductions over the past several years with no additional funding arriving to fill the budget gaps. Therefore, any fare reductions would have to be matched with service reductions. In many cases, service reductions would have a greater impact on individuals who depend on transit. Surveys also have indicated a preference among riders for better service compared with the alternative of higher fares. Many transit riders also have indicated that they are willing to pay the fare if the service gets them to where they need to go – whether to jobs, medical centers, schools, or shopping.

SANDAG has implemented new types of passes including a 30-day pass than can be bought on any day of the month to reduce the burden on people with limited incomes who may not have the cash to buy a pass at the end of each month. In addition, a 14-day



pass was introduced to reduce the initial cash outlay but still offer a significant savings over daily cash fares. Also, the sale of day passes was introduced on buses to enable users to make more trips in one day for a low fixed price. The *TransNet* sales tax ordinance also provides a subsidy to transit operators to enable them to sell senior/disabled/Medicare passes at a 75 percent discount and youth passes at a 50 percent discount. These are among the most generous discounts in the nation and well above the 50 percent cash fare discount for seniors, disabled and Medicare patients mandated by the federal government.

Infrastructure and Amenities

It has been documented in a number of regions in California that – all things being equal – LIM communities sometimes have less access to various types of amenities than others do. As discussed previously in this chapter, new social equity performance measures were added, following a recommendation from stakeholders and approval by the Board, to analyze existing access to a number of key amenities for the 2050 RTP.

Nevertheless, there are other issues that SANDAG could consider in future planning efforts. They include:

Jobs/Housing "Fit"

The stakeholders concerned with social equity and environmental justice are concerned with the "fit" between the types of jobs and the appropriate stock of housing available near those jobs. The issues of jobs/housing balance and jobs/housing fit are addressed in RHNA, which SANDAG is preparing in conjunction with the 2050 RTP. State housing element law (Government Code Section 65584 et seq.) and Senate Bills (SB) 375 and 575 (Steinberg) are guiding SANDAG work on these issues. State housing element law requires SANDAG to prepare the RHNA before each housing element cycle. The RHNA Plan allocates each jurisdiction a share of the region's very low, low, moderate, and above moderate income housing needs (as determined by the California Department of Housing and Community Development (HCD) in consultation with SANDAG) for the next housing element cycle. Each jurisdiction then prepares a housing element that identifies adequate sites for the RHNA numbers it is allocated and indicates the programs that it will implement to help ensure the provision in particular of lower and moderate income housing. The RHNA and local housing elements help ensure an adequate range of housing opportunities throughout the region, and particularly within and in proximity to our employment centers.

The SANDAG RHNA is consistent with the state's housing element law (Government Code Section 65484(d)(1)-(4)), which requires that the RHNA meet the following objectives:

- Increasing the housing supply and the mix of housing types, tenure, and affordability in all cities and counties within the region in an equitable manner, which shall result in all jurisdictions receiving an allocation of units for low and very low income households
- Promoting an improved intraregional relationship between jobs and housing
- Allocating a lower proportion of housing need to an income category when a jurisdiction already has a disproportionately high share of households in that income category, as compared to the countywide distribution of households in that category from the most recent decennial United States census

- Promoting infill development and socioeconomic equity, the protection of environmental and agricultural resources, and the encouragement of efficient development patterns

SB 375 requires SANDAG to integrate the preparation of the RTP with the RHNA. As shown during the preparation of the RHNA and SCS, the 2050 Regional Growth Forecast demonstrates that local jurisdictions in the region have adopted, or are in the process of preparing and adopting, plans and zoning ordinances with adequate residential capacity to meet the region's housing needs for the fifth housing element cycle and during the timeframe of the 2050 RTP. The planning efforts embodied in the RHNA and local housing elements will move the region and local jurisdictions toward ensuring a mix of housing types and affordability, thus providing workers of all income levels with opportunities to live close to work. Meeting these objectives is a key focus in the development of the RHNA methodology and ultimately the RHNA plan, which will be adopted in conjunction with the 2050 RTP. Success in the actual production of affordable lower income housing units in the region requires funding sources and regulatory measures adopted by local jurisdictions.

Community Cohesion and Inclusionary Design

Studies have shown that low income and minority communities are intensely affected when the informal social networks that form the basis of their social power are disrupted. During the development of 2050 RTP projects, environmental justice analyses will examine the social and environmental impacts of specific projects at that stage. SANDAG, as a regional planning agency, acts as a regional resource to encourage smart growth that considers equity issues. The Smart Growth Toolkit is a resource for local jurisdictions seeking to encourage walkability, complete streets, and transit-oriented development (www.sandag.org/smartgrowth). Discussions will continue among jurisdictions on the importance of community cohesion and inclusionary design in the context of a future RCP update.

Transit Oriented Development vs. Gentrification

The San Diego region's RCP and Sustainable Communities Strategy land use pattern call for most of the region's future residential and employment growth to occur near existing and planned public transit facilities in the urbanized western third of the region. When general and community plans and/or rezoning and specific plans occur in these areas to allow higher density development, property values can increase and gentrification can occur. The degree to which gentrification occurs and its effects vary widely, and challenges cannot be addressed by a one-size-fits-all approach. The types of strategies that can be implemented to reduce the negative effects of neighborhood changes around transit stations and along transit corridors, while capitalizing on the positive effects, are largely pursued by local jurisdictions. But a toolkit could be developed at the regional level to identify and encourage the adoption of such strategies by local jurisdictions, in a similar manner to the design guidelines prepared for smart growth.

During the development of 2050 RTP projects, environmental justice analyses will examine the social and environmental impacts of specific projects at that stage.

The following actions support the Plan's Social Equity Chapter recommendations:

Social Equity	
Actions	**Responsible Party**
1. Continue the development of modeling tools such as the Activity Based Model (ABM) to provide more refined analyses to support environmental justice.	SANDAG
2. Strengthen partnerships with community-based networks for ongoing education, citizen input, engagement, and access to LEP persons.	SANDAG and Community-Based Partners
3. Refine educational strategies for outreach and expand outreach programs so they include low technology and more face-to-face communication.	SANDAG and Community-Based Partners
4. Expand educational programs to integrate young people and seniors in a meaningful way.	SANDAG and Community-Based Partners
5. Develop a scope of work for a study on how to measure 'cumulative disadvantage' in the distribution of infrastructure investments. This refers to historically marginalized populations – particularly minorities – whose neighborhoods have been underserved by transportation investment over time, limiting their ability to attract other concomitant benefits such as attracting businesses, housing projects, and other elements that contribute to their quality of life.	SANDAG and Community-Based Partners
6. Propose addressing the issue of Transit Oriented Development and gentrification, as well as potential tools to address them, in the update of the RCP.	SANDAG, local jurisdictions, and Community-Based Partners
7. Consider further analysis of jobs/housing fit in the update of the RCP.	SANDAG, local jurisdictions, and Community-Based Partners
8. Consider adding a social equity factor for future project rankings.	SANDAG

Chapter 5

Financial Strategies: Paying Our Way

Chapter Contents

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2050 Regional Transportation Plan

A revenue constrained forecast scenario has been developed for the 2050 RTP

The financial analysis of the recommended transportation improvements in the 2050 Regional Transportation Plan (RTP or the Plan) focuses on four components: Systems Development (transit, managed lanes and highways, local streets and roads, grade separations, and goods movement projects), Land Use, Systems Management, and Demand Management. The capital, operating, maintenance, and rehabilitation costs of the region's transportation systems during the next 41 years are compared with forecasts of available revenues. Actions are recommended to obtain the revenues necessary to implement improvements included in the Plan. The level of improvements possible under the revenue constrained scenario is included as part of the financial analysis.

Unconstrained Needs

Based on the analysis of travel demand in the region to 2050, needs have been identified for transportation improvements and associated operations, maintenance, and rehabilitation. These needs require funding above and beyond assumed revenues. While no specific discussion is included regarding revenues needed to meet these Unconstrained Needs, this document does include the level of investment needed to fully fund the desired list of projects through 2050.

A revenue constrained forecast scenario has been developed for the 2050 RTP. This scenario includes a general description of the key assumptions that SANDAG used to develop projections of each of the major revenue sources, as well as a summary of the analysis of total costs and revenues.

Revenue Constrained Scenario

State and federal planning regulations require the development of a Revenue Constrained plan. Such a plan is based on current and reasonably available sources and levels of federal, state, and local transportation revenue, projected out to the year 2050. This scenario includes federal and state formula funds, as well as federal and state discretionary funds for existing projects. Future revenue forecasts for new revenues are based on reasonable assumptions of existing programs, as well as new sources extrapolated from documented sources.

Revenue Assumptions

The assumptions made for each major revenue source included in the Plan's financial analysis are provided below. All revenues have been escalated to the year that dollars are expended, and they are based on the escalation factor appropriate for that specific revenue source. Additional details for each fund source also are included in Technical Appendix 1.

Local Revenues

TransNet Half-Cent Local Sales Tax

These revenues are assumed to increase each year, above the $204 million received in FY 2010. This assumption is based on the growth in taxable retail sales as projected by the SANDAG Demographic and Economic Forecasting Model (DEFM). The amounts shown represent the funds estimated to be available through 2050. In November 2004, San Diego County voters approved an extension of the sales tax for transportation through the year 2048.

The 2050 RTP further assumes that sometime prior to 2048, San Diego voters will approve a second extension of the *TransNe*t sales tax program. This will allow revenues to continue to be collected beyond 2048. It is anticipated that about $25.2 billion in sales taxes will be generated for regional transportation improvements. An additional $6.3 billion in bond proceeds is estimated to be available to pay for major capital transportation projects.

One of the more innovative components of the sales tax extension ordinance is an initiative for early environmental mitigation, which is designed to reduce the future costs of major transportation projects. The Ordinance identifies specific amounts of money available to use toward mitigation activities required for major highway, transit, regional arterial, and local street and road improvements identified in the Plan. This initiative for early environmental mitigation is expected to expedite the implementation of transportation projects and reduce the costs associated with mitigation or permit delays. The intent is to establish a program to acquire and manage critical habitat areas, and to create a reliable approach for funding required mitigation for future transportation improvements. The result is reduced future costs and accelerated projects.

Although the *TransNet* Extension went into effect in April 2008, the SANDAG Board of Directors approved accelerating several key regional transportation projects beginning in 2005. Since that time, the Board of Directors has revised and expanded the scope of the Early Action Program (EAP). The EAP consists of several major projects that are expected to significantly relieve traffic congestion and expand transit services. The EAP strategy is to leverage as many federal and state dollars as are available, and then borrow against future *TransNet* revenues to complete these projects ahead of their initial schedules.

The Ordinance specifies subprograms within the program, including funding for major capital projects, bicycle and pedestrian projects, local street projects, and funding to provide transit service. Within the transit share, there is a set-aside to subsidize the senior and disabled patrons, as well as to comply with Americans with Disabilities Act (ADA) requirements.

Developer Impact Fees

The Regional Transportation Congestion Improvement Program (RTCIP), an element of the *TransNet* Extension Ordinance, requires the 18 cities and the County of San Diego to collect an exaction from the private sector for each new housing unit constructed in their jurisdiction. The RTCIP has been implemented in the San Diego region since July 1, 2008. The *TransNet* Extension Ordinance requires SANDAG to annually adjust the minimum RTCIP fee amount on July 1 of each year, based on an analysis of construction cost indices, such as the Engineering News Record and the Caltrans Construction Cost Index (CCI), but no less than two percent. The purpose of this annual adjustment is to ensure that the RTCIP retains its purchasing power to improve the regional arterial system. The SANDAG Board of Directors approved a two percent adjustment, raising the RTCIP fee from $2,071 to $2,123 beginning July 1, 2011.

Due to the recent decline in the CCI, the assumed escalation rates are two percent per year through 2015. This reflects the latest slowdown in the economy. From the year 2016 on, however, the escalation rate is estimated to be three percent per year. This reflects the historical growth trend in the CCI. The total amount collected is estimated at $1.4 billion, and is calculated based on the number of new housing units forecast to be developed between 2010 and 2050.

Transportation Development Act (TDA) Quarter-Cent Sales Tax

These are assumed to grow from the $99 million received in FY 2010, in the same manner as *TransNet* funds because TDA funds also are based on the growth of sales taxes. TDA funds may be used for transit operating or capital purposes, but they are not eligible for use on non-transit-related highway or local street and road improvements. The state

statute that governs this program also includes specific funding for bicycle and pedestrian projects, as well as for accessible service for the disabled. For planning purposes, it is assumed that 10 percent would be used to match capital projects, and the balance would be available for operations. Future year estimates are based on the growth in taxable retail sales as projected by DEFM, the SANDAG forecasting model. The total TDA revenues estimated to be available during the RTP period is $12.3 billion.

Local Street and Road Gas Taxes

These are assumed to be available at the current level of gas tax subventions to cities and the County of San Diego for local street and road purposes. (Actual receipts totaled $92.2 million in FY 2007.) These revenues are increased each year, based on the estimated growth rate in the number of gallons of fuel consumed in the region projected by Caltrans. These projections reflect future fuel efficiency, vehicle miles traveled (VMT), and the projected mix of the vehicle fleet (i.e., gas, diesel, electric, etc.) or an increase of between 1.7 percent and 2.4 percent annually. The total estimated revenue from the gas tax is $6.2 billion.

Local Street and Road General Fund and Other Revenues

These revenues are based on information provided in the State Controller's annual reports for local street and road expenditures and revenues. The average amount of general fund contributions and other revenues (including fines and forfeitures, interest earnings, and other miscellaneous revenue sources) used for local street and road expenditures in recent years is assumed to continue. The ten-year average for local general fund contributions to local street improvements regionwide is $48.7 million annually. Other revenues, meanwhile, have averaged $237 million annually. These revenues are projected to increase 3 percent each year (historical average is about 4.3 percent), and they total $31.9 billion.

Future Local Revenues

A provision in the *TransNet* Ordinance specified that "SANDAG agrees to act on additional regional funding measures (a ballot measure and/or other secure funding commitments) to meet the long-term requirements for implementing habitat conservation plans in the San Diego region, within the time frame necessary to allow a ballot measure to be considered by the voters no later than four years after passage of the *TransNet* Extension." A component of the future ballot measure is to fund transit operations. Although still being evaluated, a ballot measure could occur as early as 2012. Using the existing *TransNet* program as the basis for estimating revenues, the assumption is that ¼ cent of the sales tax would fund transit projects. These revenues are assumed to begin in 2016. The rate of growth assumed is the same as with *TransNet* and TDA. Revenues estimated to be available total $11.9 billion.

Toll Road and Port of Entry Funding

This funding is derived from debt financing backed by future toll revenues, and it is expected to be available for major phases of toll road and port of entry (POE) construction projects for State Route 11 (SR 11), SR 125, SR 241, and for Interstate 5 (I-5) and I-15. Total toll revenue is estimated at $5.9 billion.

Public Private Partnerships/Transit Oriented Developments (TODs)

There are two components to this source of revenue. One is from transit stations, and the other is from funds used to pay for streetcars. TOD revenues are based on existing agreements that the transit agency has with developers, using the agreed-upon acreage per square feet ratio ($20/sq. ft. and an

8 percent return), and using CPI for escalation. The total TOD available is estimated at $381 million.

One of the new options for mobility planned in this RTP is to use streetcars to improve connectivity within certain neighborhoods. Cities across the country have implemented or are proposing streetcar projects, often as a redevelopment tool to improve livability within redevelopment areas. As a result, much of the funding for these streetcar projects comes from local agencies and public/private partnerships. Based on this experience in other cities, about 90 percent of the cost is assumed to be borne by these types of funding sources. The combined estimated revenue anticipated to be available from TOD and for three streetcar projects detailed in the Plan is about $1.2 billion.

FasTrak® Revenues

These revenues are based on actual revenues on the I-15 corridor, net of operating costs in FY 2010. These revenues are expected to be available for public transportation purposes.

The assumption includes a growth rate consistent with inflation, and the expectation that a new 20-mile managed lane segment along the region's major freeways will be completed each decade. These new managed lane segments are expected to provide an additional level of funding similar to what is raised along the existing I-15 corridor. These assumptions, plus an annual increase based on CPI, provide an estimated $582 million in revenues.

Passenger Fares

The passenger farebox recovery rate was maintained at 35 percent over the RTP period to reflect the continuation of existing farebox recovery levels in the future. Actual fare revenues are assumed by multiplying the farebox recovery rate by the FY 2010 to FY 2015 operating cost projections included in the FY 2011 budgets for the North County Transit District (NCTD) and the Metropolitan Transit System (MTS). Beyond this time period, an annual operating cost growth rate of 3.3 percent is assumed, which also is multiplied by the farebox recovery rate to derive the annual estimated passenger fares. This includes projected revenues for new rail, BRT, and Rapid Bus services included in the *TransNet* Ordinance. Total estimated fares are $14.9 billion.

Prior Year Funds in RTIP

These revenues represent already expended or obligated funds for projects that are scheduled for completion within the first ten years of the RTP, where the total cost of the project is shown on the expenditure side. Total prior year funds equals $707 million.

State Revenues

State Transportation Improvement Program Funds

These revenues are consistent with the amounts available for new and existing programming through FY 2015, as included in the 2010 State Transportation Improvement Program (STIP) Fund Estimate. Beyond the year 2015, STIP funds are assumed to increase 5 percent annually, based on historical and recent legislative changes. STIP funding has come primarily from Proposition 42 Transportation Investment Fund (TIF) transfers (the gasoline sales tax); Proposition 1B bond proceeds (the Transportation Facilities Account, or TFA); and the Public Transportation Account (PTA). This has recently changed, due to the passage of the "gas tax swap" legislation (ABx8 6, Chapter 11, Statutes of 2010; and ABx8 9, Chapter 12, Statutes of 2010). Effective July 1, 2010, the gas tax swap eliminated the tax on gasoline sales and increased the gasoline excise tax from 18 cents to 35.3 cents per gallon. While intended to be revenue neutral, the gas tax swap has

significantly altered STIP funding sources by eliminating TIF funding, reducing PTA funding, and adding State Highway Account (SHA) funding. Despite this change, the assumptions used under this program remain, given that it is intended to be revenue-neutral.

The San Diego region anticipates receiving at least a minimum formula "County Share," and a proportionate share of the STIP Interregional Program funds over time as well. The total STIP funds assumed include revenue from both the Regional and Interregional STIP shares. The STIP funds are flexible, and they are available for capital projects to increase the capacity of highways, public transit, and local roads. The STIP funds also are available for efforts to manage demands on the transportation system (TDM), and for planning, programming, and monitoring activities. Beginning with the *TransNet* Plan of Finance approved by the SANDAG Board of Directors in July 2010, 90 percent of all new STIP revenues are assumed to be set aside for EAP projects, as stipulated by Board direction. These include highway, transit, and mixed-mode projects, and the remaining 10 percent for other regionally significant projects such as planning and program monitoring and TDM. Beyond the completion of the EAP, the 2050 RTP assumes sufficient funding from non-*TransNet* sources to match *TransNet* funds. Total STIP is estimated at approximately $7.8 billion.

Traffic Congestion Relief Program (TCRP)

These revenues are assumed to be available for specific projects as provided in state law. All remaining unallocated TCRP funds are assumed to be available in the next five years. About $76 million of the original $483 million identified for San Diego County remained to be allocated at the end of FY 2010.

Proposition 42 (Local Streets and Roads)

These revenues are assumed based on future fuel consumption, as estimated by Caltrans, which increases between 1.7 percent and 2.42 percent annually. No changes to fuel prices are assumed. Total revenue estimated is $2.7 billion.

State Transit Assistance (STA)

In March 2010, the governor signed into law ABx8 6 and ABx8 9, which restored the STA program (a prior budget action had suspended the program altogether) at $400 million for FY 2011 and $350 million for FY 2012. Because the STA is no longer tied to the sales tax on gasoline, a 3 percent escalation factor was used. Total revenue is estimated at $1.5 billion.

State Highway Operations and Preservation Program (SHOPP) and Maintenance and Operations Program

These revenues are assumed to be available to meet Caltrans' identified needs for state highway operations and maintenance. State law requires that these expenditures are given priority over new construction, and they are funded "off the top" of the State Highway Account before any funding for new construction projects is allocated. The 2010 base year estimates of $11 million annually for operations and administration costs, and $69 million annually for maintenance costs were increased at 3 and 5 percent per year, respectively. This reflects historical trends, and a gradual increase in these costs as the size and the age of the system to be maintained increases over time. The revenues needed for these purposes, as identified by Caltrans, are assumed to be available. For programs to reduce collisions on state highways, as well as other programs related to rehabilitating and operating highways, funds are assumed to be available, consistent with the Financially Constrained ten-year SHOPP plan through FY 2020. The approximate annual level of

funding through the SHOPP is assumed to be $87 million at the end of the current four-year SHOPP period in FY 2014. A subsequent nominal growth rate of 5 percent is assumed beyond FY 2014. Estimated needs for SHOPP activities that exceed the estimated revenues are identified as part of the overall Unconstrained Needs. The SHOPP funds total an estimated $18.9 billion.

Proposition 1B Infrastructure Bonds/Other

These revenues are assumed to be available for specific projects in which funding was awarded but no allocations were made. For those projects, the revenues are based on the actual award (through FY 2015), as approved by the California Transportation Commission (CTC). Additional future revenues were assumed based on a review of past revenues awarded to the region that were not part of the normal formula. These new sources include the Traffic Congestion Relief Program, Propositions 108/116, Proposition 42, and Propositions 1A and 1B. To be conservative, revenues begin in FY 2019 and are assumed to be $250 million annually over a five-year period. They then escalate 5 percent every five years. The total assumed to be available is $9.6 billion.

Proposition 1A High-Speed Rail Bonds

These revenues are assumed to be available based on the November 2008 voter-approved infrastructure bond program. This program funds capital improvements to intercity rail lines, commuter rail lines, and urban rails systems that provide direct connectivity to the high speed train system and its facilities. Between both the formula program and the competitive program, the CTC approved about $100 million to the region. The funds are being used by NCTD to implement the Positive Train Control project. SANDAG is using the funds to implement eligible rail projects. Future year funding for this source of revenue is combined with the future assumptions for Prop. 1B funding, which is described above.

Other State-Managed Federal Programs and Freeway Service Patrol

These revenues are assumed as various federal transportation programs administered by the state in the San Diego region continue. They include the Safe Routes to School Program; the Highway Safety Program; the Highway Bridge Program, among other programs; and the annual state legislative appropriated Freeway Service Patrol Program. The total estimated revenue is $1.5 billion.

High-Speed Rail

In addition to the Proposition 1A funds discussed above, it is assumed that additional state funds will be available beginning in 2041 to complete the section within San Diego County of the state's High-Speed Rail line. The total assumed from this source is $16.6 billion.

Prior Year Funds in RTIP

These revenues represent already expended or obligated funds for projects that are scheduled for completion within the first ten years of the RTP where the total cost of the project is shown on the expenditure side. Total prior year funds equals $561 million.

Federal Revenues

FTA Discretionary (Section 5309)

There are two types of funds. The Full Funding Grant Agreement (FFGA) is a multi-year commitment from the Federal Transit Administration (FTA) to fund one project. The other is the annual, or sometimes one-time funding for specific projects. The revenues assumed include those from an FFGA for the Mid-Coast Trolley Extension project and from future earmarks for major transit projects identified in the Plan. This assumes that every decade beginning in 2020, the San Diego

region would secure one large New Starts FFGA, similar in size to the Mid-Coast project and three Small Starts projects. This is based on the historical track record for the region, which has been successful in securing FFGAs for previous projects such as the Mission Valley East and SPRINTER projects, as well as the Mid-City Rapid. The total revenues estimated are $7.9 billion.

FTA Formula (Section 5307/5309/ 5310/5316/5317)

Sections 5307 and 5309 formula funds are mainly used for capital projects and to purchase transit vehicles. Section 5310 funds are specifically designated to assist nonprofit groups in meeting the transportation needs of the elderly and individuals with disabilities when transportation service is unavailable, insufficient, or inappropriate to meet their needs. This funding is allocated on a competitive basis and administered at the state level. Section 5316 funds projects related to the development and maintenance of transportation services designed to transport welfare recipients and eligible low income individuals to and from jobs and activities related to their employment. The Section 5317 program aims to provide additional tools to overcome existing barriers facing Americans with disabilities who seek integration into the work force and full participation in society. This program seeks to reduce barriers to transportation services and expand the transportation mobility options available to people with disabilities beyond the requirements of the ADA of 1990.

Beginning with funds appropriated in FY 2010 and continuing through 2015, revenues reflect the funds assumed in the Regional Transportation Improvement Program (RTIP). Beyond 2015, the growth rate is estimated to be 5 percent. Beginning in 2020 and every six years thereafter, a 10 percent step increase is assumed due to future transportation bill reauthorizations. This is a conservative assumption, given that since the Intermodal Surface Transportation Efficiency Act (ISTEA) (1991), the average step increase has been about 25 percent with each reauthorization. Additionally, in 2024, a 10 percent increase is assumed, corresponding with the new Mid-Coast service data. Also assumed is an additional 15 percent in 2033, to include other service expansions per the SANDAG Mid-Range Transit Plan. The federal formula funding is partly derived from transit data such as vehicle miles and population. With the service expansions included in the Plan, it is assumed additional revenues would follow. No other service expansions are assumed. The total revenues estimated are $13.3 billion.

Surface Transportation Program/ Congestion Mitigation and Air Quality Improvement

These revenue assumptions are based on estimates provided by Caltrans and included in the 2010 RTIP through FY 2015. They also are based on an assumed annual growth rate of 5 percent after FY 2015. The Surface Transportation Program (STP) funds are flexible, and they may be used for a wide range of capital projects. The Congestion Mitigation and Air Quality (CMAQ) Improvement funds are for projects that help reduce congestion and improve air quality. Eligible projects include the construction of high occupancy vehicle (HOV) lanes, the purchase of transit vehicles, rail improvements, and Transportation Demand Management, among others. CMAQ also can be used for transit operations for the first three years of new transit service. For purposes of the RTP, it was assumed that 90 percent of these funds would be set aside for EAP projects, and the remaining 10 percent would be set aside for other regionally significant projects. Beyond the completion of the EAP, the 2050 RTP assumes sufficient funding from non-*TransNet* sources

to match *TransNet* funds. The total revenues estimated are $7.2 billion.

Other Federal Highway Administration (FHWA)

These revenues are assumed based on actual earmarks or funds from the High Priority Program (HPP) to FY 2013. Beginning in FY 2014, the average HPP award is assumed to escalate 5 percent per year. The total revenue estimated is $1.8 billion.

Federal Railroad Administration Discretionary

The federal stimulus program added new responsibility to the Federal Railroad Administration (FRA) to administer funding for high-speed rail and intercity rail. Although the program is new, it is anticipated that the funding will continue, based on the priority placed on high-speed rail at the federal level. The San Diego region has received $64 million during the past two fiscal years. It is assumed that the region's annual share of these funds would increase by 2.5 percent annually. The total revenue estimated is $1.8 billion.

Corridors and Borders Infrastructure/ Other Freight and Goods Movement

The Corridors and Borders Infrastructure program is a revamped program under SAFETEA-LU, which allocates the funds based on a formula to those regions that qualify. The purpose of the program is to improve the safe movement of motor vehicles at or across the land border between the United States and Canada and the land border between the United States and Mexico. As the region directly connects with Mexico, the San Diego region qualifies for these funds. The Plan uses the actual allocation to FY 2010. It then uses an average annual allocation from SAFETEA-LU ($19 million), beginning in FY 2012 and escalating by 5 percent annually. The total revenue estimated is $2.4 billion.

Since the passage of ISTEA in 1991, the DOT has reported on intermodal connectors. Assuming DOT's continuing obligation, the Plan assumes that years of study will lead to a nationwide freight policy program that will help support the movement of goods. Beginning in 2017, the Plan assumes $10 million per year escalated by CPI which totals $710 million over life of the Plan.

The total revenue estimated under these categories is $3.1 billion.

Prior Year Funds in RTIP

These revenues represent already expended or obligated funds for projects that are scheduled for completion within the first ten years of the RTP where the total cost of the project is shown on the expenditure side. Total prior year funds are $736 million.

Air Quality and Transportation Control Measures

The U.S. Environmental Protection Agency (EPA) designated the San Diego air basin as non-attainment for the federal 1997 Eight-Hour Ozone standard, effective June 15, 2004. As such, federal regulations require the timely implementation of transportation control measures (TCMs) included in the approved State Implementation Plan (SIP). They include ridesharing, transit service improvements, traffic-flow improvements, and bicycle facilities and programs.

The 2050 RTP ensures the continuation of the TCMs as described in Chapters 6, 7, and 8. The short-term implementation document, the 2010 Regional Transportation Improvement Program (RTIP), includes substantial targeted funds for the implementation of the four Transportation Tactics adopted in the 1991 Regional Air Quality Strategy (RAQS)/1982 SIP for air quality improvement. These Transportation Tactics also are included as TCMs in the 1982 SIP and have been fully implemented.

The 2010 RTIP provides for the expeditious implementation of the four Transportation Tactics included in the 1991 RAQS.

Revenue Constrained Scenario Analysis

The Revenue Constrained Scenario analysis provides a revenue estimate than can pay for future transportation improvements envisioned in the Plan. The federal gas tax is assumed to stay at today's levels (18.4 cents per gallon) through 2050. For the state, the passage of the "gas tax swap" (ABx8 6, and ABx8 9) eliminated the sales tax on gasoline sales. But it increased the gasoline excise tax from 18 cents to 35.3 cents which results in no net change to revenues. Total revenues estimated for the entire 2050 RTP are about $213.8 billion (in year of expenditure). A summary of the major funding sources described above is provided in Table 5.1 and Figure 5.1.

Local funds make up 55 percent of the total revenue, with state and federal funds providing 28 percent and 17 percent, respectively. It also should be pointed out that revenues are shown phased in by decade or period (Table 5.1). This means that the funding information is available between 2010-2020, 2021-2030, 2031-2040, and 2041-2050. The corresponding expenditures also are shown by these same time periods, and they do not exceed the revenues available. This shows that the Revenue Constrained Scenario also is constrained by these analysis periods. Lastly, projects that are listed in the initial years of the RTP are the same ones that either are already programmed in the current five-year RTIP (the five-year period ends in FY 2014/15) or are anticipated to be included in future near-term updates of the RTIP.

Figure 5.1 – Major Revenue Sources/Revenue Constrained Scenario ($213.8 Billion in Year of Expenditures)

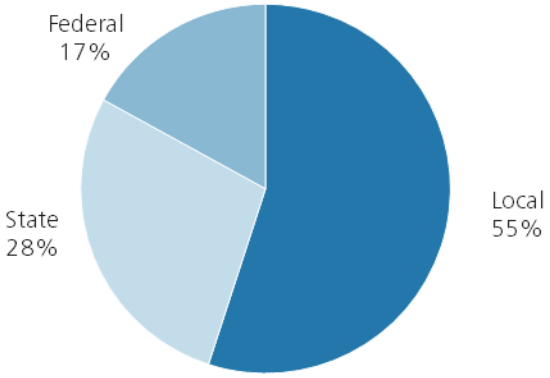

Table 5.2 and Figure 5.2 summarize the $213.8 billion in expenditures under the Revenue Constrained Scenario. About 50 percent of the total expenditures are for transit purposes, 24 percent for highway purposes, 17 percent for local street and road improvements, and 4 percent for Systems and Demand Management and Active Transportation programs. The remaining 5 percent of expenditures are for debt service and non-highway goods movement projects. The specific projects and services included in the Revenue Constrained Scenario are described in Chapter 6 and Appendix A.

Unconstrained Needs Analysis

Although not developed to the same level of detail as the revenue constrained scenario, an Unconstrained Needs Analysis was prepared to provide a cost estimate for additional projects, programs, and services to meet projected travel demands and to fully fund related operating, maintenance, and rehabilitation needs regionwide. Such improvements would require additional funding above and beyond the reasonably available levels assumed in the 2050 RTP.

Table 5.1 – Major Revenue Sources/Revenue Constrained Scenario

Revenue Sources	Estimated Revenues (in millions of YOE dollars) [1]				
	FY 2010 - 2020	FY 2021 - 2030	FY 2031 - 2040	FY 2041 - 2050	FY 2010 - 2050
Local					
TransNet	$2,997	$4,593	$7,002	$10,656	$25,248
TransNet (Bond Proceeds)	$2,849	$2,178	$1,259	$ -	$6,286
Developer Impact Fees	$292	$342	$376	$427	$1,437
Transportation Development Act (TDA)	$1,457	$2,233	$3,405	$5,181	$12,276
City/County Local Gas Taxes	$1,190	$1,321	$1,649	$2,084	$6,244
General Fund/Miscellaneous Local Road Funds[2]	$5,194	$6,435	$8,648	$11,622	$31,899
Future Local Revenues	$793	$2,296	$3,501	$5,328	$11,918
Toll Road/POE Funding (SR 11, Otay Mesa East POE, SR 125, SR 241, I-5, I-15)	$1,197	$79	$0	$4,591	$5,867
Public Private Partnerships/TODs	$340	$264	$470	$144	$ 1,218
FasTrak® Net Revenues	$18	$87	$176	$301	$582
Passenger Fares	$1,398	$2,371	$4,530	$6,642	$14,941
Prior Year Funds in RTIP	$707	$0	$0	$0	$707
Subtotal	$18,432	$22,199	$31,016	$46,976	$118,623
State					
State Transportation Improvement Program (STIP)/Traffic Congestion Relief Program (TCRP)	$624	$1,380	$2,231	$3,611	$7,846
Proposition 42 (Local Street and Road)	$506	$573	$708	$873	$2,660
State Transit Assistance (STA) Program	$153	$324	$435	$584	$1,496
State Highway Account for Operations/ Maintenance	$2,168	$3,208	$5,176	$8,367	$18,919
Proposition 1B/1A/Other	$1,287	$2,614	$2,853	$2,894	$9,648
Other State Managed Federal Programs/FSP	$229	$244	$388	$618	$1,479
High-Speed Rail	$0	$0	$0	$16,644	$16,644
Prior Year Funds in RTIP	$561	$0	$0	$0	$561
Subtotal	$5,528	$8,343	$11,791	$33,591	$59,253
Federal					
Federal Transit Administration (FTA) Discretionary	$906	$1,108	$2,533	$3,382	$7,929
Federal Transit Administration Formula	$1,122	$1,882	$3,675	$6,661	$13,340
Congestion Mitigation and Air Quality (CMAQ)/ Regional Surface Transportation Program (RSTP)	$819	$1,216	$1,980	$3,225	$7,240
Other Federal Highway Administration (FHWA)	$259	$301	$490	$798	$1,848
Federal Railroad Administration (FRA) Discretionary	$312	$367	$470	$602	$1,751
Corridors and Borders Infrastructure/Other Freight Funds	$328	$560	$867	$1,351	$3,106
Prior Year Funds in RTIP	$736	$0	$0	$0	$736
Subtotal	$4,482	$5,434	$10,015	$16,019	$35,950
[1] Year of Expenditure					
Grand Total Revenue Sources	**$28,442**	**$35,976**	**$52,822**	**$96,586**	**$213,826**

Table 5.2 – Major Expenditures/Revenue Constrained Scenario

Project Categories	Estimated Expenditures (In Millions Of YOE Dollars) [1]				
	FY 2010 - 2020	FY 2021 - 2030	FY 2031 - 2040	FY 2041 - 2050	FY 2010 - 2050
Transit					
Major New Facilities	$4,512	$5,917	$9,583	$12,993	$33,005
Miscellaneous Capital/Rehabilitation/Replacement	$1,392	$2,511	$1,196	$4,923	$10,022
Transit Operations	$3,993	$6,775	$12,942	$18,977	$42,687
ADA and Specialized Transportation Services [2]	$399	$677	$1,294	$1,898	$4,268
High-Speed Rail	$0	$0	$0	$16,644	$16,664
Subtotal	$10,296	$15,880	$25,015	$55,435	$106,626
Highways					
Managed Lanes and Highway Projects	$6,912	$5,374	$5,502	$13,335	$31,123
HOV Connectors	$483	$9	$811	$89	$1,392
Freeway Connectors	$144	$503	$286	$63	$996
Operations	$137	$170	$251	$408	$966
Maintenance	$987	$1,494	$2,434	$3,964	$8,879
Rehabilitation	$1,012	$1,286	$1,732	$2,327	$6,357
Subtotal	$9,675	$8,836	$11,016	$20,186	$49,713
Local Streets and Roads					
Capital Expansion	$1,271	$1,586	$2,168	$2,883	$7,908
Rehabilitation	$1,413	$1,845	$2,454	$3,251	$8,963
Operations & Maintenance	$3,367	$3,995	$5,953	$7,247	$20,562
Subtotal	$6,051	$7,426	$10,575	$13,381	$37,433
Non-Highway Goods Movement/Debt Service					
Non-Highway Goods Movement	$256	$0	$0	$0	$256
Debt Service	$1,223	$2,613	$4,141	$3,880	$11,857
Subtotal	$1,479	$2,613	$4,141	$3,880	$12,113
Land Use/Systems Management/Demand Management					
Smart Growth Incentive Program	$59	$91	$267	$682	$1,099
Safe Routes to Transit	$128	$152	$286	$578	$1,144
Regional Rail Grade Separations	$0	$0	$129	$471	$600
Bicycle/Pedestrian Improvements	$457	$544	$717	$944	$2,662
Transportation Systems Management	$170	$233	$359	$538	$1,300
Transportation Demand Management	$127	$201	$318	$490	$1,136
Subtotal	$941	$1,221	$2,076	$3,703	$7,941
Grand Total Cost	**$28,442**	**$35,976**	**$52,823**	**$96,585**	**$213,826**

[1] Year of Expenditure

[2] ADA and Specialized Transportation Services costs represent 5 percent each of the total transit operations cost (10 percent total)

Figure 5.2 – Major Project Expenditures/ Revenue Constrained Scenario ($213.8 Billion in YOE)

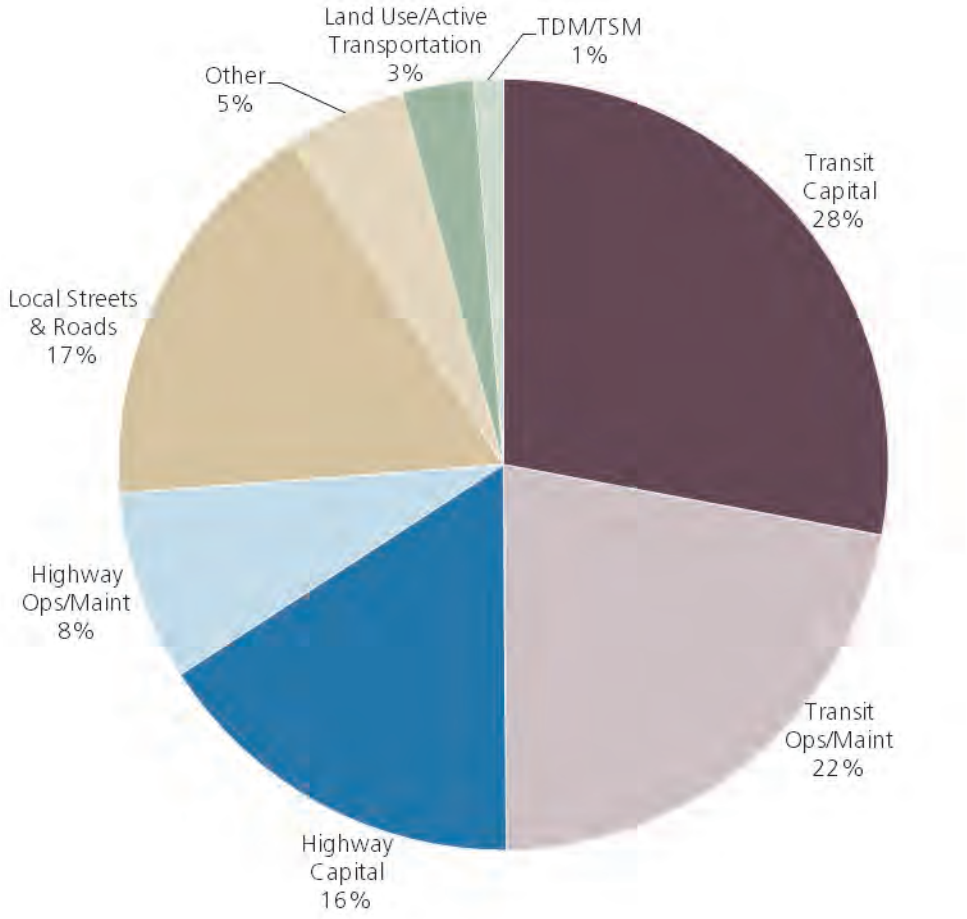

Table 5.3 summarizes the major expenditures included in the Unconstrained Needs Analysis, compared with the Revenue Constrained Scenario. The cost of Unconstrained Needs total $168 billion (in 2010 constant dollars). The Unconstrained Needs exceed the $120 billion (in 2010 constant dollars) in the 2050 RTP by about $48 billion. The $120 billion for the Revenue Constrained Plan, which is shown in 2010 constant dollars, translates into about $213.8 billion when escalated to the year that the dollars are expended. The total Unconstrained Need has not been escalated to year of expenditure dollars. These figures are provided in 2010 constant dollars for comparison purposes.

The additional transit improvements needed to fully implement the regional transit network would result in significantly higher investments in transit capital and operations. Additional Managed Lanes and other highway capital improvements would be needed to address remaining congested segments of the region's transportation system that cannot be accommodated with the $120 billion financial budget established for the 2050 RTP (in 2010 constant dollars).

Highway rehabilitation costs were increased based on estimates provided by Caltrans. The limited revenues under the other scenarios were not sufficient to fund the full level of estimated highway rehabilitation needs. Similarly, the local street and road costs were increased to match the estimates derived from the local agency needs survey.

Table 5.3 – Unconstrained Needs – Major Expenditures

Project Categories		Revenue Constrained	Unconstrained
		Estimated Cost ($ in Millions - 2010 dollars)	
Transit			
Major New Facilities		$20,371	$43,320
Miscellaneous Capital/Rehabilitation/Replacement		$6,824	$8,084
Transit Operations		$19,700	$26,560
ADA and Speicalized Transportation Services		$1,970	$3,275
High-Speed Rail		$7,000	$7,000
	Subtotal	$55,865	$88,239
Highways			
Managed Lanes and Highway Projects		$19,568	$22,744
HOV Connectors		$1,015	$2,864
Freeway Connectors		$710	$830
Operations		$485	$567
Maintenance		$4,801	$5,609
Rehabilitation		$4,985	$5,824
	Subtotal	$31,564	$38,438
Local Streets and Roads			
Capital Expansion		$3,902	$5,114
Rehabilitation		$4,490	$5,874
Operations & Maintenance		$10,947	$14,331
	Subtotal	$19,339	$25,319
Non-Highway Goods Movement		$260	$3,404
Debt Service		$7,652	$7,652
Land Use/Active Transportation/Management			
Smart Growth Incentive Program		$599	$599
Safe Routes to Transit		$700	$700
Regional Rail Grade Separations		$300	$300
Active Transportation		$1,789	$1,789
Transportation Systems Management		$829	$829
Transportation Demand Management		$703	$703
	Subtotal	$4,920	$4,920
Grand Total Cost		**$119,600**	**$167,972**
Surplus/(Deficit)			$(48,372)

The following actions support the Plan's Financial Strategies Chapter recommendations:

Financial Strategies	
Actions	**Responsible Parties**
General Legislative and Funding	
1. Maximize opportunities to leverage local transportation sales tax revenues to attract additional state and federal funds to the region for transportation and related infrastructure improvements.	SANDAG and local agencies
2. Support federal transportation legislation that provides for the following principles:	SANDAG
a. Removing the Federal Highway Trust Fund programs from the Federal Unified Budget process	
b. Establishing federal transportation program authorization and obligational authority levels based on actual and projected Trust Fund revenue levels, including interest received	
c. Maintaining or increasing the level of revenue flowing into the Trust Fund by increasing the federal gas tax rate and/or eliminating or reducing transfers of tax exemptions that shift transportation revenues to other purposes	
d. Increasing the minimum 90.5 percent "fair share" return of federal highway revenues to California	
e. Consolidating most federal highway categorical programs to provide greater flexibility and local discretion in highway fund usage	
f. Authorizing a minimum five-year highway and transit program to provide needed program stability and continuity of federal transportation policy	
g. Provide funding certainty by ensuring timely passage of annual appropriations and reauthorization to maintain and improve the transportation network	
h. Consolidate federal Department of Transportation program requirements among the different funding agencies. For example, a DBE program approved by FHWA should be accepted by FTA and FRA	
3. Support state transportation legislation that provides for the following principles:	SANDAG
a. Increasing state highway revenues as needed to maintain, rehabilitate, and operate the existing state highway system, to match all available federal highway funds, and to fully fund all new construction and right-of-way projects identified in the current State and Regional Transportation Improvement Programs (TIPs)	
b. Ensuring that any re-evaluation of the present formula "County Share" funding provisions and/or any other revenue distribution formula does not penalize counties that provide local sales tax or other local funding to state highway projects	
c. Establishing state/local matching programs or other programs to reward counties that have implemented local sales taxes or other major local funding sources for transportation improvements	

Financial Strategies (Continued)	
Actions	**Responsible Parties**
General Legislative and Funding (Continued)	
d. Sharing of both diesel fuel tax revenues and truck weight fees with local cities and counties and with Caltrans	
e. Allowing local jurisdictions, in cooperation with regional agencies, to jointly determine the allocation of additional local street and road revenues	
f. Increasing transit revenues to support transit operating and capital improvements, including new transit projects	
g. Establishing a user fee-based program to fund transportation infrastructure to accommodate increases in Goods Movement activities	
h. Provide funding certainty by ensuring the timely passage of annual state budgets and the timely selling of bonds to implement voter-approved laws to maintain and improve the transportation network	
4. Support state and federal legislation that provides additional gas tax funding, or equivalent funding from another revenue source, which is needed to implement those projects identified in the RTP.	SANDAG
5. Support state and federal legislation that provides the legal framework for expanded public/private partnerships for specific toll projects identified in the RTP.	SANDAG
6. Support state and federal legislation that provides the legal framework for public agencies to invest in and help develop public toll facilities for projects identified in the RTP.	SANDAG
7. Support state and federal legislation that provides the indexing of gas tax revenues to keep pace with inflation either by increasing the gas tax at regular intervals based on increases in the Construction Cost Index or by changing the tax from a per-gallon basis to a percentage basis so that revenues increase with the price of fuel.	SANDAG
8. Maintain current levels of local general fund and other local discretionary fund support to the local street and road program so that any new or increased revenues to the local street and road program will augment and not replace current revenues.	Local jurisdictions
9. Support state and federal legislation that provides for design-build transportation projects.	SANDAG
Transit	
10. Aggressively pursue the continuation and expansion of existing sources of transit funding and support modifications to those sources to ensure full utilization and maximum flexibility.	SANDAG and transit operators
11. Work with local, state, and federal officials to ensure that the region receives an equitable share of available discretionary transit funds.	SANDAG and transit operators
12. Adjust fare levels as needed to maintain and improve farebox recovery levels over time in order to maximize the level of transit service that can be provided.	SANDAG and transit operators
13. Pursue private sector involvement in the funding of transit facility development and operation through developer contributions, benefit assessment districts, joint development and value capture projects, and other efforts to contribute toward unfunded regional transit facilities.	SANDAG, MTS, NCTD, and local jurisdictions
14. Pursue public/private partnerships/TODs.	SANDAG, MTS, NCTD, and local jurisdictions

Chapter 6

Systems Development: Offering More Travel Choices

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2050 Regional Transportation Plan

The recommendations from past and current regional and corridor-specific transportation studies are integral to the development of the Plan.

This chapter of the 2050 Regional Transportation Plan (RTP or the Plan) describes the Plan's priorities for regional transportation infrastructure and service improvements. It includes sections on transit, intercity and high-speed rail, Managed Lanes/highways and arterials, goods movement and intermodal facilities, aviation, regional bikeways, and interregional and binational border planning and coordination.

The existing regional network consists of 610 miles of highways (including 20 miles of high occupancy toll lanes), 123 miles of regional transit service, and more than 1,000 miles of regional arterials. When implemented, the regional improvements in the 2050 RTP will capitalize on the existing transit and highway infrastructure and develop a new, improved network of high-quality transit services and a system of connected and free-flowing Managed Lanes, while still maintaining regional arterials and local roads.

Developing the 2050 RTP Network

The 2050 RTP is developed around five primary components: a Sustainable Communities Strategy, Social Equity and Environmental Justice, Systems Development, Systems Management, and Demand Management. Each component has a unique yet interdependent role in creating a sustainable transportation system that improves mobility, reduces greenhouse gases, and increases travel choices for everyone in the San Diego region through 2050.

Our region has consistently supported a multimodal approach to transportation that looks at the overall system and improvements that benefit all modes, rather than prioritizing one over the other. This approach gives all of the transportation system users choices traveling within and through the region.

SANDAG is required to address congestion management through a process involving an analysis of multimodal regionwide strategies that are cooperatively developed to foster safety and integrated management of new and existing transportation facilities eligible for federal funding. The congestion management process is described in more detail in Technical Appendix 20.

Unconstrained Transportation Network

The development of the 2050 RTP started by projecting the region's needs for transit, highway, arterial, goods movement, and active transportation improvements to meet the travel demands of the region's expected population in 2050. Labeled the Unconstrained Network, this network represents a transportation vision that meets the region's needs, assuming there are no revenue constraints.

We use priorities to identify how much of the Unconstrained Network we can build, operate, and maintain given the availability of revenue and flexibility over the life of the Plan. The 2050 RTP builds upon the existing transportation system and the major project commitments planned or under construction, and it makes substantial progress in moving toward the ultimate network needs of the region through 2050.

The recommendations from past and current regional and corridor-specific transportation studies are integral to the development of the Plan (see Appendix E for a list of the studies and links to the documents). Since the 2030 RTP, SANDAG completed a number of studies including the Urban Area Transit Strategy, Interstate 5 (I-5) South Corridor Study, Comprehensive Freight Gateway Study, Destination Lindbergh, and San Diego Regional Bicycle Plan. The recommendations

from these studies have been considered in the Plan's development.

Revenue Constrained Network

The Plan's Revenue Constrained Network described in this chapter, combined with the Sustainable Communities Strategy, Systems Management Strategy, and Demand Management Strategy described in other chapters, intend to provide the best balance and benefits across all of the RTP goals – System Preservation & Safety, Mobility, Reliability, Social Equity, a Prosperous Economy, and a Healthy Environment.

Short- and Long-Range Strategies and Actions

The 2050 RTP includes both short-term and long-term strategies that lead to the development of an integrated multimodal transportation system to facilitate the safe and efficient movement of people and goods. While the 2050 RTP serves as the long-range vision for the region, there are many plans and programs that implement the RTP in the short-term. The Regional Transportation Improvement Program (RTIP) is a prioritized five-year program required by federal and state laws and designed to implement the region's overall strategy for providing mobility and improving the efficiency and safety of the transportation system, while reducing transportation-related air pollution in support of efforts to attain air quality standards for the region. The 2010 RTIP may be found at www.sandag.org/2010RTIP. The RTIP incrementally implements the RTP in San Diego region. Additionally, the Coordinated Plan provides a five-year blueprint for the implementation of public transit and social service transportation concepts described in the 2050 RTP.

Focus on Regional Priorities

Funding for transportation is limited, and for several decades it has not kept up with the public's appetite for travel and demand for transportation services. The 2050 RTP recognizes this fact, and it calls for pursuing additional funding while focusing investments on priority corridors and projects. These priorities are derived from two sources. In 2005, after voters approved extending the *TransNet* sales tax, the region established the Early Action Program to advance revenues and expedite high-priority improvements included in the sales tax measure. In addition to the commitment to these *TransNet* projects, shown in Table 6.1, SANDAG prioritized all of the planned transportation projects using adopted criteria for evaluating them. The priorities act as a guide for selecting the multimodal facilities and services essential to meeting the mobility and accessibility goals of the region.

Regional facilities and services connect to larger transportation systems beyond the San Diego region's boundaries (freeways and rail networks in other parts of the state and nation), as well as to local systems of streets, roads, and transit services in our communities. Freight also is moved on the regional transportation network, and it requires good access and connectivity to local logistics centers and terminals to ensure the efficient movement of goods onto and off the network.

Table 6.1 – *TransNet* Early Action Program Project Descriptions

Early Action Project	Description
Blue and Orange Line Trolley Improvements	Track and station rehabilitation, including purchase of low-floor vehicles
I-5 North Coast	Complete environmental document for I-5 widening between La Jolla Village Drive and Vandegrift Boulevard
I-15 Bus Rapid Transit (BRT) Stations (SR 163 to SR 78)	Modify Escondido transit center, construct transit centers at Del Lago, Rancho Bernardo, Sabre Springs, and Mira Mesa
SR 15 BRT Stations & Service	Construct transit centers at University Avenue and El Cajon Boulevard, Sabre Springs station parking structure, and downtown BRT stations, operate BRT service between Escondido and downtown San Diego
I-15 North (Centre City Pkwy to SR 78)	Construct four Managed Lanes with fixed median barrier, add auxiliary lanes
I-15 Middle (SR 56 to Centre City Pkwy)	Construct four Managed Lanes with fixed median barrier, add auxiliary lanes (completed)
I-15 South (SR 163 to SR 56)	Construct four Managed Lanes with movable median barrier, add auxiliary lanes; construct Mira Mesa Direct Access Ramp
I-805 North (SR 52 to I-5)	Complete environmental document for I-805 Managed Lanes
I-805 Middle (SR 94 to SR 52)	Complete environmental document for I-805 Managed Lanes
I-805 South (SR 905 to SR 94)	Complete environmental document for I-805 Managed Lanes
LOSSAN	Coastal rail double tracking and increased and expanded passenger rail service
Mid-City Rapid Bus	Construct and operate Rapid Bus service between San Diego State University (SDSU) and downtown San Diego along El Cajon and Park Boulevards
Mid-Coast Trolley	Construct and operate light rail transit (LRT) service between Old Town transit center, University of California, San Diego (UCSD), and University Towne Centre (UTC)
South Bay BRT	Construct and operate BRT service between Otay Mesa and downtown San Diego via Otay Ranch/Millenia and eastern Chula Vista
SPRINTER	Oceanside to Escondido Rail (completed)
SR 52 (SR 125 to SR 67)	Extend highway from SR 125 to SR 67 (completed)
SR 52 Managed Lanes (I-805 to SR 125)	Construct two Managed Lanes
SR 76 (Melrose Drive to Mission Road)	Widen from two lanes to four lanes
SR 76 (Mission Road to I-15)	Widen from two lanes to four lanes
SuperLoop	High-frequency circulator route in University City serving UCSD and UTC (completed); construct and operate eastern loop

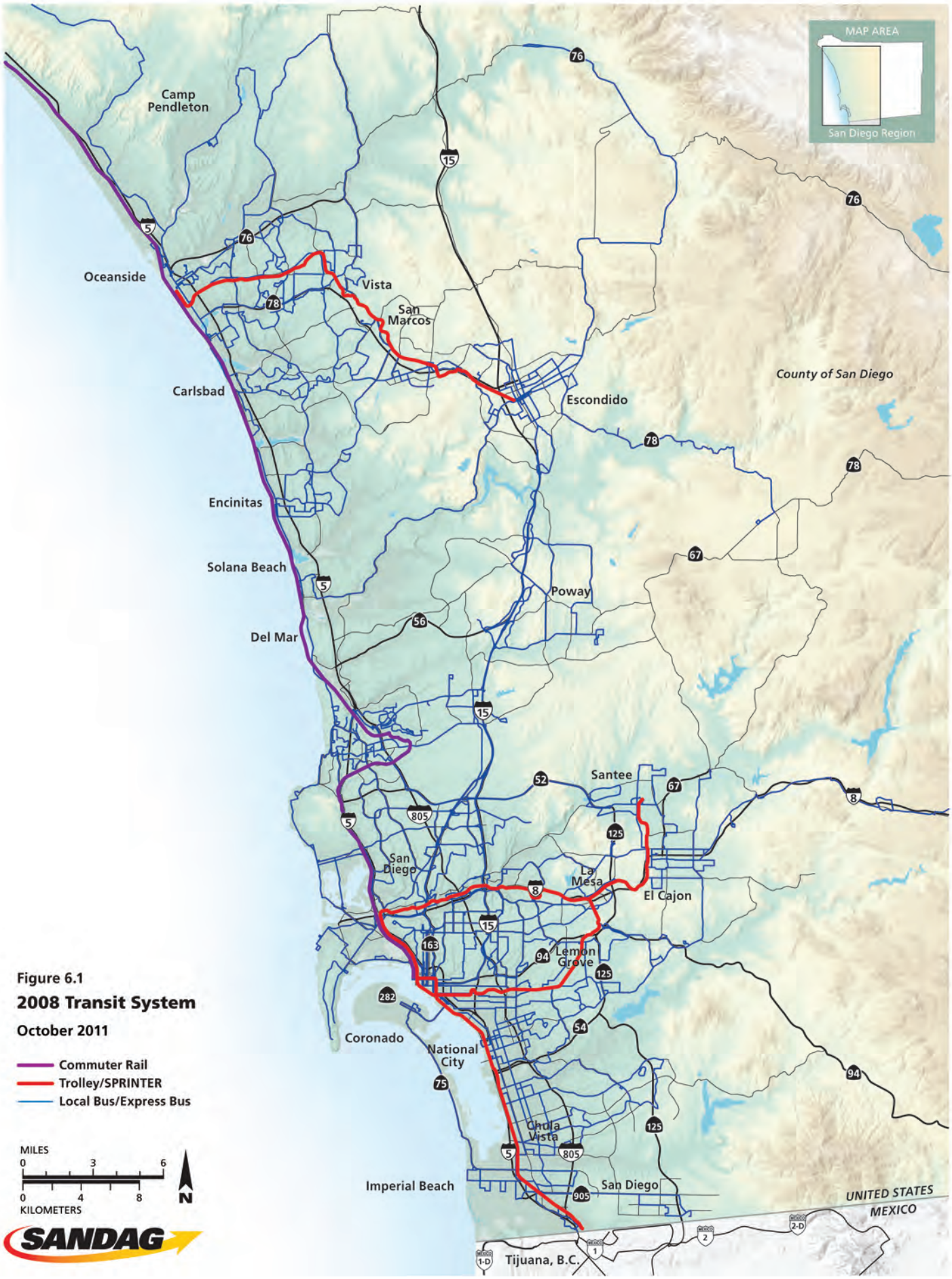

Figure 6.1
2008 Transit System
October 2011

Existing Regional Transit Network

SANDAG serves as the regional transportation planning agency, and it is therefore responsible for long-term transit planning for the San Diego region. This planning function is performed in partnership with the region's two transit operators, the Metropolitan Transit System (MTS); and the North County Transit District (NCTD).

San Diego's existing transit network is illustrated in Figure 6.1. Detailed information on existing services and performance, including social service agency transportation, is contained in the 2010-2014 Regional Short-Range Transit Plan & Coordinated Public Transit–Human Services Transportation Plan (Coordinated Plan) and included in Technical Appendix 10.

A Regional Transit Strategy

Urban Area Transit Strategy

To initiate planning for public transit in the 2050 RTP, SANDAG developed an "Urban Area Transit Strategy." Its overarching goal is to significantly increase the attractiveness of transit, walking, and biking in urbanized areas of the region. The vision calls for a network of fast, flexible, reliable, safe, and convenient transit services that maximize the role of transit in the region and reduce vehicle miles traveled and greenhouse gas emissions.

The planning process for the Urban Area Transit Strategy involved developing a range of differing transit strategies and approaches to determine what kind of transit future would be desired for the San Diego region. This process was extensive. It included brainstorming sessions, public opinion surveys, public input questionnaires, and research on success stories from other regions. Alternative unconstrained transit networks for the San Diego region also were developed, and transportation planners from the United States and other countries made recommendations. Public input on the networks was gathered, and results were evaluated. Industry experts conducted critical reviews, and there were many rounds of modifications and refinements. The process



resulted in an unconstrained transit network that nearly triples the number of transit miles in the region between now and 2050. Detailed results of the Urban Area Transit Strategy are included in Technical Appendix 7.

Public Opinion Survey and Public Input Questionnaire

To obtain input on priorities from the general public, SANDAG also developed a public opinion telephone survey and a public input questionnaire. Overall, results of the public opinion telephone survey and the public input questionnaire revealed that residents of the San Diego region support significant investments in the future of the region's transit network. Detailed results from the survey and questionnaire, and more information from the broader Public Participation Plan, are included in Chapter 9 and Technical Appendix 6.

2050 Regional Transit Network

A key focus of the 2050 RTP is to develop an ambitious and far-reaching transit network that significantly expands the role that transit plays in meeting the region's mobility needs.

To achieve this goal, the 2050 RTP transit vision focuses on three key strategies:

1. Improvements to the current system that will improve the convenience and travel speeds of bus and rail services

2. Implementation of new transit services that will improve transit connections and access in key urban areas and offer new service types designed to attract new riders to transit

3. Enhancements to the transit customer experience to make transit easier, safer, and more enjoyable to use

The different types of transit services designed to implement these three strategies are summarized in Figure 6.2 and discussed in more detail in this chapter.

2050 Unconstrained Transit Network

The Unconstrained Transit Network defines the region's vision for transit in 2050, if funding were available to implement all identified projects. The Unconstrained Transit Network was developed by combining the best transit services evaluated in the Urban Area Transit Strategy. The Unconstrained Transit Network also is focused on developing a strong link between transit and transit-supportive land use patterns to maximize the cost-effectiveness of future transit investments. Detailed performance, including subregional transit mode share goals and results, can be found in Technical Appendix 7.

A key focus of the 2050 RTP is to develop an ambitious and far-reaching transit network that significantly expands the role that transit plays in meeting the region's mobility needs.

Figure 6.2 – Definitions of Transit Services and Facilities for Urban Area Transit Strategy

High-Speed Rail:	
 ***France's TGV***	Designed for very high-speed long-distance intercity trips with long station spacing and dedicated grade-separated lines. Examples include the Shinkansen in Japan, the TGV in France, and the AVE in Spain. California High-Speed Rail (HSR) currently is being planned from Sacramento to San Diego. ▪ Vehicles are steel wheel on steel track electrically-powered bidirectional train sets ▪ Top Speed: 220 miles per hour (mph), but 150 mph maximum expected from San Diego to Escondido and 200 mph maximum from Escondido to Riverside ▪ Level boarding ▪ Passenger Capacity: Not yet determined in California. Examples from around the world range from approximately 300 to 1,300 per train but most single level trains have about 400-500 ▪ Operates on dedicated high-speed track with no at-grade crossings ▪ California HSR system will be over 600 miles
 ***Spain's AVE***	
 ***California High-Speed Rail***	

Figure 6.2 – Definitions of Transit Services and Facilities for Urban Area Transit Strategy (Continued)

Intercity Rail:	
 ***Amtrak Pacific Surfliner***	Designed for long distance intercity trips with long station spacing. Typically shares right of way with freight and commuter rail. Examples include the Amtrak Pacific Surfliner, Amtrak Capitol Corridor, and Amtrak Coast Starlight. Intercity rail accommodates leisure and business travelers with upgraded passenger amenities. ▪ Intercity rail lines typically use diesel locomotives ▪ Typical speed: 80 mph ▪ Typically low floor boarding. ▪ Average station spacing: 10 to 20 miles ▪ Typical length of line: 100 to 2,000 miles
 ***CalTrain***	
Commuter Rail:	
 ***San Diego COASTER***	Designed for higher-speed, longer-distance regional trips with stations spacing every four to five miles on average. Examples include the San Diego COASTER, Dallas/Fort Worth Trinity Railway Express, and Southern California Metrolink. Commuter rail lines use diesel or electric locomotives (diesel are more common and are used in Southern California) ▪ Typical speed: 80 mph ▪ Typically low floor boarding ▪ Supported by Park and Ride lots ▪ Typical passenger capacity: 130 seats per car operating with 3-8 car trains (typically no standees) ▪ Operates on a dedicated right of way separate from other vehicles ▪ Typical length of line: 25-100 miles
 ***Southern California MetroLink***	

Figure 6.2 – Definitions of Transit Services and Facilities for Urban Area Transit Strategy (Continued)

Light Rail Transit (LRT):



San Diego Trolley



San Diego SPRINTER

Designed for medium-distance trips with station spacing about every mile on average. Examples include the San Diego Trolley, the San Diego SPRINTER, Portland MAX, Minneapolis Hiawatha Line, and Houston MetroRail.

- Electric or diesel-powered rail vehicles
- Typical speed: corridor speed limit, generally not exceeding 55 mph
- Typically low floor boarding
- Designed for high-capacity corridors
- Integrates well with street traffic, signals, and pedestrians
- Operates on a dedicated guideway within a separate right of way or on the street
- Typical passenger capacity: 60-140 seated plus standees (per car), with 1-4 cars
- Typical length of line: 6-25 miles

Streetcar:



Portland Modern Streetcar



San Francisco Historic Streetcar

Designed for short-distance trips with station spacing every few blocks or every quarter-mile on average. Examples include the Portland Modern Streetcar, Seattle Streetcar, and San Francisco Historic Streetcar.

- Electric-powered rail vehicles
- Typical speed: speeds up to the speed limit of the street they operate on, generally averaging 12 mph (with stops)
- Designed for dense urban areas, such as downtown areas
- Integrates well with street traffic, signals, and pedestrians
- Operates either in mixed traffic with automobiles or on a dedicated right of way
- Typical passenger capacity: up to 100 seated and standees per car (vehicles generally provide few seats due to short distance nature of trips). Operate as single vehicles
- Typical length of line: 2-6 miles

Figure 6.2 – Definitions of Transit Services and Facilities for Urban Area Transit Strategy (Continued)

Bus Rapid Transit (BRT):



San Diego I-15 BRT



Los Angeles Orange Line



Las Vegas Wright BRT System
(Photo courtesy flipchip/lasvegasvegas.com)

Designed for longer-distance, higher-speed, regional trip-making on a dedicated bus guideway or freeway Managed Lanes/High Occupancy Vehicle (HOV) facilities. All-day, all-stop trunk BRT services can be complemented with peak-period commuter express services designed to provide very limited stop connections to major employment centers. Examples include San Diego Interstate 15 BRT; Los Angeles Orange Line; Eugene, Oregon EmX; and the Brisbane South-East Busway (Australia).

- Diesel or CNG/alternative fuels standard
- Typical speed: corridor speed limit, typically 40-60 mph on average
- Supported by Park and Ride lots
- Designed for high-capacity corridors
- Low floor design
- Operates on dedicated guideway and sometimes in mixed traffic with automobiles
- Typical passenger capacity: 50-60 seated plus standees on arterial routes, 50-80 seated on freeway routes (per bus)
- Typical length of line: 8-15 miles on arterial segments, 10-30 miles on freeway segments
- Typical station spacing: 0.5-1 mile on arterial segments, 4-5 miles on freeway segments

Senior and Persons with Disabilities Services:



MTS Access

- American with Disabilities (ADA) services for those who cannot access regular fixed route services
- Social service agency services, including door-to-door services

Figure 6.2 – Definitions of Transit Services and Facilities for Urban Area Transit Strategy (Continued)

Rapid Bus:



Los Angeles Metro Rapid



Future Mid-City Rapid Bus

Provides higher-speed alternatives to local bus services in high-volume arterial corridors and utilizes a range of lower-capital cost signal priority treatments, short segments of transit-only lanes, and limited station stops to achieve faster travel times. Rapid Bus services can be upgraded to BRT over time through the implementation of dedicated transit lanes to bypass congested arterial segments. Examples include Los Angeles Metro Rapid and Boston Washington Street Silver Line.

- Diesel or CNG/alternative fuels standard
- Typical speed: speeds up to the speed limit of the street they operate on, averaging about 25 mph (with stops)
- Low floor design
- Designed for high-capacity corridors
- Integrates well with street traffic, signals, and pedestrians
- Typical passenger capacity: 40 seated plus standees (per bus)
- Typical length of line: 8-15 miles
- Typical station spacing: 0.5-1 mile

High-Frequency Local Bus:



San Diego Metropolitan Transit System (MTS) Bus



San Diego North County Transit District (NCTD) Bus

Facilitates mid- to short-distance trip making within local communities, with closer station spacing. Local bus services serve as the backbone of the transit system and provide the primary access into local communities where fixed-route services are warranted.

- Typically standard and single articulated buses
- Typical speed: speeds up to the speed limit of the street they operate on, averaging 12 mph (with stops)
- Low floor design
- Integrates well with street traffic, signals, and pedestrians
- Operates in mixed traffic with automobiles, but can benefit from transit-signal priority and queue jump lanes
- Typical passenger capacity: 37-57 seated plus standees (per bus)
- Typical length of line: ranges from less than 5 miles to 25 miles
- Typical station spacing: 1-4 blocks

2050 Revenue Constrained Transit Network

Figure 6.3 illustrates the 2050 Revenue Constrained Transit Network. Table 6.2 is a list of Phased Transit Services showing transit frequencies by route. Table 6.2 also provides the dates service is estimated to begin.

The Revenue Constrained Transit Network is built on the dual philosophy of reinforcing and upgrading existing transit services in key urban corridors, and pursuing new transit projects in the most urbanized areas of the region using a broad combination of transit modes.

Upgrades and new projects include:

- Improvements to the existing Trolley system, including a tunnel in downtown San Diego, to increase the frequency of service and add limited-stop, commuter express services
- Adding new Trolley and BRT lines to provide high-quality regional transit connections along high-demand corridors
- Developing a system of high-speed Rapid Bus services in key arterial corridors to supplement local bus services
- Double tracking the LOSSAN coastal rail corridor to enable more frequent and reliable service on the COASTER and Amtrak
- Double tracking the SPRINTER rail lines to increase the frequency of service and add limited-stop express services
- Creating a system of high-frequency services on many of the existing local bus routes in urban core areas
- Reintroducing streetcar and/or shuttle/ circulator services to improve mobility within downtown areas

The Revenue Constrained Transit Network also assumes the development of the California High-Speed Rail network in the San Diego region. The San Diego-Los Angeles route is currently in Stage 2 of Planning, that is the Alternatives Analysis. (For more information see: http://www.cahighspeedrail.ca.gov/Los_Angeles_-_San_Diego.aspx)

As shown in Figure 6.3, 2050 Revenue Constrained Transit Network, new Trolley/SPRINTER lines would connect to more communities. SPRINTER service would be extended to south Escondido. A north-south Trolley corridor would be developed along the I-805 corridor that would connect University City, Kearny Mesa, Mission Valley, Mid-City, southeastern San Diego, National City, Chula Vista, and San Ysidro. Intersecting this I-805 Trolley corridor would be three new east-west Trolley lines between University City and Mira Mesa; from Pacific Beach to East County via Kearny Mesa and Mission Valley; and from downtown San Diego to SDSU via the Mid-City communities.

BRT services would complement the regional Trolley/SPRINTER services by providing regional connections along the I-15 corridor between Escondido and downtown San Diego via Kearny Mesa and Mid-City; the SR 52 corridor between East County and Kearny Mesa/University City; the south I-805 corridor between Otay Mesa/Otay Ranch and downtown San Diego; and between Otay Mesa/Otay Ranch and southeastern San Diego (with a station at 47th Street)/Kearny Mesa/University City.

A system of high-frequency local bus services in key urban arterial corridors will provide both improved local service plus access to

regional BRT and rail services. These high-frequency local bus services, planned to operate at 10-minute frequencies throughout the day by 2035, are shown in Appendix A, Table A.5 – Phased Transit Services – Revenue Constrained Plan.

Senior and Human Services

There is an increasing need to provide services for senior and disabled residents in ways that are both appropriate and cost effective.

During the growth forecast period, the number of residents aged 65-84 is projected to more than double and the number of residents age 85 and older is expected to more than triple. Ten percent of the region's population growth between 2008 and 2050 is expected to be in the oldest age group (85 and older). By 2050, nearly 19 percent of the region's population will be 65 or older. In addition, the number of disabled people is expected to rise. As a result, there is an increasing need to provide services for senior and disabled residents in ways that are both appropriate and cost effective.



The 2050 RTP places more attention on transportation for seniors, people with limited means, and individuals with disabilities. These specialized transportation services are coordinated with conventional fixed-route services. SANDAG annually develops a Coordinated Public Transit–Human Services Transportation Plan (also known as the Coordinated Plan) to coordinate fixed route transit service with services provided by organizations that respond to the Americans with Disabilities Act (ADA) requirements, community-based services, non-profit services, and private services. While the 2050 RTP provides a broad framework for these services, the Coordinated Plan provides the specific strategies to guide these investments. The 2050 RTP also includes additional funding for supplemental specialized transportation services, which is estimated to be five percent of the cost of fixed route transit. The Consolidated Transportation Services Agency (CTSA) is the agency designated by SANDAG to coordinate social services transportation in San Diego County.

Safe Routes to Transit

Often the biggest impediment to using transit is the challenge of getting to and from a transit stop or station. Auto-oriented land use patterns, poor pedestrian sidewalk/crosswalk design, lack of bicycle facilities, disconnected street networks, varying topography, and long distances between trip origins and transit stations ("first-mile") or transit stations and trip destinations ("last-mile") all create barriers that are difficult for transit vehicles to negotiate. They also are difficult or impractical for those wishing to access transit to overcome.

Potential strategies to facilitate Safe Routes to Transit include first-mile/last-mile solutions such as enhanced pedestrian crosswalks near transit stations, bicycle lanes that connect to transit and bike parking at transit stations, feeder-distributor bus/shuttle routes, car sharing/station cars, and ridesharing. The 2050 RTP includes $700 million (2010 dollars) toward a Safe Routes to Transit program. These are further discussed as part of the iCommute program in Chapter 8.

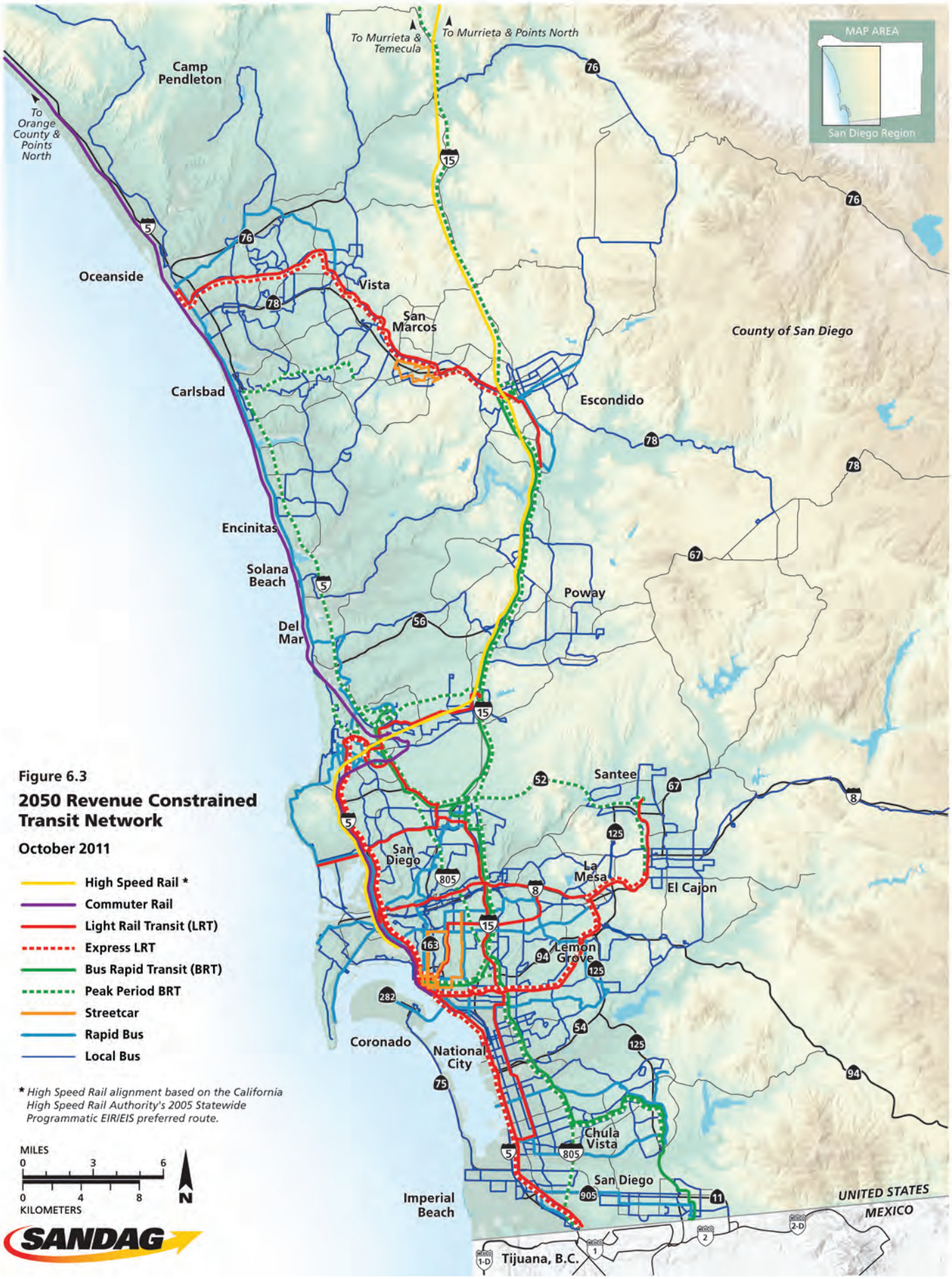
To Murrieta & Temecula
To Murrieta & Points North
MAP AREA
San Diego Region
Camp Pendleton
To Orange County & Points North
Oceanside
Vista
San Marcos
County of San Diego
Carlsbad
Escondido
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 6.3
2050 Revenue Constrained Transit Network
October 2011
High Speed Rail *
Commuter Rail
Light Rail Transit (LRT)
Express LRT
Bus Rapid Transit (BRT)
Peak Period BRT
Streetcar
Rapid Bus
Local Bus
* High Speed Rail alignment based on the California High Speed Rail Authority's 2005 Statewide Programmatic EIR/EIS preferred route.
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Table 6.2 – Phased Transit Services – Revenue Constrained Plan

Decade	Service	Route	Description	Peak Headway (Minutes)	Off-Peak Headway (Minutes)
2018	COASTER	398	Double tracking/Increased Frequency between Oceanside and downtown San Diego with extension to Convention Center/Petco Park	20	current
2018	Trolley	510	Mid-Coast LRT Extension (peak frequencies 7.5 to downtown/15 to UTC)	7.5/15	15
2018	Trolley	530	Green Line Extend to downtown - Bayside	15	15
2018	BRT	470	Escondido-UTC/UCSD via Mira Mesa Blvd	10	-
2018	BRT	607	Rancho Bernardo - downtown Express	10	-
2018	BRT	608	Escondido - downtown Express	10	-
2018	BRT	610	Temecula (Peak Only)/Escondido - downtown	10	10
2018	BRT	628	South Bay BRT (Otay Mesa - downtown) via Otay Ranch/Millenia	15	-
2018	BRT	680	Otay Mesa to Sorrento Mesa via I-805 Corridor, Otay Ranch/Millenia, National City, Southeastern San Diego, Kearny Mesa	15	15
2018	BRT	688	San Ysidro to Sorrento Mesa Express	15	-
2018	BRT	689	Millenia/Otay Ranch to UTC/Torrey Pines Express	15	-
2018	Rapid	15	Mid-City Rapid (SDSU - downtown) via Mid-City, El Cajon and Park Blvds	10	10
2018	Rapid	201/202	UTC Area Super Loop	10	15
2018	Rapid	350	Escondido to Del Lago via Escondido Blvd and Bear Valley	10	10
2020	Streetcar	554	Hillcrest/Balboa Park/downtown San Diego Loop	10	10
2020	BRT	90	Santee/El Cajon Transit Centers to downtown via SR 94	15	-
2020	BRT	640	I-5 - San Ysidro to downtown and Kearny Mesa via I-5 shoulder lane/HOV lanes, downtown, Hillcrest, Mission Valley	15	15
2020	BRT	870	El Cajon to UTC/Campus Point via Santee, SR 52, I-805 (Peak only)	10	-
2020	Rapid	10	La Mesa to Ocean Beach via Mid-City, Hillcrest, Old Town	10	10
2020	Shuttle	448/449	San Marcos Shuttle	15	15
2020	Airport Express		I-5 from McClellan-Palomar Airport to San Diego International Airport	30	30
2020	Airport Express		I-15 from Escondido Transit Center to San Diego International Airport	30	30
2020	Airport Express		I-15 from Escondido Transit Center to Crossborder Facility	30	30
2020			Local Bus Routes - 15 minutes in key corridors	15	15

Table 6.2 – Phased Transit Services – Revenue Constrained Plan (Continued)

Decade	Service	Route	Description	Peak Headway (Minutes)	Off-Peak Headway (Minutes)
2030	COASTER	398	Additional double tracking/Increased Frequency	20	60
2030	SPRINTER	399	Double tracking (Oceanside-Escondido) Increased Frequencies)	10	10
2030	Trolley	561	UTC to Mira Mesa via Sorrento Mesa/Carroll Canyon (extension of route 510)	7.5	7.5
2030	Trolley	520	Orange Line - Increased Frequency	7.5	15
2030	Streetcar	553	Downtown San Diego: Little Italy to East Village	10	10
2030	SPRINTER	588	SPRINTER Express	10	15
2030	BRT	890	El Cajon to Sorrento Mesa via SR 52, Kearny Mesa	10	-
2030	Rapid	2	North Park to downtown San Diego via North Park, Golden Hill	10	10
2030	Rapid	28	Point Loma to Kearny Mesa via Old Town, Linda Vista	10	10
2030	Rapid	30	Old Town to Sorrento Mesa via Pacific Beach, La Jolla, UTC	10	10
2030	Rapid	120	Kearny Mesa to downtown via Mission Valley	10	10
2030	Rapid	473	Oceanside to UTC via Hwy 101 Coastal Communities, Carmel Valley	10	10
2030	Rapid	709	H Street Trolley to Otay Ranch/Millenia via H Street Corridor, Southwestern College	10	10
2030	Rapid	910	Coronado to downtown via Coronado Bridge	10	10
2035	Trolley	520	Orange Line - Extend to Airport Intermodal Transit Center	7.5	15
2035	Streetcar	555	30th St to downtown San Diego via North Park/Golden Hill	10	10
2035	Trolley	560	Mid-City to downtown (Phase 1) via El Cajon and Park Blvds	7.5	7.5
2035	Trolley	563	Pacific Beach to El Cajon via Clairemont, Kearny Mesa, Mission Valley, SDSU	7.5	10
2035	BRT	653	Mid-City to Palomar Airport Road via Kearny Mesa/I-805/I-5	15	-
2035	Rapid	11	Spring Valley to SDSU via Southeastern San Diego, downtown, Hillcrest, Mid-City	10	10
2035	Rapid	180	UTC Area Super Loop - Increase Frequencies	10	10
2035	Rapid	471	Downtown Escondido to East Escondido	10	10
2035	Rapid	474	Oceanside to Vista via Mission Ave/Santa Fe Road Corridor	10	10
2035	Rapid	635	Eastlake/EUC to Palomar Trolley via Main Street Corridor	10	10
2035	Rapid	636	SDSU to Spring Valley via East San Diego, Lemon Grove, Skyline	10	10

Table 6.2 – Phased Transit Services – Revenue Constrained Plan (Continued)

Decade	Service	Route	Description	Peak Headway (Minutes)	Off-Peak Headway (Minutes)
2035	Rapid	637	North Park to 32nd Street Trolley via Golden Hill	10	10
2035	Rapid	638	San Ysidro to Otay Mesa via Otay, SR 905 Corridor	10	10
2035	Shuttle	448/449	San Marcos - Increase Frequencies	10	10
2035			Local Bus Routes - 10 minutes in key corridors	10	10
2040	Trolley	520	Orange Line - Increased Frequencies	7.5	7.5
2040	Trolley	522	Orange Line Express - El Cajon to downtown San Diego	10	10
2040	Trolley	530	Green Line Extend to downtown - Bayside	7.5	7.5
2040	Trolley	540	Blue Line Express - UTC to San Ysidro via downtown	10	10
2050	Trolley	560	SDSU to downtown (Phase 2) via Mid-City, El Cajon and Park Blvds	7.5	7.5
2050	Trolley	562	UTC to San Ysidro via Kearny Mesa, Mission Valley, Mid-City, Southeastern San Diego, National City, Chula Vista via Highland Ave/4th Avenue	7.5	10

Transit Priority Measures

For transit to offer reliable schedules and competitive travel times, the Plan invests significantly in transit priority measures designed to help people bypass congested arterial and freeway segments. When used on a corridor-wide basis, the use of transit priority measures also can reduce operating costs, leading to a more efficient and cost-effective system. Examples of the types of transit priority measures being pursued as part of the 2050 RTP include signal priority treatments, queue jump lanes, the use of Managed Lanes/HOV lanes, and exclusive bus lanes. A more detailed description of these priority measures is included in Appendix M of Technical Appendix 7.

Transit Experience

In order to attract new market segments to public transportation, the customer experience must be considered. Factors ranging from transit access (e.g., the ability to safely cross streets, station amenities, and real-time information) to vehicle design (e.g., interior design, seat availability and comfort, and Wi-Fi connections) play key roles in people's decisions about which travel modes to choose. In addition, transit stations should be well designed and maintained to create a safe, comfortable environment.

The 2050 RTP includes capital and operating cost resources in the various transit capital and operating projects to implement and maintain a high-quality transit product.

Emerging Technologies

Transportation plans must be responsive to emerging technologies that make existing modes more efficient, and to new modes of transit that could better address transit needs in a given travel corridor. Technology will lead to improvements in how transit operates in the future, and innovative designs and passenger amenities will help make transit attractive to new market segments.

Coastal Rail Improvement Program

The San Diego coastal rail corridor is the southern terminus of the 351-mile Los Angeles-San Diego-San Luis Obispo (LOSSAN) rail corridor. The LOSSAN corridor is the nation's second busiest rail corridor, and it is shared by commuter and intercity passenger and freight rail services. In 2010, more than 8 million passengers used the rail corridor to commute to work, for vacations, and other purposes. For the Amtrak system alone, one in every 10 passengers used the corridor's intercity passenger trains, also known as Pacific Surfliner.

The 2050 RTP proposes critical improvements in areas that will benefit all users of the coastal rail corridor.

In San Diego, the 60-mile coastal rail corridor runs south from Orange County to downtown San Diego. With sections of the corridor dating back to the 1880s, about half of the corridor is single track. Trains traverse six coastal lagoons and the coastal cities of Oceanside, Carlsbad, Encinitas, Solana Beach, Del Mar, and San Diego. NCTD is the owner of the railway between the Orange County line and the southern limits of the City of Del Mar. MTS owns the railway south to the



Santa Fe Depot in the City of San Diego. NCTD operates and maintains the entire San Diego County portion of the LOSSAN corridor.

Pacific Surfliner trains provide intercity passengers with stations in downtown San Diego, Solana Beach, and Oceanside that connect the region to the rest of the nation. Two-thirds of the 2.6 million annual Amtrak passengers use the region's three intercity stations. COASTER commuter trains operate south from Oceanside to downtown San Diego, serving the cities of Carlsbad, Encinitas, Solana Beach, and San Diego. The Southern California Regional Rail Authority (SCRRA) operates Metrolink commuter trains north from Oceanside to Orange and Los Angeles counties and the Inland Empire.

BNSF Railway is the freight rail operator on the corridor, operating trains from the Port of San Diego north. On a typical weekday, there are between 65 and 73 trains operating along portions of the coastal rail corridor, and each operator has a vision for expanding service. Facing shared challenges, the 2050 RTP proposes critical improvements in areas that will benefit all users of the coastal rail corridor. These improvements include future growth in both passenger and freight services. Figure 6.4 displays the 2011 Southern California intercity and commuter rail network.

Service Driven Plan

The 2050 RTP includes substantial improvements to the coastal rail corridor, each of which is phased in according to plans for expanding service for intercity, commuter, and freight trains. Furthermore, additional local/commuter passenger rail service between San Diego and Los Angeles to serve new markets or enhance service to current markets is planned by LOSSAN and its member agencies.

Capital improvements include double tracking the rail line between Orange County and downtown San Diego; building the Del Mar Tunnel; building new platforms at the Del Mar Fairgrounds and at the San Diego Convention Center; building selected grade separations; improving grade crossings; establishing quiet zones; implementing Positive Train Control (PTC); and making other station improvements. Environmental and alternative analyses need to be conducted before construction of the Del Mar Tunnel and other capital improvements can move forward. Station improvements are expected to include parking structures at stations, as well as real-time information for passengers and other amenities. Maintaining rail bridges in a state of good repair is a major goal for the corridor, so the 2050 RTP proposes replacing all aging single track trestle bridges made of timber with modern, double tracked structures.

This corridor also is a priority for the State of California. Since 1974, the State has supported Pacific Surfliner services with capital and operating assistance. These improvements have led to faster, more frequent and more convenient service, improved stations, and increased ridership. Since 2008, the federal government has provided a capital matching program that so far has resulted in $177 million in matching funds for corridor capital projects. In 2006 and 2008, California voters approved the sale of bonds to fund additional rail improvements. A portion of these bond proceeds has been dedicated to double tracking and PTC projects in San Diego County. The *TransNet* Early Action Program includes $300 million in local funds for high-priority rail improvements and additional operating funds for the COASTER.

The LOSSAN Rail Corridor Agency is a Joint Powers Authority (JPA) that coordinates planning and programming on the coastal rail

line to increase the rail lines' capacity and improve reliability. SANDAG is a member of the JPA and provides staff support to the authority. The LOSSAN Corridorwide Strategic Implementation Plan, which will identify programs and policies to better coordinate all rail services in the corridor, aims to increase ridership and develop new markets. The plan is expected to be completed in early 2012.

High-Speed Rail Services

The California High-Speed Rail Authority (Authority) was created by the California Legislature in 1996 to develop a plan for the financing, construction, and operation of a statewide, intercity high-speed passenger rail system. The Authority has developed plans for an 800-mile system that includes nine corridors connecting California's major metropolitan areas. Trains will reach speeds in excess of 200 miles per hour in more rural areas on a dedicated, fully grade-separated system, making it possible to travel from San Diego to Los Angeles in less than 80 minutes and San Diego to San Francisco in less than four hours (Figure 6.5).

The Authority completed an environmental impact report for the statewide high-speed rail network in November 2005. In November 2008, California voters approved a $9.95 billion bond measure to complete the planning and environmental phases on all of the state's high-speed rail corridors, and to construct the Bay Area-to-Anaheim segment of the proposed plan as Phase 1. The federal government followed the state's commitment to fund high-speed rail by committing more than $10 billion nationwide through the American Recovery and Investment Act (ARRA) and the Passenger Rail Investment and Improvement Act (PRIIA). The state of California so far has received $3.5 billion for Phase 1 sections of the network.

The San Diego region will be connected to the high-speed rail system by a corridor that links Los Angeles with San Diego via the Inland Empire. This project is now scheduled in Phase 2 of the Authority's plan. Figure 6.6, High-Speed Rail Alternative Alignments, shows the corridor as it stretches from downtown Los Angeles east, through San Bernardino and Riverside counties. It then heads south, through Murrieta and Temecula, to downtown San Diego along the I-15 corridor. More than 17 million people live along this corridor, and nearly 26 million are projected to live along the corridor by 2050. The Authority has completed an Alternatives Analysis, which will narrow alternatives and station options that will then be subject to environmental reviews. These reviews are scheduled to be completed in 2013-14. The state government is working closely with local and regional agencies along the corridor, and it has partnered with SANDAG and other regional transportation agencies along the corridor to form the Southern California Inland Corridor Group. This group will oversee the environmental reviews.

San Diego's high-speed corridor runs from Southwest Riverside County along the I-15 corridor, with a key intermodal transit station planned in the City of Escondido. This transit station will provide connections to the SPRINTER light rail line, local bus and feeder services, and the I-15 BRT service. Continuing south, the high-speed rail route could turn west and run through the University City area to the terminus at the Airport ITC. An alternative is to continue the high-speed rail down along I-15 to SR 163 and terminate at the ITC. At the ITC, the San Diego Trolley, COASTER, Amtrak, future BRT service, local bus, and feeder services all will connect to the state's high-speed trains.

Trains will reach speeds in excess of 200 miles per hour in more rural areas on a dedicated, fully grade-separated system, making it possible to travel from San Diego to Los Angeles in less than 80 minutes and San Diego to San Francisco in less than four hours.

A Flexible Roadway System

Roadways in the region serve many purposes and accommodate different types of travel. They accommodate buses and other transit vehicles, automobiles, the movement of freight, and bicycles. The local streets and arterials that connect our communities are typically used for shorter trips, while the region's highways link homes with major centers for jobs, education, shopping, and recreation. People also use them, of course, for longer trips out of town.

Capacity enhancements are needed to improve mobility on our highways and on regional arterial networks. The region's congestion management process is outlined in Technical Appendix 20.

The 2050 RTP improves the existing highway system and does not propose new highway corridors, with the exception of a two-mile toll highway (State Route 11) that will connect to a new international land port of entry at Otay Mesa East.

The Plan's 2050 vision is for a flexible highway system in which the same lanes used by BRT services also are used by carpools, vanpools, and fee-paying patrons (similar to the FasTrak® system, in which fees support transit services along the I-15 corridor). The highway improvements are focused on making carpooling/vanpooling and transit more time competitive with driving alone by providing Managed Lanes facilities that ensure these alternatives have fast and reliable travel that bypasses main lane congestion. As shown in Figure 6.7, 2050 Revenue Constrained Highway Network, the 2050 RTP includes an extensive network of Managed Lanes, which is critical to many of the Plan's regional transit services.

The Managed Lanes operate at free-flow speeds, and they provide passengers of high occupancy vehicles with a quicker ride. Several Managed Lanes also serve solo drivers who choose to pay a fee to save time. Table 6.3 lists the phased highway improvements. Table 6.4 summarizes the major capital improvements included in the 2050 RTP. Highway and regional arterial improvements in the Plan are coordinated to support and complement the expanded transit system.





Figure 6.4

2011 Southern California Intercity/Commuter Rail

October 2011

Passenger Rail Service

- Amtrak Pacific Surfliner
- Metrolink
- COASTER

- Amtrak Pacific Surfliner
- Metrolink Ventura County Line
- Metrolink Antelope Valley Line
- Metrolink San Bernadino Line
- Metrolink Riverside Line
- Metrolink 91 Line
- Metrolink Orange County Line
- Metrolink Inland Empire-Orange County Line
- COASTER



Figure 6.5

California High-Speed Train Statewide Overview

October 2011

Source: **California High-Speed Rail Authority**
Map based on preferred alignments and station locations in the 2005 and 2008* program EIR/Ss.

* *Authority rescinded 2008 Pacheco Pass selection to comply with Atherton judgment. Board will make new decision after revising Bay Area to Central Valley PEIR. New Decision could change depicted alignment connection Bay Area and Central Valley.*

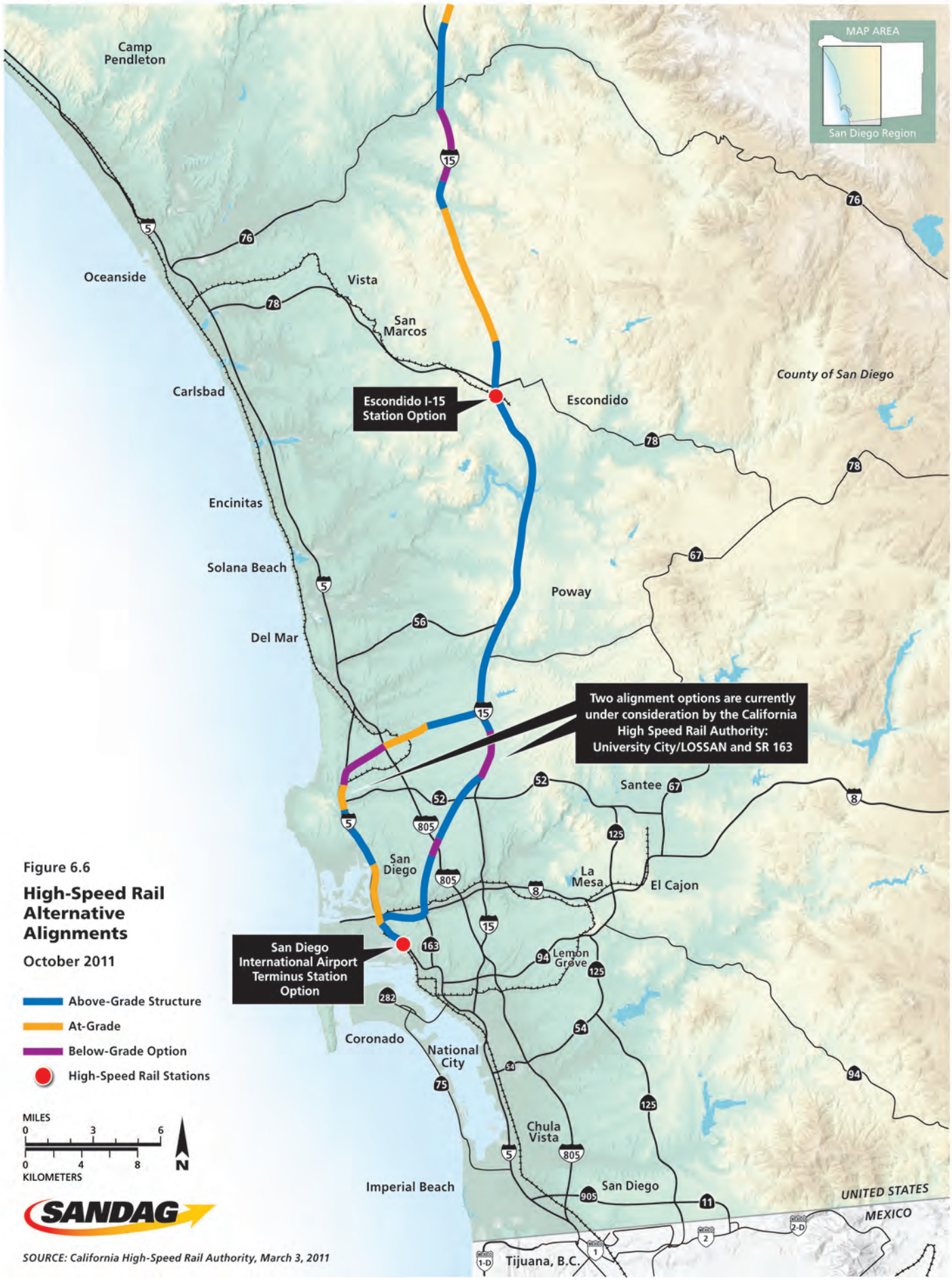


Figure 6.6

High-Speed Rail Alternative Alignments

October 2011

SOURCE: California High-Speed Rail Authority, March 3, 2011

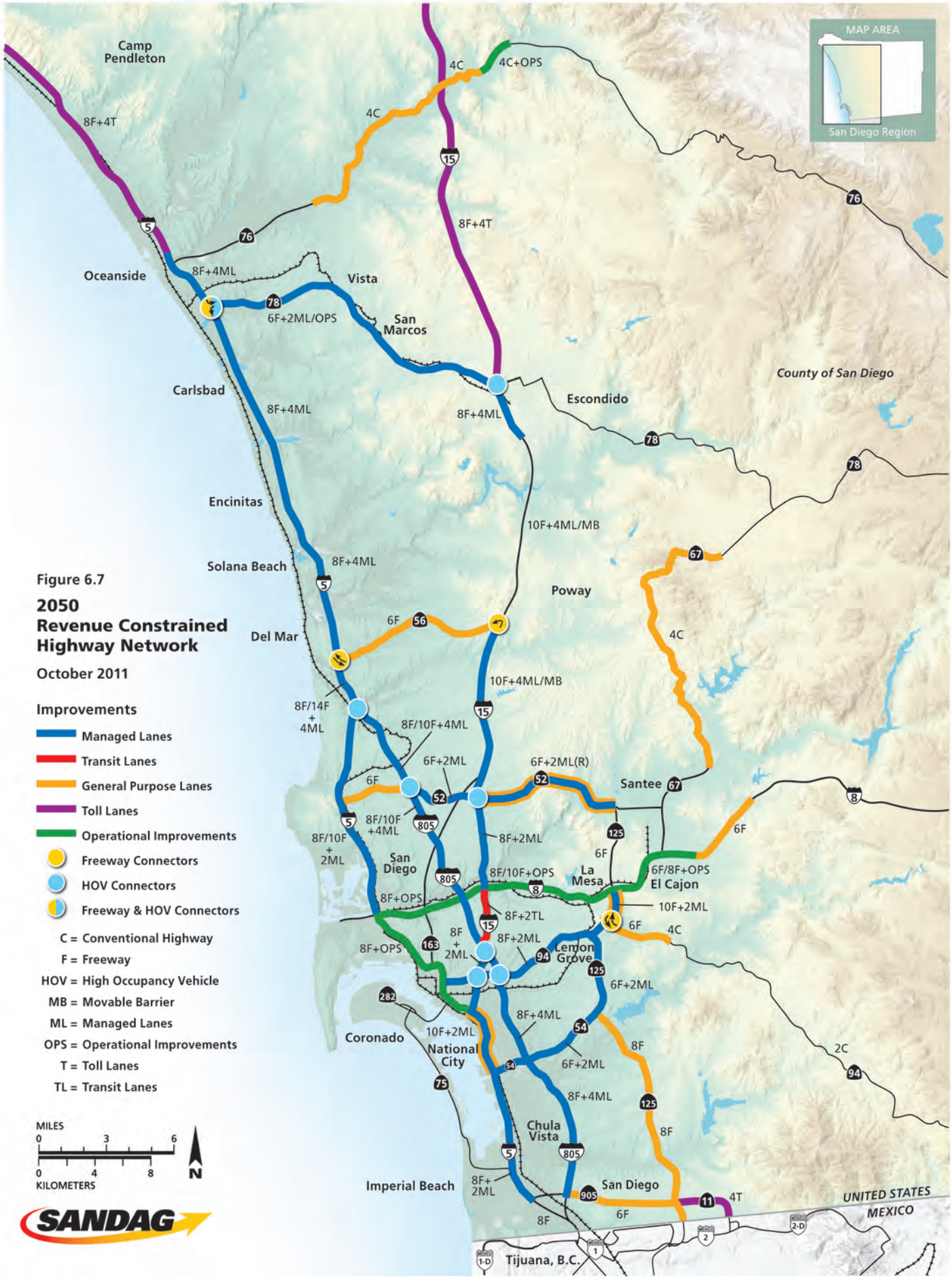


Figure 6.7
2050
Revenue Constrained
Highway Network
October 2011
Improvements
Managed Lanes
Transit Lanes
General Purpose Lanes
Toll Lanes
Operational Improvements
Freeway Connectors
HOV Connectors
Freeway & HOV Connectors
C = Conventional Highway
F = Freeway
HOV = High Occupancy Vehicle
MB = Movable Barrier
ML = Managed Lanes
OPS = Operational Improvements
T = Toll Lanes
TL = Transit Lanes
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG
MAP AREA
San Diego Region
Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
County of San Diego
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Tijuana, B.C.
UNITED STATES
MEXICO
8F+4T
4C
4C+OPS
8F+4ML
6F+2ML/OPS
10F+4ML/MB
6F
8F/14F + 4ML
8F/10F+4ML
6F+2ML
6F+2ML(R)
8F/10F +4ML
8F/10F + 2ML
8F+2ML
8F/10F+OPS
8F+OPS
8F+2TL
8F + 2ML
10F+2ML
6F/8F+OPS
8F+4ML
6F+2ML
8F
2C
4T

Table 6.3 – Phased Highway Projects – Revenue Constrained Plan ($ millions – YOE dollars)

Year Built By	Freeway	From	To	Existing	Improvements	($ Millions – YOE Dollars)
2018	I-5	Manchester Ave	SR 78	8F	8F+2HOV	$460
2018	SR 11/Otay Mesa East POE	SR 905	Mexico	--	4T	$755
2018	I-15	SR 163	SR 56	8F+2ML(R)	10F+4ML/MB	$419
2018	I-15	Centre City Parkway	SR 78	8F	8F+4ML	$210
2018	SR 76	Melrose Drive	I-15	2C	4C	$404
2018	SR 241	Orange County	I-5	--	4T	$443
2018	I-805	Palomar St	SR 94	8F	8F+2HOV	$197
2018	I-805	SR 52	Carroll Canyon Rd	8F/10F	8F/10F+2HOV	$160
2018	I-805	Carroll Canyon Rd	I-5 (north)	8F/10F	8F/10F+2ML	$81
2018	SR 905	I-805	Mexico	--	6F	$595
2018	Vesta Street Bridge		Mobility Connector over Harbor Drive at Naval Base San Diego			$59
2018	32nd Street		Freeway Access Enhancement			$ 117
2018	10th Avenue Marine Terminal Entrance		Rail Line Grade Separation/Barrio Logan Enhancement			$66
2018	National City Marine Terminal		Bay Marina Drive, Civic Center Freeway Access Improvements			$7
2020	I-5	La Jolla Village Drive	I-5/I-805 Merge	8F/14F	8F/14F+2ML	$260
2020	I-5/I-805	North to North & South to South (HOV Connectors)				$114
2020	SR 15	I-805	I-8	8F	8F+2TL	$47
2020	I-15	I-8	SR 163	8F	8F+2ML	$135
2020	SR 15/I-805	North to North & South to South (HOV Connectors)				$94
2020	I-15/SR 78	East to South & North to West (HOV Connectors)				$109
2020	SR 78	I-5	I-15	6F	6F+2ML/Operational	$592
2020	SR 94	I-5	I-805	8F	8F+2ML	$499
2020	SR 94/SR 125	South to East (Freeway Connector)				$144
2020	I-805	Palomar St	SR 15	8F/8F+2HOV[1]	8F+4ML	$1,247
2020	I-805/SR 94	North to West & East to South (HOV Connectors)				$166
2020	I-805	SR 52	Carroll Canyon Rd	8F/10F+2HOV	8F/10F+4ML	$406
2020	National City Rail Yard					$7

Table 6.3 – Phased Highway Projects – Revenue Constrained Plan ($ millions – YOE dollars) (Continued)

Year Built By	Freeway	From	To	Existing	Improvements	($ Millions – YOE Dollars)
2030	I-5	Palomar St	SR 15	8F	8F+2ML	$274
2030	I-5	I-5/I-805 Merge	SR 56	8F/14F+2HOV	8F/14F+4ML	$68
2030	I-5	SR 56	Manchester Ave	8F+2HOV	8F+4ML	$685
2030	I-5/SR 56	West to North (Freeway Connector)				$89
2030	I-5/SR 56	South to East (Freeway Connector)				$164
2030	I-5	Manchester Ave	Palomar Airport Rd	8F+2HOV[2]	8F+4ML	$1,301
2030	SR 67	Mapleview St	Dye Rd	2C/4C	4C	$781
2030	SR 94/SR 125	West to North (Freeway Connector)				$247
2030	SR 125	SR 94	I-8	8F	10F	$295
2030	SR 241	Orange County	I-5	4T	6T	$79
2030	I-805	SR 905	Palomar St	8F	8F+4ML	$463
2030	I-805	SR 15	Mission Valley Viaduct	8F	8F+4ML	$315
2030	I-805	Mission Valley Viaduct	SR 52	8F/10F	8F/10F+4ML	$873
2035	I-5	Palomar Airport Rd	SR 78	8F+2HOV[2]	8F+4ML	$1,181
2035	I-5	SR 78	Vandegrift Blvd	8F	8F+4ML	$661
2035	I-5/SR 78	South to East and West to North (HOV Connectors)				$188
2035	I-5/SR 78	North to East and West to South (HOV Connectors)				$189
2035	I-5/SR 78	South to East (Freeway Connector)				$94
2035	I-5/SR 78	West to South (Freeway Connector)				$72
2035	SR 15	SR 94	I-805	8F	8F+2ML	$31
2035	SR 15/SR 94	South to West & East to North (HOV Connectors)				$126
2035	SR 52	I-805	I-15	6F	6F+2ML	$314
2040	I-8	I-15	SR 125	8F/10F	8F/10F+Operational	$226
2040	I-8	SR 125	2nd Street	6F/8F	6F/8F+Operational	$226
2040	SR 52	I-15	SR 125	4F	6F+2ML(R)	$587
2040	SR 56	I-5	I-15	4F	6F	$244
2040	SR 76	I-15	Couser Canyon	2C	4C/6C+Operational	$235

Table 6.3 – Phased Highway Projects – Revenue Constrained Plan ($ millions – YOE dollars) (Continued)

Year Built By	Freeway	From	To	Existing	Improvements	($ Millions – YOE Dollars)
2040	SR 94	I-805	College Ave	8F	8F+2ML	$396
2040	SR 94	College Ave	SR 125	8F	8F+2ML	$415
2040	SR 125	SR 94	I-8	10F	10F+2ML	$126
2040	I-805	Mission Valley Viaduct		8F	8F+4ML	$1,101
2040	I-805/SR 52	West to North & South to East (HOV Connectors)				$146
2050	I-5	SR 905	Palomar St	8F	8F+2ML	$226
2050	I-5	SR 54	I-15	8F	10F+2ML	$393
2050	I-5	I-15	I-8	8F	8F+Operational	$2,689
2050	I-5	I-8	La Jolla Village Dr	8F/10F	8F/10F+2ML	$1,261
2050	I-5	Vandegrift Blvd	Orange County	8F	8F+4T	$1,795
2050	I-8	I-5	I-15	8F	8F+Operational	$1,047
2050	I-8	2nd Street	Los Coches	4F/6F	6F	$129
2050	SR 15	I-5	SR 94	6F	8F+2ML	$214
2050	I-15	Viaduct		8F	8F+2ML	$1,714
2050	I-15	SR 78	Riverside County	8F	8F+4T	$2,392
2050	I-15/SR 52	West to North and South to East (HOV Connectors)				$260
2050	I-15/SR 56	North to West (Freeway Connector)				$186
2050	SR 52	I-5	I-805	4F	6F	$262
2050	SR 54	I-5	SR 125	6F	6F+2ML	$238
2050	SR 94	SR 125	Avocado Blvd	4F	6F	$214
2050	SR 94	Avocado Blvd	Jamacha Rd	4C	6C	$71
2050	SR 94	Jamacha Rd	Steele Canyon Rd	2C/4C	4C	$48
2050	SR 125	SR 905	San Miguel Rd	4T	8F	$262
2050	SR 125	San Miguel Rd	SR 54	4F	8F	$143
2050	SR 125	SR 54	SR 94	6F	6F+2ML	$238

KEY

C = Conventional Highway Lanes
F = Freeway Lanes
HOV = High Occupancy Vehicle Lanes
MB = Movable barrier
ML = Managed lanes (HOV & Value Pricing)
ML(R) = Managed lanes (Reversible)
T = Toll Lanes
TL = Transit Lanes

[1] Project completed in two phases. See improvement from 8F to 8F+2HOV by 2018.
[2] Project completed in two phases. See improvement from 8F to 8F+2HOV by 2018.

Table 6.4 – Capital Improvements – Revenue Constrained Plan ($ millions – YOE dollars)

Transit Facilities				
TransNet	**Service**	**Route**	**Description**	**Cost**
TransNet	COASTER	398	Double tracking (includes grade separations at Leucadia Blvd + Convention Center/Petco Park and Del Mar Fairgrounds stations, Del Mar Tunnel, and quiet zone improvements)	$4,979
TransNet	SPRINTER	399	Double tracking (includes grade separations at El Camino Real, Vista Village Dr, Melrose Dr, Mission/San Marcos stations + two additional locations)	$1,149
	SPRINTER	588	SPRINTER Express	$334
TransNet	Trolley	510	Mid-Coast LRT Extension	$1,642
TransNet	Trolley	510 and 520	Trolley System Rehabilitation (Blue and Orange Lines)	$456
	Trolley	510	Blue Line Rail Grade Separations (Taylor St, Washington/Sassafras St, 28th St, 32nd St, E St, H St, Palomar St)	$861
	Trolley	520	Orange Line Rail Grade Separations (Euclid Ave, Broadway/Lemon Grove Ave, Allison Ave/University Ave/La Mesa Blvd, Severin St)	$491
	Trolley	522	Orange Line Express - El Cajon to downtown San Diego	$415
	Trolley	540	Blue Line Express - UTC to San Ysidro via downtown	$821
	Trolley	560	SDSU to downtown via Mid-City, El Cajon/Park Blvds	$4,009
	Trolley	561	UTC to Mira Mesa via Sorrento Mesa/Carroll Canyon	$1,556
	Trolley	562	UTC to San Ysidro via Kearny Mesa, Mission Valley, Mid-City, Southeastern San Diego, National City/Chula Vista via Highland Ave/4th Ave	$6,043
	Trolley	563	Pacific Beach to El Cajon via Clairemont, Kearny Mesa, Mission Valley, SDSU	$1,978
	Trolley	510, 520, 540, 522, and 560	Downtown Trolley Tunnel (12th & Imperial Transit Center to County Center/Little Italy Trolley Station)	$4,293
	BRT	90	Santee/El Cajon Transit Centers to downtown via SR 94 (Peak Only)	$0
TransNet	BRT	470	Escondido-UTC/UCSD via Mira Mesa Blvd	$18
TransNet	BRT	610	Temecula (peak only)/Escondido to downtown	$80
TransNet	BRT	628	South Bay BRT (Otay Mesa-downtown) via Otay Ranch/Millenia	$181
	BRT	640	I-5 - San Ysidro to downtown & Kearny Mesa via I-5 shoulder lanes/HOV lanes, downtown, Hillcrest, Mission Valley	$86
	BRT	653	Mid-City to Palomar Airport Road via Kearny Mesa/I-805/I-5	$16
	BRT	870	El Cajon to UTC via Santee, SR 52, I-805	$7
	BRT	890	El Cajon to Sorrento Mesa via SR 52, Kearny Mesa	$17
TransNet	BRT	680 and 688/689	Otay Mesa/San Ysidro to Sorrento Mesa via I-805 Corridor, Otay Ranch/Millenia, National City, Southeastern San Diego, Mid-City, Kearny Mesa	$441
	BRT	120, 610, and 640	Hillcrest to Mission Valley Transit Priority Measures and I-15 Green Line/BRT transfer station	$518

Table 6.4 – Capital Improvements – Revenue Constrained Plan ($ millions – YOE dollars) (Continued)

Transit Facilities (Continued)				
TransNet	**Service**	**Route**	**Description**	**Cost**
TransNet	BRT	-	South Bay Maintenance Facility	$45
TransNet	BRT	-	Downtown BRT stations/layovers	$97
	Rapid	2	North Park to downtown San Diego via 30th St, Golden Hill	$43
	Rapid	10	La Mesa to Ocean Beach via Mid-City, Hillcrest, Old Town	$90
	Rapid	11	Spring Valley to SDSU via Southeastern San Diego, downtown, Hillcrest, Mid-City	$157
TransNet	Rapid	15	Mid-City Rapid (downtown to SDSU via North Park, Mid-City)	$63
	Rapid	28	Point Loma to Kearny Mesa via Old Town, Linda Vista	$61
	Rapid	30	Old Town to Sorrento Mesa via Pacific Beach, La Jolla, UTC	$142
	Rapid	120	Kearny Mesa to downtown via Mission Valley	$131
	Rapid	471	Downtown Escondido to East Escondido	$48
	Rapid	473	Oceanside to UTC via Hwy 101 Coastal Communities, Carmel Valley	$176
	Rapid	474	Oceanside to Vista via Mission Ave/Santa Fe Road Corridor	$76
	Rapid	635	Eastlake/EUC to Palomar Trolley via Main Street Corridor	$81
	Rapid	636	SDSU to Spring Valley via East San Diego, Lemon Grove, Skyline	$57
	Rapid	637	North Park to 32nd Street Trolley via Golden Hill	$48
	Rapid	638	San Ysidro to Otay Mesa via Otay, SR 905 Corridor	$84
	Rapid	709	H Street Trolley to Millenia via H Street Corridor, Southwestern College	$39
	Rapid	910	Coronado to downtown via Coronado Bridge	$29
	Streetcar	553	Downtown San Diego: Little Italy to East Village	$187
	Streetcar	554	Hillcrest/Balboa Park/downtown San Diego Loop	$284
	Streetcar	555	30th St to downtown San Diego via North Park, Golden Hill	$397
	Shuttle		San Marcos Shuttle[1]	$0
	Airport Express		Airport Express Routes[2]	$55
	Intermodal	-	Airport Intermodal Transit Center	$171
	Intermodal	-	San Ysidro Intermodal Center	$52
	Other	-	Other Improvements (Vehicles/vehicle replacement, maintenance facilities, transit system rehab, regulatory compliance, park and ride, ITS)	$10,022
			Subtotal	$43,027

[1] Capital cost to be funded by the City of San Marcos

[2] Capital cost to be funded by aviation funds.

Table 6.4 – Capital Improvements – Revenue Constrained Plan ($ millions – YOE dollars) (Continued)

Managed Lanes/Highway Projects						
TransNet	**Freeway**	**From**	**To**	**Existing**	**Improvements**	**Cost**
TransNet	I-5	SR 905	SR 54	8F	8F+2ML	$500
TransNet	I-5	SR 54	SR 15	8F	10F+2ML	$393
TransNet	I-5	SR 15	I-8	8F	8F+Operational	$2,689
TransNet	I-5	I-8	La Jolla Village Dr	8F/10F	8F/10F+2ML	$1,261
TransNet	I-5	La Jolla Village Dr	I-5/I-805 Merge	8F/14F	8F/14F+2ML	$260
TransNet	I-5	I-5/I-805 Merge	SR 56	8F/14F+2HOV	8F/14F+4ML	$68
TransNet	I-5	SR 56	Vandegrift Blvd	8F/8F+2HOV	8/10F+4ML	$4,286
	I-5	Vandegrift Blvd	Orange County	8F	8F+4T	$1,795
	I-8	I-5	SR 125	8F/10F	8F/10F+Operational	$1,273
	I-8	SR 125	2nd Street	6F/8F	6F/8F+Operational	$226
TransNet	I-8	2nd Street	Los Coches	4F/6F	6F	$129
	SR 11/Otay Mesa East POE	SR 905	Mexico	--	4T & POE	$755
	SR 15	I-5	SR 94	6F	8F+2ML	$214
TransNet	SR 15	SR 94	I-805	8F	8F+2ML	$31
TransNet	SR 15	I-805	I-8	8F	8F+2TL	$47
TransNet	I-15	I-8	SR 163	8F	8F+2ML	$1,849
TransNet	I-15	SR 163	SR 56	8F+2ML(R)	10F+4ML/MB	$419
TransNet	I-15	Centre City Parkway	SR 78	8F	8F+4ML	$210
	I-15	SR 78	Riverside County	8F	8F+4T	$2,392
	SR 52	I-5	I-805	4F	6F	$262
	SR 52	I-805	I-15	6F	6F+2ML	$314
TransNet	SR 52	I-15	SR 125	4F	6F+2ML(R)	$587
TransNet	SR 54	I-5	SR 125	6F	6F+2ML	$238
TransNet	SR 56	I-5	I-15	4F	6F	$244
TransNet	SR 67	Mapleview St	Dye Rd	2C/4C	4C	$781
TransNet	SR 76	Melrose Drive	I-15	2C	4C	$404
	SR 76	I-15	Couser Canyon	2C	4C/6C+Operational	$235

Table 6.4 – Capital Improvements – Revenue Constrained Plan ($ millions – YOE dollars) (Continued)

Managed Lanes/Highway Projects						
TransNet	**Freeway**	**From**	**To**	**Existing**	**Improvements**	**Cost**
TransNet	SR 78	I-5	I-15	6F	6F+2ML/Operational	$592
TransNet	SR 94	I-5	SR 125	8F	8F+2ML	$1,310
TransNet	SR 94	SR 125	Avocado Blvd	4F	6F	$214
TransNet	SR 94	Avocado Blvd	Jamacha Rd	4C	6C	$71
TransNet	SR 94	Jamacha Rd	Steele Canyon Rd	2C/4C	4C	$48
	SR 125	SR 905	San Miguel Rd	4T	8F	$262
	SR 125	San Miguel Rd	SR 54	4F	8F	$143
TransNet	SR 125	SR 54	SR 94	6F	6F+2ML	$238
TransNet	SR 125	SR 94	I-8	8F	10F+2ML	$421
	SR 241	Orange County	I-5	--	4T/6T	$522
TransNet	I-805	SR 905	Carroll Canyon Rd	8F/10F	8F/10F+4ML	$4,764
TransNet	I-805	Carroll Canyon Rd	I-5 (north)	8F/10F	8F/10F+2ML	$81
	SR 905	I-805	Mexico	--	6F	$595
					Subtotal	$ 31,123

HOV Connectors				
TransNet	**Freeway**	**Intersecting Freeway**	**Movement**	**Cost**
	I-5	SR 78	South to East and West to North, North to East and West to South	$377
TransNet	I-5	I-805	North to North & South to South	$114
	I-15	SR 52	West to North and South to East	$260
TransNet	I-15	SR 78	East to South & North to West	$109
TransNet	SR 15	SR 94	South to West & East to North	$126
	SR 15	I-805	North to North & South to South	$94
	I-805	SR 52	West to North & South to East	$146
	I-805	SR 94	North to West & East to South	$166
			Subtotal	$1,392

Table 6.4 – Capital Improvements – Revenue Constrained Plan ($ millions – YOE dollars) (Continued)

Freeway Connectors				
TransNet	**Freeway**	**Intersecting Freeway**	**Movement**	**Cost**
TransNet	I-5	SR 56	West to North and South to East	$253
TransNet	I-5	SR 78	South to East and West to South	$166
	I-15	SR 56	North to West	$186
TransNet	SR 94	SR 125	South to East and West to North	$391
			Subtotal	$996
Non-Highway Goods Movement Projects				
				Cost
	Vesta Street Bridge		Mobility Connector over Harbor Drive at Naval Base San Diego	$59
	32nd Street		Freeway Access Enhancement	$117
	10th Avenue Marine Terminal Entrance		Rail Line Grade Separation/Barrio Logan Enhancement	$66
	National City Marine Terminal		Bay Marina Drive, Civic Center Freeway Access Improvements	$7
	National City Rail Yard			$7
			Subtotal	$256
			Total	**$76,794**

KEY

C = Conventional Highway Lanes
F = Freeway Lanes
HOV = High Occupancy Vehicle Lanes
MB = Movable barrier
ML = Managed lanes (HOV & Value Pricing)
ML(R) = Managed lanes (Reversible)
T = Toll Lanes
TL = Transit Lanes

Note: All HOV lanes will convert to Managed Lanes by 2035 with an HOV occupancy of HOV3+ people.

Completing Regional Highways

The 2050 RTP includes the funding to maintain and preserve the existing highway system (see Chapter 5 – Financial Strategies). Improving the efficiency of the regional transportation system also is one of the Plan's priorities, and Systems Management and Demand Management strategies are discussed in detail in Chapters 7 and 8, respectively.

After these basic needs are met, the Plan's priorities are to complete missing links in the regional highway system and to develop a Managed Lane network that will serve many modes of transportation. The Plan calls for completing State Routes 11 and 905 serving South County and our border with Mexico. These same highways serve both commuter and freight travel in the region. Two new freeway to freeway connections will be completed along I-5 at its junctions with SR 56 and SR 78. In addition, missing connectors at SR 94/SR 125 will be completed.

The 2050 RTP provides funding for improvements to arterial roadways that are designed to keep public transit flowing smoothly.

Managed Lane Network

Unlike Orange and Los Angeles counties to the north, the San Diego region doesn't have an HOV network on its highways. Currently, about 20 miles of mainline HOV and Managed Lane facilities exist on portions of Interstates 5, 15, and 805. The 2050 RTP will continue to develop a robust Managed Lane network that includes four-lane managed facilities on I-5, I-15, and I-805, and two-lane facilities on State Route 52, SR 54, SR 78, SR 94, and SR 125 (totaling nearly 130 more miles).

The I-15 model showcases the integration of transit and roadways into a flexible transportation system for the corridor. Currently under construction, the I-15 Managed Lanes will create a 20-mile Managed Lane facility between SR 163 and SR 78. When the I-15 Managed Lanes project is completed, it will feature four lanes with a movable barrier (similar to the movable barriers on the San Diego-Coronado Bridge), dynamic pricing, multiple access points to regular highway lanes, and direct access ramps for buses, high occupancy vehicles, and toll-paying customers. A high-frequency rapid transit system of buses will operate in these lanes, connecting people who live in various areas of North County to job centers.

This project is an innovative tool to reduce growing traffic congestion in the corridor. It will offer high-level service to people who ride transit, share rides, and drive solo during rush hours. During off-peak periods, Managed Lanes could be used to help smooth the flow of freight trucks and other vehicles transporting goods throughout the region.

In addition to mainline Managed Lane improvements, the Plan includes direct HOV to HOV connectors at the I-5/I-805 merge, and at eight other interchanges where major HOV facilities intersect.

An Enhanced Focus on Local Streets and Roads

The 2050 RTP provides funding for improvements to arterial roadways that are designed to keep public transit flowing smoothly. Like highways, the arterial network plays an important role in improving regional transit, as well as serving subregional trips. These include extending green lights for public transit vehicles, allowing "queue jumpers" to bypass bottlenecks on local streets, and adding grade separations where needed. These measures link regional arterials to the Managed Lane network and transitways at transit stations and other strategic locations, providing transit vehicles with easy access to the regional network.

Completing the Regional Arterial System is a priority in the 2050 RTP. Regional arterials provide critical links to the highway network, and they serve as alternative routes to highways as well. Planned improvements to the Regional Arterial System (Figure 6.8) are identified in the local circulation elements of each of the local jurisdictions in the San Diego region. A complete list is included in Technical Appendix 4, Table TA 4.26. Local jurisdictions are responsible for improving regional roadways and local streets, to meet their residents' needs and mitigate the effects of local developments. Funding is intended to come from local jurisdictions, including Proposition 42.

The 2050 RTP assumes additional arterial improvements, in addition to projects that increase the capacity of the arterial network. These include coordinating traffic signals, systems that detect traffic, measures that give public transit priority on the network, and management systems that optimize the arterial network and integrate arterial operations with other modes (see Chapter 7).

A Corridor Approach

The 2050 RTP recognizes the importance of planning from a regional perspective and within a subregional context. The Plan recognizes that no one size fits all, in part because the long-term performance of transportation facilities and services depends heavily on surrounding land uses and nearby communities.

The individual modal improvements in the 2050 RTP are tailored to support land uses in major travel corridors. They build upon multimodal systems already in place, and they add preferred improvements recommended in completed transportation planning studies (see Appendix E for a list of studies and links to their location). This corridor approach considers multiple facilities, modes, jurisdictions, and land uses. The objective is to select the most effective mix of strategies to improve mobility along a specific corridor.

To improve sustainability, the 2050 RTP focuses major roadway and transit improvements in urban and suburban areas of the region, encouraging growth away from the region's more rural areas. However, the Plan also recognizes the need to address the unique transportation issues facing the region's rural communities, particularly those affected by increasing development on tribal reservations.

Accommodating bicycle and pedestrian travel also is important as we develop our regional highways and arterials. Highway and arterial improvements, such as freeway interchanges and widened arterial streets, should be designed to encourage bicycling and walking. The *TransNet* Extension Ordinance requires all *TransNet* funded projects to support active transportation, where it is reasonable to do so.

The Plan recognizes that no one size fits all, in part because the long-term performance of transportation facilities and services depends heavily on surrounding land uses and nearby communities.



Public Safety

Several natural disasters and acts of terrorism have brought the safety and security of our transportation system to the forefront. The federal transportation bill, Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), calls for an increased emphasis to be placed on the safety and security of the transportation system. On a regional planning scale, three key areas of concern have been identified: the ability to plan for and react to natural disasters; the capability to respond effectively to man-made events; and the interoperability of various public safety communication systems.

The San Diego region has a number of existing organizations, plans, and infrastructure in place to provide for the safety of the regional transportation system. Additionally, there are a number of current or pending efforts to plan for and respond to large-scale natural or man-made disasters and improve public safety communications systems.

Within the San Diego region, the County of San Diego Office of Emergency Services (OES) coordinates the overall county response to disasters and provides for a single operational area for the coordination of mitigation, preparedness, response, and recovery. The San Diego Transportation Management Center (TMC) integrates Caltrans' Traffic Operations and Maintenance and the California Highway Patrol (CHP) communications in a unified communication and command center and provides communications, surveillance, and computer infrastructure to coordinate transportation management on state highways.

It is important to have plans to evacuate individuals who do not have access to private vehicles. Identified coordination and response agencies provide for a systematic response to natural and man-made disasters. Existing infrastructure, such as changeable message signs (CMS) and the Reverse 911 telephone system, allow for information to be shared expeditiously with portions of the population. The Reverse 911 telephone system was employed with positive results when more than 500,000 people were evacuated during the San Diego County wildfires in October 2007.

As neighbors and key trade partners, it is critical that we ensure safe and time-efficient travel to the economies of both California and Baja California. The U.S. Customs and Border Protection (CPB) has many systems in place to prevent the entry of potentially dangerous individuals and materials. Many physical, technology, and policy systems are in place to ensure safety and security at the border.

SANDAG and various local, state and federal agencies continue to work together to continue to improve the safety and security of the transportation system.



Figure 6.8

Regional Arterial System

October 2011

2050 Goods Movement Strategy

The 2050 Goods Movement Strategy (GMS) developed a forecast and truck model, and then produced a menu of projects that reflects the needs of the region and balances freight benefits with sustainability needs. The goods movement portion of the Unconstrained Network consists primarily of road and truckway projects (accommodating more than 90 percent of freight by volume) that comprise the backbone of the freight distribution network. The Unconstrained Network outlined in the 2050 GMS also includes several maritime, rail, border, air cargo, intermodal centers, and pipeline-related projects.

The GMS, as shown in Figure 6.9, serves as the freight component of the 2050 RTP. The GMS considers the growing importance of freight and goods movement to the region's economic prosperity, and it seeks to balance regional and national freight priorities.

The relationship between freight transportation and economic growth has long been recognized as an important ingredient in both regional and national policy.



The San Diego Region Goods Movement Network

The movement of goods in the San Diego region involves intermodal systems of air cargo, border crossings, maritime, pipeline, rail and roadways/truckways. Situated between major production, trade, and population centers, San Diego hosts a wide array of freight transportation and infrastructure components. The freight transportation system includes interstate and state highways, Class I freight rail operations, two short line railroad operations (all freight operations occur on tracks shared with passenger rail services), airport cargo systems, the Port of San Diego with two working marine terminals, and the Otay Mesa and Tecate commercial border crossings.

The existing conditions, capacity needs, and other important issues for each of the region's individual freight systems are summarized in this GMS. The shared freight and passenger components for aviation, border, rail, and roadway systems are discussed more fully by topic in this chapter.

Air Cargo

California's Global Gateways Development Program identifies San Diego International Airport (SDIA) as one of the priority air cargo gateways in California. Most air cargo in the San Diego region is handled through SDIA. Air cargo activity has grown rapidly at SDIA, increasing at an average annual rate of 8.5 percent through 2000. It has since slowed to a more moderate rate of growth of 4.3 percent annually. In 2009, SDIA handled more than 121,000 tons of air cargo. The air cargo capacity at SDIA is currently constrained by limited infrastructure. Therefore, increasing cargo handling capacity, as well as improved access roads, are proposed in the 2050 RTP Unconstrained Network.

Land Ports of Entry

In 2010, nearly $27 billion in goods moved between Mexico and the United States at the Otay Mesa Port of Entry (POE) and at the Tecate POE. The SANDAG 2050 Comprehensive Freight Gateway Study (Gateway Study), included in Technical Appendix 11, projects that the nearly 2 million trucks that crossed the California-Mexico border in 2007 will increase to nearly 5 million trucks in 2050. According to the SANDAG study, "Economic Impacts of Wait Times at the San Diego-Baja California Border," trucks crossing at the border at Otay Mesa and Tecate currently experience delays of more than two hours, on average, even when they are not subjected to secondary inspections. To shorten these delays, the GMS proposes roadway projects at the border, as well as the new Otay Mesa East POE.

Maritime

San Diego Bay is a natural harbor situated about 96 nautical miles southeast of Los Angeles and just north of the U.S.-Mexico border. The Port of San Diego has two marine cargo terminals on San Diego Bay. One is at Tenth Avenue in the City of San Diego, and the other is in National City. In FY 2009-2010, the two terminals handled about 2.8 million revenue tons of cargo. Built in the 1950s, the Tenth Avenue Marine Terminal (TAMT) is a general cargo terminal. It supports cool-frozen food storage, break bulk, dry-liquid bulk, small container operations, and construction materials. The National City Marine Terminal (NCMT) is a primary maritime POE for imported automobiles and lumber, with the capacity to handle 500,000 motor vehicles for distribution by rail and truck throughout the United States.

The Port's maritime capacity is constrained by limited terminal space, landside access constraints, and dock space. While the potential for maritime growth is possible, the expansion of existing and new businesses must be complemented by enhanced terminal capacity and improved highway access. Also, the Port's proximity to the community of Barrio Logan creates the need for context sensitive community improvements to support the port access projects.

Pipeline

In the San Diego region, Kinder Morgan Energy Partners (a private company) is the key provider of bulk freight transport by pipeline. The pipeline network runs between Orange, California and the Kinder Morgan Terminal in San Diego's Mission Valley. The 66-acre terminal has the capacity to distribute significant amounts of petroleum products by truck on I-5, I-805, I-15, and on Friars Road. The volume of petroleum products shipped by pipeline in the region is projected to continually increase, and new pipeline capacity may be required beginning in 2015. Therefore, improved truck access to the pipeline terminal may be needed to ensure the efficient delivery of petroleum products.

Rail

San Diego County is served by three rail companies that own and/or operate rail facilities within the county. In the northern



The 2050 RTP includes proposed rail capacity improvements to reduce current passenger/freight rail bottlenecks and to increase capacity for existing port and border-related freight.

part of the county along the I-5 corridor, BNSF Railway operates on two lines owned by NCTD and MTS. They run from Oceanside to Escondido, and from Oceanside to downtown San Diego. BNSF also operates on a rail line segment between downtown San Diego and the National City Marine Terminal (this segment is owned by BNSF).

In the southern portion of the county, San Diego and Imperial Valley Railroad (SD&IV), a subsidiary of Fortress Investment Group (formerly Rail America Inc.), operates two short lines owned by MTS. One line connects the Santa Fe Depot in downtown San Diego with the San Ysidro border crossing and freight yard. The other line runs from downtown San Diego to the City of Santee, in the eastern part of the region.

Additionally, the Carrizo Gorge Railway (CZRY) owns the rights to operate limited service between the Mexican border at San Ysidro/Tijuana, through Mexico to the U.S.-Mexico border crossing at Tecate. The rail line continues from Tecate to Plaster City in the western part of Imperial County. The section between Tijuana and Tecate is owned by the Mexican government, while the section between Tecate, California and Plaster City is owned by MTS. However, the portion between Division, near Tecate, and Plaster City is currently closed due to bridge repairs.

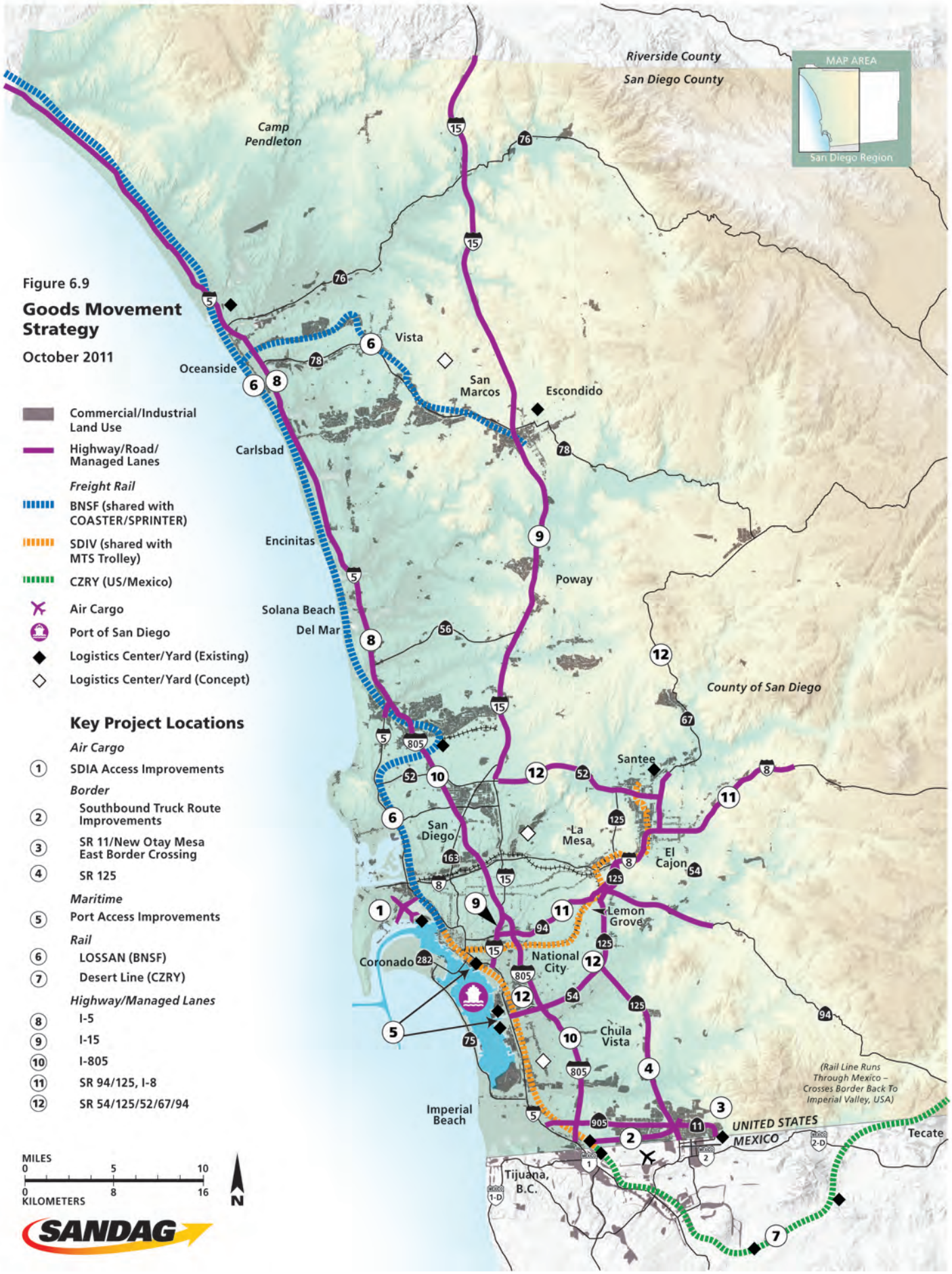
In 2008, all of the region's rail operators handled about 32,000 carloads, including such commodities as motor vehicles, lumber, chemicals, petroleum, agricultural products, cement, and aggregate.

Freight rail capacity along the coast and south to Mexico is currently constrained by limited infrastructure and the sharing of track with passenger operations including Amtrak, the COASTER, and the Trolley. The 2050 RTP includes proposed rail capacity improvements to reduce current passenger/freight rail bottlenecks and to increase capacity for existing port and border-related freight. New rail logistics centers at key locations would allow rail and truck transfers where the demand for local or subregional industrial/manufacturing is high and where land is less expensive. Track improvements on the San Diego to Tecate line would provide better connections and service to manufacturing centers in Mexico, with the potential to grow rail carloads.

Road/Truckways

The majority of the region's freight travels by truck. Congested freeways and highways slow the movement of freight, especially at key gateway access points. These include the border crossing at Otay Mesa and the port connector roads along Harbor Drive and ultimately to the Interstate system. New Managed Lanes are planned along the region's primary truck routes, including primary north-south routes such as I-5, I-15, and I-805. Also, the potential use of Managed Lanes during off-peak periods for moving goods will be evaluated in the near future. Other proposals for increasing truck capacity include improvements on SR 52, SR 54, SR 67, SR 94, and SR 125.

In the San Diego region, I-5, I-805, and I-15 are the major north-south corridors used by significant numbers of commercial trucks. SR 94/125, I-8, and SR 905/Otay Mesa Road are the region's primary east-west truck corridors.


Riverside County
San Diego County
MAP AREA
San Diego Region
Camp Pendleton
Vista
Oceanside
San Marcos
Escondido
Carlsbad
Encinitas
Poway
Solana Beach
Del Mar
County of San Diego
Santee
La Mesa
El Cajon
San Diego
Lemon Grove
National City
Coronado
Chula Vista
Imperial Beach
Tijuana, B.C.
UNITED STATES
MEXICO
Tecate
(Rail Line Runs Through Mexico – Crosses Border Back To Imperial Valley, USA)
Figure 6.9
Goods Movement Strategy
October 2011
Commercial/Industrial Land Use
Highway/Road/ Managed Lanes
Freight Rail
BNSF (shared with COASTER/SPRINTER)
SDIV (shared with MTS Trolley)
CZRY (US/Mexico)
Air Cargo
Port of San Diego
Logistics Center/Yard (Existing)
Logistics Center/Yard (Concept)
Key Project Locations
Air Cargo
1 SDIA Access Improvements
Border
2 Southbound Truck Route Improvements
3 SR 11/New Otay Mesa East Border Crossing
4 SR 125
Maritime
5 Port Access Improvements
Rail
6 LOSSAN (BNSF)
7 Desert Line (CZRY)
Highway/Managed Lanes
8 I-5
9 I-15
10 I-805
11 SR 94/125, I-8
12 SR 54/125/52/67/94
MILES
0 5 10
0 8 16
KILOMETERS
N
SANDAG

Aviation and Ground Access

Existing Conditions

The 2050 RTP includes the development of an Airport Intermodal Transit Center (ITC), adjacent to the airport with direct connections to rail, Trolley, and bus services.

Each year, more than 17 million air passengers use one of the region's three commercial airports: San Diego International Airport (SDIA), McClellan-Palomar Airport, or Tijuana International Airport. These airports are part of the San Diego County Airport System of 12 public use airports in San Diego County, along with Tijuana International (Figure 6.10). SDIA, McClellan-Palomar, and Tijuana International accommodate commercial, general aviation, and corporate services. Airports accommodating only general aviation and corporate services are Brown Field Municipal, Gillespie Field, Montgomery Field, and Ramona. The remaining airports accommodate general aviation only.

In addition, there are airport users that choose to use other airports in the region, including in Mexico, because of the varied air services they offer. For example, of the total San Diego County passengers connecting at Los Angeles International Airport (LAX) annually, about 41 percent originate their travel at SDIA, while about 54 percent connect at LAX using ground transportation (e.g., train, car, and bus). About 5 percent of the passengers connecting at LAX begin their trips at McClellan-Palomar, which currently only offers commercial service to LAX. About 780,000 San Diego County residents traveled to Mexican destinations in 2006. About 640,400 of them, or 83 percent, flew from Tijuana International after crossing the international border.

In 2010, about 127,000 tons of air cargo were shipped from or to the San Diego region. About 90 percent of the cargo handled at SDIA was accommodated on integrated/express carriers that originated from or were destined for downtown San Diego. Just as SDIA is ideally situated for passenger service and general aviation because it is easily accessible, the airport also is ideal for transporting cargo. Moreover, integrated carriers employ vast distribution networks that require a centralized airport. SDIA provides this ideal base for ground transportation.

Senate Bill 10 (SB 10), passed into law in 2007, requires SANDAG and the San Diego County Regional Airport Authority (Airport Authority) to coordinate planning for the multiple modes of transportation that serve the airport. SB 10 primarily requires the development of a Regional Aviation Strategic Plan (RASP) and an Airport Multimodal Accessibility Plan (AMAP). The Airport Authority is the lead agency for the RASP, which analyzes scenarios to improve the performance of the regional airport system. SANDAG is the lead agency for the AMAP, which details a multimodal strategy to improve airport access for cars, shuttles, trucks and other surface transportation. The overarching goal of both the RASP and AMAP is to maximize the efficiency and effectiveness of existing and planned aviation facilities by using all the transportation infrastructure available.

In 2009, SANDAG, the Airport Authority, and the City of San Diego completed Destination Lindbergh, which details a planning strategy for the ultimate buildout of SDIA at its present location. The document evaluated improved intermodal access to the airport, and determined actions that could reduce traffic on surrounding arterial streets. In the recommended buildout plan, terminal gates would remain on the south side of the runway. However, all ground access to the airport would lead to the north side of Pacific Highway, where passengers and cargo would arrive first at the airport at new facilities. A people mover would then bring passengers to

a reconstructed terminal on the south side of the runway. Elements of the airport's north side complex include a consolidated rental car facility (CONRAC), a passenger processing facility, and parking structures. Also included is the development of an Airport Intermodal Transit Center (ITC), adjacent to the airport and with direct connections to rail, Trolley, and bus services. The ITC would be located along the existing railroad tracks and connect to airport facilities with a passenger walkway across Pacific Highway. Future improvements would include high-speed train (HST) service and direct connector ramps from I-5.

RASP and AMAP

The Airport Authority initiated the RASP in 2008 by developing 15 scenarios to evaluate how to meet the region's air service needs through 2030. The AMAP, initiated in 2010, studied a number of freeway, roadway, and public transportation improvements based on the aviation demand forecast developed by the Airport Authority and the alternative RASP scenarios.

SDIA

RASP results indicate that the full build-out of the north side terminal at SDIA has no effect on projected enplanements, relative to the Baseline Scenario, because it does not improve the capacity of the airfield. The study also confirmed that SDIA's fleet mix already is nearly optimized because the Airport is projected to have a relatively low proportion of regional jets and turboprops in the future. However, there are other reasons to build out the north side terminal, as well as to construct the opening-day scenario of the Airport ITC. These reasons include improving regional intermodal transportation connections, offering alternatives to driving alone to the airport, and relieving congestion. The ITC will include connections from developments at the north side of the airport to the Trolley, commuter rail, and local and regional buses. These improvements are included in the AMAP, which also calls for the full build out of the ITC, including a high-speed train station, direct access ramps from I-5, and direct express bus service from the I-5 and I-15 corridors.

The RASP evaluated two HST alignments that would offer passengers an alternative solution for ground transportation to cities and airports within California. The study found that diverting a portion of aviation operations to HST, per the assumptions in both alignments, would delay by about five years the time when SDIA capacity becomes constrained. It should be noted that the true long term impact of high speed trains on the region could not be precisely determined. This is because results were evaluated for only three years, with effects being observed only between 2027, when the California High-Speed Rail Authority expects to be running service to San Diego, and 2030. Based on the degree of uncertainty surrounding the timing of HST, as well as the time and cost of accessing and using the service, the best estimate is that between 8 percent and 25 percent of the region's aviation demand to northern California would be diverted to rail.



Crossborder Facility

The RASP found that the number of passengers using Tijuana International would increase by 30 percent with the introduction of the Crossborder Facility (CBF). But the CBF only would marginally alleviate the mid-term constraints on capacity, because it does not materially affect whether travelers choose the airport for domestic travel. This is because U.S. travel from Tijuana, notwithstanding any form of crossborder facility or terminal, is international travel, requiring customs clearance for Mexico-departing and U.S.-arriving passengers. The study found that the CBF attracts more passengers from the Los Angeles region than from San Diego County. This is primarily because the Los Angeles region has a larger service population, and airports there do not have the capacity to serve all the region's residents. The AMAP reviewed a number of ground access improvements to the CBF, including future local bus routes; additional arterial widening projects that are consistent with the draft Otay Mesa community plan update under development by the City of San Diego; and additional improvements to the interchange between SR 905 and Britannia Boulevard. Direct express bus service that provides a one-seat ride from North County Inland is proposed.

McClellan-Palomar Airport

The RASP found that increasing commercial passenger service at McClellan-Palomar does not alleviate capacity constraints at SDIA, primarily because the additional demand that can be accommodated at McClellan-Palomar only accounts for five percent of SDIA's total traffic. The RASP also evaluated using McClellan-Palomar for high-end/corporate general aviation by providing the necessary amenities at the airfield, but it found this would delay only by about two years the time that capacity becomes constrained at SDIA. The AMAP alternatives for improving ground access include additional lanes on Palomar Airport Road, widening of arterial streets for better transit and vehicle access directly to the airport, and direct transit from the Poinsettia COASTER station to the airport terminal.

Gillespie Field

The RASP found that maximizing the use of Gillespie Field for both high-end/corporate and recreational general aviation would delay by about two years the time when capacity becomes constrained at SDIA. Enhanced general aviation is a market that is traditionally difficult for public transit to serve effectively and although the AMAP evaluated a number of potential transit improvements, intersection and signal improvements along Marshall Avenue and the SR 67/Bradley Avenue interchange project are proposed to improve the flow of traffic to the terminal.

Beyond 2030, capacity constraints are likely at SDIA. This will result in the inability of the region to accommodate all demand, potential service disruptions, and higher air fares. Several options, including high-speed trains, also could accommodate additional demand in the 2030 to 2050 timeframe.

The RASP Technical Report is available at www.sdrasp.com and the AMAP is available at www.sandag.org/amap. Both are included in Technical Appendix 12.

Figure 6.10

San Diego Region Airport Locations

October 2011

Airport Operator

- San Diego County Regional Airport Authority
- City of Oceanside
- City of San Diego
- County of San Diego
- Military
- Grupo Aeroportuario del Pacifico

MILES
0 3 6 9 12
0 4 8 12 16
KILOMETERS

N

SANDAG

Orange County
Riverside County
San Diego County
Imperial County
UNITED STATES
MEXICO
Fallbrook Community Airpark
Camp Pendleton Marine Corps Base
Oceanside Municipal Airport
McClellan-Palomar Airport
Ramona Airport
Borrego Valley Airport
Agua Caliente Airport
Ocotillo Airport
Jacumba Airport
Miramar Marine Corps Air Station
Montgomery Field
Gillespie Field
San Diego International Airport
North Island Naval Air Station
Brown Field Municipal Airport
Imperial Beach Naval Outlying Field
Tijuana Rodriguez International Airport

Active Transportation

Our region can increase mobility, reduce greenhouse gases, and improve public health by making bicycling and walking viable options for everyday travel.

Offering More Choices Will Make Our Transportation System More Efficient

As noted at the beginning of this Chapter, the 2050 RTP is developed around five primary components: a Sustainable Communities Strategy, Social Equity and Environmental Justice, Systems Development, Systems Management, and Demand Management. Each component has a unique yet interdependent role in creating a sustainable transportation system that improves mobility, reduces greenhouse gases, and increases travel choices for everyone in the San Diego region through 2050.

In addition, the Regional Comprehensive Plan (RCP), adopted in 2004, also calls for more transportation options, and a balanced regional transportation system to support smart growth and a more sustainable region. Toward that end, the RCP established a regional objective to "create more walkable and bicycle-friendly communities consistent with good urban design concepts." A well-designed and thoughtfully integrated multimodal transportation system will give people choices, allowing them to select the transportation mode that is best suited for a particular trip. In an area as large and diverse as the San Diego region, this approach is necessary to make the best use of our limited transportation resources.



Active Transportation, Transit, and Smart Growth

Well-planned bicycling and walking facilities support compact, mixed-use communities. They also improve safe routes to rail and bus transit stops/stations. Compact communities with a rich mix of homes and businesses place more destinations within the range of bicycling and walking trips. Studies show that people living in smart growth communities typically drive about 20 percent to 40 percent less than those in suburbs that are highly dependent on driving. Communities conducive to bicycling and walking can support more intensive development because they require fewer auto trips. Even those who choose to drive benefit because mixed-use smart growth neighborhoods are more compact and therefore the distances between destinations are reduced. If properly designed and convenient, bicycling and walking infrastructure will lead to more people choosing bicycling or walking for short trips in smart growth areas.

Well-planned bicycling and walking facilities support compact, mixed-use communities.

Combined with public transportation, walking and bicycling can be a part of longer trips as well. Ninety percent of all public transportation trips begin with walking. Seventy-five percent of people who walk to transit stops walk for less than nine minutes, and 42 percent walk for less than four minutes. Improvements that make the walk to public transit stops more pleasant and safe also will encourage more people to ride public transit. Bicycling in particular has great potential to allow more people to access public transportation conveniently.

Accessing public transit stops by bicycle can shorten travel times significantly. Because bicyclists travel about four times as fast as

pedestrians, convenient access by bicycle can increase the geographic area served by one transit station by 16-fold.

Universal Access to Mobility

Good mobility is fundamental to thriving economically, socially, and physically. However, many people in the region do not drive because they are too young or too old. Many more do not drive because of financial constraints, a disability, personal choice, and other reasons. The transportation needs of these people can be met with a mix of options for bicycling, walking, and public transit. Transportation in our region must be accessible for everybody. Support for bicycling and walking is crucial to providing universal mobility.

The 2050 RTP fully funds the identified needs for bicycling and walking over the next 40 years.

This goal is supported by federal, state, regional, and local statutes and policies that require a "complete streets" approach to developing the transportation system. With the adoption of Assembly Bill 1358 – The Complete Streets Act in 2008, California became the first state to require city and county legislative bodies, when revising circulation elements, to identify how they will accommodate all roadway users regardless of their mode of travel. Bicyclists, public transportation vehicles, and pedestrians of all ages and abilities are to be recognized as legitimate roadway users. Streets should be designed to be safer and accessible for all roadway users to promote and enable the creation of livable streets and more livable communities.



Complete Streets policies and practices complement and help to enable Active Transportation projects and programs supported by SANDAG. The benefits of Complete Streets are many and should be a part of improving access and safety in all communities regardless of size or location. Complete Streets encourage improved safety which leads to more walking and bicycling. Shifting some trips to walking, bicycle, and public transit fosters a more balanced transportation system and provides opportunities for people to be more active and thus improve the health of the people in our communities.

Implementation of Complete Streets that provide room for safe bicycling and walking help children get physical activity and opportunities to gain independence. Children who have safe walking and bicycling routes have a more positive view of their neighborhood and are more connected to their community. Safe Routes to School programs will also benefit from Complete Streets policies that can help turn all routes into safe routes.

At the regional level, Section 4(E)(3) of the *TransNet* Extension Ordinance requires all *TransNet* funded projects to support active transportation where it is reasonable to do so.

The benefits of walking and bicycling are many, while the costs of supporting active transportation are relatively minor. The 2050 RTP fully funds the identified needs for bicycling and walking over the next 40 years. Chief among the benefits is the opportunity

to improve public health. Using active transportation options such as walking, biking, and public transit reduces vehicle miles traveled; cuts vehicle emissions; reduces respiratory disease due to exposure to environmental contamination from fuel and oil spills; and reduces hypertension due to exposure to high decibels of noise. Switching to an active mode of transportation also incorporates exercise into an activity done by most people everyday. Just a five-mile bicycle trip or a two-mile walk to work provides most people with the minimum 30 minutes of moderate to vigorous physical activity recommended by the Surgeon General.

Riding to 2050: The San Diego Regional Bicycle Plan

The RTP calls for a multimodal regional transportation network that includes a regional bicycle network. Toward that end, Riding to 2050: The San Diego Regional Bicycle Plan (Bicycle Plan) sets forth a vision for a distinctive regional bicycle system composed of interconnected bicycle corridors, support facilities, and programs. The goal is to make bicycling more practical and desirable to a larger number of the region's residents and visitors. The Bicycle Plan is located in Technical Appendix 13 and can be found at www.sandag.org/bicycle. Implementing the plan is critical for the development of a robust active transportation system in the region. The Bicycle Plan is a guide for the future development of the regional bicycle system, through the year 2050.

The Bicycle Plan outlines a range of recommendations to accomplish the regional goals of increasing the number of people who bike, as well as the frequency of bicycle trips for all purposes. It encourages the development of Complete Streets, improving safety for bicyclists and increasing public awareness and support for bicycling in the San Diego region. The recommendations include bicycle infrastructure improvements, programs to encourage cycling and safe cycling behavior, implementation strategies, and policy and design guidelines.

Bicycle Infrastructure Improvements

The Bicycle Plan presents an interconnected network of 40 bicycle corridors (Figure 6.11, 2050 Regional Bicycle Network) that will enable residents to bicycle with greater safety, directness, and convenience within and between major regional destinations. It was developed in coordination with local agencies, in order to connect to and complement local bike networks. The regional bicycle network consists of a combination of standard bicycle facilities, including about 228 miles of Class I bike paths, 213 miles of Class II bike lanes, and 33 miles of Class III bike routes. These facilities and the Regional Bicycle Corridor Classification System are described and depicted in greater detail in Figure 6.12. The Bicycle Plan also proposes two new types of facilities: eight miles of bicycle boulevards and 34 miles of cycle tracks. While they are not defined in the California Highway Design Manual, they are emerging as promising innovative treatments. The plan proposes to develop these two types of facilities as demonstration projects, in order to study their potential for providing greater safety and comfort to bicyclists (see Figure 6.12). Figure 6.13 depicts the adopted corridor alignments and facility classifications of the Regional Bicycle Network. To enhance the regional bicycle network, the Bicycle Plan also includes provisions for secure and convenient bicycle parking, and support facilities that encourage transportation-based bicycle trips and enhanced access to transit.

In April 2011, the SANDAG Board of Directors approved $6.5 million to fund the initial implementation of the Bicycle Plan.

The San Diego Regional Bicycle Plan sets forth a vision for a distinctive regional bicycle system composed of interconnected bicycle corridors, support facilities, and programs.

The Regional Safe Routes to School Strategy supports communities and schools in implementing programs that promote walking and bicycling to school safely and routinely.

The Bicycle Plan acknowledges the importance of completing the regional network of Class I bike paths, which includes the Inland Rail Trail, Coastal Rail Trail, San Diego River Trail, and Bayshore Bikeway. Although many sections of the regional network have been completed, together they fall short of creating a continuous regional network. Completing these segments will make an important contribution in moving toward an interconnected Class I network and provide additional facilities that bicyclists and pedestrians can use now. The initial implementation of the Bicycle Plan includes final design and construction for two portions of the Coastal Rail Trail in the cities of Oceanside and Encinitas as well as preliminary engineering and environmental work to advance portions of the Inland Rail Trail, Coastal Rail Trail, and San Diego River Trail in the cities of San Marcos, Vista, Encinitas, San Diego, Santee, and the County of San Diego.

In addition to the established Class I network, the Bicycle Plan proposes a number of additional projects to provide a comprehensive bicycle network for the San Diego region. Also in April 2011, the Transportation Committee was presented with the prioritized list of these additional projects resulting from applying the Transportation Committee approved project prioritization criteria. Proposed initial implementation of the Bike Plan includes preliminary planning for eight projects from the prioritized list that would serve some of the highest density development in the region.



Safe Routes to School Strategy

The Regional Safe Routes to School Strategy supports communities and schools in implementing programs that promote walking and bicycling to school safely and routinely. In addition to increasing the number of students walking and bicycling to school, Safe Routes to School programs improve health; address traffic safety and personal security issues; mitigate transportation costs; heighten awareness about the benefits of active transportation; and decrease school-related vehicle trips. The result is improved air quality and reduced traffic congestion in school zones.

The Safe Routes to School Strategy is gaining prominence as an effective tool for managing demands on the transportation system, improving air quality, and reducing greenhouse gas emissions.

To achieve these benefits, Safe Routes to School programs encourage children to walk and bicycle to school by planning and evaluating initiatives, improving infrastructure, making sure traffic laws are enforced, education, and other activities. Comprehensive Safe Routes to School programs encompass all of these components. They are commonly referred to as the "Five E's" (engineering, education, enforcement, encouragement, and evaluation).

While funding for local Safe Routes to School programs primarily comes from the state and federal programs, the planning and implementation of Safe Routes to School programs is inherently local. These efforts rely on collaboration among local jurisdictions, school districts, schools, and community

based and nonprofit organizations. Several of these local programs exist throughout the San Diego region.

The Regional Safe Routes to School Strategy seeks to build upon the region's existing Safe Routes to School programs and related efforts. The strategy consists of the following elements:

- Integrating Safe Routes to School into regional planning efforts
- Providing technical assistance to help ensure that local Safe Routes to School programs will be effective and comprehensive
- Establishing partnerships and fostering collaboration among agencies and organizations
- Offering education and encouragement programs that are valuable tools for communities. For example, SchoolPool might otherwise be too costly or onerous to administer locally. SchoolPool is included as part of the iCommute Program (see Chapter 8).

SANDAG is now developing the San Diego Regional Safe Routes to School Strategic Plan. It will detail actions, identify responsible agencies, and estimate the cost of implementing the strategy. The anticipated benefits of this Safe Routes to School Strategy are substantial, and they would help the region meet state targets for reducing greenhouse gas emissions.

California Coastal Trail

The California Coastal Trail (CCT) is made up of a series of trails stretching 1,300 miles up and down the California coastline, as shown in Figure 6.14. Its development is a collaborative effort among the Coastal Conservancy, State Parks, the Coastal Commission, and the nonprofit agency Coastwalk. Designated in 1999 as California's Millennium Legacy Trail, it is defined as "a continuous public right of way along the California coastline; a trail designed to foster appreciation and stewardship of the scenic and natural resources of the coast through hiking and other complementary modes of nonmotorized transportation."

The CCT is intended as a continuous public right of way that extends from the northern border of California to the southern border, all within sight, sound, or at least smell of the ocean. It is the CCT's proximity to the ocean that makes it distinctive among other trails.

SANDAG has developed Technical Memoranda entitled "Feasibility Study for the San Diego Portion of the California Coastal Trail" to inform the scoping of a comprehensive feasibility study for the region. The Memoranda lay the groundwork and gathers preliminary material to help to identify existing and potential network segments, linkages, gaps, and coastal access routes. These Technical Memoranda are located in Technical Appendix 14 and can be found at www.sandag.org/CACoastalTrail.

The California Coastal Trail is intended as a continuous public right of way that extends from the northern border of California to the southern border, all within sight, sound, or at least smell of the ocean.

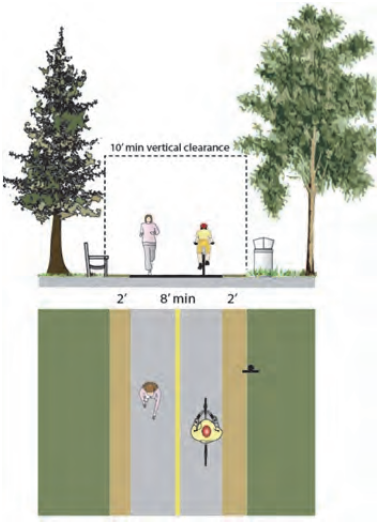



Figure 6.11
2050 Regional Bicycle Network
October 2011
1 Bayshore Bikeway
2 Bay to Ranch Bikeway
3 Border Access Corridor
4 Camp Pendleton Trail
5 Carlsbad-San Marcos Corridor
6 Central Coast Corridor
7 Centre City-La Mesa Corridor
8 Chula Vista Greenbelt
9 City Heights-Old Town Corridor
10 Clairemont-Centre City Corridor
11 Coastal Rail Trail
12 East County Northern Loop
13 East County Southern Loop
14 El Camino Real
15 Encinitas-San Marcos Corridor
16 Escondido Creek Bikeway
17 Gilman Connector
18 Hillcrest-El Cajon Corridor
19 Imperial Beach Connector
20 Inland Rail Trail
21 Kearny Mesa-Beaches Corridor
22 Kensington-Balboa Park Corridor
23 North Park-Centre City Corridor
24 Mid-County Bikeway
25 Mira Mesa Corridor
26 Mission Valley-Chula Vista Corridor
27 Park Boulevard Connector
28 Poway Loop
29 San Diego River Bikeway
30 San Luis Rey River Trail
31 Santee-El Cajon Corridor
32 Sweetwater River Bikeway
33 Vista Way Connector
34 I-8 Corridor
35 I-15 Bikeway
36 SR 52 Bikeway
37 SR 56 Bikeway
38 SR 125 Bikeway
39 I-805 Connector
40 SR 905
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG
MAP AREA
San Diego Region
Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
County of San Diego
Encinitas
Solana Beach
Del Mar
Poway
Santee
La Mesa
El Cajon
Lemon Grove
San Diego
Coronado
Ferry Service
National City
Chula Vista
Imperial Beach
San Diego
Tijuana, B.C.
UNITED STATES
MEXICO

Figure 6.12: Regional Bicycle Corridor Classification System

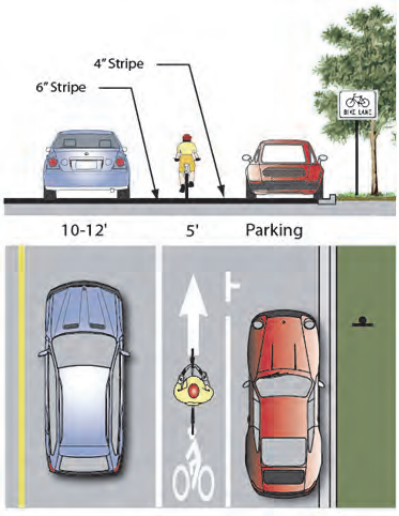
Class I – Bike Path

Bike paths are bikeways that are physically separated from vehicular traffic. Also termed shared-use paths, bike paths accommodate bicycle, pedestrian, and other non-motorized travel. Paths can be constructed in roadway right of way or independent right of way. Bike paths provide critical connections in the region where roadways are absent or are not conducive to bicycle travel.



Class II - Bike Lanes

Bike lanes are defined by pavement markings and signage used to allocate a portion of a roadway for exclusive or preferential bicycle travel. Within the regional corridor system, bike lanes should be enhanced with treatments that improve safety and connectivity by addressing site-specific issues. Such treatments include innovative signage, intersection treatments, and bicycle loop detectors.



Class III - Bike Routes

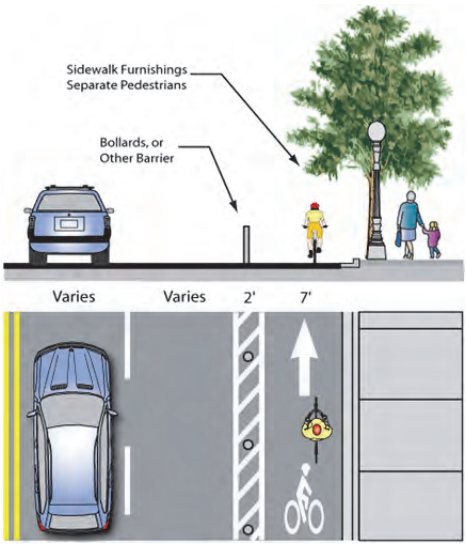
Bike routes are located on shared roadways that accommodate vehicles and bicycles in the same travel lane. Established by signs, bike routes provide continuity to other bike facilities or designate preferred routes through corridors with high demand. Within the regional corridor system, bike routes should be enhanced with treatments that improve safety and connectivity by addressing site-specific issues.



Figure 6.12: Regional Bicycle Corridor Classification System (Continued)

Cycle Tracks

A cycle track is a hybrid type of bicycle facility that combines the experience of a separated path with the on-street infrastructure of a conventional bike lane. Cycle tracks are bikeways located in roadway right of way but separated from vehicle lanes by physical barriers or buffers. Cycle tracks provide for one-way bicycle travel in each direction adjacent to vehicular travel lanes and are exclusively for bicycle use. Cycle tracks are not recognized by Caltrans Highway Design Manual as a bikeway facility. Development of cycle track on segments of the regional corridor system is proposed through experimental, pilot projects.



Bicycle Boulevards

Bicycle boulevards are local roads or residential streets that have been enhanced with traffic calming and other treatments to facilitate safe and convenient bicycle travel. Bicycle boulevards accommodate bicyclists and motorists in the same travel lanes, typically without specific vehicle or bicycle lane delineation. These roadway designations prioritize bicycle travel above vehicular travel. The treatments applied to create a bike boulevard heighten motorists' awareness of bicyclists and slow vehicle traffic, making the boulevard more conducive to safe bicycle and pedestrian activity. Bicycle boulevard treatments include signage, pavement markings, intersection treatments, traffic calming measures and can include traffic diversions. Bicycle boulevards are not defined as bikeways by Caltrans Highway Design Manual; however, the basic design features of bicycle boulevards comply with Caltrans standards.

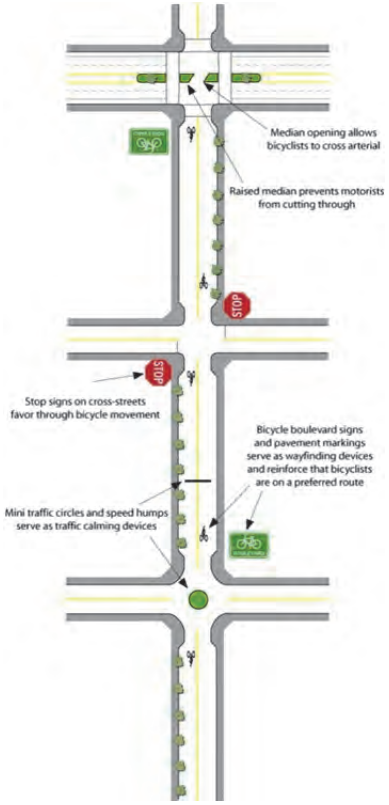




Figure 6.13

2050 Regional Bicycle Network Corridor Alignments and Classifications

October 2011


MAP AREA
San Diego Region
Camp Pendleton
San Luis Rey River Trail
Oceanside
Vista
San Marcos
Carlsbad
Escondido
County of San Diego
San Dieguito River Park
Encinitas
Solana Beach
Poway
Del Mar
Trans County Trail
Santee
San Diego
San Diego River Park
La Mesa
El Cajon
Lemon Grove
Sweetwater Bikeway
Coronado
National City
Chula Vista
Otay River Trail
Imperial Beach
San Diego
Tijuana River Valley Trail
UNITED STATES
MEXICO
Tijuana, B.C.
Figure 6.14
California Coastal Trail
October 2011
Improvements Adequate
Needs Substantial Improvements
Other Trails
MILES
0 3 6
0 4 8
KILOMETERS
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SANDAG

Planning Across Borders

The 2050 RTP looks beyond the San Diego region to link transportation and land use planning across our borders with Orange, Riverside, and Imperial counties, with tribal governments, and with the State of Baja California, Mexico.

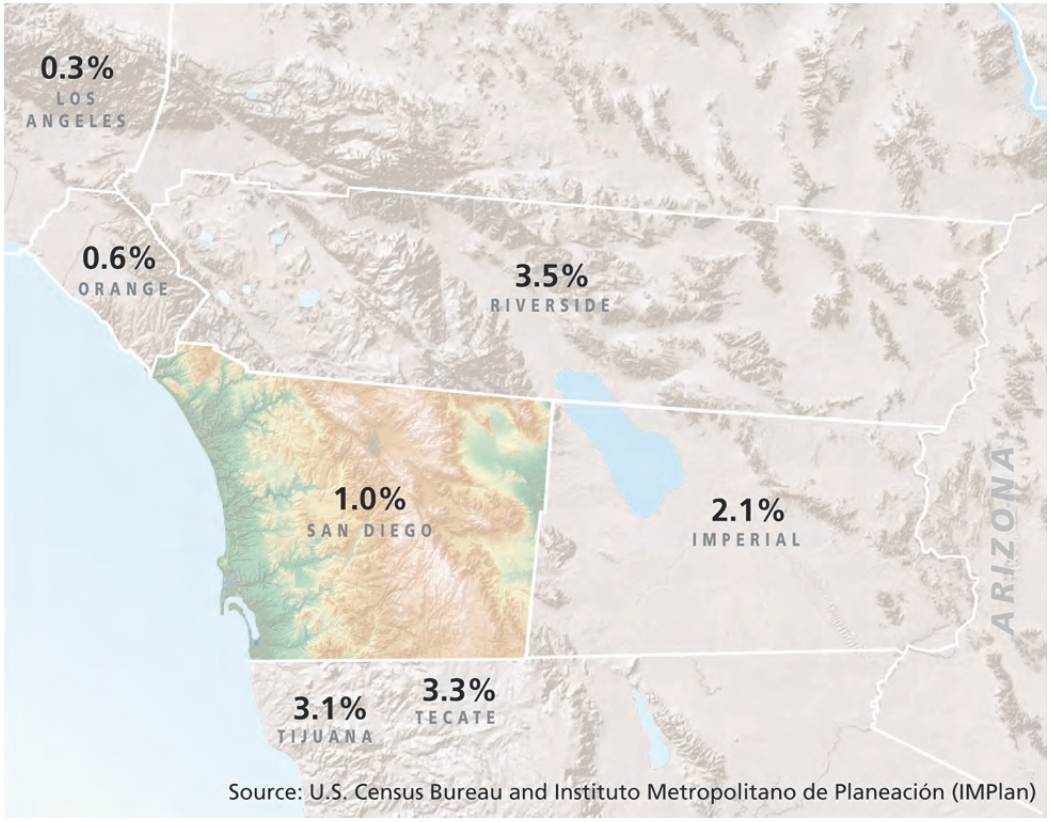
Planning in the San Diego region has traditionally been considered as bounded by San Diego County. However, over the years, our perceived borders have expanded. San Diego County has increasingly close ties to its neighboring counties and to the Republic of Mexico. This challenges us to think of our region as extending beyond our borders. We also are home to 17 diverse tribal governments, each of which is a sovereign nation within our region. The region's distinct characteristics present a variety of opportunities and challenges for coordinating transportation planning along our interregional and binational borders.

How our region grows inevitably impacts those around us, just as growth around us impacts our region. During the past decade, the average annual population growth rate in the San Diego region paralleled the national average. However, the growth rates in Riverside and Imperial counties, and in Baja California, Mexico, were substantially higher as shown in Figure 6.15 Southern California/Northern Baja California Average Annual Percentage Change in Population 2000-2010.

The 2050 RTP looks beyond the San Diego region to link transportation and land use planning across our borders with Orange, Riverside, and Imperial counties, with tribal governments, and with the State of Baja California, Mexico.

The last several years saw a steady increase in interregional and international commuting, as more people chose to live in Riverside County and Baja California, Mexico, while working in

Figure 6.15 – Southern California/Northern Baja California Average Annual Percentage Change in Population 2000-2010



the San Diego region. The 2050 Regional Growth Forecast continues to recognize these travel trends, and it accounts for future housing for our workers both within the San Diego region and outside the region's boundaries.

I-15 Interregional Partnership Program

The I-15 Interregional Partnership (I-15 IRP) is a voluntary partnership of local officials who represent SANDAG and the Western Riverside Council of Governments (WRCOG). The I-15 IRP was formed in 2001 to address the imbalance of jobs and housing that had developed between the San Diego region and southwestern Riverside County over the previous decade.

SANDAG worked closely over the last decade with the I-15 IRP partner agencies – Riverside County Transportation Commission (RCTC), Riverside Transit Agency (RTA), Western Riverside Council of Governments (WRCOG), and Caltrans Districts 8 and 11 – to strengthen the partnership and create an effective interregional framework for addressing transportation, economic development, and housing issues. More information on the I-15 IRP can be found at www.i15irp.org.

Orange County

In 2005, the Borders Committee identified topics for discussion with the Orange County Transportation Authority (OCTA). They included I-5 corridor studies, updates of long range RTPs, and passenger rail improvements. Since that year, staff members from the OCTA and SANDAG have met periodically to strengthen cooperative relationships and to discuss topics of joint interest.

In 2010, the Board of Directors approved the Southern California Association of Governments (SCAG) as the newest advisory member of the Borders Committee. SCAG is the largest council of governments in the United States, functioning as the Metropolitan Planning Organization (MPO) for six counties: Los Angeles, Ventura, San Bernardino, Orange, Riverside, and Imperial. These last three counties border the San Diego region.

I-8 Interregional Partnership with Imperial County

In 2008, the San Diego-Imperial County I-8 Corridor Strategic Plan Joint Policy Advisory Group participated in efforts to develop the I-8 Interregional Partnership with Imperial County by providing policy direction on the development of the I-8 Corridor Strategic Plan.

The Strategic Plan identified issues, established goals and objectives, and developed interregional strategies in the areas of transportation, housing, and employment to ensure adequate levels of service on the I-8 corridor. The Strategic Plan was completed in February 2009. Staff from the Imperial County Transportation Commission, Caltrans District 11, and SANDAG continue to work toward implementing the San Diego-Imperial County I-8 Corridor Strategic Plan.

Government-to-Government Framework with Tribal Nations

The U.S. Constitution and treaties recognize Native American communities as separate and independent political communities, within the territorial boundaries of the United States. The current government-to-government relationship is a federal/tribal relationship, the origin of which flows from treaties, federal statutes, and U.S. Supreme Court decisions. Government-to-government relations between regional planning agencies, local governments, and counties is voluntary. However, regional transportation agencies are required by federal law to consult with tribes

in the development of various planning efforts, including the RTP. During the last few years, SANDAG, through its Borders Committee, has been building a government-to-government framework for engaging tribal nations at a regional level. A more detailed description of the tribal consultation process is included in Appendix C.

Binational Transportation

The San Diego region is bounded on the south by the international border with Mexico. Just south of the international border are the cities of Tijuana, Tecate, and Playas de Rosarito, which comprise a metropolitan zone of 1.6 million people. This metropolitan zone is home to important multinational manufacturing plants known as "maquiladoras." Several of these maquiladoras have administrative facilities in San Diego County, and they contribute to the local economy. This binational and symbiotic relationship includes other contributors to the economy, including crossborder travelers who spend money in local retail, tourism, and service sectors. In addition, crossborder travelers visit family and friends, and they attend cultural and sporting events. The success of this relationship depends on access to safe, efficient and secure transportation infrastructure leading to and from the regions' three international ports of entry.

To accommodate the dynamic border transportation system, the 2050 RTP considers major projects to improve land border crossing infrastructure. This includes a proposed POE at Otay Mesa East and the proposed San Diego-Tijuana Airport CBF that would connect Otay Mesa and the Tijuana International Airport. Other projects would improve access to the existing passenger and commercial border crossings in San Ysidro and Otay Mesa, including improvements to freight rail service. Collectively and in conjunction with projects at Imperial County border crossings, these projects would modernize and transform transportation infrastructure along the U.S.-Mexico border, from San Diego-Tijuana east to Arizona-Sonora.



After many years of growth, there has been a downward trend in interregional commuting over the last few years. However, long-term forecasts developed using historical pedestrian and vehicle crossings suggest that crossborder vehicle traffic will increase by more than 40 percent between 2008 and 2050. Additional pedestrian crossings are projected with the construction of the CBF in Otay Mesa. The 2050 Regional Growth Forecast continues to recognize these travel trends, and it accounts for future housing for workers both within the San Diego region as well as outside of the region. Over the 41-year forecast period, it is estimated that an additional 15,000 households would have residents commuting into the region for work. Nearly half of these households would be located in Baja California, Mexico, and much of the remainder would be in Riverside County.

International Border Crossings

The San Diego region shares a common international border with the municipalities of Tijuana and Tecate in the State of Baja California, Mexico. There are three land border POEs that connect Mexico with the San Diego region: San Ysidro-Puerta México, Otay Mesa-Mesa de Otay, and Tecate-Tecate (Figure 6.16).

The population of the border area of San Diego and Tijuana-Tecate exceeded 4.8 million people in 2010. San Diego's population is forecast to increase to nearly 4.4 million by the 2050. The City of Tijuana could grow to about 5 million, based on an annual growth rate of 2.4 percent. Those who cross the border into the United States regularly face long and unpredictable wait times. In 2007 alone, northbound delays for crossbborder personal travel and freight movements were estimated to cost the San Diego-Baja California economies nearly $4.2 billion in lost output, as well as a loss of more than 35,000 jobs. These impacts are felt beyond the border region, and they represent $7.2 billion in lost output and a loss of more than 62,000 jobs for the national economies of the U.S. and Mexico. Both output and job losses are projected to increase over the next ten years, if steps are not taken to improve border crossing and transportation infrastructure and management. Air quality at the border also is affected by excessive idling from trucks and private vehicles.

Southbound Inspections

In the last two years, traffic bottlenecks and wait times for those crossing the border in the southbound direction have become common. In 2009, Mexico launched *Sistema de Aforo Vehicular* (SIAVE), its new program for inspecting inbound vehicles. The program uses weight-in-motion (WIM) scales, license plate readers, and vehicle photographs. In addition, the U.S. Department of Homeland Security performs random vehicle inspections on the southbound lanes of I-5, in the vicinity of the San Ysidro POE, and on southbound lanes of SR 905 approaching the Otay Mesa POE.

In 2007 alone, northbound delays for crossborder personal travel and freight movements were estimated to cost the San Diego-Baja California economies nearly $4.2 billion in lost output, as well as a loss of more than 35,000 jobs.



Figure 6.16

Existing and Planned Ports of Entry

October 2011

Ports of Entry (POE)

- Existing
- Future
- Future Alignment
- Airport

MILES 0 1 2 3 / KILOMETERS 0 2 4

N

SANDAG

San Diego
Santee
El Cajon
La Mesa
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Tijuana, B.C.
Tijuana-Rosarito Corridor
UNITED STATES
MEXICO

San Ysidro - Puerta México POE
San Diego - Tijuana Airport Cross Border Facility
Otay Mesa - Mesa de Otay POE
Otay Mesa East - Mesa de Otay II POE
Tecate - Tecate POE
Jacumba - Jacumé POE

San Ysidro – Puerta México POE

The San Ysidro Land Port of Entry is reportedly the world's busiest land POE, and it is the region's primary gate for auto and pedestrian traffic in both directions.

This POE serves as a federal multimodal inspection facility that provides service for pedestrians, passenger vehicles, and buses. The San Ysidro POE currently has 12 pedestrian and 24 passenger vehicle lanes, including one bus lane. In 2010, this POE handled about 13.3 million passenger vehicles, more than 70,000 buses, and nearly 6.4 million pedestrian northbound inspections.

These figures translate to more than 30 million individual crossings from Tijuana to San Diego. It is estimated that a similar number of crossings take place from San Diego to Tijuana, which means the San Ysidro-Puerta Mexico POE combined handled about 60 million individual crossings in 2010. That's about two percent more travelers than at Los Angeles International Airport, which accommodated about 59 million air passengers in 2010.

Most people who cross northbound on foot or on their bicycles use the Trolley or buses to complete their journey. The Trolley is the most used form of transportation, providing service to about 40 percent of the more than 30,000 daily pedestrian crossers. Consequently, the Blue Line Trolley at the San Ysidro Intermodal Transit Center maintains the Trolley system's highest volume of riders.

San Ysidro POE Reconfiguration and Expansion Project

The U.S. General Services Administration (GSA) is working to expand the San Ysidro border crossing facilities. When completed, the POE would increase its capacity from 24 to 63 northbound vehicle primary inspection booths, including double-stacked booths and one dedicated bus lane. There also would be an increase in the number of northbound pedestrian lanes, from 13 to 20. In addition, the realignment of I-5 would relocate the interstate to Virginia Avenue and Mexico's El Chaparral gate, and increase the number of southbound vehicle lanes from six to 12.

Otay Mesa – Mesa de Otay POE

The Otay Mesa POE in San Diego County is a federal multimodal inspection facility that provides service for pedestrians, passenger vehicles, buses, and commercial vehicles. The Otay Mesa POE currently has six pedestrian lanes, 13 passenger vehicle lanes, one bus lane, and ten commercial inspection booths. It also has 100 bays for handling truck inspections.

The Otay Mesa POE is one of the ten busiest land ports of entry in the country, and it is the busiest commercial border crossing on the California-Baja California border. In 2010, the Otay Mesa POE handled nearly 4.7 million passenger vehicles, more than 729,000 trucks, nearly 35,000 buses, and about 2.2 million pedestrian inspections in the northbound direction. The Otay Mesa commercial crossing continues to rank third, in terms of the dollar value of trade, along the U.S.-Mexico border (after Laredo-Nuevo Laredo and El Paso-Ciudad Juarez in Texas). In 2010, the Otay Mesa POE handled more than $26 billion dollars worth of freight. In 2007, the California Business, Transportation and Housing Agency and the California Environmental Protection Agency identified the San Diego/Border region as one of the state's four "port-to-border" goods movement corridors.

Otay Mesa POE Modernization

The existing infrastructure of the Otay Mesa POE is already taxed, and growth in crossborder trade is expected to continue over

In 2010, the San Ysidro Port of Entry handled about 13.3 million passenger vehicles, more than 70,000 buses, and nearly 6.4 million pedestrian northbound inspections.

The proposed Otay Mesa East POE would be located approximately two miles east of the existing Otay Mesa POE, and it would be the fourth border crossing along the San Diego region's border with Baja California.

time. Short-term circulation improvements to alleviate existing congestion for southbound commercial vehicles at the Otay Mesa POE have been implemented.

In April 2010, in recognition of the need to modernize this POE, the Department of Homeland Security (DHS) was awarded $21.3 million in ARRA funds for some initial modernization projects at the Otay Mesa POE. This project laid the groundwork for future improvements to both commercial and non-commercial portions of the existing port.

Tecate – Tecate POE

The Tecate Land POE is the smallest POE in the region. It is located in the eastern portion of the County of San Diego. It is a multimodal inspection facility that provides service for pedestrians, passenger vehicles, buses, commercial vehicles, and rail (the rail line crosses at Campo, located east of the POE). The Tecate POE currently has two passenger vehicle lanes, two pedestrian lanes, and two commercial vehicle lanes. In 2010, the Port handled more than 810,000 passenger vehicles, about 55,000 trucks, and nearly 508,000 pedestrian northbound inspections. In addition, the Tecate POE handled nearly $778 million in trade in 2010.

Two rail projects, in the conceptual planning stage, to modernize and double-track the Desert Line have been proposed to increase the market potential of this route for the international and interstate movement of goods. In Mexico, roadway improvements are planned to facilitate traffic to and from the POE.

Proposed Otay Mesa East POE

SANDAG and Caltrans, in cooperation with GSA and other project stakeholders, are proposing to construct a new POE and a new toll highway, SR 11, as well as a Commercial Vehicle Enforcement Facility (CVEF). The proposed Otay Mesa East POE would be located approximately two miles east of the existing Otay Mesa POE, and it would be the fourth border crossing along the San Diego region's border with Baja California.

The proposed SR 11 would extend generally east and south for about 2.1 miles, from the SR 905/SR 125 interchange and terminate at the proposed Otay Mesa East POE site at the U.S.-Mexico international border.

To advance this project, Caltrans, in cooperation with GSA and FHWA, initiated project-level environmental clearance studies for SR 11 and the Otay Mesa East POE. SANDAG and Caltrans also are working jointly to develop a financial strategy to build the SR 11/Otay Mesa East POE project and to conduct a traffic and revenue study for the project.

The project on the U.S. side of the border is expected to cost approximately $750 million, and it would be funded through tolls, fees, and other revenues such as California's Proposition 1B Trade Corridors Improvement Fund. Completion of SR 11 and the Otay Mesa East POE are anticipated in 2015.

Jacumba-Jacumé POE

In 2000, SANDAG conducted a feasibility study for a new border crossing that would link Jacumba in San Diego County and Jacumé in the Municipality of Tecate, Mexico. This study recommended that California and Baja California government agencies continue planning and coordination efforts to identify and reserve right of way for inspection facilities and connecting roadways to allow for the development of a future POE. The Secretariat of Infrastructure and Urban Development (SIDUE), Baja California's state planning agency, also has considered this location for a future port of entry in its long-range planning work to improve access for passenger vehicles and trucks that travel

between Baja California and locations east of San Diego.

Binational Intermodal Issues

Key intermodal components of the binational transportation system include land POEs and the connecting roadways, rail crossings, a light rail transit connection at San Ysidro, and a planned BRT system at Otay Mesa. The 2050 RTP reflects rail capacity improvements in the San Ysidro freight yard and upgraded truck access to accommodate future rail growth and intermodal truck transfer operations.

Full implementation of the trucking provisions of the North America Free Trade Agreement (NAFTA), which would allow trucks from the United States and Mexico to move freely in each country, is still pending. Nevertheless, binational commercial vehicle traffic already uses the San Diego regional highway system. In 2010, more than 784,000 trucks crossed northbound at the San Diego region-Baja California border. According to the San Diego and Imperial Valley Freight Gateway Study, about 77 percent of these truck trips have a final destination in other California counties. Eight percent are destined outside of the state. The remaining trucks travel within the San Diego region.

San Ysidro Intermodal Transit Center

The San Ysidro Intermodal Transit Center, which is located east of I-5, has improved pedestrian safety and access to various transit services, local businesses, and to the international border. On the west side of I-5, a new intermodal center also has been built. The Friendship Plaza project accommodates transit services, a walking path, and a bicycle lane for people crossing into Mexico, as well as a "kiss and drop" area.

The 2050 RTP includes funding toward transportation improvements of the San Ysidro Intermodal Transportation Center (ITC), which would help improve access for transit users and pedestrians at the San Ysidro POE. The San Ysidro ITC is one of several critical infrastructure projects contemplated at the border to facilitate transportation choices for users entering or leaving the U.S. through this POE.

South Bay Bus Rapid Transit

The planned South Bay BRT project is a 21-mile transit service that will be rapid, reliable, and frequent. It will serve passengers traveling between the Otay Mesa POE and downtown San Diego via eastern Chula Vista. The service is scheduled to begin in 2014.

Major Highway Projects

SR 905 is one of the major highway projects addressing binational transportation needs included in the 2050 RTP. It will connect I-5 and I-805 to the Otay Mesa POE and with the San Diego regional and interregional highway network. The future SR 11 toll road will link to the proposed Otay Mesa East border crossing. Other investments included in the 2050 RTP on I-5, I-8, I-15, and I-805 also will serve these key international trade corridors. The South Bay Expressway (SR 125 tollway), which opened to traffic in 2007, connects the Otay Mesa POE with the San Diego regional and interregional highway network.

Border Airport Services

There are two public airports in the immediate border region. Tijuana International Airport, located in Mesa de Otay, Tijuana, is a passenger and cargo airport with service to major cities in Mexico. It has a single runway of 9,800 feet, with options to extend it up to 15,000 feet and to build a second runway. Brown Field, owned and operated by the City of San Diego, is located in Otay Mesa just north of the border. It is primarily a general aviation field, with one runway of 8,000 feet and a second runway of 3,000 feet.

The 2050 RTP includes funding toward transportation improvements of the San Ysidro ITC, which would help improve access for transit users and pedestrians at the San Ysidro Port of Entry.

The California-Baja California Border Master Plan is a binational, comprehensive approach to coordinate the planning and delivery of projects at land ports of entry.

In September 2008, in an effort to advance the terminal construction plans, the Otay-Tijuana Venture LLC purchased 52 acres of undeveloped industrial land in Otay Mesa to construct the San Diego-Tijuana CBF. The facility will include an above-grade pedestrian bridge linking border facilities in the United States with a commercial passenger airport terminal at Tijuana International Airport. Approval of the Presidential Permit from the U.S. Department of State was granted in August 2010.

Additional approvals from the City of San Diego still need to be secured. The project developer (Otay-Tijuana Venture, LLC) anticipates that the crossborder airport terminal could begin operating in late 2012 or early 2013.

California – Baja California Border Master Plan

Completed in 2008, the California-Baja California Border Master Plan is a binational, comprehensive approach to coordinate the planning and delivery of projects at land POEs, as well as transportation infrastructure serving those POEs in the California-Baja California region. The Border Master Plan was prepared for the U.S./Mexico Joint Working Committee (JWC), and led by Caltrans and the Secretariat of Infrastructure and Urban Development of Baja California.

The California-Baja California Border Master Plan developed a methodology and criteria to evaluate and rank POE projects, as well as roadway, interchange, and rail projects serving the POEs. This Plan created a list of prioritized projects that can serve as a guide to identify important projects within the California-Baja California border region.

POEs were ranked in the following order: Otay Mesa East-Mesa de Otay II (new proposed POE); San Ysidro-Puerta México/Virginia Avenue-El Chaparral POE; Calexico-Mexicali POE; Otay Mesa-Mesa de Otay POE; Tecate-Tecate POE; Calexico East-Mexicali II POE; and Andrade-Los Algodones.

The following actions support the Plan's Systems Development Chapter recommendations:

Systems Development	
Actions	**Responsible Parties**
Priority Corridors	
1. Maintain project evaluation criteria for prioritizing highway, regional transit, goods movement, rail grade separations, and direct freeway and HOV connector projects. Update these criteria to better reflect the goals of the RTP, as needed.	SANDAG
2. Allocate regional funds to transportation projects, programs, and services based on established criteria that give priority to implementing smart growth, the *TransNet* Early Action Program, and performance monitoring efforts.	SANDAG
Transit	
3. Upgrade major existing transit and roadway infrastructure to support transit operations and transit use. This includes:	SANDAG, MTS, NCTD, Caltrans, and local jurisdictions
▪ transit priority measures	
▪ technology enhancements (e.g., improved passenger information, new vehicle	
▪ Safe Routes to Transit including bicycle and pedestrian access improvements	
▪ station upgrades and improvements and rail grade separation projects	
4. Plan, design, and build future transit infrastructure and services identified in the 2050 RTP.	
a) Develop/implement Five- and Ten-Year Transit Project Phasing Plans to facilitate progress toward designing and building the transit projects included in the 2010-2020 phasing years of the 2050 RTP. These include:	
▪ Commuter Rail	MTS, NCTD, SANDAG, and LOSSAN
▪ Light Rail Transit	MTS, NCTD, Caltrans, and SANDAG
▪ Bus Rapid Transit	MTS, NCTD, Caltrans, and SANDAG
▪ Rapid Bus	MTS, NCTD, and SANDAG
▪ Streetcar/Shuttle-Circulator	MTS, NCTD, local jurisdictions, and SANDAG
▪ Local Bus service	MTS, NCTD, and SANDAG
b) Incorporate transit services identified in the 2050 RTP into local general plans, community plans, and specific project development plans, and reserve appropriate right of way.	Local jurisdictions
c) Maximize opportunities for supporting transit in redevelopment areas.	Local jurisdictions and SANDAG

Systems Development (Continued)	
Actions	**Responsible Parties**
Transit (Continued)	
5. Prioritize and implement the Safe Routes to Transit program, including bicycle and pedestrian connections to facilitate first- and last-mile access to high-frequency transit service.	Local jurisdictions and SANDAG
6. Explore policy options for the pricing of regional parking that support public transit and provide opportunities for reinvesting in local neighborhoods in the next update of the Regional Comprehensive Plan.	Local jurisdictions, MTS, NCTD, and SANDAG
7. Aggressively pursue federal, state, and local funding for public transit, and pursue public-private partnerships to maximize the region's opportunities to compete successfully for state and federal funding grants.	MTS, NCTD, and SANDAG
8. Implement recommendations of the Coordinated Public Transit–Human Services Transportation Plan to support specialized transportation services for seniors and individuals with disabilities.	SANDAG, FACT, and social service agencies
9. Annually update the Coordinated Public Transit–Human Services Transportation Plan, which serves as the region's five-year transit plan, and implement service productivity, reliability, and efficiency improvements.	SANDAG
Rail	
10. Complete an evaluation of parking capacity and future demand at coastal rail stations, including a prioritization of infrastructure. Evaluate opportunities for joint financing.	SANDAG, NCTD, LOSSAN, and coastal jurisdictions
11. Based on the Program Environmental Impact Report/Environmental Impact Statement for the LOSSAN corridor, proceed with project-level environmental studies, design and implementation of double tracking, and other rail improvement projects in the coastal rail corridor. Tunnel studies will include appropriate environmental and alternative analyses.	SANDAG, NCTD, MTS, and LOSSAN
12. Support efforts to secure federal and state funding to improve and expand the LOSSAN intercity and commuter passenger rail services.	CHSRA, Caltrans, SANDAG, NCTD, MTS, Amtrak, and LOSSAN member agencies
13. Support the implementation of the LOSSAN Corridorwide Strategic Implementation Plan recommendations for service integration.	SANDAG, NCTD, MTS, and LOSSAN member agencies
14. Coordinate with efforts of the CHSRA for high-speed passenger rail service on the coastal rail and inland I-15 corridors.	SANDAG, Caltrans, NCTD, and MTS
15. Continue engineering and environmental studies for the Los Angeles to San Diego via Inland Empire HST corridor, including coordination with the Southern California Inland Corridor Group.	SANDAG, NCTD, MTS, Caltrans, and SOCAL ICG member agencies
16. Complete planning for the high-speed rail commuter overlay service between Southwest Riverside county and downtown San Diego in order to evaluate inclusion into future RTPs.	SANDAG, Caltrans, CHSRA, NCTD, and MTS

Systems Development (Continued)	
Actions	**Responsible Parties**
Highways and Arterials	
17. Continue to coordinate coastal rail efforts with the LOSSAN member agencies and explore new initiatives, such as a corridor-wide Rail2Rail Program, joint ticketing, and joint customer information.	SANDAG, NCTD, MTS, and LOSSAN member agencies
18. Incorporate the planned highway network, identified in the RTP, into local general plans, community plans, and specific project development plans. Reserve appropriate right of way through the subdivision review process and other means.	Local jurisdictions
19. Develop Project Study Reports (PSRs) in accordance with the priorities identified in the RTP.	Caltrans
20. Provide operational and other improvements, such as auxiliary and passing lanes where appropriate, to improve safety and to maximize the efficiency of highways and arterials. Pursue additional state and federal funding to match the regional program and develop a prioritized list of potential projects to consider in future funding cycles.	SANDAG, Caltrans, and local jurisdictions
21. Implement signal timing programs along the designated Regional Arterial System, and improve traffic signal operations by interconnecting signalized intersections under centralized control and by coordinating with ramp signal systems at freeway interchanges.	SANDAG and local jurisdictions
22. Consider congestion pricing as an alternative whenever major new highway capacity is added.	SANDAG and Caltrans
Goods Movement	
23. Support the development of policies, programs, and funding for moving goods in the state and nation, as well as for infrastructure in the region that supports moving goods.	SANDAG, Caltrans, freight operators, and local jurisdictions
24. Develop strategic alliances for public/private funding partnerships for services related to moving goods in the San Diego region.	SANDAG, Caltrans, Port of San Diego, freight operators, industry, and local jurisdictions
25. Allocate regional funds to projects, programs, and services related to moving goods, based on established criteria and priorities from the San Diego Regional Goods Movement Strategy (GMS).	SANDAG, Caltrans, freight operators, and local jurisdictions
26. Support efforts to secure state and federal rail funding to improve and expand rail services and operations.	Class I railroads, Caltrans, SANDAG, NCTD, MTS, Amtrak, SDIV Short Line, and southern California rail agencies
27. Analyze the economic opportunities available with an expanded role in trade and the movement of goods to determine what role the region should have.	SANDAG, Caltrans, freight operators, and local jurisdictions
28. Update the SANDAG Regional Comprehensive Plan (RCP) to include policies, programs, and guidelines to integrate goods movement land uses and facilities, with minimal impact to adjacent communities.	SANDAG, Caltrans, freight operators, and local jurisdictions

Systems Development (Continued)	
Actions	**Responsible Parties**
Goods Movement (Continued)	
29. Support and provide assistance for the update of local general plans to identify the long-term needs of moving goods, industrial warehousing infrastructure, and connectors to the regional freight network. Coordinate this effort with economic studies and RCP updates.	SANDAG, Caltrans, freight operators, and local jurisdictions
30. Support the development of freight operators' (e.g., rail companies, Port of San Diego) master business and long-term development plans so they include agency trade market analyses, as well as input from economic studies and updates of the RCP and local general plans.	SANDAG, Caltrans, freight operators, and local jurisdictions
31. Continue to evaluate whether to establish logistics centers that would integrate intermodal freight and establish specific staging areas and connectors to the regional freight network.	Caltrans, SANDAG, Port of San Diego, MTS, rail carriers, and shippers
32. Protect right of way when possible for GMS projects as opportunities occur.	SANDAG, local jurisdictions, MTS, rail operations, NCTD, and Caltrans
33. Update and refine the Freight Gateway Study to assess the volume, value, and freight routing data necessary to support decisions concerning the GMS, and implement data collection.	SANDAG, Caltrans, and freight stakeholders
34. Proceed with project-level environmental studies, and the design and implementation of GMS projects as funds become available.	SANDAG, Port of San Diego, Caltrans, MTS, and NCTD
35. Evaluate rail capacity needs and Managed Lanes facilities for moving freight during off-peak periods.	NCTD, MTS, rail operators, Caltrans, local jurisdictions, and SANDAG
36. Develop a strategic plan to determine if innovative technologies can be deployed to improve the efficiency of the region's intermodal freight system.	SANDAG, Caltrans, and freight operators
37. Work with air quality agencies to assess the health impacts of cumulative air emissions from truck, train, and ship engine exhaust on communities in the San Diego region. Report on Trade Corridors Improvement Fund (TCIF) freight projects air quality impacts under Assembly Bill 268 through the California Transportation Commission (CTC).	SANDAG, Caltrans, local jurisdictions, Port of San Diego, air quality agencies, environmental and community stakeholders
38. Work with stakeholder groups to assess the health and safety impacts of truck routes on local streets. Where possible, develop mitigation strategies or alternative routes where there is a significant impact on the local community.	SANDAG, Caltrans, local jurisdictions, Port of San Diego, resource agencies, environmental and community stakeholders
39. Include community representatives from impacted areas such as Barrio Logan on the Freight Stakeholders Group for future discussions on the movement of goods.	SANDAG

Systems Development (Continued)	
Actions	**Responsible Parties**
Aviation and Ground Access	
40. Continue to work with truckers, the Port of San Diego, and rail operators so that they can retrofit or replace diesel engines to reduce emissions.	SANDAG, San Diego County Air Pollution Control District, and California Air Resources Board
41. Continue to work with the California Air Resources Board (CARB) and freight operators to conduct information sessions for the trucking community regarding new air quality regulations for diesel engines.	SANDAG, Caltrans, and trucking industry
42. Continue regional collaboration on multimodal airport planning, including development of the Airport ITC and regular staff and policy-level coordination meetings.	SANDAG, SDCRAA, local jurisdictions
43. Encourage local jurisdictions and transit districts to incorporate airport ground access improvements in local plans.	SANDAG, NCTD, MTS, local jurisdictions.
44. Cooperate on the Airport Authority's Airport Land Use Compatibility Planning per Senate Bill 10. SANDAG will review proposed airport land use compatibility plans and updates to the plans submitted by the Airport Authority, and make a determination as to their compatibility with the airport multimodal accessibility plan.	SANDAG, SDCRAA
Active Transportation	
45. Develop an Active Transportation Early Action Program.	SANDAG
46. Implement a robust regional program to monitor active transportation.	SANDAG
47. Develop systems to forecast and model active transportation in order to better evaluate the benefits of the program.	SANDAG
48. Encourage local government bicycle projects that connect local facilities to regional bicycle corridors.	SANDAG and local jurisdictions
49. Promote consistent signage that directs bicyclists to destinations and increases the visibility of the regional bicycle network.	SANDAG and local jurisdictions
50. Take the lead to implement the regional bike plan in cooperation with local agencies.	SANDAG
51. Implement robust education and encouragement programs in order to encourage more people to walk and ride a bicycle.	SANDAG
52. Consistent with Assembly Bill 1358 - The Complete Streets Act, encourage the reallocation of roadway rights-of-way to accommodate bicycle and pedestrian facilities by providing on-going Complete Streets educational opportunities in conjunction with project funding and incentives.	SANDAG and local jurisdictions
53. Continue to mandate bicycle and pedestrian travel accommodations of all projects funded with *TransNet* revenue, in support of Board Policy No. 031, *TransNet* Ordinance and Expenditure Plan Rules, Rule #21: Accommodation of Bicyclists and Pedestrians.	SANDAG
54. Develop a regional Complete Streets policy.	SANDAG and local jurisdictions

Systems Development (Continued)	
Actions	**Responsible Parties**
Safe Routes to Schools	
55. Develop regional on demand bike lockers that are accessible using a fare payment card, which allows users to access a variety of transit modes administered by multiple agencies.	SANDAG
56. Continue to pursue opportunities to develop an implementation plan for the California Coastal Trail.	SANDAG and local jurisdictions
57. Facilitate the convening of a Regional Safe Routes to School Coalition that will serve as a forum to connect implementing agencies and share relevant information.	SANDAG, non-profit organizations, and local jurisdictions
58. Develop a Regional Safe Routes to School Strategic Plan to articulate the Regional Safe Routes to School Strategy as well as actions to implement the strategy.	SANDAG
59. As part of the Safe Routes to School Strategic Plan, develop cost estimates and a funding strategy to implement the plan.	SANDAG
60. Foster communication and cultivate partnerships by soliciting input on the Regional Safe Routes to School Strategy from SANDAG Policy Advisory Committees and working groups, nonprofit organizations, school districts, and other Safe Routes to School implementers, experts, and local agencies.	SANDAG
Borders	
61. Continue to implement interregional transportation strategies from the I-15 IRP and the San Diego-Imperial County I-8 Corridor Strategic Plan.	SANDAG, Western Riverside Council of Governments (WRCOG), Riverside County Transportation Commission (RCTC), Riverside Transit Agency (RTA), Imperial County Transportation Commission (ICTC), and Caltrans
62. Coordinate transportation projects at county lines with neighboring agencies.	SANDAG, WRCOG, RCTC, RTA, ICTC, Orange County Council of Governments (OCCOG), Orange County Transportation Authority (OCTA), Southern California Association of Governments (SCAG), and Caltrans
63. Support the use of technology at the international land ports of entry, as well as the expansion of SENTRI-like programs for travelers and cargo.	SANDAG, Caltrans, GSA, Customs and Border Protection (CBP), and Department of Homeland Security (DHS)

Systems Development (Continued)	
Actions	**Responsible Parties**
Borders (Continued)	
64. Promote the use of technologies and best practices to reduce vehicle emissions due to congestion and idling at the border.	GSA, DHS, CBP, Caltrans, SANDAG, California Air Resources Board, San Diego County Air Pollution Control District, U.S. EPA, and Mexico's counterpart agencies
65. Support the use of transit centers and transportation facilities by agencies and passengers from outside the county.	SANDAG, NCTD, MTS, Caltrans, WRCOG, RCTC, RTA, ICTC, OCCOG, OCTA, and Caltrans
66. Continue discussions among SANDAG, Caltrans, the County of San Diego, and tribal governments to assess rural/reservation transit and transportation needs, and develop strategies to meet these needs.	SANDAG, Caltrans, the County of San Diego, Reservation Transportation Authority, Bureau of Indian Affairs, County of San Diego, MTS, and NCTD
67. Secure funding for needed transportation infrastructure in the region's border areas, and coordinate the implementation of border-related capital and operating improvements with the General Services Administration (GSA) and other involved agencies.	GSA, DHS, CBP, SANDAG, Caltrans, City of San Diego, the County of San Diego, and Mexico's counterpart agencies
68. Work with Caltrans, DHS, CBP, and other involved agencies to monitor the impacts of northbound and southbound traffic delays at the international land ports of entry and explore opportunities to mitigate these delays.	GSA, DHS, CBP, SANDAG, Caltrans, and Mexico's counterpart agencies
69. Work with related agencies to develop strategies for adapting to climate change.	Caltrans, SANDAG, U.S. DOT, and U.S. EPA
70. Secure funding for needed transportation infrastructure in the region's border area (e.g., San Ysidro POE, SR 11, and the Otay Mesa East POE), and coordinate border-related capital and operating improvements with GSA.	Caltrans, SANDAG, City of San Diego, County of San Diego, GSA, and Mexico's counterpart agencies
71. Work with CBP, GSA, Caltrans, and Mexico to secure funds to study ways to reduce pedestrian wait times and better accommodate bicycle and pedestrian travel, including access improvements to transit stops and provision of walkways for people with disabilities.	GSA, DHS, CBP, Caltrans, SANDAG, and Mexico's counterpart agencies
72. Work with CBP and Caltrans to secure funds to develop performance indicators such as level of service for cross-border vehicle (private and commercial) and pedestrian wait times at the ports of entry.	GSA, DHS, CBP, Caltrans, SANDAG, and Mexico's counterpart agencies

Chapter 7

Systems Management: Making Better Use of What We Have

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Transportation Systems Management

TSM investments enhance today's transportation network and ensure that future improvements realize their full potential.

Reducing traffic congestion, travel times, and air pollution depend on effectively managing the region's transportation system. Known among regional planners as Transportation Systems Management, or TSM, the effort is a core component of the 2050 Regional Transportation Plan (RTP) and its Sustainable Communities Strategy (SCS). Its goal is to smooth the flow of traffic on streets and highways, eliminate bottlenecks, and enhance public transit. TSM investments, detailed in the 2050 RTP, enhance today's transportation network and ensure that future improvements realize their full potential.

Management of our transportation system depends on implementing several techniques and incorporating advanced technologies, such as metering the flow of traffic onto freeways, coordinating traffic signals, tracking public transit vehicles, and keeping travelers informed – all of which helps keep traffic flowing. Transportation planners also are exploring new strategies that employ cutting-edge technology and innovative operating concepts that expand TSM capabilities.

Our region's transportation agencies are working together to implement two of these innovative concepts, known as Integrated Corridor Management (ICM) and the Connected Vehicle Initiative, formally known as IntelliDrive℠. Both can have a significant impact on improving traffic flows. These and other initiatives will help transportation operators manage the transportation system in real time, can improve safety, are highly cost-effective, and offer the public high value for their tax dollars. By managing our transportation system in real time, operators do not have to rely on pre-established plans that estimate the flow of traffic. Instead, they



can rapidly respond to conditions on the ground at any given time.

The returns or benefits (i.e., in savings from shorter travel times, less fuel consumed, and lower emissions) and improved safety from TSM investments outweigh the costs associated with implementing them. Various studies by the U.S. Department of Transportation (U.S. DOT) and recognized academic and transportation institutions cite TSM benefit-cost ratios ranging from 5:1 to as high as 40:1. Adopting plans to explore and implement TSM solutions will improve the productivity of the region's roadways, highways and transit systems in a cost effective manner.

Intelligent Transportation Systems Strategic Plan

SANDAG has been working on updating the Regional Intelligent Transportation Systems (ITS) Strategic Plan with a ten-year forward look at developing and implementing new technology strategies for TSM. Whereas the 2050 RTP has a 40-year horizon, the ITS Strategic Plan looks at a shorter horizon and focuses on system improvements in the coming decade.

The ITS Strategic Plan was developed through the active participation of the regional stakeholders, including the 18 cities, the County of San Diego, Caltrans District 11, the Metropolitan Transit System, and the North County Transit District. The Plan documents the region's priorities for TSM investments and measures for evaluating the value of ITS projects.

The TSM Chapter of the 2050 RTP was developed with outputs from the ITS Strategic Plan, which are reflected in the following discussion of TSM investments areas. The ITS Strategic Plan describes the work plan for the first ten years of the RTP's 40-year horizon and is included as Technical Appendix 21 of the 2050 RTP.

TSM Investment Areas

A diverse range of investments is needed to best manage the region's transportation system. The objectives of the overall investment strategy are to:

- Emphasize management approaches based on the performance of multiple modes of transportation
- Continue providing travelers information as a means to manage demand and provide choices for travel on the transportation system
- Leverage existing management tools and electronic payment systems for multiple modes of transportation
- Actively explore, evaluate, and implement advanced technologies that can benefit the transportation system

These objectives have been applied across six program areas. Some investments, although identified for a particular mode of transportation, do not necessarily limit the benefits to that particular mode. Investments in pervasive technologies, such as real-time modeling, detection devices, and the Connected Vehicle Initiative, have universal benefits that support solutions across different modes and transportation networks.



Multimodal Integration and Performance-Based Management

As reflected in the TSM investment objectives, an important strategy to maximize the efficiency of the existing system is to cohesively manage all modes of transportation. Our region's ground transportation network is comprised of freeways, roads, and the public transit system. These elements can be identified separately, but they are interdependent and must be managed comprehensively to achieve regional mobility and reliability goals.

Improving mobility requires strategies that give the public reliable choices for travel across the transportation network. These strategies also help balance regional priorities for managing our transportation system and the everyday demands on it. This approach, known as Integrated Performance Management (IPM), relies on the incorporation of a number of ITS and operational initiatives. The application of IPM

provides the foundation for managing the entire transportation system based on its overall performance.

Effective integrated performance management relies on the following:

- The application and deployment of performance monitoring tools
- The application of advanced technologies for detection and modeling
- Connections between the management systems for local roads, highways and public transit
- Common and unified transportation policies and procedures

The region is working to demonstrate the benefits of an IPM strategy through the ICM initiative, sponsored by the U.S. DOT. The ICM pilot program focuses on maximizing the management capabilities and efficiency within the I-15 corridor by:

- Managing the flow of traffic onto the interstate (also known as ramp metering)
- Coordinating traffic signals on local streets and freeway interchanges to reduce travel times
- Utilizing managed lanes and congestion pricing to match capacity with demand
- Providing real-time traveler information to promote choices
- Enhancing the Bus Rapid Transit (BRT) system to reduce transit trip times

The I-15 ICM project also includes defining and establishing the institutional commitments to ensure that the corridor is managed and operated based on the combined performance of local roads, I-15, and transit services.



The ICM project has the following objectives:

- Improved Situational Awareness: Operators will have a more comprehensive and accurate understanding of the underlying operational conditions of all transportation networks in the corridor.
- Enhanced Response and Control: Operating agencies within the corridor will work together to improve their management practices and coordinate decision-making, resulting in more effective responses to changing conditions.
- Better Informed Travelers: Travelers will have information they can act on for multiple choices of travel. This will empower them to take more control of their travel decisions, including when to begin a trip and what route to take.
- Improved Corridor Performance: Managing all modes of transportation will improve the overall performance of the corridor, particularly during peak travel times and also when corridor capacity is reduced (e.g., after a traffic accident or during construction).
- All these efforts help reduce congestion and travel times during daily commutes, special events, and emergencies. Achieving these results in other corridors will depend on continued investments in TSM tools. Monitoring the network and performing real-time analysis, with the capability of coordinating traffic across arterials, freeways, and public transit, will help maximize the efficiency of our region's existing transportation system

Performance Monitoring

The collection and analysis of transportation data continues to play a critical role in assessing the performance of the transportation system, changing management tactics, and estimating the benefits of future investments. Limited funding and obstacles to obtaining right of way make building new transportation infrastructure difficult. Greater focus must be placed on using tools that manage traffic flows in real time, in order to better manage traffic conditions.

Mitigating traffic congestion requires sophisticated transportation management software that collects, analyzes, and manages large amounts of real-time information. Real-time data has been used to manage ramp meters, as well as for timing traffic signals on local roadways. These systems dynamically adjust to improve traffic flow based on current conditions. Wider use of these tactics will make the region's entire transportation system more efficient.

SANDAG has identified the following principles of an effective performance monitoring program.

- Data collection, analysis, and management should be automated, uniform year-to-year, and regularly reported to decision-makers and the public.
- The transportation system is multi-faceted and measuring its performance should consider its full complexity, including freeway on-ramps, freeway connectors, principal arterials, public transit, and other features.
- The availability and accuracy of data are critical to operational decisions.
- Periodic public surveys should be conducted to augment automated data.

Several efforts are underway to monitor the performance of our region's transportation system. They include:

- Major Streets and Roads: SANDAG coordinates the annual collection of average daily traffic volumes from Caltrans and from local jurisdictions.

- Freeway System: For most freeways, traffic volumes and speed data are automatically collected by Caltrans through loop detectors embedded under the pavement, as well as through other non-intrusive technologies. About 65 percent of the urban freeway system is automatically monitored by detectors located near freeway on ramps. SANDAG is working to increase this coverage and address data collection needs for connections between freeways and from on/off ramps.

- Transit Service: The Regional Transit Management System (RTMS) is a sophisticated management tool that monitors the performance, in real time, of more than 50 percent of the region's fixed route bus services. The transit operators also use the region's automated fare collection system, known as Compass, to collect data on ridership and payment activities. As these systems are expanded, the region's public transit operators will be able to use them to better manage services and deliver real-time information to customers (e.g., bus speed, mileage, and hours of service).

- Multimodal Performance Measurement System (PeMS): In cooperation with Caltrans, SANDAG is working to enhance the statewide PeMS tool to include real-time data and reporting for arterials and public transit. Historically, PeMS has provided freeway data and performance measures, such as travel times, traffic volumes, and speeds. SANDAG is developing new modules that will provide similar performance statistics for arterials and public transit by incorporating detection data from local streets and real-time performance and passenger count data from public transit vehicles. The completion of the arterial and transit modules will serve as the platform for making PeMS a system for reporting door-to-door travel times, and providing an arterial and corridor-wide performance monitoring framework.

- Transportation Performance Monitoring Reports: SANDAG is involved in several performance monitoring efforts to document, report, and communicate the effectiveness of transportation projects. These efforts include the State of the Commute Report, the *TransNet* Independent Taxpayer Oversight Quarterly Corridor Performance Report, and the RCP Performance Monitoring Report.

Real-Time Modeling/Simulation

Managing our transportation system in real time requires the ability to rapidly analyze data on its current performance and to evaluate solutions to minimize traffic congestion. The ICM project in the San Diego region has this ability. It relies on advancements in processing power, sophisticated algorithms, and the development of software applications that provide real-time multimodal modeling and simulation capabilities. This state-of-the-art solution extrapolates historical data and combines it with real-time data to develop dynamic Decision Support Systems (DSS).

These DSS systems are used to forecast traffic patterns, and then analyze and recommend operational changes to minimize or reduce traffic congestion. This technology allows transportation system managers to modify traffic signal timing and ramp meters; provide travelers with route information and options during recurring congestion or incidents; and

analyze and develop new TSM strategies and action plans.

Initial transportation models show that performance-based management approaches, such as ICM, which integrate freeways, arterials, and public transit, can produce benefit-cost ratios ranging from 7:1 to 25:1. The ICM project for the I-15 corridor is expected to significantly improve peak period road conditions, according to modeling. Projected improvements include a savings of 350,000 person-hours of travel time, an 11 percent increase in reliability for expected travel times along the corridor, and annual reductions of more than 3,000 tons of emissions.

Traveler Information

Keeping travelers informed about road conditions is an important part of reducing traffic congestion and improving safety. Informed travelers can help make the transportation system work better by making more intelligent decisions about when and how to travel. This is especially true during accidents and other incidents. Continued investments in improving traveler information, by making it more accessible through new devices and increasing usability through richer trip planning, will help our region meet the mobility and reliability goals of the 2050 RTP.

From the start of their day, commuters begin deciding how they will travel. They check the weather, listen to news reports, and think about where they need to be and when they need to be there. All of this plays into their final decisions about whether to drive, carpool, or take public transit; what routes to take, and when to leave. Our region's efforts to keep commuters informed empowers them to make intelligent decisions about when and how to travel.



The San Diego Regional 511 program and other traveler information efforts offer commuters real-time information on highway speeds, incidents, travel times, and transit arrival times. San Diego 511 is a central source of regional travel information for a variety of programs, including Compass Card, FasTrak®, iCommute, Roadside Assistance, and public transit. San Diego 511 disseminates information by phone, the internet and on TV. As improvements are made to our region's transportation network through investments in public transit and the expansion of carpool and high occupancy toll lanes, keeping travelers informed of their options will help them plan their trips most efficiently. Travelers, for example, may get information on options to drive to a public transit or rideshare stop during their commute. Information about comparative travel times and the environmental consequences of their travel choices will be available by telephone, the Web, and newer devices such as in-vehicle computers, after-market navigation systems, and smart phone apps.

Transportation System Management initiatives such as ICM and Connected Vehicle will improve the quality, usefulness, and delivery of information to travelers. These initiatives eventually will allow travelers to manage their trips better by, among other things, adjusting their travel speed to avoid red lights and prevent traffic jams. Keeping travelers informed will require more outreach and marketing campaigns in which private industry can play a role. This will help to keep travelers up-to-date as their demand grows for information and new business models are needed to support costs.

Arterial Management

Managing arterial roadways (major streets) can reduce delays and result in quicker trips and lower emissions. Investments in this area have been limited in the past because initiatives to measure and manage the performance of arterial roadways were not cost-effective. However, recent advances in wireless technology are making new investments in collecting traffic data along arterial roadways more economical.

Improving the flow of traffic on arterial roadways is among the most cost-effective strategies for reducing stop-and-go traffic, cutting overall travel times, and lowering fuel consumption and pollution.

Expanding these technologies for the Regional Arterial Network System will help improve the region's traffic signal systems. Improvements to arterial detection and signal interconnect will provide the ability to create a traffic signal system that is dynamic and coordinated throughout the region. This enhanced system will help improve the flow of traffic to and from freeways, and the overall effort will help support the mobility, reliability, and system preservation goals of the 2050 RTP.

Improving the flow of traffic on arterial roadways is among the most cost-effective TSM strategies for reducing stop-and-go traffic, cutting overall travel times, and lowering fuel consumption and pollution. The benefit-cost ratios of adopting strategies to better manage arterial roadways have ranged from 17:1 to 40:1, according to national studies. In the San Diego region, initiatives to synchronize traffic lights near I-805 resulted in a benefit-cost ratio of 11:1. They led to about 154,000 fewer hours of delay annually (a 14 percent decrease), about 5.4 million fewer stops annually (a 6 percent decrease), and 149,000 fewer gallons of fuel consumed per year (a 6 percent decrease). Similar results have been demonstrated across the country for other projects, including the optimization of 700 intersections in the Tysons Corner area of Northern Virginia, where the number of hours of delay was reduced by about 22 percent and stops were reduced by about 6 percent.

Improved data collection, analysis, and management for arterials promote a more comprehensive understanding of how traffic can be better managed across arterials and in conjunction with freeways. Past efforts to re-time traffic signals depended heavily on manual data collection, limiting the ability to easily update timing plans for changes in traffic. The results were timing plans that were soon out of date. Technology used today allows operators to re-time traffic signals more frequently, and even adjust them to accommodate real-time traffic conditions. This newer technology also can help operators coordinate the timing of traffic signals on arterials with the flow of traffic to and from freeways.

The Connected Vehicle platform, discussed later in the Emerging Technologies section of this chapter, is another advanced technology that will further improve the management of arterial roadways. Connected Vehicle promotes strategies such as "Eco Driving," which calculates the optimum speed a driver should use in order to avoid stopping at red lights. This could result in reduced traffic congestion, and lower emissions for arterial roadways.

Investing in arterial TSM solutions, which includes the deployment of Connected Vehicle devices along 2,000 miles of arterial roadways, will improve the ability of operators to monitor performance and better manage the flow of traffic along major streets as well as to and from freeways.

Freeway Management

The freeway system is the backbone of our regional transportation network, and continued TSM investments will help to minimize congestion and reduce bottlenecks. Our region has been progressive in deploying and using various tools to better manage freeway traffic flows. They include traffic detection technologies, closed-circuit television (CCTV) cameras, ramp meters, electronic message signs, and the Advanced Transportation Management System (ATMS), which provides central monitoring and sign control for managing incidents. These tools need to be built upon and improved to better manage our transportation system.

Traffic operators at Caltrans District 11 monitor traffic conditions, post information on highway signs, and coordinate with first responders – a commonly-practiced strategy to effectively manage the freeway system. Other regions that employ an ATMS show decreases in crashes, delays, and response times during incidents. In Espola, New Mexico, a traffic management system deployed for NM-68 resulted in a 27.5 percent decrease in the number of crashes, as well as an 87.5 percent reduction in vehicle delays. In Georgia, the NaviGAtor incident management program reduced the duration of an average incident from 67 minutes to 21 minutes. The result was 7.25 million fewer vehicle hours of delay over one year.

About 65 percent of the urban freeway system in the San Diego region is automatically monitored by detectors located near freeway on-ramps. Increased geographical coverage and additional spot detection technology at freeway connectors, off-ramps, and other locations are needed to improve the ability of operators to monitor freeway traffic and better manage the system. Ramp metering is a highly effective tool that reduces congestion. Our region has a significant number of metered ramps, but the technology is coordinated only with the freeway segment closest to the ramp. Optimizing the flow of freeway traffic requires a broader view that considers upstream and downstream flows, as well as the traffic exiting and entering the freeway from

Electronic message signs provide real-time information along critical sections of the freeway network so travelers can be advised of current conditions.





Our region has successfully implemented sophisticated management systems for bus and Trolley operations.

arterials. Future ATMS investments will seek to complete a Universal Ramp Metering System that provides operators with the ability to dynamically adjust ramp metering rates to match specific traffic conditions. These ATMS enhancements will help operators better manage connections between arterial roadways and freeways, making both more efficient.

Advising drivers of downstream traffic conditions is a valuable TSM tactic that traditionally is provided through electronic message signs. These signs provide real-time information along critical sections of the freeway network, so that travelers can be advised of current conditions, and make decisions to modify their route or mode of travel. Documented benefits include decreases in crashes where the signs were used to alert drivers of work zones, and decreases in secondary incidents where drivers are advised of an accident or congestion ahead. Some driver frustration also was reduced when travel time or incident information was displayed along a particular route.

Roadway signs and newer technologies, such as smart phones and the Connected Vehicle can improve the timely delivery of this information and incorporate information about the time that drivers can save by taking public transit or carpooling.

Similar to its application on arterials, Connected Vehicle technology can help make traffic flow smoother along freeways by increasing safety and providing drivers with information such as a recommended speed. The Connected Vehicle initiative includes existing underlying technologies to support driving in narrow lanes, safely reduce the distance between vehicles, deliver relevant information to drivers, allow for paying roadway or parking tolls without a transponder, and provides enhanced data collection. All of these aspects will play a significant role in reducing congestion and lowering emissions.

Another innovative TSM concept that will aid the region's mobility and environmental goals is called Active Transportation and Demand Management (ATDM). This concept applies additional management controls to freeway traffic flows by using electronic signs to introduce variable speed limits and dynamic lane usage. These tactics can smooth the flow of traffic and reduce bottlenecks during peak periods or incidents and provide additional capacity through the use of part-time shoulders.

The Freeway Service Patrol (FSP), which provides roadside assistance to stranded motorists during periods of peak traffic congestion, is a more traditional TSM program that mitigates traffic impacts. FSP focuses on quickly removing disabled vehicles from the freeway when traffic can be at its worst. Reducing the distractions and slowdowns caused by disabled vehicles

provides a significant and cost-effective benefit for mobility and safety.

Transit Management – Bus and Rail

Transit management systems help ensure that bus and rail lines are safe and performing optimally. The public transit industry has long used performance-based management techniques. They rely on a variety of rudimentary and sophisticated systems to monitor rubber tire and steel wheel fleet vehicles. These systems also play a critical role in monitoring the safety of public transit drivers and customers, and the system as a whole, through tracking solutions and dedicated voice and data communications.

Our region continues to explore new ways to improve the operation, convenience, and safety of the public transit system. The future application of technologies, such as wireless detection systems, that specifically can identify buses and rail vehicles, real-time simulation software that can predict travel times and passenger loads, and broad solutions such as Connected Vehicle all should be examined for potential benefits.

Our region has successfully implemented sophisticated management systems for bus and Trolley operations, which allow operators to monitor performance and safety and provide customers with real-time information. These systems are essential to the operations of public transit, and future investments will pay for upgrades, life-cycle replacements, and the introduction of new technology. Past investments also include completing the Trolley fiber communications and security network, which supports the management system; CCTV; customer information; and fare collection systems.

Our region's management systems for bus and rail operations allow public transit managers to develop coordinated service schedules; monitor the adherence to schedules; manage duty rosters; and, in the case of light rail, monitor and control critical wayside elements as well as life and safety systems. Investing in the management of public transit covers four key systems. These include the Regional Scheduling System (RSS), which provides tools for maximizing resources for both bus and rail; the Regional Transit Management System (RTMS), which provides automated dispatching and vehicle tracking for buses; Positive Train Control (PTC), which implements automated safety controls for heavy rail services; and the Centralized Train Control System (CTC), which provides a critical safety system for light rail operations. Each of these transit investment areas are discussed further in the following sections.

Regional Scheduling System (RSS)

The RSS helps public transit operators maximize human resources and minimize the need for additional vehicles by efficiently combining bus routes and rail lines with available resources. The RSS also is used to schedule the correct number of personnel, the frequency of buses, and the configuration of trains to meet expected demands. The system also allows transit operators to perform "what-if" scenarios, to compare proposed system changes and then measure the expected outcome of each scenario.

Regional Transit Management System (RTMS)

The RTMS provides public transit agencies with the ability to track buses via the Global Positioning System (GPS). This enables transit managers to measure on-time performance along routes and for individual buses, and therefore better plan bus service, particularly during periods of peak demand. The RTMS has been integrated with the San Diego 511

regional traveler information service enabling patrons to request real-time information on the departure time of buses at stops along a particular transit route. The RTMS helps improve the reliability of bus schedules by automatically tracking vehicles and directing service changes in real time.

The Regional Transit Management System helps improve the reliability of bus schedules by automatically tracking vehicles and directing service changes in real time.

The RTMS also enables transit signal priority, allowing buses to automatically communicate with traffic signals and request priority treatment in the form of shortened red or extended green signals. This priority treatment provides significant benefit to transit operations by reducing transit trip times and improving schedule reliability.

The region is working to expand the RTMS to include contract and suburban routes in the eastern and southern parts of the county. The inclusion of all fixed route buses in the region will enhance performance monitoring and broaden the availability of real-time traveler information to all transit patrons through 511, and increased deployment of electronic message signs at bus stops.

Positive Train Control (PTC)

In October 2008, the President signed the Rail Safety Improvement Act of 2008 into law. The Act clarifies that the mission of the Federal Railroad Administration is to ensure that rail safety is the highest priority. This new law requires all Class I railroads and intercity passenger and commuter railroads to implement a positive train control (PTC) system by December 31, 2015.

A PTC system, as defined in the new law, must prevent train-to-train collisions due to:

- over-speed derailments
- unauthorized incursions by trains into established work zones
- the movement of a train caused by a switch left in the wrong position

The PTC system meets these requirements by using digital communications and GPS technology to monitor train locations and speeds.

The system integrates with the railroad dispatching system, communicating with PTC equipment on the right of way and onboard each train. A train's speed and performance is therefore monitored in real-time. If an engineer fails to operate the train within defined safety parameters in connection with a wayside signal, a speed restriction, maintenance work zones, or a switch position, the PTC system proactively brings the train to a stop before an unsafe condition materializes.

Centralized Train Control (CTC)

The Trolley CTC system delivers many of the same tools for the rail system that the RTMS delivers for bus operations. The tools include on-time performance and vehicle tracking throughout the system. The CTC system monitors train movement, block signaling, and system functionality around the clock. The system monitors and maintains remote control of traction power substations, which electrify the overhead catenary system. The CTC system also integrates tools for CCTV, public announcements, traveler information systems, and critical life-safety monitoring and control systems installed in tunnels and along other segments of the rail system.

Electronic Payment Services

Electronic Payment Services and Systems is a growing investment area in TSM, due to the development of advanced applications such as transit smartcard systems and open road tolling. Both applications make collecting payments for services quicker and more efficient. Electronic Payment Systems also

create opportunities for innovative pricing models. When combined with applications for parking, they can be used to create a Universal Transportation Account (UTA). This type of unified account can help motivate travelers to use the transportation system more efficiently. For example, discounts for parking can be offered when the traveler uses public transit.

The SANDAG Electronic Payment Services area includes three programs: Compass Card for paying transit fares; FasTrak® for tolling; and "Smart Parking," the region's research effort into future applications for parking management and payment. The sections below detail each of these programs and highlight the SANDAG vision for the future in Electronic Payment.

Compass Card

Our region's automated fare collection system, dubbed "Compass Card," was developed and deployed in cooperation with the two regional transit agencies: the North County Transit District (NCTD) and the Metropolitan Transit System (MTS). The Compass Card is a contactless smart card configured to hold transit products such as monthly passes and stored value (i.e., "electronic cash") that can be used to pay fares on a bus or at rail ticket vending machines.

The Compass Card system is used on all urban buses and rail lines in the county. It is fast and easy to use. With a quick "Tap and Ride®," transit users have access to all types of public transportation. It is convenient to use and re-load, with multiple options for purchasing products at agency-operated transit stores, third-party outlets, by phone, and on a secure Web site. Customers also can protect the balances on their cards by obtaining optional "balance protection." The service allows them to receive a replacement card, with the value



or pass restored, if their original card is lost or stolen.

The Compass Card system also provides transit operators with better information about ridership and for analyzing fares. For example, knowing how many transfers a rider makes on his or her way to a destination is crucial to delivering services where they are needed most. The Compass Card system gives operators that capability. The Compass Card system also allows transit agencies to quickly adapt fare structures to meet market conditions. It delivers additional flexibility and agility so agencies can develop and deliver new transit products. The 30-day rolling pass, for example, gives users the flexibility to purchase a pass on their schedule, and not necessarily on the first of the month.

With a quick "Tap and Ride®," transit users have access to all types of public transportation.

FasTrak® - Open Road Tolling

The San Diego region is recognized worldwide for introducing dynamic pricing on high occupancy toll (HOT) lanes on I-15. As a TSM solution, applying open road tolling and HOT lanes balances demand through a performance-based management approach. SANDAG manages this innovative solution through its FasTrak® program.

Regional commuters pay a fee, or toll, through their FasTrak® account to use the I-15 Managed Lanes and State Route 125 (SR 125). Costs vary, from congestion pricing used on I-15 to manage traffic volumes to traditional tolling on SR 125.

Electronic parking systems apply advanced technologies to deliver real-time information about the availability of parking for a particular location or a particular space within a parking facility.

The tolling system maintains customer information, tracks their use of toll roads, and deducts payments from the customer's prepaid account. This is achieved by using transponder Radio Frequency (RF) technology. By using a transponder, customers are able to make toll payments at highway speeds without stopping, eliminating the bottlenecks associated with manually collecting cash at toll booths. The investments made in the I-15 Express Lanes project and the SANDAG FasTrak® program will continue as vital TSM solutions for current and future HOT lanes, in addition to traditional toll facilities. These technologies also can be used to pay for parking and other transportation services.



Smart Parking Systems

Parking continues to grow as an issue in policy discussions about the regional transportation system, in part because there is limited capacity for parking at public transit facilities. Our region needs new ways to monitor how parking facilities are being used, as well as new ways to inform travelers about parking and how to pay for it. Advances in wireless detection technology, meanwhile, have made deploying parking management systems more economical. SANDAG is working with NCTD to pilot the technical, operational, and policy aspects of Smart Parking solutions.

Electronic parking systems apply advanced technologies to deliver real-time information about the availability of parking for a particular location or a particular space within a parking facility. Management information and tools such as pricing are then incorporated. These systems are used to optimize the use of existing parking infrastructure, and to improve the management of supply and demand for parking.

Smart Parking systems have been implemented in the San Francisco Bay Area, in Europe, and in Japanese cities as management tools to more efficiently use parking capacity at transit stations. These systems provide convenient and reliable information and access to transit parking facilities. Providing this type of service helps make transit more competitive than driving alone, research shows.

The continued study and deployment of smart parking management could be further leveraged in coordination with FasTrak® and/or Compass Card to enable SANDAG to explore coordinated pricing for users.

Advanced Technologies

The application of ever improving technology has the ability to help our region achieve its mobility goals, reducing congestion and emissions. Used wisely, technology can increase capacity and maximize the efficiency, utilization, and safety of our current transportation system. Maximizing the potential of TSM requires ongoing research into technologies that improve management capabilities, system operations, and safety. There can be some risks and additional costs in deploying new technologies, but the latest developments warrant a close look to see what they have to offer the San Diego region.

The list of new technologies is extensive, but those available to SANDAG that can have a direct and immediate benefit or bring transformative change to transportation systems management are fairly limited. Still, they are significant. Three technologies in particular have the potential to improve our region's efforts to better manage the transportation system: wireless sensors and detection, real-time modeling and simulation, and the Connected Vehicle initiative. Respectively, these technologies improve performance monitoring and planning information; provide capabilities for proactive management based on predictive data; and introduce a completely new platform for safety, mobility, and environmentally-focused applications.

Wireless Detection

Expanding our region's detection system is a key goal in the effort to improve how the region monitors the performance of our transportation system. Data gathered using a comprehensive sensor and detection program provides a better understanding of how the transportation system is performing. This understanding can then be used to determine which transportation investments can provide the greatest benefits to promote greater mobility. The information also will provide system operators with the data they need to design strategies for better managing the transportation system.

Advances in wireless technology have made comprehensive performance monitoring systems more feasible. The proliferation of wireless technology has resulted in the advent of low-cost sensors and detectors that serve as replacements for traditional methods of collecting data, such as in-pavement loops. The new wave of devices reduces the cost, time, and infrastructure needed to collect data for measuring the performance of transportation systems.

The information captured through this technology helps operators manage and attain an understanding of operational conditions across the transportation system, including along arterial roadways, at parking facilities, and along transit routes and bikeways. The expansion of this technology has given operators the ability to attain a more complete picture of regional and multimodal travel patterns, and to predict volume and speed flows as traffic moves from streets to highways and vice-versa. Improved data, and the expansion of data coverage, also provide the public with a more complete picture.

There are many monitoring systems available, each with its own strengths. Detection technologies that use loops, video, and infra-red sensors are being used in transportation. Wireless solutions involving anonymous probe data using cell phones or Bluetooth devices are in their infancy, but they have gained significant momentum. The benefits and costs associated with implementing each technology should be justified, based on the specific application or project.

Variation between the systems ranges from data quality or accuracy levels to long-term maintenance costs. The level of granularity available from fixed devices exceeds that of probe data because of the lane-level precision that can be gained and because of the number of measurements that are captured. This level of information is needed for systems management, but it may exceed what is needed purely for travelers.

Similar technologies also may help in monitoring emissions. Advances in detection technology are being pursued to determine and directly monitor emissions reductions, as well as other improvements. Using knowledge gained from initiatives such as the "Transportation Air Quality & Congestion

Evaluation" (TRACE) project from the State of Florida's Department of Transportation, advances are being made in small, portable air quality monitors. These air quality monitors, measuring various levels of contaminants that have been identified as contributing to greenhouse gas emissions (e.g. CO, NO, NOx, NO2, PM), are tracked before and after a project's implementation. Therefore, a baseline is established and a tangible measurement of the project benefits is made. These sensors are now economical enough to procure and deploy in sufficient numbers at TSM project sites.

It is important to note that regardless of the various types of technologies available, the overall goal is to achieve a comprehensive view of performance for all modes and transportation networks. Accordingly, a regional focus should be placed on finding a technology solution that provides the greatest benefits from a functional and cost perspective. The advent of low-cost sensors provides opportunities to expand our region's data collection network on arterials and parking facilities. Doing so will help establish a solid foundation for understanding the current and proposed state of the transportation system. Deployment of these detection technologies also provides the information needed to improve system efficiency, safety, and operations. The data also will enrich the quality and extent of the information offered to travelers.

Real-Time Multimodal Modeling and Simulation

Modeling that supports traffic and transportation planning has long been a staple in the transportation field. These models have focused mainly on supporting project development or transportation planning efforts. These efforts have included producing regional travel demand forecast statistics and analysis, as well as project-specific traffic analysis.

An emerging technology within this field is the development of real-time multimodal modeling and simulation applications. These applications are designed to simulate and evaluate traffic flows and multiple operational strategies simultaneously, and to produce recommendations in minutes. Real-time modeling applications complement existing tools by extrapolating historical data and combining it with real-time data to develop dynamic decision support applications. The benefits from this new technology include the ability to forecast traffic patterns and recommend operational changes to minimize delays and congestion. This forecasting and real-time analysis allows transportation system managers to take proactive measures, such as modifying the timing of traffic signals, ramp meters, or speed limits; providing route information and options to travelers during recurring congestion or during incidents; and analyzing and developing new TSM strategies and action plans. The advances in modeling and simulation technology have proven successful in locations such as Madrid, Spain and in Singapore. The deployment of this real-time system locally will allow regional and local operators to improve management of our transportation system.

This technology has been proposed to the U.S. DOT for a demonstration as part of the I-15 ICM project. The technology is planned for development and implementation as part of the I-15 ICM traffic prediction and decision support system. The I-I5 ICM project is planned for completion in 2014, and its findings and corresponding ICM applications will serve as the foundation for pursuing similar deployments along other regional corridors as part of the SANDAG ICM program.

Connected Vehicle

Connected Vehicle is the U.S. DOT program name given to a platform for advanced vehicle communication technologies and applications. It is internationally recognized for significantly improving roadway performance, increasing safety, and providing environmental benefits. Through the development of a ubiquitous high-speed communications network, the Connected Vehicle platform leverages and advances the intelligence of the vehicle itself and the roadway it travels on. Connected Vehicle will enable an entirely new suite of applications that will significantly change the transportation network, performance measurement, and management capabilities.

The U.S. DOT's Joint Program Office has announced that Connected Vehicle is its highest priority program, and it is working with state and local agencies to complete planning and expand pilot deployments. The U.S. DOT envisions broad deployments of Connected Vehicle by 2014 as part of its strategic research plan, which was approved by the ITS Management Council in December 2009. To this end, the U.S. DOT has engaged national and international industry groups to deliver a robust technology environment within which Connected Vehicle will come to fruition on schedule. The Institute of Electrical and Electronics Engineers (IEEE), the Society of Automotive Engineers (SAE), and the American Association of State Highway and Transportation Officials (AASHTO) have worked over the last six years to solidify standards for industry certification. These standards will ensure that robust deployment strategies and plans are available.

The core of the Connected Vehicle platform is the communications network, which addresses safety, traffic management, and traveler information applications by enabling vehicle-to-infrastructure and vehicle-to-vehicle communication. This communications medium between vehicles and roadside devices, such as traffic signals, creates a collective intelligence that can bring vast changes to the planning and operation of transportation systems. These changes improve safety, but they also provide the primary platform for enhancing accessibility, reliability, mobility, and effective systems management. This ubiquitous communications platform will extend to state routes, local streets, buses, bikes, Trolley, and heavy rail systems. It is therefore an important step toward achieving overall goals for regional livability.

Safety

The U.S. DOT, private industry, and educators are strong supporters of Connected Vehicle as a tool to significantly reduce accidents and the number of people killed in highway accidents every year – now totaling about 40,000. In California, more than one million vehicle crashes occur every year, with an economic cost of about $25 billion annually. Of this total number of accidents, 210,000 are injury crashes and 4,000 include fatalities. In the San Diego region, about 25 percent of fatal crashes occur at intersections, while another 25 percent result from vehicles changing lanes or veering off the roadway. The U.S. DOT estimates that Connected

Connected Vehicle is internationally recognized for significantly improving roadway performance, increasing safety, and providing environmental benefits.



Vehicle could reduce annual fatalities by 83 percent, and also significantly reduce the number of crashes not due to driving under the influence of alcohol or drugs.

Human error can be reduced through a variety of improvements to the engineering of a vehicle that increase its overall "intelligence." Vehicles can be made "aware" of other vehicles on the roadway, their speeds, the status of traffic signals they are approaching, and the road conditions ahead. They also can have access to detailed lane-level maps to calculate curve/speed ratios and respond to road hazards.

The initial deployment of Connected Vehicle will likely focus mostly on assistive functions, along with braking and throttle control. But the exchange of information between intelligent vehicles and an intelligent infrastructure will provide a platform for more autonomous functions.

As the technology is deployed, an increasing number of vehicles will become "Connected Vehicle Ready," either when they are manufactured or through after-market installations. Therefore, the penetration of Connected Vehicle into the marketplace, and the level of sophistication of the applications deployed, will work in unison. However, many applications are not dependent on the penetration rate of Connected Vehicle technologies into all vehicles. These include:

- Control Loss Warning: This warns a driver when he or she is about to lose control of the vehicle.
- Red Light Running: The vehicle issues visual, physical, and audible alerts if the driver is at risk of violating a red light or stop sign.
- Curve Speed Warning: The vehicle warns the driver to slow down.
- Road and Travel Conditions Warning: The vehicle is aware of crashes, work zones, slippery road conditions, detours, traffic congestion, weather-related road conditions, parking restrictions, turning restrictions, and other situational elements that may affect the driver. The vehicle issues an audible or visual warning to help a driver avoid these conditions.

As Connected Vehicle is fully deployed – expected sometime between 2018 and 2025 – the numerous applications available to assist a driver increasingly lessen the chances for human error on the road. These applications are expected to become radically more intuitive. Some examples include:

- Electronic Emergency Brake Lights: The vehicle would notify the driver when a vehicle ahead is braking hard.
- Intersection Movement Assist: The vehicle would warn the driver when it is not safe to enter an intersection, for example when something is blocking a driver's view of oncoming traffic.
- Do Not Pass Warning: The aim of this application is to warn the driver if he or she attempts to change lanes and pass when there is a vehicle in the opposing lane within the passing zone.
- Collision Warning and Crash Mitigation: This application would warn the driver of an approaching object (e.g., a stopped vehicle, a slowed vehicle, or a vehicle following too closely), or a vehicle ahead that is suddenly decelerating – whether it is in good or bad weather.
- Blind Spot Warning: The vehicle would warn a driver when he or she tries to change lanes, if there is a car in the blind spot.

- Forward Collision Warning: The vehicle would issue alerts and then warn a driver if he or she fails to apply the brake when a vehicle ahead is stopped or traveling significantly slower.

Mobility

Additionally, the Connected Vehicle platform and the resulting connected intelligent vehicles will enable our transportation system managers to receive and send enhanced decision-quality data to vehicles about the status of the network. This is one of the single greatest opportunities for system managers, across modes and jurisdictional boundaries, to put into effect proactive congestion management strategies that have the potential to deliver a profound impact on the reliability of travel times.

The Connected Vehicle platform provides a connected, data-rich travel environment. The platform will capture real-time data from equipment located onboard all types of vehicles (automobiles, trucks, buses, and bikes) moving within the network. The data will then be available for transportation managers to use in order to optimize our transportation system for peak performance. Drivers, meanwhile, will enjoy unparalleled visibility into the road ahead. To achieve this, the Connected Vehicle platform is used in the following contexts:

- Vehicles as Anonymous Data Probes: Future Connected Vehicle technologies are expected to provide Traffic Management Centers (TMCs) with a richer data set than current wireless devices that are not integrated into vehicles. On Board Equipment (OBE) integrated with a vehicle's electronic systems will be designed to anonymously relay information on vehicle conditions such as traction control or anti-lock braking activation, which are proxies for road surface conditions. The OBE will transmit this data anonymously to Road Side Equipment (RSE), which in turn will relay the information in aggregate form to system operators. The data will be turned into useful information to show operators where roadway maintenance may be needed.

- Ramp Metering: Connected Vehicle technologies of the future could deliver real-time data to optimize the operation of ramp meters in response to changing conditions on the freeway and on nearby surface streets. By ensuring that ramp metering does not merely shift congestion to the arterial network, operators would optimize the capacity of the transportation system. If Connected Vehicle improves the operation of ramp meters by just 5 percent, it will save an estimated 1.2 million gallons of gas nationally every year. The projected savings are valued at $2.8 million, and more than 11,000 tons of CO2 emissions would be avoided, once the system is fully deployed.

- Corridor Management: In the future, transportation agencies could use real-time data to manage corridor-level traffic. Travel demands could be balanced across adjacent or parallel facilities, using strategies such as changing the direction of a reversible lane in response to an incident; changing the timing of ramp metering; and using message boards to encourage motorists to divert to a different route.

- Performance Measurement: Connected Vehicle offers the potential to generate an expanded set of measures for monitoring the status and operation of the transportation system. Connected Vehicle generated data could provide metrics to measure the effectiveness of system

The Connected Vehicle platform will play a significant role in reducing greenhouse gas emissions and improving public health.

operation, including travel time, stops, delays, and travel reliability; condition metrics, including indicators of pavement traction, pavement roughness, precipitation, visibility, and air quality; and demand metrics, such as vehicle counts.

- Traveler information: The ability of the platform to send location-specific data and target it to specific vehicles greatly enhances the information available to travelers. This targeted capability introduces the concept of dynamic in-vehicle signage, augmenting or replacing the regulatory or informational signs used today. It also allows real-time messaging on road conditions, the status of traffic signals, and even recommended speeds to smooth the flow of traffic. Further enhancements of this capability and vehicle intelligence could lead to vehicles automatically taking action based on the messages they receive.

- Tolling: Connected Vehicle also is being promoted as the new platform for a nationwide tolling standard. This standard potentially would reduce costs related to infrastructure deployment and ongoing operation by eliminating transponders, leveraging a common platform, and introducing more competition. The integration of new Connected Vehicle applications with vehicle systems also has the capability to introduce new enforcement and pricing strategies for carpool lanes and HOT lanes by detecting the number of occupants in the vehicle.

Environment

By providing the traveling public with real-time information about traffic congestion and other travel conditions, the Connected Vehicle platform can help reduce emissions. The Connected Vehicle platform, combined with environmental applications, will be targeted specifically at reducing fuel consumption, idling, and vehicle miles traveled while reducing acute congestion. It will play a significant role in reducing greenhouse gas emissions and improving public health, particularly in major metropolitan areas, around ports and freight hubs, and on major highways and corridors.

Applications such as Eco-Driving will possibly be the largest single unifying activity for the 40 percent of travel that occurs here in the San Diego region on Connected Vehicle-ready local streets. The concept of "Green Driving" or "Eco Driving" is where the system informs a driver of the speed he or she should travel in order to avoid red lights and instead catch a "wave" of green lights. This can be achieved with or without high levels of penetration by the Connected Vehicle platform into vehicles. Connected Vehicle is a broad-reaching platform that will have a transformational impact on all modes of the nation's transportation network. Delivering a communications platform to increasingly intelligent vehicles will have a profound impact on the way highways and roadways are planned and used. The U.S. DOT is therefore working toward making Connected Vehicle a required safety feature of all new vehicles. The National Highway Traffic Safety Administration is expected to begin the rule-making process in 2013 to adopt this emerging technology.

The following actions support the Plan's Systems Management Chapter recommendations:

Transportation Systems Management	
Actions	**Responsible Parties**
Multimodal Integration and Performance-Based Management	
1. Implement a regional system to implement and maintain the monitoring of 100 percent of the region's urban freeway lanes, on/off ramps and connectors, and critical arterial networks through the use of automated data collection systems.	Caltrans, SANDAG, and local jurisdictions
2. Expand the monitoring of regional transit service with automated data collection through vehicle location systems and automated passenger counters.	SANDAG, MTS, and NCTD
3. Continue developing enhancements to PeMS to improve transportation system performance reporting and to develop corridor measures that comprehensively examine person throughput across highways, arterials, and transit.	SANDAG
4. Complete the demonstration and evaluation of real-time modeling and decision support systems as part of the I-15 Integrated Corridor Management project and apply improvements to other major corridors.	Caltrans, SANDAG, and local jurisdictions
5. Provide regular system performance reports to the SANDAG Board of Directors, Policy Advisory Committees, and working groups for review and action.	SANDAG
Traveler Information	
6. Continue the delivery of traveler information to the public using data collected through performance monitoring investments and disseminated through public and private channels.	Caltrans, SANDAG, and local jurisdictions
7. Enhance traveler information services to provide multimodal choices that promote sustainable strategies and reduce congestion.	SANDAG, MTS, NCTD, and Caltrans
8. Explore new dissemination options such as in-vehicle devices, mobile applications, and Connected Vehicle, and evaluate non-public subsidies for delivery.	SANDAG
Arterial Management	
9. Develop a plan and initiate phased deployment of additional detection devices and/or service for major arterials throughout the region.	SANDAG and local jurisdictions
10. Develop an ongoing program to enhance traffic flows on arterials and to/from freeways using timing updates and a responsive/adaptive system that consider corridor performance and multi-jurisdictional coordination.	SANDAG, local jurisdictions, and Caltrans
11. Evaluate wireless devices, Connected Vehicle, and innovative applications such as Eco Driving to further improve traffic flows and reduce environmental impacts.	SANDAG
12. Develop a plan and initiate phased deployment of additional detection devices for main lanes, HOV/HOT facilities, on/off ramps, and highway connectors.	Caltrans and SANDAG

Transportation Systems Management (Continued)	
Actions	**Responsible Parties**
Freeway Management	
13. Continue improvement of Caltrans District 11 management systems for monitoring the freeways through detection and traffic cameras; and for making real-time adjustments to ramp metering that consider corridor performance.	Caltrans and SANDAG
14. Evaluate the benefits and devise a deployment plan for additional electronic message signs to convey multimodal traveler information using traditional roadside signage and/or advanced in-vehicle solutions.	SANDAG and Caltrans
15. Continue the partnership with the State to monitor and expand the Freeway Service Patrol (FSP) program, to align it with extended peak commute and weekend hours.	SANDAG
16. Implement an automated FSP vehicle fleet tracking and management system to monitor and report FSP program performance.	SANDAG
Transit Management – Bus and Rail	
17. Program the life-cycle replacement of the Communications/Security, Scheduling, Transit Management, and Centralized Train Control systems and evaluate opportunities for improvements.	MTS and NCTD
18. Continue efforts to develop plans to implement Positive Train Control.	NCTD and SANDAG
19. Evaluate and demonstrate the benefits of new technologies such as wireless detection, real-time modeling, and Connected Vehicle for transit.	SANDAG, MTS, and NCTD
Electronic Payment Services	
20. Program the life cycle replacement of the Compass Card and Fastrak® electronic payment systems.	SANDAG, MTS, and NCTD
21. Continue evaluation of Smart Parking systems, the benefits of parking information, and the impact of pricing models.	SANDAG
22. Evaluate and demonstrate the benefits of the Universal Transportation Account concept and coordinated pricing strategies.	SANDAG
Advanced Technologies	
23. Continue research and demonstration efforts to identify and evaluate new TSM technologies.	SANDAG
24. Develop implementation plans and/or pilot projects for wireless detection and real-time modeling/simulation.	SANDAG, MTS, NCTD, and Caltrans
25. Coordinate with the U.S. DOT on Connected Vehicle development and possible early adoption/deployment in San Diego using local, state, and federal funds.	SANDAG

Chapter 8

Demand Management: Innovative Incentives for Taking the Path Less Traveled

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Capital improvements can take many years and significant resources to implement, but managing the demand for various forms of transportation, also known as Transportation Demand Management (TDM), can provide flexible and cost-effective solutions.

Transportation Demand Management Overview

Our transportation system in the San Diego region faces many challenges. In the past, steady population growth; the dispersion of homes, jobs, schools and services; increased interregional commuting; and the expanded movement of goods all have led to mounting congestion on our roadways. These trends challenged our ability to keep pace with growing travel demands and to operate a reliable transportation system. Capital improvements can take many years and significant resources to implement, but managing the demand for various forms of transportation, also known as Transportation Demand Management (TDM), can provide flexible and cost-effective solutions. Typical TDM programs include ridesharing initiatives such as carpooling, vanpooling, and buspooling; promoting alternative work schedules and teleworking; and promoting bicycling, walking, and the use of public transit. These programs reduce the overall number of vehicle miles traveled (VMT), making more efficient use of our existing roadways and maximizing the movement of people and goods.

This chapter describes our region's effort to implement TDM programs that optimize our investment in the transportation network, and provide our region with viable travel alternatives. Since TDM measures are most effective when coordinated with public education and outreach strategies, this plan combines complementary TDM programs with strategies for motivating and reinforcing sustainable travel behavior.

The 2050 RTP is developed around five primary components: a Sustainable Communities Strategy, Social Equity and Environmental Justice, Systems Development, Systems Management, and Demand Management. Each component has a unique yet interdependent role in creating a sustainable transportation system that improves mobility, reduces greenhouse gases, and increases travel choices for everyone in the San Diego region through 2050.

iCommute – The Regional TDM Program

In 1995, the San Diego Association of Governments (SANDAG) began operating a regional TDM program when it assumed management of "Commuter Computer," the California Department of Transportation's (Caltrans) regional rideshare program. This operation was transformed into the "RideLink" service for the region. In 2009, SANDAG re-branded RideLink as "iCommute" to modernize the program, expand and upgrade services, and reach new audiences. iCommute is now the TDM program for the San Diego region. The goal of the iCommute program is to manage and reduce traffic congestion during peak times, as well as reduce greenhouse gas emissions and other environmental pollutants that result from commuters driving to work alone each day. The iCommute program pulls together proven trip-reduction strategies from the past, and it adds state-of-the-art Internet tools that provide access to convenient transportation choices that reduce auto dependency, vehicle energy consumption, and polluting emissions.

With an innovative Web site (www.iCommuteSD.com) as its central hub for outreach to commuters and employers, iCommute makes it easy to access, evaluate, and compare transportation choices. The "Commute Cost Calculator" provides commuters with the actual cost of their current commute and the potential savings from choosing alternative forms of transportation. "RideMatcher," a tool within

the Web site, helps commuters securely find a vanpool, carpool, or bicycle partner. The "TripTracker" tool allows commuters to log their commute trips on an interactive calendar that calculates the financial and environmental costs of their daily commute patterns. The online program also simplifies the administration of regional TDM programs by measuring participation in and demand for TDM programs, and by quantifying the program's benefits at the regional level.

TDM Strategy – Outreach, Education, and Incentives

In the early 1990s, TDM regulations in the San Diego region required employer trip reduction plans. These regulations, including the San Diego County Air Pollution Control District Regulation XIII and the City of San Diego's TDM Ordinance, were enacted when the federal government designated the region's air quality as "severe." To reduce emissions from motor vehicles, the regulations required employers with more than 100 employees, the source of significant peak period traffic, to implement trip reduction plans for their work sites. In 1995, the federal government re-classified the region's air quality designation from "severe" to "serious," and the TDM regulations were rescinded. Since the mid-1990s, participation by area employers and commuters in TDM efforts has been voluntary.

In a voluntary environment, commuters base their travel choices on a desire to save time and money, reduce stress, improve the environment, and other considerations. Employers participate in TDM programs that are easy to implement and make business sense by helping to attract and retain employees and reduce costs. The iCommute TDM strategy seeks to address these personal and business motivations by promoting and educating the public on their transportation choices, and by providing incentives to change travel behavior.

Outreach and Education

Employer Outreach and Services – iCommute's partnership with employers has proven to be the most effective method for promoting alternative travel choices among the region's commuters. This is partly because TDM programs can be tailored to the transportation needs of employees at their specific place of work. iCommute's initial outreach and education efforts have focused on the region's largest employers.

As of May 2011, iCommute has partnered with 157 employers to develop customized commute programs that meet employer and employee needs.

As of July 2011, iCommute has partnered with 159 employers to develop customized commute programs that meet employer and employee needs.



iCommute solicits employer interest and participation in TDM programs through extensive outreach efforts. These include presentations to businesses and professional and industry organizations; participation in employer-sponsored wellness fairs and green fairs; special events and promotions; and coordination of the Diamond Awards, which honor employers who have exceptional commuter benefit programs.

To further assist employers, iCommute developed a comprehensive Commuter Benefit Program Starter Kit that outlines a simple, three-step process to help employers identify their commute needs, design a custom program, and roll it out to their employees. The kit includes sample policies, forms, tax deduction information, commuter program descriptions, and examples of best practices from other companies and agencies. It also includes advice and sample material for how to market a commuter program to employees. iCommute staff also works one-on-one with employers to provide the technical assistance they may need, such as surveying for employee travel preferences, mapping employee commute routes, and developing a customized plan that makes business sense.

One year after launching the iCommute Web site, more than 10,000 commuters use the online system to improve their commuting choices.

Moving forward, iCommute's employer outreach program will continue to be a focal point of communications as the most effective way to reach large numbers of commuters. Marketing efforts will focus on increasing the scope of and participation in commuter benefits programs within mid- to large-size employers that already offer such programs. Additional effort will be placed on establishing new programs in companies that do not already have commuter benefits in place. This will be accomplished through a variety of marketing mechanisms, including:

- more self-service options such as Web-based forums and tutorials
- more incentives for employers and employees
- new and improved events and promotions

Public Outreach – Marketing and outreach are key strategies for the implementation of the SANDAG TDM program. Research shows that access to information will provide commuters with viable choices and guide travel behavior. The iCommute Web site is the primary portal for communicating information on transportation choices and raising awareness about the financial, environmental, and health benefits of TDM programs. The iCommute Web site provides commuters with the information, tools, and resources they need to try an alternative mode of transportation. One year after launching the iCommute Web site, more than 10,000 commuters use the online system to improve their commuting choices.

iCommute seeks to increase awareness about alternative transportation choices through events and promotions such as Bike to Work Day, Rideshare Week, and "Dump the Pump."



Direct outreach to community groups, schools, agencies, and neighborhood organizations also is a key strategy for reaching the region's commuters. Fostering partnerships with organizations and agencies to co-market transportation alternatives leverages marketing resources and augments outreach efforts. Moving forward, building and strengthening relationships with partners and sponsors will be a key strategy for reaching new and larger audiences.

Successful marketing and outreach requires a continuous dialogue with commuters to determine changing public preferences and respond with appropriate programs and services. iCommute will achieve this through ongoing surveys of users and potential users

of alternative transportation choices. This information will be used to develop targeted marketing campaigns that deliver appealing messages that inform commuters about improved programs and services.

Agency Outreach – There are many ways that local governments can educate the public and encourage alternatives to driving alone in their communities. Through the SANDAG Energy Roadmap Program, iCommute is partnering with local governments to provide free assistance and tools for assessing, designing, and implementing TDM programs at the employer level and community level. By implementing TDM programs, local governments can reduce energy consumption, help their employees save money and time, decrease traffic congestion, and reduce their community's overall carbon footprint. iCommute encourages establishing TDM programs at the local government level under three categories:

- Commuter policies and benefit programs: iCommute works with local governments in the same way it works with other employers to assess and develop customized commuter benefit programs for their employees.
- TDM in the development review process: The inclusion of TDM measures in the development review process offers developers creative, affordable, and effective ways to reduce motor vehicle trips and their associated impacts. iCommute will work with local governments to develop policies that require or encourage the inclusion of TDM measures in new developments to reduce the environmental impacts of vehicular traffic generated by those projects. Moving forward, iCommute will develop a best practices guide for local jurisdictions that want to make TDM a formal part of their development review process. These linkages also will be included in the update of the Regional Comprehensive Plan.
- TDM in the community: iCommute provides local governments with the tools they need to educate the public and encourage alternatives to driving alone in their communities, including:
  - Providing information on commuting resources and commute alternatives, to be shared with the public through their Web sites, newsletters, and at public venues
  - Soliciting their participation in annual events and campaigns, such as Bike to Work Day, "Dump the Pump," and Rideshare Week
  - Partnering with local governments to evaluate public programs, such as car sharing and bike sharing that encourage making alternative transportation choices

Financial Incentives

Providing people with financial incentives to try alternatives to driving alone is a tried and proven strategy. Currently, iCommute offers a vanpool program subsidy of $400 per month per vanpool as well as the Guaranteed Ride Home (GRH) program. GRH is a safety net for commuters who carpool, vanpool, take an Express Bus, ride the COASTER, or walk or bike to work three or more times per week. GRH provides a free taxicab ride or 24-hour car rental up to three times per year in the event of an unscheduled incident, overtime, or illness. The cost of offering this service is relatively low because it acts as an insurance policy and is seldom actually used. As of July 2011, GRH has 1,988 members enrolled, but on average only a couple hundred rides are issued each year. However, GRH is an

Providing people with financial incentives to try alternatives to driving alone is a tried and proven strategy. Currently, iCommute offers a vanpool program subsidy of $400 per month per vanpool as well as the Guaranteed Ride Home program.

important factor in the commuter's decision to choose an alternative form of transportation. Expanding eligibility for the GRH program may prove to have a positive benefit/cost ratio, and this will be explored in the future.

To increase participation in TDM programs, more aggressive financial incentives for all alternative modes of transportation will be needed. iCommute will continue to develop and pilot varying levels and types of incentives for employers and commuters who are not currently covered by other incentive programs. For example, iCommute plans to launch a carpool incentive program that provides a subsidy for new carpools. iCommute also is exploring partnerships with businesses to provide discounts and incentives to commuters who take alternative modes of transportation and log their sustainable commute trips in the iCommute system.

RideMatcher is a convenient online tool to securely form carpools or vanpools 24/7.

Locational Emphasis –TDM programs and incentives are promoted throughout the region. However, due to limited resources, more intensive outreach efforts will be targeted toward locations with the most potential for impact. These are:

- Major employment centers
- Urban areas
- Major corridors with High Occupancy Vehicle (HOV) or Managed Lanes
- Corridors impacted by highway construction
- Areas around public transit stations

iCommute Programs

Regional Vanpool Program

This program provides long-distance commuters with a cost-effective alternative to driving alone. Figure 8.1 illustrates the growth of the vanpool program since the 1990s. SANDAG contracts with vanpool vendors to provide the vehicles, maintenance, and insurance, and it currently provides a $400 monthly subsidy per eligible van to reduce the vehicle lease costs. As of May 2011, the vanpool program accounts for:

- 749 vanpools
- 5,885 daily passengers
- 56-mile average, one-way distance
- 575,232 average vehicle miles reduced each day

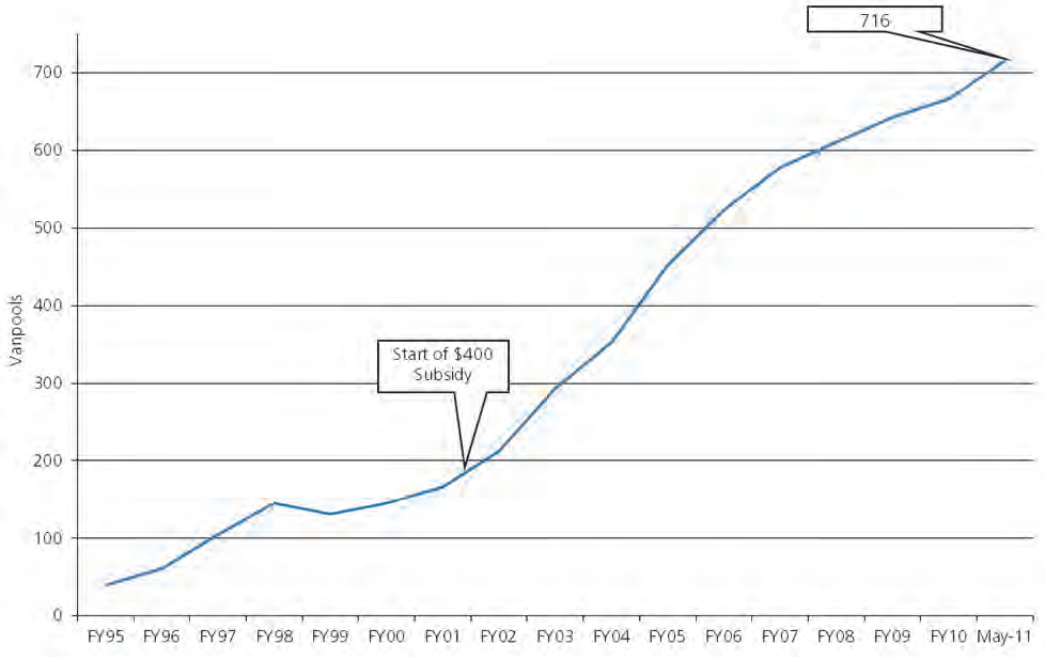
Looking to the future, iCommute will encourage the continued growth of the vanpool program by examining the feasibility of a tiered, monthly subsidy that provides a larger incentive to vanpools with higher vehicle occupancy rates. Additionally, iCommute will support the Regional Energy Strategy and the Climate Action Strategy by introducing clean fuel and electric vehicles into the regional vanpool fleet, as the necessary infrastructure is available to enable this transition.

Carpool Program

iCommute maintains an online database of commuters who are interested in joining a carpool. RideMatcher is a convenient online tool to securely form carpools or vanpools 24/7.

Currently, RideMatcher works best to coordinate regularly scheduled carpools. However, in the future iCommute intends to enhance this technology to promote

Figure 8.1 – Vanpool Growth Trend



ridesharing during major regional events, and instant ridematching on an occasional basis.

To increase the number of carpools and measure VMT reduction attributable to carpooling, iCommute plans to launch a regional carpool incentive program – as recommended in the 2009 Ridelink Carpool Incentive Study. This new program will result in an estimated 5,300 new carpools per year, which would put carpooling on a level playing field with the regional vanpool program. New carpoolers who enroll in the iCommute on-line system would be eligible to receive incentives. Based on the best practices and outcomes from similar programs nationwide, it is expected that after carpooling for three months with the incentive, commuters will be more likely to continue carpooling once the incentive expires. A pilot program is anticipated in Fiscal Year 2012.

Buspool Program

In 2010, SANDAG, the Metropolitan Transit System (MTS), and the Navy collaborated to implement a pilot buspool service (Murph Express) that provides Premium Express Bus service from the Murphy Canyon military housing cluster to Naval Base San Diego. The Navy is one of the San Diego region's largest employers, with about 34,000 naval personnel and civilians who commute within the county to naval facilities. Therefore, the goal of the buspool program is to provide quick and convenient access to military bases, reducing congestion on our region's transportation system, and improving the quality of life for military personnel and the public in general. The operation of the buspool service is funded through the military's Transportation Incentive Program, but SANDAG markets the program and provides technical planning support for the program's expansion. If the pilot project is successful, SANDAG, in cooperation with MTS, will work with the military to expand buspool services to other military housing clusters and facilities. The military may consider options to mandate a certain level of participation in the program as part of their overall TDM strategy. iCommute also will seek similar opportunities and partnerships with other large employers in the region.

The goal of the buspool program is to provide quick and convenient access to military bases, reducing congestion on the region's transportation system and improving the quality of life for military personnel and the public in general.

In the San Diego region, about one-third of workforce jobs, or 519,000 jobs, are compatible with telework. However, less than 5 percent of the workforce currently participates in a formal telework program.

School Services

iCommute offers SchoolPool, a free, convenient, and secure online carpool, walk, and bikepool matching system for parents who want to share the job of getting their children to and from school. SchoolPool reduces traffic congestion in and around school zones, creating a safer environment for students. The SchoolPool program is open to students in all public and private elementary, middle, and high schools within San Diego County. Figure 8.2 shows the schools in the San Diego Region. Since transitioning to an online SchoolPool program in 2009, 36 schools with nearly 400 parents have enrolled in the service.

As part of SchoolPool, iCommute will offer a Walking School Bus and Bike Buddy program that supports regional public health initiatives and the Safe Routes to School strategy by promoting active transportation choices for children (see Chapter 6). iCommute offers parents and schools the online tools to form safe, supervised opportunities for children to walk or bike to school. To promote these services, iCommute plans to hold annual Walk and Bike to School Day events in conjunction with International Walk to School Day starting in 2011. Ongoing education and partnerships with school-based groups such as parent associations will continue to support this effort.

Telework and Alternative Work Schedules

Telework is a transportation alternative that allows employees to work at home, at a nearby satellite facility, or from a "virtual office." Teleworking replaces travel to and from work with telecommunications technologies. The goal of telework is to bring work to employees rather than bringing employees to work, thereby relieving peak-period congestion. In the San Diego region,



about one-third of workforce jobs, or 519,000 jobs, are compatible with telework. However, less than 5 percent of the workforce currently participates in a formal telework program. Studies show that teleworking can improve a company's bottom line with increased productivity, reduced overhead, improved retention, and recruitment, but many companies are reluctant to implement a telework policy. In our region's efforts to identify cost-effective strategies for reducing peak period congestion and the associated greenhouse gas emissions, telework rises to the top. However, telework is a solution that currently lacks a dedicated program. To promote it, iCommute proposes to launch a regionwide telework program that includes incentives and technical assistance to support employers with developing telework policies and programs.

Like the teleworker who avoids the peak period commute by working from home, the employee who participates in a flex schedule or compressed workweek avoids commuting during peak periods. Employees with flexible schedules arrive and/or leave work before or after rush hours. Compressed work weeks, like the "9/80" work schedule, help eliminate one day of home-to-work commuting every two weeks. These alternative schedules are simple yet powerful tools that employers can use to help reduce travel demand while providing employees with flexibility. iCommute will continue to provide employers

with the resources they need, such as sample policies, best practices, and technical support to implement and manage alternative work schedules.

Bicycle Encouragement Programs

These programs support the regional bicycle network and promote bicycle commuting by providing services such as the Regional Bicycle Locker program, Bike to Work Day, and the regional bike map. Currently, iCommute manages more than 800 bike lockers at more than 60 transit centers and park and ride lots throughout San Diego County (Figure 8.3). iCommute is now upgrading to "on-demand" bike lockers to simplify reserving lockers and provide additional storage capacity. On-demand bike lockers allow bicycle commuters to use any locker at a given site on a first-come, first-served basis. These state-of-the-art lockers, which use key cards, give multiple users the opportunity to use the same locker, enable the user to reserve lockers using online tools, and provide administrators with information about utilization and demand.



The benefits of on-demand lockers include reduced program administration costs, reduced inappropriate use of lockers, and increased utilization.

iCommute intends to launch more programs that encourage bicycling to support the Regional Bicycle Plan (see Chapter 6). These programs will provide the incentives, recognition, and services that make bicycling a viable choice for commuting. This will include the introduction of bike stations in areas with a high demand for bike lockers. Bike stations provide secure, indoor bicycle parking and amenities. Bike stations have the capacity to accommodate more bikes, requiring less space than traditional bike lockers.

iCommute also is planning bike sharing programs. Bike sharing gives people on-demand access to a fleet of public rental bicycles at designated locations. When used in combination with transit, a shared bike program is an affordable option that can reduce the travel time between home, transit stops, and the office. Bike sharing also encourages the use of public transit by providing commuters with a convenient transportation option for making local trips during the workday.

Multimodal Solutions

Decreasing reliance on conventional auto travel requires seamless transitions between transportation choices.

First- and Last-Mile Solutions

One of the barriers that commuters face when considering public transit is the first- and-last mile of the commute between their homes, transit stops, and work or school. It's essential to provide uncomplicated and safe routes to transit, in order to develop a multimodal transportation network. First- and last-mile solutions include enhanced bike

and pedestrian infrastructure around transit stations, services such as carsharing and bike sharing, and short-distance vanpools and shuttles. To increase transit as a viable option for commuting, iCommute will analyze the first- and last-mile barriers to transit along major commute corridors, and identify unique solutions that make transit accessible and viable in specific communities, as part of the SANDAG Safe Routes to Transit program.

Systems Integration

Integrating the Compass Card program with the iCommute online system and TDM programs will promote the transition between modes of transportation and streamline the administration of the TDM program. iCommute will incorporate Compass Card as the universal access and fare card for TDM programs such as bike lockers and stations, carshare, and bikeshare.

This effort will assist in expanding bike-to-work promotions and events during the month of May. These include bike safety education, bike commuting training, and special events. The planned expansion of "Walking School Bus" and "Bike Buddies" programs will complement the Safe Routes to School initiative, and introduce the benefits of active commuting to children. Additionally, the iCommute Web site will be upgraded to add new tools to encourage active commuting. Among them will be an Active Commute Calculator that measures and tracks the personalized health benefits of an active commute choice.

511 Advanced Traveler Information Services (511)

While the iCommute program provides commuters with their travel choices, 511 is the region's central hub for travel information and services. 511 provides commuters with real-time information on travel conditions so they can make informed decisions on what time to travel and what mode or route to take. The SANDAG Intelligent Transportation System (ITS) program manages this service. Features planned for the service include personalized communications such as e-mails and texts specific to a user's commute, help with planning trips across different modes of transportation, and integrating communications with mobile devices.



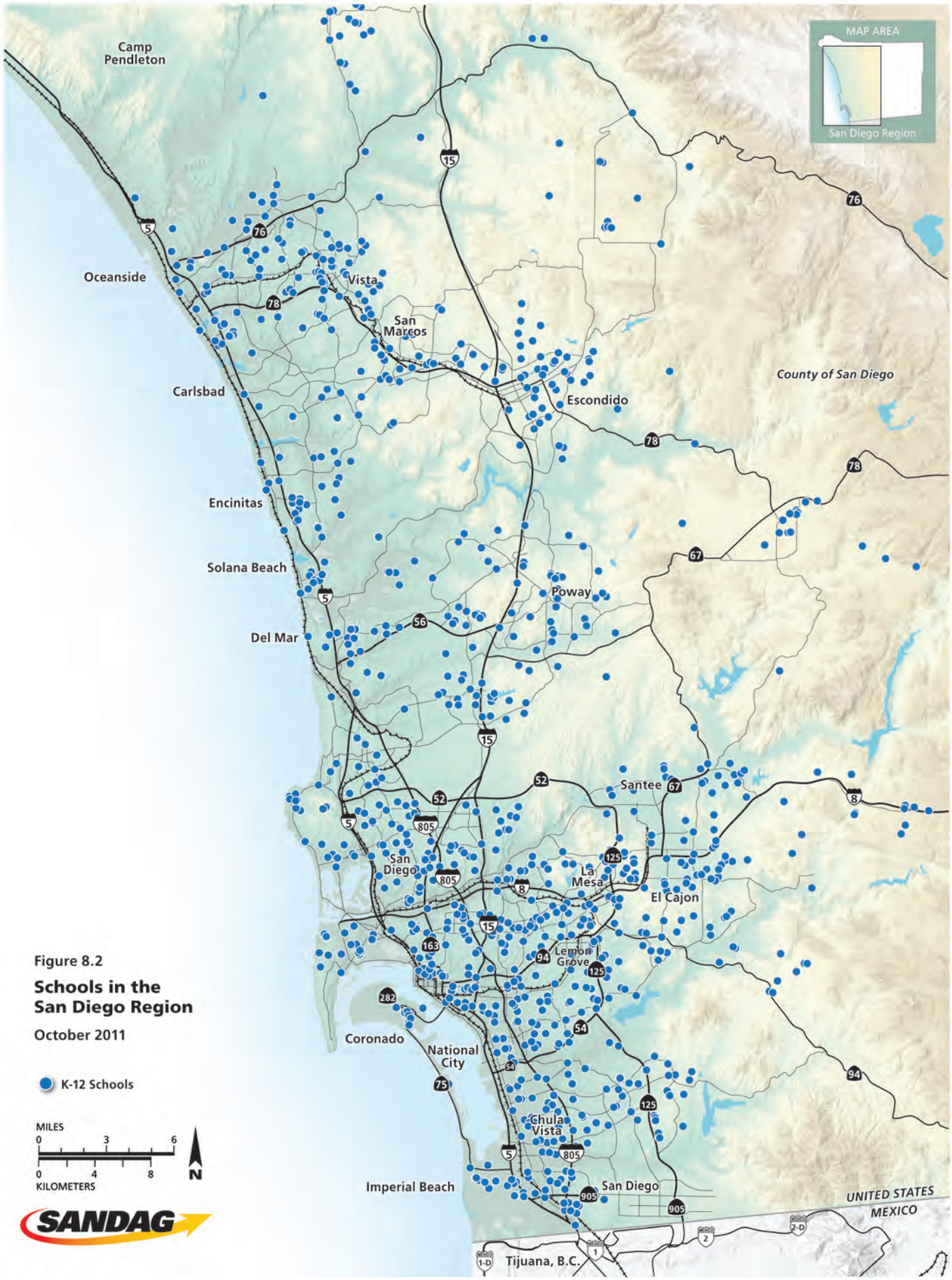
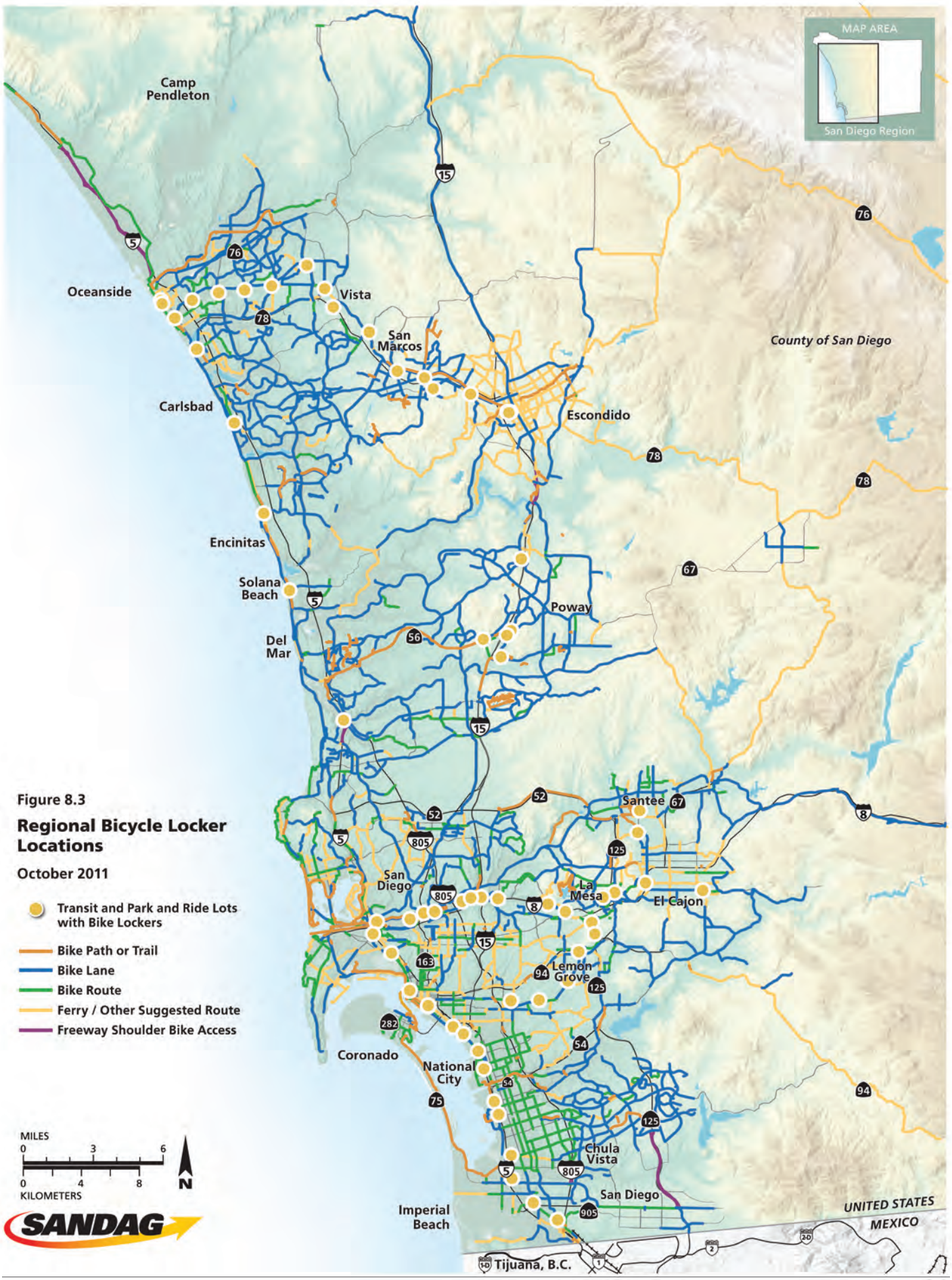


Figure 8.2

Schools in the San Diego Region

October 2011


MAP AREA
San Diego Region
Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
County of San Diego
Encinitas
Solana Beach
Del Mar
Poway
Santee
La Mesa
El Cajon
San Diego
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Tijuana, B.C.
UNITED STATES
MEXICO
Figure 8.3
Regional Bicycle Locker Locations
October 2011
Transit and Park and Ride Lots with Bike Lockers
Bike Path or Trail
Bike Lane
Bike Route
Ferry / Other Suggested Route
Freeway Shoulder Bike Access
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG

Opportunities and New Directions

Corridor Approach

One way that TDM measures can complement Systems Development and Systems Management is by supporting the region's corridor approach to transportation planning and implementing projects. Each regional corridor is confronted with unique transportation challenges, depending on the types of facilities available, adjacent land uses, and the surrounding environment. Therefore, a one-size-fits-all TDM strategy for the entire region will not provide optimal results.

Construction Mitigation

Another very tangible way that TDM measures support Systems Development is by applying TDM programs and services as mitigation for major highway construction projects. While temporary in nature, construction-related TDM measures are designed to provide solo commuters with options for avoiding construction-related traffic congestion. Concern over construction-related delays can be a key motivator for commuters to switch their mode or time of travel. Once commuters take action and choose a commute alternative, they may be more likely to continue using an alternative mode after the construction is complete.

With significant roadway improvements anticipated along several regional corridors, iCommute will form partnerships with Caltrans, local jurisdictions, transit agencies, and employers to develop project-specific TDM solutions to improve traffic congestion caused by construction.

With significant roadway improvements anticipated along several regional corridors, iCommute will form partnerships with Caltrans, local jurisdictions, transit agencies, and employers to develop project-specific TDM solutions to improve traffic congestion caused by construction. The model for this collaboration was developed by Caltrans and the City of San Diego in conjunction with the "Survive the Drive" campaign developed for the I-5/I-805 merge widening project completed in 2007. Since then, iCommute has worked with employers along the I-15 corridor to provide commuting solutions during construction of the I-15 Express Lanes. TDM efforts to relieve congestion during highway construction projects include increased funding, marketing of alternative commute options, developing performance measurements during the construction period, and outreach to employers situated near highway construction projects.

Funding and Performance Monitoring

TDM measures are relatively low-cost solutions that can be implemented more quickly than major capital projects, and they provide short-term results that help meet regional goals for reducing greenhouse gas emissions. The TDM plan includes more than $700 million (in 2010 dollars) budgeted over 40 years to fund programs and strategies described in this chapter. They directly support the other RTP strategies.

Quantitative and qualitative performance measures are used to monitor and report on the effectiveness of each element of the regional TDM program. The number of trips and vehicle miles of travel avoided in the region due to the SANDAG iCommute program, as well as the associated environmental and monetary savings, are measured on a monthly basis and reported each quarter. Qualitative performance measures will be captured through annual customer surveys.

The following actions support the plan's Demand Management Chapter recommendations:

Transportation Demand Management	
Actions	**Responsible Parties**
1. Expand outreach, education, and marketing to employers, commuters, schools, and agencies.	SANDAG, employers, schools, and member agencies
2. Develop a formal incentive program for commuters to track eligible trips in iCommute.	SANDAG
3. Develop a tiered vanpool subsidy that will increase participation in the Regional Vanpool Program by 70% by 2020.	SANDAG
4. Implement a regional carpool incentive program that will encourage the start of 5,300 new carpools annually.	SANDAG, employers, member agencies
5. Expand buspool services to additional military housing clusters and facilities.	SANDAG, regional military, MTS, NCTD
6. Increase the number of parents and schools participating in SchoolPool services through outreach and incentives.	SANDAG, schools, parent organizations
7. Launch a regional telework program that provides incentives and technical assistance to support employers with developing formal telework policies and programs.	SANDAG, employers
8. Study and implement bike encouragement programs and services that make bicycling a viable commute choice.	SANDAG
9. Study and implement multimodal solutions that integrate the transportation system and make alternatives to driving alone competitive and reliable.	SANDAG, MTS, NCTD, member agencies
10. Expand education and outreach activities that encourage active commuting.	SANDAG, member agencies
11. Enhance 511 services to include personalized traveler information and services.	SANDAG
12. Collaborate with partner agencies to develop customized TDM solutions for regional corridors.	SANDAG, Caltrans, MTS, NCTD, member agencies

Chapter 9

From the Ground Up: A Comprehensive Public Involvement Program that Generated Input from Stakeholders Throughout San Diego County

Chapter Contents

From the Ground Up 9-2
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2050 Regional Transportation Plan

From the Ground Up

The San Diego Association of Governments (SANDAG) implemented a comprehensive public outreach and involvement program to support the development of the 2050 Regional Transportation Plan (RTP or the Plan) and its Sustainable Communities Strategy (SCS). The 2050 RTP Public Involvement Plan (PIP) is based on the SANDAG Public Participation Plan, adopted by the SANDAG Board of Directors on December 18, 2009, per Government Code Section 65980(b)(2)(E).

Developing the Public Involvement Plan

The Public Involvement Plan guides outreach efforts to build awareness of the regional transportation planning process and identify opportunities for stakeholders to shape the region's future.

The PIP established a process and outlined specific activities for communicating with the public throughout the RTP development process, per Government Code Section 65080(b)(2)(F) (see Technical Appendix 6).

SANDAG developed the PIP with input received from the general public, Regional Planning Stakeholders Working Group (SWG), Regional Planning Committee, Transportation Committee, and the Board of Directors. Parallel to this, a tribal consultation work plan was developed (see Appendix C).

The goals, strategies, and tactics outlined in the PIP guide outreach efforts to build awareness of the regional transportation planning process and to identify opportunities for stakeholders to shape the region's future. The plan also describes SANDAG efforts to gather input on developing priorities and project selection criteria, as well as transportation networks, funding alternatives, how to meet greenhouse gas emissions targets, and other elements of the 2050 RTP. These efforts were coordinated during regular collaborations with the Regional Planning SWG and recipients of community-based outreach grants. The PIP also guided efforts to gather input from individuals, organizations, agencies, and other stakeholders in the development of the 2050 RTP.



Goals

The following broad goals were established to guide the outreach process.

- Raise awareness of the 2050 RTP as the region's updated blueprint for a transportation system that enhances our quality of life and meets our mobility needs for the future
- Stimulate dialogue about the transportation challenges facing the San Diego region
- Provide the public with opportunities to offer input on the 2050 RTP and its SCS, a new feature of the 2050 RTP required by state climate change legislation

- Develop and incorporate into the plan realistic solutions that address the diverse mobility needs of the region's residents, visitors, and business people
- Build public support for transportation improvements outlined in the 2050 RTP

Objectives

The following measurable objectives contributed to accomplishing the goals of the outreach process.

- Gather input from a wide variety of individuals, organizations, agencies, and local governments throughout the 2050 RTP development and decision-making process
- Provide timely and accessible public information about the proposed policies and plans contained in the 2050 RTP to a broad range of regional stakeholders
- Make public information accessible in a variety of formats and languages, using easy-to-understand language and concepts, and a variety of media including innovative visualization techniques
- Hold public workshops and meetings that foster meaningful dialogue and result in effective and inclusive decision-making
- Consider public input at each decision-making milestone in the development of the 2050 RTP
- Meet or exceed local, state, and federal guidelines and requirements for involving the public in the development of the RTP

Strategies

Pursuing the following strategies helped achieve the goals and objectives outlined above.

- Establish a clear project identity to convey information about the 2050 RTP, its SCS, and other RTP elements
- Develop materials on the RTP and other components using easily understood language
- Develop a marketing campaign to build awareness and gather public input
- Regularly involve public stakeholders in the process to foster understanding and agreement on issues related to the development of the 2050 RTP
- Communicate in a variety of ways to keep the public up-to-date on the development of the 2050 RTP, including through presentations; one-on-one and small group meetings; public workshops; written materials; online communications; social media; and the news media



- Provide the public with up-to-date information about the 2050 RTP on a regular basis through presentations, Web site and online communications, written materials, and news
- Provide information and notices on the 2050 RTP, public workshops, and other events to the SANDAG Board and Committee members so they can share information with their constituents and stakeholders
- Document and address public comments received during the public involvement process
- Provide information to the public about the 2050 RTP development process and promote opportunities for input and comments
- Provide information to decision-makers on the comments received throughout the public involvement process
- Assess the effectiveness of the PIP as key phases conclude (i.e., following workshops or the release of draft documents), to evaluate how strategies are working and what enhancements could be made

Community-Based Outreach

To help ensure that public input for the 2050 RTP reflected the diversity of the San Diego region, SANDAG partnered with community-based organizations in Communities of Concern to ensure that local voices were heard. The goal of the Community-Based Outreach Mini-Grant program is to engage and encourage diverse, inclusive, and active public participation from stakeholders in specific communities who traditionally are not involved in regional public policy planning. These stakeholders include low-income households, seniors, minorities, people with disabilities, and other groups.

Through a competitive bid process, SANDAG awarded grant funding to eight community-based organizations to conduct outreach. This outreach was coordinated with other public involvement activities by SANDAG to help prepare the RTP, update the SANDAG Public Participation Plan, and develop other regional initiatives.

Each organization that received a grant appointed one representative to serve as a member of the Regional Planning SWG. The following community-based organizations worked on this outreach and involvement effort:

- Able-Disabled Advocacy
- All Congregations Together
- Casa Familiar
- Chula Vista Community Collaborative
- El Cajon Community Collaborative
- Friends of Adult Day Health Care Centers
- Linda Vista Collaborative
- San Ysidro Business Association

Each group conducted outreach using strategies and techniques to reach residents and stakeholders in the communities they serve. A summary of the reports, public input, and comments from the community-based organizations is included in Technical



Appendix 6. This input was used to help develop the project evaluation criteria, performance measures, environmental justice analyses, network scenarios, and other elements of the 2050 RTP.

Public Workshops/ Public Hearings

Spring 2010 Public Workshops

In spring 2010, SANDAG held five subregional public workshops to provide information and gather input for the development of the 2050 RTP (Table 9.1). These workshops provided the public with information on the Urban Area Transit Strategy and transportation networks, the Notice of Preparation for the 2050 RTP Environmental Impact Report (EIR), and the greenhouse gas target setting process, which is a requirement of Senate Bill 375 (Steinberg, 2008) (SB 375).

Members of the Regional Planning SWG and community-based organizations helped structure the workshop format and assisted with outreach by serving as workshop co-hosts.

Spring 2011 Public Workshops/ Public Hearings

To secure input on the Draft 2050 RTP and SCS, SANDAG conducted five combination public workshops/public hearings and two additional public hearings at regularly scheduled SANDAG meetings (Table 9.2). While SB 375 required two public hearings for public input following the release of the Draft 2050 RTP and SCS, SANDAG held seven hearings to maximize opportunities for public input.

Staff considered the feedback from the spring 2010 public workshops in developing the format for the 2011 outreach. E-mail notification was very successful in building awareness of the public workshops/hearings and the public comment period. The workshop format was discussed at a SWG meeting and feedback was incorporated into the format and activities scheduled. For example, SWG members recommended including access to the Envision 2050 visualization tool at the workshops. A computer station was set up so participants could view the Envision 2050 tool at the workshops.

Table 9.1 – 2050 RTP/SCS Public Workshops – Spring 2010

Date	Time	Location
April 26, 2010	4 to 7 p.m.	Escondido City Hall 201 North Broadway Escondido
April 27, 2010	4 to 7 p.m.	Loma Verde Recreation Center 1420 Loma Lane Chula Vista
April 28, 2010	4 to 7 p.m.	Tri-City Medical Center Wellness Center 6250 El Camino Real Carlsbad
May 3, 2010	4 to 7 p.m.	Bayside Community Center 2202 Comstock Street San Diego
May 6, 2010	4 to 7 p.m.	Ronald Reagan Community Center 195 East Douglas Avenue El Cajon

Table 9.2 – 2050 RTP/SCS Public Workshops and Hearings – Spring 2011

Date	Time	Location
June 7, 2011	4 to 7 p.m.	Encinitas Community & Senior Center 1140 Oakcrest Park Drive Encinitas
June 8, 2011	4 to 7 p.m.	The Joe & Vi Jacobs Center 404 Euclid Avenue San Diego
June 9, 2011	4 to 7 p.m.	Sonrise Community Church 8805 North Magnolia Avenue Santee
June 13, 2011	4 to 7 p.m.	Martin Luther King Jr. Center 140 East 12th Street National City
June 16, 2011	4 to 7 p.m.	San Marcos City Council Chambers 1 Civic Center Drive San Marcos
Draft 2050 RTP and SCS Public Hearings		
June 10, 2011	10 a.m.	SANDAG Board Meeting 401 B Street San Diego
June 21, 2011	5 p.m.	Regional Planning Stakeholders Working Group Meeting 4050 Taylor Street San Diego

All workshops were conducted in an open house format where participants were invited to attend at any time during the workshop; review maps, displays, and information; ask questions of staff; complete comment cards; or speak to a bilingual English/Spanish transcriber to have their comments recorded. The public hearings were officiated by a SANDAG Board member. Transcriptions were produced and provided to the SANDAG Board of Directors and Policy Advisory Committees, as well as provided to the general public.

In total, more than 160 participants attended the workshops. While many comments were received at the workshops/hearings, staff encouraged participants also to access the other tools to provide feedback.

Public Outreach Activities

Public outreach activities, including meetings, presentations, community events, personal contacts, notices, and newsletters, were tracked and recorded to document the wide range of efforts that SANDAG employed to communicate with people throughout the region during the development of the 2050 RTP. These activities are included in table format in Technical Appendix 6.

The Public Involvement and Outreach Activities, included in table format in Technical Appendix 6, list 2050 RTP elements that have been presented since spring 2009 at meetings of the SANDAG Board of Directors, Policy Advisory Committees, Regional Planning SWG, and other working groups and community organizations. These meetings were promoted on the SANDAG Web site, and notices for them were distributed to

opt-in e-mail lists. Key milestones are featured at www.sandag.org/news.

These activities also included outreach to affordable housing advocates, transportation advocates, neighborhood and community groups, environmental advocates, builder representatives, broad-based business organizations, landowners, commercial property interests, and homeowner associations (see Technical Appendix 6). Through the 2050 RTP Speakers Bureau, presentations were made to groups representing these interests in order to disseminate information and provide opportunities for input and feedback. In addition, regular communications via newsletter, invitations, and e-mail provided ongoing updates and information on the 2050 RTP development process and how to get involved.

Through the Board of Directors, Policy Advisory Committees, Technical Working Groups, Stakeholder Working Groups, and other meetings and workshops, SANDAG consulted with agencies responsible for land use, natural resources, conservation, and historic preservation (see Technical Appendix 6).

SANDAG placed advertising in 17 print and online publications to promote the spring 2011 public workshops/public hearings schedule. Public input opportunities and the meeting schedule also were promoted on all MTS and NCTD bus, trolley, and rail vehicles in the region. E-mail blasts were distributed to more than 10,000 subscribers, and the SANDAG Facebook page promoted the workshops and public input opportunities. Extensive press coverage was garnered in local and regional newspapers and on television news broadcasts. See additional advertising and notification activities in table format in Technical Appendix 6.

SANDAG promoted several methods by which the public could submit comments on the 2050 RTP, SCS, EIR, and other elements. They include an online form in English and Spanish; printed comment form in English and Spanish; e-mail at: 2050rtp@sandag.org; a toll-free telephone number at (877) 277-5736; a fax number at (619) 699-1905; and U.S. mail or delivery to SANDAG.

Nearly 200 presentations (see Technical Appendix 6) were made between April 2009 and September 2011 throughout the region at business and community organizations. These included chambers of commerce, economic development corporations, taxpayer advocate groups, community collaboratives and community planning groups, local jurisdictions and agencies, trade associations, and other organizations.

A table included in Technical Appendix 6 details the general public involvement planning process that supports the development of the 2050 RTP, and it identifies activities that comply with SB 375 requirements. The tribal consultation process for the 2050 RTP was carried out in a parallel time frame, but it followed a government-to-government framework.

As with other stakeholder groups, input was sought from tribal nations on each step of the process that led to the selection of the Revenue Constrained Transportation Scenario, which forms the basis of the 2050 RTP, including:

- Goals/Objectives
- Project Evaluation Criteria
- Performance Measures
- Travel Times in Corridors

- Sustainable Communities Strategy
- Alternative Scenarios

With input from the Tribal Working Group, the SANDAG Board on June 11, 2010, approved the 2050 RTP Project Evaluation Criteria. These incorporate tribal lands into the overall set of criteria for transit and highway corridors and connectors, as well as the movement of goods.

This effort is summarized in the Government-to-Government Framework with Tribal Nations section of Chapter 6 and detailed in Appendix C.

Public Opinion Survey

SANDAG conducted a public opinion survey in June 2010. The survey provided answers to a number of questions to provide input for the development of the 2050 RTP. Among them: What are residents' priorities when it comes to building more transportation infrastructure, improving transit, and preserving open space? How should the region pay for new infrastructure? Are residents aware of new legislation mandating a reduction in greenhouse gas emissions from cars and light trucks?



SANDAG hired True North Research to conduct a regionwide telephone survey that asked residents about transportation system priorities, gauged awareness of new legislation mandating a reduction in greenhouse gases, and gathered information on what methods the public supports to reduce greenhouse gases from cars and light trucks. The information in the 2050 Regional Transportation Plan: Public Opinion Survey Report (see Technical Appendix 6) helped SANDAG make critical decisions about the 2050 RTP, its SCS, transportation networks, funding priorities, and other transportation infrastructure initiatives.

A total of 1,200 registered voters in the San Diego region were selected using stratified random sampling. This sample of people provided statistically reliable estimates for the region as a whole, as well as within six planning areas (North County West, North County East, North City, Central San Diego, East County, and South County). The study employed a strategic oversample by planning area to balance the statistical margins of error associated with estimates at the planning area level. SANDAG used the survey results to stimulate additional public policy discussions and provide background data to use for developing the 2050 RTP.

The survey results are posted at www.sandag.org/2050rtp.

Public Input Questionnaire

To support the development of the 2050 RTP, SANDAG also developed a public input questionnaire in English and in Spanish that was available online and in print from June to September 2010.

SANDAG distributed printed copies of the questionnaire at community meetings, and to various stakeholders interested in contributing to the development of the 2050 RTP. An online version of the questionnaire was posted on the SANDAG Web site. Information about answering the questionnaire was posted on the SANDAG Web site, distributed in the rEgion and RTP e-mail newsletters, provided at RTP workshops, and disseminated through community-based outreach. Announcements about the questionnaire also were featured in local and regional newspapers. The public input questionnaire contained the same questions as the RTP public opinion phone survey, with a few modifications so it could be converted to online and printed formats. More than 2,600 community members completed the questionnaire. Only one response per computer was allowed. The public input questionnaire was not designed to be representative of everyone's opinions, but rather to serve as a forum for public involvement.

While the questionnaire had the same questions as the statistically valid RTP public opinion telephone survey, the sampling process for the two surveys was quite different. Therefore, the results are different. The RTP public opinion telephone survey was designed to be representative of the region's population. Randomly sampling the population (as was done for the telephone survey) is a scientifically valid way to ensure that the survey results truly represent the views of a majority of residents in the San Diego region. In contrast, people who choose to complete a questionnaire (known as self selection) typically have stronger opinions than the public as a whole. However, the questionnaire did ask more questions about transportation infrastructure and funding priorities than the telephone survey. A report on the public input questionnaire is posted at www.sandag.org/2050rtp.

RTP Video

A three-minute video, entitled "Our Region. Our Future" and produced in English and Spanish, was designed to engage viewers in the discussion about the region's future plans for communities, transportation, employment, the economy, and the environment. The video provides an overview of the work, strategies, forecasts, and public input that are serving as guides for the region's vision through the year 2050.

Visualization Tool

An interactive Web-based visualization tool – called Envision 2050 – was launched in May 2011 following the release of the Draft 2050 RTP and its SCS. The tool visually demonstrated the priorities, investments, transportation system, and other key elements and concepts in the Draft 2050 RTP. The tool also included a Web-based form in English and Spanish for members of the public to submit public comments.

The 2050 RTP video provides an overview of the work, strategies, forecasts, and public input that are serving as guides for the region's vision through the year 2050.



Public Input on the Draft 2050 RTP

Throughout the development of the 2050 RTP, information was provided and public input gathered on various elements of the Plan. They included infrastructure priorities, performance measures, criteria, networks, and funding priorities. As part of this initial development process, public input and feedback were provided to the Policy Advisory Committees and the Board of Directors so this input could be considered during all stages of the decision-making process.

The PIP guided public outreach efforts to gather input on the 2050 RTP, its SCS, and the Draft 2050 RTP EIR. The Regional Planning SWG and community-based organizations provided strategic input and recommendations that SANDAG followed to provide information and obtain public comment on all elements of the 2050 RTP. Following are key accomplishments from the public outreach effort for the 2050 RTP.

Results

- Successfully outreached to partners and stakeholder networks to build awareness of the 2050 RTP and SCS
- Nearly 200 presentations were provided to groups and organizations throughout the county
- Meeting notifications, updates, and informational e-mail blasts were delivered periodically to more than 10,000 subscribers
- Nearly 2,600 visits were made during an 8-week period to the Envision 2050 Web site (www.envision2050sd.com) – an interactive visualization tool that demonstrated the networks and elements of the Draft 2050 RTP and SCS
- Enhanced participation and input from college students, community-based organizations, transportation advocates, transit riders, environmental groups, taxpayer advocates, and others are included in Technical Appendix 6
- A dedicated Web site at www.sandag.org/2050rtp is regularly updated with information, meetings and workshops, and opportunities to provide public input and comments
- Key documents are translated into Spanish and bilingual Spanish/English staff are available at public workshops, hearings, and other meetings
- Nearly 4,100 comments were received on the Draft 2050 RTP and SCS

The following actions support the Plan's Public Involvement Chapter recommendations:

Public Involvement	
Actions	**Responsible Parties**
1. Continue to use the SANDAG Public Participation Plan to guide efforts to provide information and gather input as 2050 RTP programs and projects are implemented.	SANDAG
2. Implement a process for ongoing collaboration with community-based organizations and other stakeholders in SANDAG programs and projects.	SANDAG, community based organizations, and other stakeholders
3. Track, assess, and report on public outreach and involvement efforts that supported the development of the 2050 RTP and SCS.	SANDAG
4. Follow industry best practices and consider using emerging media, trends, and practices as the 2050 RTP progresses.	SANDAG

Appendix A

2050 RTP Projects, Costs, and Phasing

Appendix Contents

2050 RTP Projects, Costs, and Phasing.....A-2

2050 RTP Projects, Costs, and Phasing

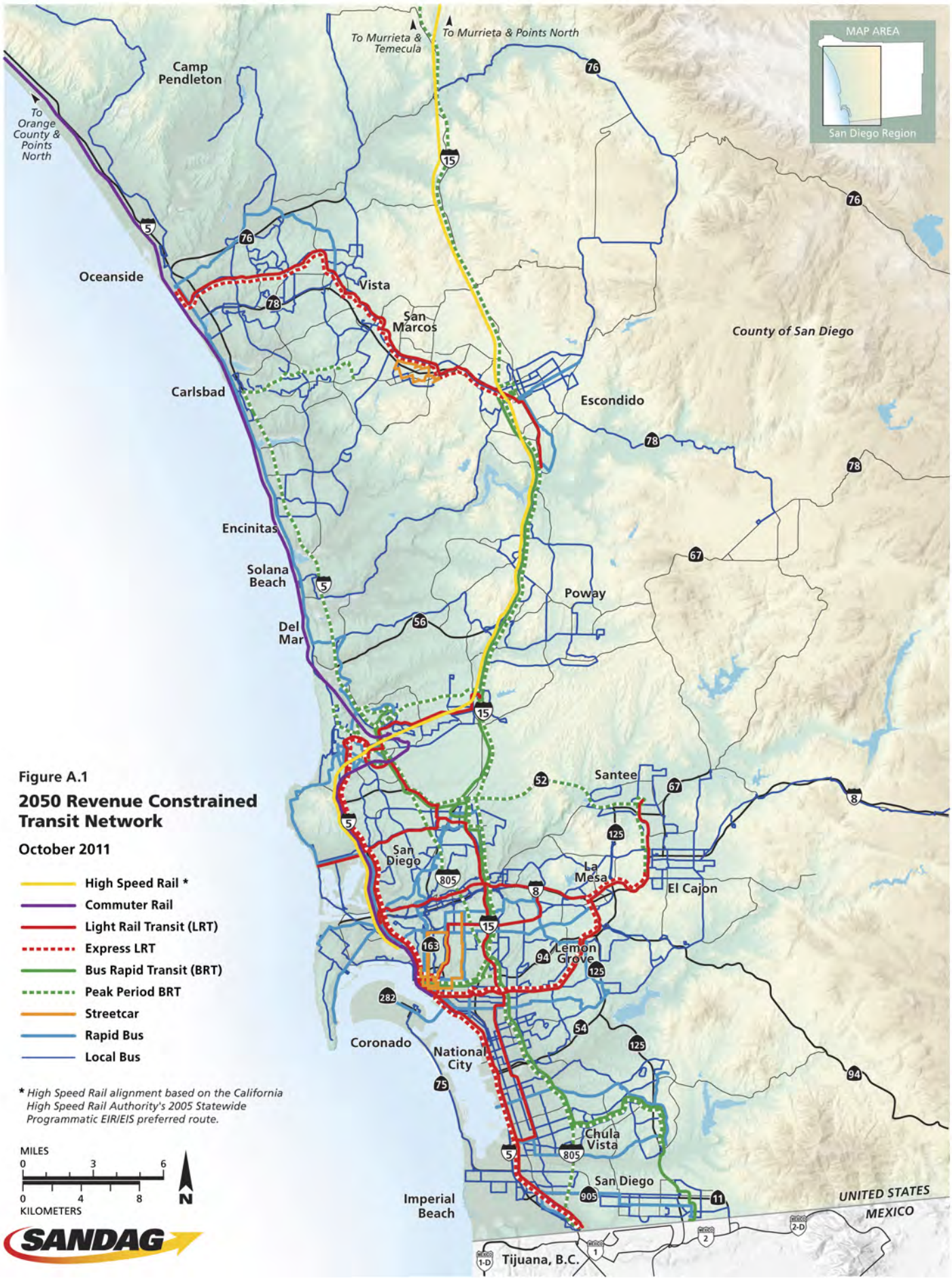
This appendix includes information for both the Revenue Constrained Plan and Unconstrained Needs scenario. Detailed highway and transit listings, cost estimates, and phasing are included for the Revenue Constrained Plan. For the Unconstrained Revenue scenario, detailed highway and transit listings and cost estimates are provided. In addition to the projects, costs, and phasing, level of service (LOS) and average daily traffic (ADT) data is included.

Figures A.1 and A.2 depict the 2050 Revenue Constrained transit and highway improvements, respectively. Tables A.1 and A.2 list the capital improvements in the 2050 Revenue Constrained Plan in 2010 and year of expenditure (YOE) dollars, respectively. Tables A.3 and A.4 include highway project phasing with costs shown in 2010 and YOE dollars, respectively. Table A.5 includes transit services phasing and headways for the Revenue Constrained Plan. Tables A.6 and A.7 list major transit expenditures in 2010 and YOE dollars, respectively. Table A.8 lists the phased arterial improvements. In addition to the 2050 Revenue Constrained highway and transit improvements, Figures A.3 through A.6 depict the 2020 and 2035 transit and highway improvements, respectively.

Figure A.7 illustrate the high frequency transit routes in 2035. Figures A.8 and A.9, depict the transit and highway improvements in the 2050 Unconstrained Network, respectively. The 2050 Unconstrained Network is summarized in Tables A.9 through A.11. Table A.9 lists the major capital improvements included in the Unconstrained Network. Tables A.10 and A.11 summarize the differences between the Revenue Constrained and the Unconstrained Networks (transit and highway projects).

Table A.12 lists the projects assumed in the 2050 No Build Scenario.

Figures A.10 and A.11 depict the LOS and ADT volumes for 2008 and for 2050, respectively.


To Murrieta & Temecula
To Murrieta & Points North
MAP AREA
San Diego Region
Camp Pendleton
To Orange County & Points North
Oceanside
Vista
San Marcos
County of San Diego
Carlsbad
Escondido
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
Figure A.1
2050 Revenue Constrained Transit Network
October 2011
High Speed Rail *
Commuter Rail
Light Rail Transit (LRT)
Express LRT
Bus Rapid Transit (BRT)
Peak Period BRT
Streetcar
Rapid Bus
Local Bus
* High Speed Rail alignment based on the California High Speed Rail Authority's 2005 Statewide Programmatic EIR/EIS preferred route.
MILES
0 3 6
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SANDAG

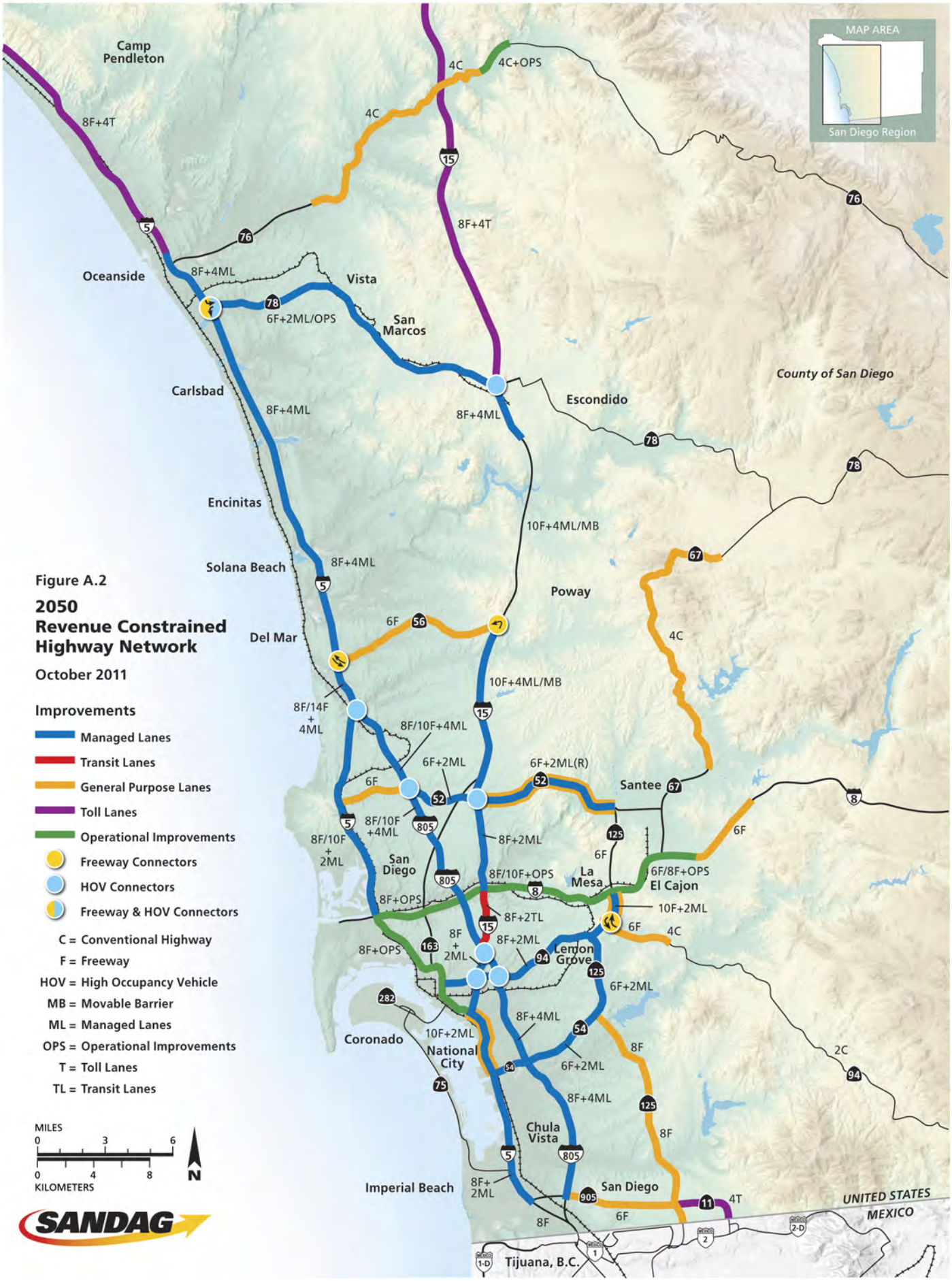


Figure A.2
2050
Revenue Constrained
Highway Network
October 2011
Improvements
Managed Lanes
Transit Lanes
General Purpose Lanes
Toll Lanes
Operational Improvements
Freeway Connectors
HOV Connectors
Freeway & HOV Connectors
C = Conventional Highway
F = Freeway
HOV = High Occupancy Vehicle
MB = Movable Barrier
ML = Managed Lanes
OPS = Operational Improvements
T = Toll Lanes
TL = Transit Lanes
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG
MAP AREA
San Diego Region
Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
County of San Diego
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Tijuana, B.C.
UNITED STATES
MEXICO
8F+4T
4C
4C+OPS
8F+4ML
6F+2ML/OPS
10F+4ML/MB
6F
8F/14F +4ML
8F/10F+4ML
6F+2ML
6F+2ML(R)
8F/10F +4ML
8F/10F +2ML
8F+2ML
8F/10F+OPS
8F+OPS
8F+2TL
8F +2ML
10F+2ML
6F/8F+OPS
8F+4ML
6F+2ML
8F
8F+ 2ML
4T
2C

Table A.1 – Capital Improvements – Revenue Constrained Plan ($ millions – 2010 dollars)

Transit Facilities			
Service	**Route**	**Description**	**Cost**
COASTER	398	Double tracking (includes grade separations at Leucadia Blvd and stations/platforms at Convention Center/Petco Park and Del Mar Fairgrounds, Del Mar Tunnel, and quiet zone improvements)	$2,617
SPRINTER	399	Double tracking (includes grade separations at El Camino Real, Vista Village Dr, Melrose Dr, Mission/San Marcos stations and two additional locations)	$970
SPRINTER	588	SPRINTER Express	$284
Trolley	510	Mid-Coast LRT Extension	$1,642
Trolley	510 and 520	Trolley System Rehabilitation (Blue and Orange Lines)	$510
Trolley	510	Blue Line Rail Grade Separations (Taylor St, Washington/ Sassafras St, 28th St, 32nd St, E St, H St, Palomar St)	$550
Trolley	520	Orange Line Rail Grade Separations (Euclid Ave, Broadway/ Lemon Grove Ave, Allison Ave/University Ave/La Mesa Blvd, Severin St)	$312
Trolley	522	Orange Line Express - El Cajon to downtown San Diego	$230
Trolley	540	Blue Line Express - UTC to San Ysidro via downtown	$455
Trolley	560	SDSU to downtown via Mid-City, El Cajon/Park Blvds	$1,921
Trolley	561	UTC to Mira Mesa via Sorrento Mesa/Carroll Canyon	$1,140
Trolley	562	UTC to San Ysidro via Kearny Mesa, Mission Valley, Mid-City, Southeastern San Diego, National City/Chula Vista via Highland Ave/4th Ave	$2,548
Trolley	563	Pacific Beach to El Cajon via Clairemont, Kearny Mesa, Mission Valley, SDSU	$1,262
Trolley	510, 520, 540, 522, and 560	Downtown Trolley Tunnel (12th & Imperial Transit Center to County Center/Little Italy Trolley Station)	$2,592
BRT	90	Santee/El Cajon Transit Centers to downtown via SR 94 (Peak Only)	$0
BRT	470	Escondido – UTC/UCSD via Mira Mesa Blvd	$ 20
BRT	610	Temecula (peak only)/Escondido to downtown	$ 89
BRT	628	South Bay BRT (Otay Mesa-Downtown) via Otay Ranch/Millenia	$200
BRT	640	I-5 - San Ysidro to downtown & Kearny Mesa via I-5 shoulder lanes/HOV lanes, downtown, Hillcrest, Mission Valley	$90
BRT	653	Mid-City to Palomar Airport Road via Kearny Mesa/I-805/I-5	$10
BRT	870	El Cajon to UTC via Santee, SR 52, I-805	$7
BRT	890	El Cajon to Sorrento Mesa via SR 52, Kearny Mesa	$12
BRT	680 and 688/689	Otay Mesa/San Ysidro to Sorrento Mesa via I-805 Corridor, Otay Ranch/Millenia, National City, Southeastern San Diego, Mid-City, Kearny Mesa	$425
BRT	120, 610, and 640	Hillcrest to Mission Valley Transit Priority Measures and I-15 Green Line/BRT transfer station	$400
BRT	-	South Bay Maintenance Facility	$51
BRT	-	Downtown BRT stations/layovers	$110

Table A.1 – Capital Improvements – Revenue Constrained Plan ($ millions – 2010 dollars) (Continued)

Transit Facilities (Continued)			
Service	**Route**	**Description**	**Cost**
Rapid	2	North Park to downtown San Diego via 30th St, Golden Hill	$38
Rapid	10	La Mesa to Ocean Beach via Mid-City, Hillcrest, Old Town	$85
Rapid	11	Spring Valley to SDSU via Southeastern San Diego, downtown, Hillcrest, Mid-City	$110
Rapid	15	Mid-City Rapid (downtown to SDSU via Mid-City, El Cajon, and Park Blvds)	$68
Rapid	28	Point Loma to Kearny Mesa via Old Town, Linda Vista	$48
Rapid	30	Old Town to Sorrento Mesa via Pacific Beach, La Jolla, UTC	$102
Rapid	120	Kearny Mesa to downtown via Mission Valley	$100
Rapid	471	Downtown Escondido to East Escondido	$31
Rapid	473	Oceanside to UTC via Hwy 101 Coastal Communities, Carmel Valley	$127
Rapid	474	Oceanside to Vista via Mission Ave/Santa Fe Road Corridor	$49
Rapid	635	Eastlake/EUC to Palomar Trolley via Main Street Corridor	$54
Rapid	636	SDSU to Spring Valley via East San Diego, Lemon Grove, Skyline	$39
Rapid	637	North Park to 32nd Street Trolley via Golden Hill	$32
Rapid	638	San Ysidro to Otay Mesa via Otay, SR 905 Corridor	$53
Rapid	709	H Street Trolley to Otay Ranch/Millenia via H Street Corridor, Southwestern College	$36
Rapid	910	Coronado to downtown via Coronado Bridge	$25
Streetcar	553	Downtown San Diego: Little Italy to East Village	$277
Streetcar	554	Hillcrest/Balboa Park/downtown San Diego Loop	$249
Streetcar	555	30th St to downtown San Diego via North Park, Golden Hill	$135
Shuttle	448/449	San Marcos Shuttle[1]	$0
Airport Express		Airport Express Routes[2]	$51
Intermodal	-	Airport Intermodal Transit Center	$165
Intermodal	-	San Ysidro Intermodal Transit Center	$50
Other	-	Other Improvements (Vehicles/vehicle replacement, maintenance facilities, transit system rehab, regulatory compliance, park and ride, ITS)	$6,824
		Subtotal	$27,195

[1] Capital cost to be funded by the City of San Marcos

[2] Capital cost to be funded by aviation funds

Table A.1 – Capital Improvements – Revenue Constrained Plan ($ millions – 2010 dollars) (Continued)

Managed Lanes/Highway Projects					
Freeway	**From**	**To**	**Existing**	**Improvements**	**Cost**
I-5	SR 905	SR 54	8F	8F+2ML	$295
I-5	SR 54	SR 15	8F	10F+2ML	$165
I-5	SR 15	I-8	8F	8F+Operational	$1,130
I-5	I-8	La Jolla Village Dr	8F/10F	8F/10F+2ML	$530
I-5	La Jolla Village Dr	I-5/I-805 Merge	8F/14F	8F/14F+2ML	$250
I-5	I-5/I-805 Merge	SR 56	8F/14F+2HOV	8F/14F+4ML	$50
I-5	SR 56	Vandegrift Blvd	8F/8F+2HOV	8F+4ML	$3,100
I-5	Vandegrift Blvd	Orange County	8F	8F+4T	$754
I-8	I-5	SR 125	8F/10F	8F/10F+Operational	$565
I-8	SR 125	2nd Street	6F/8F	6F/8F+Operational	$125
I-8	2nd Street	Los Coches	4F/6F	6F	$54
SR 11/Otay Mesa East Port of Entry (POE)	SR 905	Mexico	--	4T & POE	$755
SR 15	I-5	SR 94	6F	8F+2ML	$90
SR 15	SR 94	I-805	8F	8F+2ML	$20
SR 15	I-805	I-8	8F	8F+2TL	$45
I-15	I-8	SR 163	8F	8F+2ML	$850
I-15	SR 163	SR 56	8F+2ML(R)	10F+4ML/MB	$419
I-15	Centre City Parkway	SR 78	8F	8F+4ML	$210
I-15	SR 78	Riverside County	8F	8F+4T	$1,005
SR 52	I-5	I-805	4F	6F	$110
SR 52	I-805	I-15	6F	6F+2ML	$223
SR 52	I-15	SR 125	4F	6F+2ML(R)	$325
SR 54	I-5	SR 125	6F	6F+2ML	$100
SR 56	I-5	I-15	4F	6F	$135
SR 67	Mapleview St	Dye Rd	2C/4C	4C	$570
SR 76	Melrose Drive	I-15	2C	4C	$404
SR 76	I-15	Couser Canyon	2C	4C/6C+Operational	$130
SR 78	I-5	I-15	6F	6F+2ML/Operational	$570
SR 94	I-5	SR 125	8F	8F+2ML	$930
SR 94	SR 125	Avocado Blvd	4F	6F	$90
SR 94	Avocado Blvd	Jamacha Rd	4C	6C	$30
SR 94	Jamacha Rd	Steele Canyon Rd	2C/4C	4C	$20

Table A.1 – Capital Improvements – Revenue Constrained Plan ($ millions – 2010 dollars) (Continued)

Managed Lanes/Highway Projects (Continued)					
Freeway	**From**	**To**	**Existing**	**Improvements**	**Cost**
SR 125	SR 905	San Miguel Rd	4T	8F	$110
SR 125	San Miguel Rd	SR 54	4F	8F	$60
SR 125	SR 54	SR 94	6F	6F+2ML	$100
SR 125	SR 94	I-8	8F	10F+2ML	$285
SR 241	Orange County	I-5	--	4T/6T	$501
I-805	SR 905	Carroll Canyon Rd	8F/10F	8F/10F+4ML	$3,781
I-805	Carroll Canyon Rd	I-5 (north)	8F/10F	8F/10F+2ML	$87
SR 905	I-805	Mexico	--	6F	$595
				Subtotal	$19,568

HOV Connectors			
Freeway	**Intersecting Freeway**	**Movement**	**Cost**
I-5	SR 78	South to East and West to North, North to East and West to South	$240
I-5	I-805	North to North & South to South	$110
I-15	SR 52	West to North and South to East	$140
I-15	SR 78	East to South & North to West	$105
SR 15	SR 94	South to West & East to North	$80
SR 15	I-805	North to North & South to South	$90
I-805	SR 52	West to North & South to East	$90
I-805	SR 94	North to West & East to South	$160
		Subtotal	$1,015

Freeway Connectors			
Freeway	**Intersecting Freeway**	**Movement**	**Cost**
I-5	SR 56	West to North and South to East	$185
I-5	SR 78	South to East and West to South	$106
I-15	SR 56	North to West	$100
SR 94	SR 125	South to East and West to North	$319
		Subtotal	$710

Table A.1 – Capital Improvements – Revenue Constrained Plan ($ millions – 2010 dollars) (Continued)

Non-Highway Goods Movement Projects		
		Cost
Vesta Street Bridge	Mobility Connector over Harbor Drive at Naval Base San Diego	$60
32nd Street	Freeway Access Enhancement	$119
10th Avenue Marine Terminal Entrance	Rail Line Grade Separation/Barrio Logan Enhancement	$67
National City Marine Terminal	Bay Marina Drive, Civic Center Freeway Access Improvements	$7
National City Rail Yard		$7
	Subtotal	$260
	Total	**$48,748**

Key

C = Conventional Highway Lanes	MB = Movable barrier	T = Toll Lanes
F = Freeway Lanes	ML = Managed lanes (HOV & Value Pricing)	TL = Transit Lanes
HOV = High Occupancy Vehicle Lanes	ML(R) = Managed lanes (Reversible)	

Note: All HOV lanes would convert to Managed Lanes by 2035 with an HOV occupancy of 3+ people.

Table A.2 – Capital Improvements – Revenue Constrained Plan ($ millions – YOE dollars)

Transit Facilities			
Service	**Route**	**Description**	**Cost**
COASTER	398	Double tracking (includes grade separations at Leucadia Blvd, stations/platforms at Convention Center/Petco Park and Del Mar Fairgrounds, Del Mar Tunnel, and quiet zone improvements)	$4,979
SPRINTER	399	Double tracking (includes grade separations at El Camino Real, Vista Village Dr, Melrose Dr, Mission/San Marcos stations and two additional locations)	$1,149
SPRINTER	588	SPRINTER Express	$334
Trolley	510	Mid-Coast LRT Extension	$1,642
Trolley	510 and 520	Trolley System Rehabilitation (Blue and Orange Lines)	$456
Trolley	510	Blue Line Rail Grade Separations (Taylor St, Washington/Sassafras St, 28th St, 32nd St, E St, H St, Palomar St)	$861
Trolley	520	Orange Line Rail Grade Separations (Euclid Ave, Broadway/Lemon Grove Ave, Allison Ave/University Ave/La Mesa Blvd, Severin St)	$491
Trolley	522	Orange Line Express - El Cajon to downtown San Diego	$415
Trolley	540	Blue Line Express - UTC to San Ysidro via downtown	$822
Trolley	560	SDSU to downtown via Mid-City, El Cajon/Park Blvds	$4,009
Trolley	561	UTC to Mira Mesa via Sorrento Mesa/Carroll Canyon	$1,556
Trolley	562	UTC to San Ysidro via Kearny Mesa, Mission Valley, Mid-City, Southeastern San Diego, National City/Chula Vista via Highland Ave/4th Ave	$6,043
Trolley	563	Pacific Beach to El Cajon via Clairemont, Kearny Mesa, Mission Valley, SDSU	$1,978
Trolley	510, 520, 540, 522, and 560	Downtown Trolley Tunnel (12th & Imperial Transit Center to County Center/Little Italy Trolley Station)	$4,293
BRT	90	Santee/El Cajon Transit Centers to downtown via SR 94 (Peak Only)	$0
BRT	470	Escondido – UTC/UCSD via Mira Mesa Blvd	$18
BRT	610	Temecula (peak only)/Escondido to downtown	$80
BRT	628	South Bay BRT (Otay Mesa – downtown) via Otay Ranch/Millenia	$181
BRT	640	I-5 - San Ysidro to downtown & Kearny Mesa via I-5 shoulder lanes/HOV lanes, downtown, Hillcrest, Mission Valley	$86
BRT	653	Mid-City to Palomar Airport Road via Kearny Mesa/I-805/I-5	$16
BRT	870	El Cajon to UTC via Santee, SR 52, I-805	$7
BRT	890	El Cajon to Sorrento Mesa via SR 52, Kearny Mesa	$17
BRT	680 and 688/689	Otay Mesa/San Ysidro to Sorrento Mesa via I-805 Corridor, Otay Ranch/Millenia, National City, Southeastern San Diego, Mid-City, Kearny Mesa	$441
BRT	120, 610, and 640	Hillcrest to Mission Valley Transit Priority Measures and I-15 Green Line/BRT transfer station	$518
BRT	-	South Bay Maintenance Facility	$45
BRT	-	Downtown BRT stations/layovers	$97

Table A.2 – Capital Improvements – Revenue Constrained Plan ($ millions – YOE dollars) (Continued)

Transit Facilities (Continued)			
Service	**Route**	**Description**	**Cost**
Rapid	2	North Park to downtown San Diego via 30th St, Golden Hill	$43
Rapid	10	La Mesa to Ocean Beach via Mid-City, Hillcrest, Old Town	$90
Rapid	11	Spring Valley to SDSU via Southeastern San Diego, downtown, Hillcrest, Mid-City	$157
Rapid	15	Mid-City Rapid (downtown to SDSU via Mid-City, El Cajon, and Park Blvds)	$63
Rapid	28	Point Loma to Kearny Mesa via Old Town, Linda Vista	$61
Rapid	30	Old Town to Sorrento Mesa via Pacific Beach, La Jolla, UTC	$142
Rapid	120	Kearny Mesa to downtown via Mission Valley	$131
Rapid	471	Downtown Escondido to East Escondido	$48
Rapid	473	Oceanside to UTC via Hwy 101 Coastal Communities, Carmel Valley	$176
Rapid	474	Oceanside to Vista via Mission Ave/Santa Fe Road Corridor	$76
Rapid	635	Eastlake/EUC to Palomar Trolley via Main Street Corridor	$81
Rapid	636	SDSU to Spring Valley via East San Diego, Lemon Grove, Skyline	$57
Rapid	637	North Park to 32nd Street Trolley via Golden Hill	$48
Rapid	638	San Ysidro to Otay Mesa via Otay, SR 905 Corridor	$84
Rapid	709	H Street Trolley to Otay Ranch/Millenia via H Street Corridor, Southwestern College	$39
Rapid	910	Coronado to downtown via Coronado Bridge	$29
Streetcar	553	Downtown San Diego: Little Italy to East Village	$187
Streetcar	554	Hillcrest/Balboa Park/downtown San Diego Loop	$284
Streetcar	555	30th St to downtown San Diego via North Park, Golden Hill	$397
Shuttle	448/449	San Marcos Shuttle[1]	$0
Airport Express		Airport Express Routes[2]	$55
Intermodal	-	Airport Intermodal Transit Center	$171
Intermodal	-	San Ysidro Intermodal Transit Center	$52
Other	-	Other Improvements (Vehicles/vehicle replacement, maintenance facilities, transit system rehab, regulatory compliance, park and ride, ITS)	$10,022
		Subtotal	$43,027

[1] Capital cost to be funded by the City of San Marcos

[2] Capital cost to be funded by aviation funds.

Table A.2 – Capital Improvements – Revenue Constrained Plan ($ millions – YOE dollars) (Continued)

Managed Lanes/Highway Projects					
Freeway	**From**	**To**	**Existing**	**Improvements**	**Cost**
I-5	SR 905	SR 54	8F	8F+2ML	$500
I-5	SR 54	SR 15	8F	10F+2ML	$393
I-5	SR 15	I-8	8F	8F+Operational	$2,689
I-5	I-8	La Jolla Village Dr	8F/10F	8F/10F+2ML	$1,261
I-5	La Jolla Village Dr	I-5/I-805 Merge	8F/14F	8F/14F+2ML	$260
I-5	I-5/I-805 Merge	SR 56	8F/14F+2HOV	8F/14F+4ML	$68
I-5	SR 56	Vandegrift Blvd	8F/8F+2HOV	8F+4ML	$4,286
I-5	Vandegrift Blvd	Orange County	8F	8F+4T	$1,795
I-8	I-5	SR 125	8F/10F	8F/10F+Operational	$1,273
I-8	SR 125	2nd Street	6F/8F	6F/8F+Operational	$226
I-8	2nd Street	Los Coches	4F/6F	6F	$129
SR 11/Otay Mesa East Port of Entry (POE)	SR 905	Mexico	--	4T & POE	$755
SR 15	I-5	SR 94	6F	8F+2ML	$214
SR 15	SR 94	I-805	8F	8F+2ML	$31
SR 15	I-805	I-8	8F	8F+2TL	$47
I-15	I-8	SR 163	8F	8F+2ML	$1,849
I-15	SR 163	SR 56	8F+2ML(R)	10F+4ML/MB	$419
I-15	Centre City Parkway	SR 78	8F	8F+4ML	$210
I-15	SR 78	Riverside County	8F	8F+4T	$2,392
SR 52	I-5	I-805	4F	6F	$262
SR 52	I-805	I-15	6F	6F+2ML	$314
SR 52	I-15	SR 125	4F	6F+2ML(R)	$587
SR 54	I-5	SR 125	6F	6F+2ML	$238
SR 56	I-5	I-15	4F	6F	$244
SR 67	Mapleview St	Dye Rd	2C/4C	4C	$781

Table A.2 – Capital Improvements – Revenue Constrained Plan ($ millions – YOE dollars) (Continued)

Managed Lanes/Highway Projects (Continued)					
Freeway	**From**	**To**	**Existing**	**Improvements**	**Cost**
SR 76	Melrose Drive	I-15	2C	4C	$404
SR 76	I-15	Couser Canyon	2C	4C/6C+Operational	$235
SR 78	I-5	I-15	6F	6F+2ML/Operational	$592
SR 94	I-5	SR 125	8F	8F+2ML	$1,310
SR 94	SR 125	Avocado Blvd	4F	6F	$214
SR 94	Avocado Blvd	Jamacha Rd	4C	6C	$71
SR 94	Jamacha Rd	Steele Canyon Rd	2C/4C	4C	$48
SR 125	SR 905	San Miguel Rd	4T	8F	$262
SR 125	San Miguel Rd	SR 54	4F	8F	$143
SR 125	SR 54	SR 94	6F	6F+2ML	$238
SR 125	SR 94	I-8	8F	10F+2ML	$421
SR 241	Orange County	I-5	--	4T/6T	$522
I-805	SR 905	Carroll Canyon Rd	8F/10F	8F/10F+4ML	$4,764
I-805	Carroll Canyon Rd	I-5 (north)	8F/10F	8F/10F+2ML	$81
SR 905	I-805	Mexico	--	6F	$595
				Subtotal	$31,123

HOV Connectors			
Freeway	**Intersecting Freeway**	**Movement**	**Cost**
I-5	SR 78	South to East and West to North, North to East and West to South	$377
I-5	I-805	North to North & South to South	$114
I-15	SR 52	West to North and South to East	$260
I-15	SR 78	East to South & North to West	$109
SR 15	SR 94	South to West & East to North	$126
SR 15	I-805	North to North & South to South	$94
I-805	SR 52	West to North & South to East	$146
I-805	SR 94	North to West & East to South	$166
		Subtotal	$1,392

Table A.2 – Capital Improvements – Revenue Constrained Plan ($ millions – YOE dollars) (Continued)

Freeway Connectors			
Freeway	**Intersecting Freeway**	**Movement**	**Cost**
I-5	SR 56	West to North and South to East	$253
I-5	SR 78	South to East and West to South	$166
I-15	SR 56	North to West	$186
SR 94	SR 125	South to East and West to North	$391
		Subtotal	$996
Non-Highway Goods Movement Projects			
			Cost
Vesta Street Bridge		Mobility Connector over Harbor Drive at Naval Base San Diego	$59
32nd Street		Freeway Access Enhancement	$117
10th Avenue Marine Terminal Entrance		Rail Line Grade Separation/Barrio Logan Enhancement	$66
National City Marine Terminal		Bay Marina Drive, Civic Center Freeway Access Improvements	$7
National City Rail Yard			$7
		Subtotal	$256
		Total	**$76,794**

KEY

C = Conventional Highway Lanes	MB = Movable barrier	T= Toll Lanes
F = Freeway Lanes	ML = Managed lanes (HOV & Value Pricing)	TL = Transit Lanes
HOV= High Occupancy Vehicle Lanes	ML(R) = Managed lanes (Reversible)	

Note: All HOV lanes would convert to Managed Lanes by 2035 with an HOV occupancy of 3+ people.

Table A.3 – Phased Highway Projects – Revenue Constrained Plan ($ millions – 2010 dollars)

Year Built By	Freeway	From	To	Existing	Improvements	($ Millions - 2010 Dollars) Cost	Cumulative Cost
2018	I-5	Manchester Ave	SR 78	8F	8F+2HOV	$480	$480
2018	SR 11/ Otay Mesa East POE	SR 905	Mexico	--	4T	$755	$1,235
2018	I-15	SR 163	SR 56	8F+2ML(R)	10F+4ML/MB	$419	$1,654
2018	I-15	Centre City Parkway	SR 78	8F	8F+4ML	$210	$1,864
2018	SR 76	Melrose Drive	I-15	2C	4C	$404	$2,268
2018	SR 241	Orange County	I-5	--	4T	$443	$2,711
2018	I-805	Palomar St	SR 94	8F	8F+2HOV	$200	$2,911
2018	I-805	SR 52	Carroll Canyon Rd	8F/10F	8F/10F+2HOV	$163	$3,074
2018	I-805	Carroll Canyon Rd	I-5 (north)	8F/10F	8F/10F+2ML	$87	$3,161
2018	SR 905	I-805	Mexico	--	6F	$595	$3,756
2018	Vesta Street Bridge		Mobility Connector over Harbor Drive at Naval Base San Diego			$60	$3,816
2018	32nd Street		Freeway Access Enhancement			$119	$3,935
2018	10th Avenue Marine Terminal Entrance		Rail Line Grade Separation/Barrio Logan Enhancement			$67	$4,002
2018	National City Marine Terminal		Bay Marina Drive, Civic Center Freeway Access Improvements			$7	$4,009
2020	I-5	La Jolla Village Drive	I-5/I-805 Merge	8F/14F	8F/14F+2ML	$250	$4,259
2020	I-5/I-805	North to North & South to South (HOV Connectors)				$110	$4,369
2020	SR 15	I-805	I-8	8F	8F+2TL	$45	$4,414
2020	I-15	I-8	SR 163	8F	8F+2ML	$130	$4,544
2020	SR 15/ I-805	North to North & South to South (HOV Connectors)				$90	$4,634
2020	I-15/SR 78	East to South & North to West (HOV Connectors)				$105	$4,739
2020	SR 78	I-5	I-15	6F	6F+2ML/Operational	$570	$5,309
2020	SR 94	I-5	I-805	8F	8F+2ML	$480	$5,789
2020	SR 94/ SR 125	South to East (Freeway Connector)				$139	$5,928
2020	I-805	Palomar St	SR 15	8F/8F+ 2HOV[1]	8F+4ML	$1,200	$7,128

Table A.3 – Phased Highway Projects – Revenue Constrained Plan ($ millions – 2010 dollars) (Continued)

Year Built By	Freeway	From	To	Existing	Improvements	($ Millions - 2010 Dollars) Cost	Cumulative Cost
2020	I-805/ SR 94	North to West & East to South (HOV Connectors)				$160	$7,288
2020	I-805	SR 52	Carroll Canyon Rd	8F/10F+ 2HOV	8F/10F+4ML	$391	$7,679
2020	National City Rail Yard					$7	$7,686
2030	I-5	Palomar St	SR 15	8F	8F+2ML	$200	$7,886
2030	I-5	I-5/I-805 Merge	SR 56	8F/14F+2H OV	8F/14F+4ML	$50	$7,936
2030	I-5	SR 56	Manchester Ave	8F+2HOV	8F+4ML	$500	$8,436
2030	I-5/SR 56	West to North (Freeway Connector)				$65	$8,501
2030	I-5/SR 56	South to East (Freeway Connector)				$120	$8,621
2030	I-5	Manchester Ave	Palomar Airport Rd	8F+2HOV[2]	8F+4ML	$950	$9,571
2030	SR 67	Mapleview St	Dye Rd	2C/4C	4C	$570	$10,141
2030	SR 94/ SR 125	West to North (Freeway Connector)				$180	$10,321
2030	SR 125	SR 94	I-8	8F	10F	$215	$10,536
2030	SR 241	Orange County	I-5	4T	6T	$58	$10,594
2030	I-805	SR 905	Palomar St	8F	8F+4ML	$350	$10,944
2030	I-805	SR 15	Mission Valley Viaduct	8F	8F+4ML	$230	$11,174
2030	I-805	Mission Valley Viaduct	SR 52	8F/10F	8F/10F+4ML	$637	$11,811
2035	I-5	Palomar Airport Rd	SR 78	8F+2HOV[2]	8F+4ML	$750	$12,561
2035	I-5	SR 78	Vandegrift Blvd	8F	8F+4ML	$420	$12,981
2035	I-5/SR 78	South to East and West to North (HOV Connectors)				$120	$13,101
2035	I-5/SR 78	North to East and West to South (HOV Connectors)				$120	$13,221
2035	I-5/SR 78	South to East (Freeway Connector)				$60	$13,281
2035	I-5/SR 78	West to South (Freeway Connector)				$46	$13,327
2035	SR 15	SR 94	I-805	8F	8F+2ML	$20	$13,347
2035	SR 15/ SR 94	South to West & East to North (HOV Connectors)				$80	$13,427
2035	SR 52	I-805	I-15	6F	6F+2ML	$223	$13,650

Table A.3 – Phased Highway Projects – Revenue Constrained Plan ($ millions – 2010 dollars) (Continued)

Year Built By	Freeway	From	To	Existing	Improvements	($ Millions - 2010 Dollars) Cost	Cumulative Cost
2040	I-8	I-15	SR 125	8F/10F	8F/10F+Operational	$125	$13,775
2040	I-8	SR 125	2nd Street	6F/8F	6F/8F+Operational	$125	$13,900
2040	SR 52	I-15	SR 125	4F	6F+2ML(R)	$325	$14,225
2040	SR 56	I-5	I-15	4F	6F	$135	$14,360
2040	SR 76	I-15	Couser Canyon	2C	4C/6C+Operational	$130	$14,490
2040	SR 94	I-805	College Ave	8F	8F+2ML	$220	$14,710
2040	SR 94	College Ave	SR 125	8F	8F+2ML	$230	$14,940
2040	SR 125	SR 94	I-8	10F	10F+2ML	$70	$15,010
2040	I-805	Mission Valley Viaduct		8F	8F+4ML	$610	$15,620
2040	I-805/ SR 52	West to North & South to East (HOV Connectors)				$90	$15,710
2050	I-5	SR 905	Palomar St	8F	8F+2ML	$95	$15,805
2050	I-5	SR 54	I-15	8F	10F+2ML	$165	$15,970
2050	I-5	I-15	I-8	8F	8F+Operational	$1,130	$17,100
2050	I-5	I-8	La Jolla Village Dr	8F/10F	8F/10F+2ML	$530	$17,630
2050	I-5	Vandegrift Blvd	Orange County	8F	8F+4T	$754	$18,384
2050	I-8	I-5	I-15	8F	8F+Operational	$440	$18,824
2050	I-8	2nd Street	Los Coches	4F/6F	6F	$54	$18,878
2050	SR 15	I-5	SR 94	6F	8F+2ML	$90	$18,968
2050	I-15	Viaduct		8F	8F+2ML	$720	$19,688
2050	I-15	SR 78	Riverside County	8F	8F+4T	$1,005	$20,693
2050	I-15/SR 52	West to North and South to East (HOV Connectors)				$140	$20,833
2050	I-15/SR 56	North to West (Freeway Connector)				$100	$20,933
2050	SR 52	I-5	I-805	4F	6F	$110	$21,043
2050	SR 54	I-5	SR 125	6F	6F+2ML	$100	$21,143

Table A.3 – Phased Highway Projects – Revenue Constrained Plan ($ millions – 2010 dollars) (Continued)

Year Built By	Freeway	From	To	Existing	Improvements	($ Millions - 2010 Dollars) Cost	Cumulative Cost
2050	SR 94	SR 125	Avocado Blvd	4F	6F	$90	$21,233
2050	SR 94	Avocado Blvd	Jamacha Rd	4C	6C	$30	$21,263
2050	SR 94	Jamacha Rd	Steele Canyon Rd	2C/4C	4C	$20	$21,283
2050	SR 125	SR 905	San Miguel Rd	4T	8F	$110	$21,393
2050	SR 125	San Miguel Rd	SR 54	4F	8F	$60	$21,453
2050	SR 125	SR 54	SR 94	6F	6F+2ML	$100	$21,553

KEY

C = Conventional Highway Lanes
F = Freeway Lanes
HOV = High Occupancy Vehicle Lanes
MB = Movable barrier
ML = Managed lanes (HOV & Value Pricing)
ML(R) = Managed lanes (Reversible)
T = Toll Lanes
TL = Transit Lanes

[1] Project completed in two phases. See improvement from 8F to 8F+2HOV by 2018.

[2] Project completed in two phases. See improvement from 8F to 8F+2HOV by 2018.

Note: All HOV lanes would convert to Managed Lanes by 2035 with an HOV occupancy of 3+ people.

Table A.4 – Phased Highway Projects – Revenue Constrained Plan ($ millions – YOE dollars)

Year Built By	Freeway	From	To	Existing	Improvements	($ Millions - YOE Dollars) Cost	Cumulative Cost
2018	I-5	Manchester Ave	SR 78	8F	8F+2HOV	$460	$460
2018	SR 11/ Otay Mesa East POE	SR 905	Mexico	--	4T	$755	$1,215
2018	I-15	SR 163	SR 56	8F+2ML(R)	10F+4ML/MB	$419	$1,634
2018	I-15	Centre City Parkway	SR 78	8F	8F+4ML	$210	$1,844
2018	SR 76	Melrose Drive	I-15	2C	4C	$404	$2,248
2018	SR 241	Orange County	I-5	--	4T	$443	$2,691
2018	I-805	Palomar St	SR 94	8F	8F+2HOV	$197	$2,888
2018	I-805	SR 52	Carroll Canyon Rd	8F/10F	8F/10F+2HOV	$160	$3,048
2018	I-805	Carroll Canyon Rd	I-5 (north)	8F/10F	8F/10F+2ML	$81	$3,129
2018	SR 905	I-805	Mexico	--	6F	$595	$3,724
2018	Vesta Street Bridge		Mobility Connector over Harbor Drive at Naval Base San Diego			$59	$3,783
2018	32nd Street		Freeway Access Enhancement			$117	$3,900
2018	10th Avenue Marine Terminal Entrance		Rail Line Grade Separation/Barrio Logan Enhancement			$66	$3,966
2018	National City Marine Terminal		Bay Marina Drive, Civic Center Freeway Access Improvements			$7	$3,973
2020	I-5	La Jolla Village Drive	I-5/I-805 Merge	8F/14F	8F/14F+2ML	$260	$4,233
2020	I-5/I-805	North to North & South to South (HOV Connectors)				$114	$4,347
2020	SR 15	I-805	I-8	8F	8F+2TL	$47	$4,394
2020	I-15	I-8	SR 163	8F	8F+2ML	$135	$4,529
2020	SR 15/ I-805	North to North & South to South (HOV Connectors)				$94	$4,623
2020	I-15/SR 78	East to South & North to West (HOV Connectors)				$109	$4,732
2020	SR 78	I-5	I-15	6F	6F+2ML/Operational	$592	$5,324
2020	SR 94	I-5	I-805	8F	8F+2ML	$499	$5,823
2020	SR 94/ SR 125	South to East (Freeway Connector)				$144	$5,967
2020	I-805	Palomar St	SR 15	8F/8F+2HOV[1]	8F+4ML	$1,247	$7,214

Table A.4 – Phased Highway Projects – Revenue Constrained Plan ($ millions – YOE dollars) (Continued)

Year Built By	Freeway	From	To	Existing	Improvements	($ Millions - YOE Dollars) Cost	Cumulative Cost
2020	I-805/ SR 94	North to West & East to South (HOV Connectors)				$166	$7,380
2020	I-805	SR 52	Carroll Canyon Rd	8F/10F+ 2HOV	8F/10F+4ML	$406	$7,786
2020	National City Rail Yard					$7	$7,793
2030	I-5	Palomar St	SR 15	8F	8F+2ML	$274	$8,067
2030	I-5	I-5/I-805 Merge	SR 56	8F/14F+2H OV	8F/14F+4ML	$68	$8,135
2030	I-5	SR 56	Manchester Ave	8F+2HOV	8F+4ML	$685	$8,820
2030	I-5/SR 56	West to North (Freeway Connector)				$89	$8,909
2030	I-5/SR 56	South to East (Freeway Connector)				$164	$9,073
2030	I-5	Manchester Ave	Palomar Airport Rd	8F+2HOV[2]	8F+4ML	$1,301	$10,374
2030	SR 67	Mapleview St	Dye Rd	2C/4C	4C	$781	$11,155
2030	SR 94/ SR 125	West to North (Freeway Connector)				$247	$11,402
2030	SR 125	SR 94	I-8	8F	10F	$295	$11,697
2030	SR 241	Orange County	I-5	4T	6T	$79	$11,776
2030	I-805	SR 905	Palomar St	8F	8F+4ML	$463	$12,239
2030	I-805	SR 15	Mission Valley Viaduct	8F	8F+4ML	$315	$12,554
2030	I-805	Mission Valley Viaduct	SR 52	8F/10F	8F/10F+4ML	$873	$13,427
2035	I-5	Palomar Airport Rd	SR 78	8F+ 2HOV[2]	8F+4ML	$1,181	$14,608
2035	I-5	SR 78	Vandegrift Blvd	8F	8F+4ML	$661	$15,269
2035	I-5/SR 78	South to East and West to North (HOV Connectors)				$189	$15,458
2035	I-5/SR 78	North to East and West to South (HOV Connectors)				$188	$15,646
2035	I-5/SR 78	South to East (Freeway Connector)				$94	$15,740
2035	I-5/SR 78	West to South (Freeway Connector)				$72	$15,812
2035	SR 15	SR 94	I-805	8F	8F+2ML	$31	$15,843
2035	SR 15/ SR 94	South to West & East to North (HOV Connectors)				$126	$15,969
2035	SR 52	I-805	I-15	6F	6F+2ML	$314	$16,283

Table A.4 – Phased Highway Projects – Revenue Constrained Plan ($ millions – YOE dollars) (Continued)

Year Built By	Freeway	From	To	Existing	Improvements	($ Millions - YOE Dollars) Cost	Cumulative Cost
2040	I-8	I-15	SR 125	8F/10F	8F/10F+Operational	$226	$16,509
2040	I-8	SR 125	2nd Street	6F/8F	6F/8F+Operational	$226	$16,735
2040	SR 52	I-15	SR 125	4F	6F+2ML(R)	$587	$17,322
2040	SR 56	I-5	I-15	4F	6F	$244	$17,566
2040	SR 76	I-15	Couser Canyon	2C	4C/6C+Operational	$235	$17,801
2040	SR 94	I-805	College Ave	8F	8F+2ML	$396	$18,197
2040	SR 94	College Ave	SR 125	8F	8F+2ML	$415	$18,612
2040	SR 125	SR 94	I-8	10F	10F+2ML	$126	$18,738
2040	I-805	Mission Valley Viaduct		8F	8F+4ML	$1,101	$19,839
2040	I-805/ SR 52	West to North & South to East (HOV Connectors)				$146	$19,985
2050	I-5	SR 905	Palomar St	8F	8F+2ML	$226	$20,211
2050	I-5	SR 54	I-15	8F	10F+2ML	$393	$20,604
2050	I-5	I-15	I-8	8F	8F+Operational	$2,689	$23,293
2050	I-5	I-8	La Jolla Village Dr	8F/10F	8F/10F+2ML	$1,261	$24,554
2050	I-5	Vandegrift Blvd	Orange County	8F	8F+4T	$1,795	$26,349
2050	I-8	I-5	I-15	8F	8F+Operational	$1,047	$27,396
2050	I-8	2nd Street	Los Coches	4F/6F	6F	$129	$27,525
2050	SR 15	I-5	SR 94	6F	8F+2ML	$214	$27,739
2050	I-15	Viaduct		8F	8F+2ML	$1,714	$29,453
2050	I-15	SR 78	Riverside County	8F	8F+4T	$2,392	$31,845
2050	I-15/SR 52	West to North and South to East (HOV Connectors)				$260	$32,105
2050	I-15/SR 56	North to West (Freeway Connector)				$186	$32,291
2050	SR 52	I-5	I-805	4F	6F	$262	$32,553
2050	SR 54	I-5	SR 125	6F	6F+2ML	$238	$32,791

Table A.4 – Phased Highway Projects – Revenue Constrained Plan ($ millions – YOE dollars) (Continued)

Year Built By	Freeway	From	To	Existing	Improvements	($ Millions - YOE Dollars) Cost	Cumulative Cost
2050	SR 94	SR 125	Avocado Blvd	4F	6F	$214	$33,005
2050	SR 94	Avocado Blvd	Jamacha Rd	4C	6C	$71	$33,076
2050	SR 94	Jamacha Rd	Steele Canyon Rd	2C/4C	4C	$48	$33,124
2050	SR 125	SR 905	San Miguel Rd	4T	8F	$262	$33,386
2050	SR 125	San Miguel Rd	SR 54	4F	8F	$143	$33,529
2050	SR 125	SR 54	SR 94	6F	6F+2ML	$238	$33,767

KEY

C = Conventional Highway Lanes
F = Freeway Lanes
HOV = High Occupancy Vehicle Lanes
MB = Movable barrier
ML = Managed lanes (HOV & Value Pricing)
ML(R) = Managed lanes (Reversible)
T = Toll Lanes
TL = Transit Lanes

[1] Project completed in two phases. See improvement from 8F to 8F+2HOV by 2018.

[2] Project completed in two phases. See improvement from 8F to 8F+2HOV by 2018.

Note: All HOV lanes would convert to Managed Lanes by 2035 with an HOV occupancy of 3+ people.

Table A.5 – Phased Transit Services – Revenue Constrained Plan

Decade	Service	Route	Description	Peak Headway (Minutes)	Off-Peak Headway (Minutes)
2018	COASTER	398	Double tracking/Increased Frequency between Oceanside and downtown San Diego with extension to Convention Center/Petco Park	20	Current
2018	Trolley	510	Mid-Coast LRT Extension (peak frequencies 7.5 to downtown/15 to UTC)	7.5/15	15
2018	Trolley	530	Green Line Extend to downtown – Bayside	15	15
2018	BRT	470	Escondido – UTC/UCSD via Mira Mesa Blvd	10	-
2018	BRT	607	Rancho Bernardo – downtown Express	10	-
2018	BRT	608	Escondido – downtown Express	10	-
2018	BRT	610	Temecula (Peak Only)/Escondido – downtown	10	10
2018	BRT	628	South Bay BRT (Otay Mesa – downtown) via Otay Ranch/Millenia	15	-
2018	BRT	680	Otay Mesa to Sorrento Mesa via I-805 Corridor, Otay Ranch/Millenia, National City, Southeastern San Diego, Kearny Mesa	15	15
2018	BRT	688	San Ysidro to Sorrento Mesa Express	15	-
2018	BRT	689	Millenia/Otay Ranch to UTC/Torrey Pines Express	15	-
2018	Rapid	15	Mid-City Rapid (SDSU – downtown) via Mid-City, El Cajon and Park Blvds	10	10
2018	Rapid	201/202	UTC Area Super Loop	10	15
2018	Rapid	350	Escondido to Del Lago via Escondido Blvd & Bear Valley	10	10
2020	Streetcar	554	Hillcrest/Balboa Park/downtown San Diego Loop	10	10
2020	BRT	90	Santee/El Cajon Transit Centers to downtown via SR 94	15	-
2020	BRT	640	I-5 - San Ysidro to downtown & Kearny Mesa via I-5 shoulder lanes/HOV lanes, downtown, Hillcrest, Mission Valley	15	15
2020	BRT	870	El Cajon to UTC via Santee, SR 52, I-805 (Peak only)	10	-
2020	Rapid	10	La Mesa to Ocean Beach via Mid-City, Hillcrest, Old Town	10	10
2020	Shuttle	448/449	San Marcos Shuttle	15	15
2020	Airport Express		I-5 from McClellan-Palomar Airport to San Diego International Airport	30	30
2020	Airport Express		I-15 from Escondido Transit Center to San Diego International Airport	30	30
2020	Airport Express		I-15 from Escondido Transit Center to Cross Border Facility	30	30
2020			Local Bus Routes - 15 minutes in key corridors	15	15

Table A.5 – Phased Transit Services – Revenue Constrained Plan (Continued)

Decade	Service	Route	Description	Peak Headway (Minutes)	Off-Peak Headway (Minutes)
2030	COASTER	398	Additional Double tracking/Increased Frequency	20	60
2030	SPRINTER	399	Double tracking (Oceanside-Escondido) Increased Frequencies	10	10
2030	Trolley	561	UTC to Mira Mesa via Sorrento Mesa/Carroll Canyon (extension of route 510)	7.5	7.5
2030	Trolley	520	Orange Line - Increased Frequency (existing 15/15)	7.5	15
2030	Streetcar	553	Downtown San Diego: Little Italy to East Village	10	10
2030	SPRINTER	588	SPRINTER Express	10	15
2030	BRT	890	El Cajon to Sorrento Mesa via SR 52, Kearny Mesa	10	-
2030	Rapid	2	North Park to downtown San Diego via North Park, Golden Hill	10	10
2030	Rapid	28	Point Loma to Kearny Mesa via Old Town, Linda Vista	10	10
2030	Rapid	30	Old Town to Sorrento Mesa via Pacific Beach, La Jolla, UTC	10	10
2030	Rapid	120	Kearny Mesa to downtown via Mission Valley	10	10
2030	Rapid	473	Oceanside to UTC via Hwy 101 Coastal Communities, Carmel Valley	10	10
2030	Rapid	709	H Street Trolley to Otay Ranch/Millenia via H Street Corridor, Southwestern College	10	10
2030	Rapid	910	Coronado to downtown via Coronado Bridge	10	10
2035	Trolley	520	Orange Line - Extend to Airport Intermodal Transit Center	7.5	15
2035	Streetcar	555	30th St to downtown San Diego via North Park/Golden Hill	10	10
2035	Trolley	560	Mid-City to downtown (Phase 1) via El Cajon and Park Blvds	7.5	7.5
2035	Trolley	563	Pacific Beach to El Cajon via Clairemont, Kearny Mesa, Mission Valley, SDSU	7.5	10
2035	BRT	653	Mid-City to Palomar Airport Road via Kearny Mesa/I-805/I-5	15	-
2035	Rapid	11	Spring Valley to SDSU via Southeastern San Diego, Downtown, Hillcrest, Mid-City	10	10
2035	Rapid	201/202	UTC Area Super Loop - Increase Frequencies	10	10
2035	Rapid	471	Downtown Escondido to East Escondido	10	10
2035	Rapid	474	Oceanside to Vista via Mission Ave/Santa Fe Road Corridor	10	10
2035	Rapid	635	Eastlake/EUC to Palomar Trolley via Main Street Corridor	10	10
2035	Rapid	636	SDSU to Spring Valley via East San Diego, Lemon Grove, Skyline	10	10
2035	Rapid	637	North Park to 32nd Street Trolley via Golden Hill	10	10

Table A.5 – Phased Transit Services – Revenue Constrained Plan (Continued)

Decade	Service	Route	Description	Peak Headway (Minutes)	Off-Peak Headway (Minutes)
2035	Rapid	638	San Ysidro to Otay Mesa via Otay, SR 905 Corridor	10	10
2035	Shuttle	448/449	San Marcos - Increase Frequencies	10	10
2035			Local Bus Routes - 10 minutes in key corridors	10	10
2040	Trolley	520	Orange Line - Increased Frequencies	7.5	7.5
2040	Trolley	522	Orange Line Express - El Cajon to downtown San Diego	10	10
2040	Trolley	530	Green Line Extend to downtown - Bayside	7.5	7.5
2040	Trolley	540	Blue Line Express - UTC to San Ysidro via downtown	10	10
2050	Trolley	560	SDSU to downtown (Phase 2) via Mid-City, El Cajon and Park Blvds	7.5	7.5
2050	Trolley	562	UTC to San Ysidro via Kearny Mesa, Mission Valley, Mid-City, Southeastern San Diego, National City/Chula Vista via Highland Ave/4th Ave	7.5	10

Table A.6 – Major Transit Expenditures – Revenue Constrained Plan ($ millions – 2010 dollars)

Project Categories	2010 - 2020	2021 - 2030	2031 - 2040	2041 - 2050	Total
Major New Facilities	$4,519	$4,001	$6,345	$5,506	$20,371
Miscellaneous Capital/Rehabilitation/Replacement	$1,368	$1,807	$1,142	$2,507	$6,824
Transit Operations	$3,449	$4,220	$5,840	$6,191	$19,700
ADA, Senior, and Specialized Transportation Services	$345	$422	$584	$619	$1,970
High-Speed Rail	$0	$0	$0	$7,000	$7,000
TOTAL	**$9,681**	**$10,450**	**$13,911**	**$21,823**	**$55,865**

Table A.7 – Major Transit Expenditures - Revenue Constrained Plan ($ millions – YOE dollars)

Project Categories	2010 - 2020	2021 - 2030	2031 - 2040	2041 - 2050	Total
Major New Facilities	$4,512	$5,917	$9,583	$12,993	$33,005
Miscellaneous Capital/Rehabilitation/Replacement	$1,392	$2,511	$1,196	$4,923	$10,022
Transit Operations	$3,993	$6,775	$12,942	$18,977	$42,687
ADA, Senior, and Specialized Transportation Services	$399	$677	$1,294	$1,898	$4,268
High-Speed Rail	$0	$0	$0	$16,644	$16,644
TOTAL	**$10,296**	**$15,880**	**$25,015**	**$55,435**	**$106,626**

Table A.8 – Phased Arterial Projects[1] – Revenue Constrained Plan

Conformity Analysis Year	SANDAG ID	Lead Agency	Project Title	Project Description
2018	CB04A	Carlsbad	El Camino Real Widening - Tamarack Avenue to Chestnut Avenue	In Carlsbad, widen El Camino Real to prime arterial standards with three travel lanes, bike lanes and sidewalks in each direction including intersection improvements at Tamarack Avenue and Chestnut Avenue
2018	CB04B	Carlsbad	El Camino Real and Cannon Road	In Carlsbad, along the eastside of El Camino Real just south of Cannon Road widen to prime arterial standards with three through lanes, a right turn lane and a sidewalk approaching the intersection
2018	CB04C	Carlsbad	El Camino Real - Lisa Street to Crestview Drive	In Carlsbad, along the west side of El Camino Real, roadway widening to provide three southbound through lanes, curb, gutter and sidewalk per Prime Arterial standards
2018	CB12	Carlsbad	College Boulevard Reach A - Badger Lane to Cannon Road	In Carlsbad, from Badger Lane to Cannon Road, construct a new segment of College Blvd. to provide 4-lane roadway with raised median, bike lanes and sidewalks/trails in accordance with Major Arterial standards
2018	CB13	Carlsbad	Poinsettia Lane Reach E - Cassia Drive to Skimmer Court	In Carlsbad, from Cassia Drive to Skimmer Court, construct a new 4-lane roadway with median, bike lanes, and sidewalks/trails to major arterial standards
2018	CB22	Carlsbad	Avenida Encinas - Widen from Palomar Airport Road to EWPCF	In Carlsbad, Avenida Encinas from Palomar Airport Road southerly to existing improvements adjacent to the EWPCF, roadway widening to Secondary Arterial standards
2018	CB24	Carlsbad	College Boulevard and Palomar Airport Road - Intersection Improvements	In Carlsbad, at the intersection of College Blvd. and Palomar Airport Road, roadway widening along southbound College Blvd. to provide dual left turns, one thru lane, one shared thru/right turn lane and one right turn lane and to lengthen right turn lanes on the other approaches to the intersection
2018	CB26	Carlsbad	Melrose and Palomar Airport Road	In Carlsbad, at the intersection of Palomar Airport Road and Melrose Drive, roadway widening along southbound Melrose to provide an additional right turn lane to westbound Palomar Airport Road
2018	CB32	Carlsbad	El Camino Real Widening - Cassia to Camino Vida Roble	In Carlsbad, widen El Camino Real from 900 feet north of Cassia Road to Camino Vida Roble, along the northbound side of the roadway to provide three travel lanes and a bike lane in accordance with Prime Arterial standards
2018	CB30	Carlsbad	El Camino Real – El Camino Real to Tamarack Avenue	In Carlsbad, at the intersection of El Camino Real and Tamarack Avenue construct a second left turn lane from El Camino Real to westbound Tamarack

[1] The arterials listed in this table reflect locally initiated projects that were submitted by local jurisdictions in the 2010 Regional Transportation Improvement Program.

Table A.8 – Phased Arterial Projects – Revenue Constrained Plan (Continued)

Conformity Analysis Year	SANDAG ID	Lead Agency	Project Title	Project Description
2018	CB31	Carlsbad	El Camino Real – La Costa Avenue to Arenal Road	In Carlsbad along El Camino Real from 700 feet north of La Costa Avenue to Arenal Road, widening along the southbound side of the roadway to provide three travel lanes and a bike lane in accordance with Prime Arterial Standards
2018	CB33	Carlsbad	Palomar Airport Road and El Camino Real Right Turn Lane	In Carlsbad, widening along eastbound Palomar Airport Road to provide a dedicated right turn lane to southbound El Camino Real
2018	CB34	Carlsbad	Palomar Airport Road - Palomar Airport Road to Paseo Del Norte	In Carlsbad widening along eastbound Palomar Airport Road to provide a dedicated right turn lane to southbound Paseo Del Norte
2018	CB35	Carlsbad	Palomar Airport Road - Palomar Airport Road to Paseo Del Norte	In Carlsbad lengthen the left turn pocket along eastbound Palomar Airport Road to northbound Paseo Del Norte
2018	CHV08	Chula Vista	Willow Street Bridge Project - Bonita Road to Sweetwater Road	Replace and widen bridge including shoulders
2018	CHV20	Chula Vista	North Fourth Avenue and Brisbane Street	Add additional lane on east side of Fourth Avenue
2018	CNTY14	San Diego County	South Santa Fe Avenue North - Montgomery Drive to South of Woodland Drive	Vista City limits to 700 feet south of Woodland - reconstruct and widen from 2 to 4 lanes including bicycle lane
2018	CNTY21	San Diego County	Bradley Avenue Overpass at SR 67 - Magnolia Avenue to Mollison Avenue	Widen Bradley Avenue including the SR 67 overpass from 2 to 4 lanes plus sidewalks
2018	CNTY24	San Diego County	Cole Grade Road - North of Horse Creek Trail to South of Pauma Heights Road	Widen to accommodate 14-ft traffic lane in both direction, 12-ft center 2-way left turn, 6-ft bike lane & 10-ft pathway
2018	CNTY34	San Diego County	Dye Road Extension - Dye Road to San Vicente Road	In Ramona, study, design and construct a 2-lane community collector road with intermittent turn lanes, bike lanes, curb, gutter, and pathway/walkway
2018	CNTY35	San Diego County	Ramona Street Extension - Boundary Avenue to Warnock Drive	In the community of Ramona, construct new road extension, 2 lanes with intermittent turn lanes, bike lanes and walkway/pathway
2018	CNTY36	San Diego County	San Vicente Road Improvements - Warnock Drive to Wildcat Canyon Road	In Ramona, design and reconstruct road improvements, including 2-lane community collector road with intermittent turn lanes, bike lanes, asphalt concrete dike, and pathway/walkway

Table A.8 – Phased Arterial Projects – Revenue Constrained Plan (Continued)

Conformity Analysis Year	SANDAG ID	Lead Agency	Project Title	Project Description
2018	CNTY39	San Diego County	Bear Valley Parkway North - San Pasqual Valley Road to Boyle Avenue	Widen from 2 to 4 lanes, with a center median, a bike lane and shoulder in each direction of travel
2018	CNTY76	San Diego County	Jamacha Blvd (Phase 1 and 2) - Omega Street to Sweetwater Spring Boulevard	In unincorporated Spring Valley, the current funds programmed are for Phase 1 - between Omega Street and Spring Valley Glen, widen from 2-lane to 4-lane roadway with bicycle and pedestrian improvements
2018	ENC31	Encinitas	I-5/Encinitas Boulevard Interchange Modification	Modify interchange to improve safety and alleviate congestion (design only)
2018	ESC02	Escondido	Bear Valley/East Valley/Valley Center - Citrus Avenue to Beven Drive	Realignment and widening from 2 to 4 lanes
2018	ESC02A	Escondido	East Valley/Valley Center	Widen roadway from 4 to 6 lanes with raised medians and left turn pockets; modify signal at Lake Wohlford and Valley Center Road; widen bridge over Escondido Creek
2018	ESC03	Escondido	Citracado Parkway - Don Lee Place to Vineyard	Widen from 2 to 4 lanes with left turn pockets and new traffic signal at Aero Way and Citracado Parkway
2018	ESC04	Escondido	Citracado Parkway II - West Valley to Harmony Grove	Widen from 2 to 4 lanes with raised medians, construct bridge over Escondido Creek
2018	ESC05	Escondido	El Norte Parkway Phase IV	Widen from 2 to 4 lanes and construct missing section of El Norte Pkwy. with left turn pockets, raised medians and new traffic signals
2018	ESC06	Escondido	El Norte Parkway Bridge at Escondido Creek - Kaile Lane to Key Lime Way	Construct missing 2-lane bridge at Escondido Creek
2018	ESC08	Escondido	Felicita Avenue/ Juniper Street - from Escondido Boulevard to Juniper Street and from Juniper Street to Chestnut Street	Widen from 2 to 4 lanes with left turn pockets, raised medians on Felicita; new traffic signals at Juniper and Chestnut, Juniper and 13th Avenue, Juniper and 15th Avenue; modify traffic signal at Juniper and Felicita
2018	ESC09	Escondido	Ninth Avenue – La Terraza Boulevard to Spruce Street	Widen from 2 to 4 lanes with raised median and modify traffic signals at Ninth Avenue and Tulip Street - design phase
2018	ESC24	Escondido	Centre City Parkway - Mission Road to SR 78	Widen 4 lanes to 6 lanes with intersection improvements

Table A.8 – Phased Arterial Projects – Revenue Constrained Plan (Continued)

Conformity Analysis Year	SANDAG ID	Lead Agency	Project Title	Project Description
2018	ESC25	Escondido	Citracado/Nordahl - Country Club Lane to SR 78	Widen from 4 lanes to 6 lanes with double left turn lanes and exclusive right turn lanes
2018	LG13	Lemon Grove	Street Improvements (Congestion Relief)	Lemon Grove Avenue Realignment Project: A key project in the redevelopment of the city's downtown Village Specific Plan, this project improves access to and from SR 94, reducing motorist delays and emissions, while greatly enhancing the visual appeal of the block adjacent to the trolley station.
2018	NC01	National City	Plaza Boulevard Widening	Widen from 2 to 3 lanes including a new traffic lane in each direction, new sidewalks, sidewalk widening, traffic signal upgrades and interconnection
2018	O06	Oceanside	Melrose Drive	Extension in Oceanside, future construction of 4-lane arterial highway with medians, sidewalks and bike lanes
2018	O26	Oceanside	SR 76 & Rancho Del Oro Boulevard	Widen SR 76 for one additional lane width 1,500 feet west and east of Rancho del Oro Boulevard
2018	O27	Oceanside	Coast Highway and SR 76	Roundabout in Oceanside, construction of a traffic circle at the intersection of North Coast Highway and SR 76; the traffic circle will be unsignalized; free traffic flow at all approaches
2018	POW02	Poway	Espola Road	Widen Espola Road from 2 to 3 lanes with 8-foot bike lanes/shoulders
2018	SD34	San Diego	El Camino Real	In San Diego on El Camino Real from San Dieguito Road to Via de la Valle - reconstruct and widen from 2 to 4 lanes and extend transition lane and additional grading to avoid biological impacts (CIP 52-479.0)
2018	SD70	San Diego	West Mission Bay Drive Bridge	In San Diego, replace bridge and increase from 4- to 6-lane bridge including Class II bike lane (52-643)
2018	SD83	San Diego	SR 163/Friars Road Interchange Modification	Friars Road from Avenida de las Tiendas to Mission Center Road widen and improve Friars Road and overcrossing; reconstruct interchange including improvements to ramp intersections (Phase 1). Construct new connector roadways and structures (Phase 2). Construct auxiliary lanes along northbound and southbound SR 163 (Phase 3)
2018	SD90	San Diego	SR 163/Clairemont Mesa Boulevard Interchange	In San Diego, widen from 4- to 6-lane prime arterial; Phase II of the project - west ramps (CIP 52-745.0)

Table A.8 – Phased Arterial Projects – Revenue Constrained Plan (Continued)

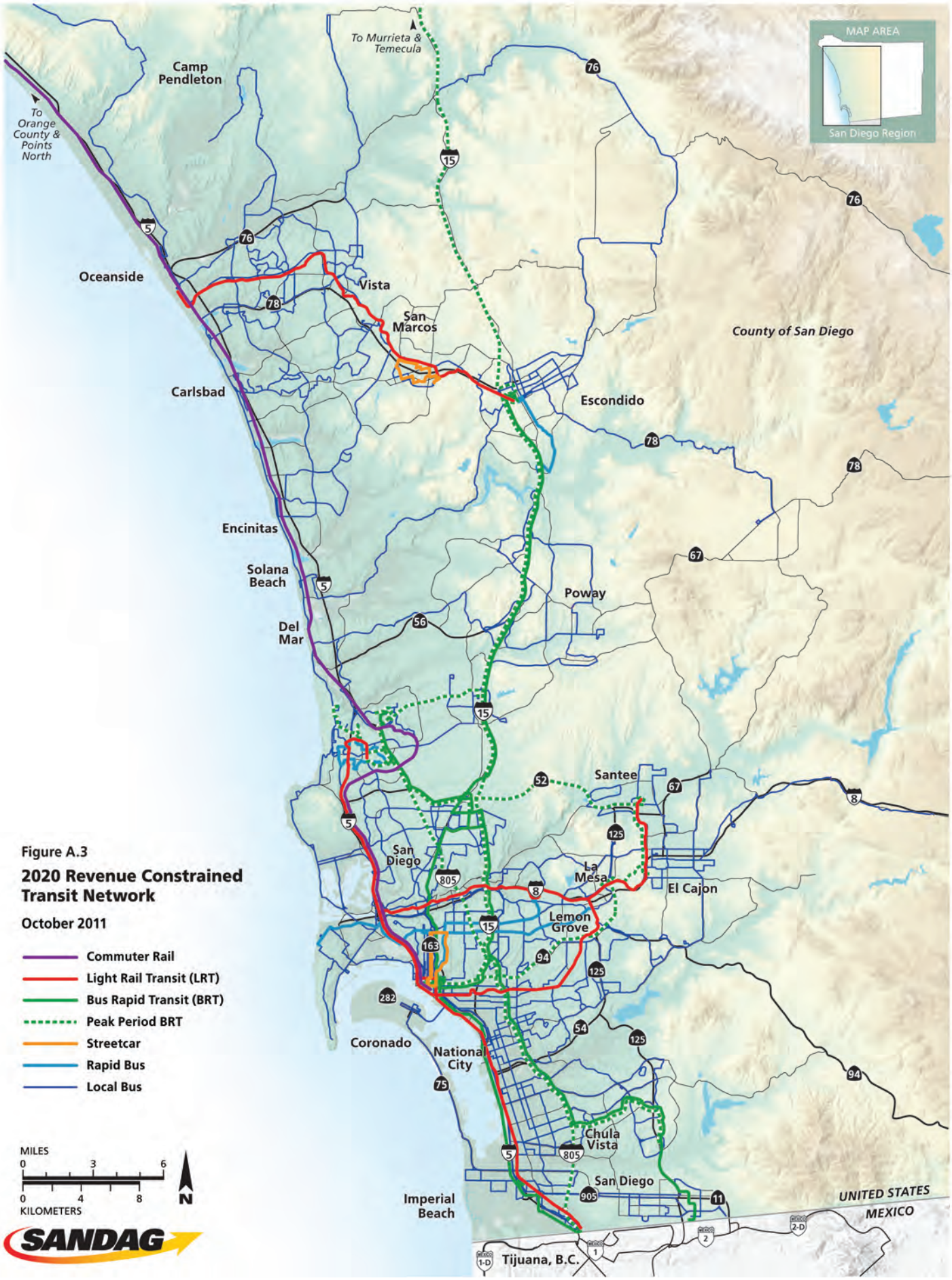
Conformity Analysis Year	SANDAG ID	Lead Agency	Project Title	Project Description
2018	SD102A	San Diego	Otay Truck Route Widening	On Otay Truck Route in San Diego from Drucker Lane to La Media, add one lane (total 3 lanes) for trucks; from Britannia to La Media, add one lane for trucks and one lane for emergency vehicles (Border Patrol/fire department access); along Britannia from Britannia Court to the Otay Truck Route - add one lane for trucks
2018	SD103	San Diego	I-5/Genesee Avenue Interchange	In San Diego, replace Genesee Avenue over crossing from 4-lane bridge with 6-lane bridge; construct auxiliary lanes and replace Voigt Drive bridge; add additional lane at on/off ramp to Sorrento Valley Rd.; add one carpool lane and one general purpose lane to on ramp from Sorrento Valley Road to southbound I-5; install ramp meters at on ramp and construct a southbound auxiliary lane between Sorrento Valley Road and Genesee Avenue
2018	SD133	San Diego	Mira Sorrento Place	Mira Sorrento Place from Scranton Road to Vista Sorrento Parkway in San Diego widen the existing 2-lane 560-foot portion of Mira Sorrento Place (40-foot road width, 55-foot right of way) to a 4-lane collector (72-foot road width, 92-foot right of way), and extend the road to intersect with Vista Sorrento Parkway at the existing on/off ramps to I-805
2018	SM19	San Marcos	Grand Avenue Bridge	In San Marcos, construct 4-lane arterial; between Bent Avenue to Discovery Street construct 6-lane arterial
2018	SM22	San Marcos	South Santa Fe - Bosstick to Smilax	Widen and realign existing road to 4-lane secondary arterial standards
2018	SM24	San Marcos	Woodland Parkway Interchange Improvements – La Moree Road to Rancheros Drive	Modify existing ramps at Woodland Parkway and Barham Drive; widen and realign Barham Drive to accommodate a new eastbound SR 78 on-ramp; widen and realign SR 78 undercrossing and associated work
2018	SM25	San Marcos	Borden Road Street Improvements and Bridge Construction - Twin Oaks to Woodward Street	Construction of approximately 700 lineal feet of a new 4-lane secondary arterial including a bridge
2018	SM30	San Marcos	San Marcos Boulevard Street Improvements - Rancho Santa Fe to Bent Avenue	Widen road to a 6-lane prime arterial
2018	SM31	San Marcos	Discovery Street Improvements - McMahr Rd to Bent Avenue/Craven Road	Widen roadway to 4-lane secondary arterial

Table A.8 – Phased Arterial Projects – Revenue Constrained Plan (Continued)

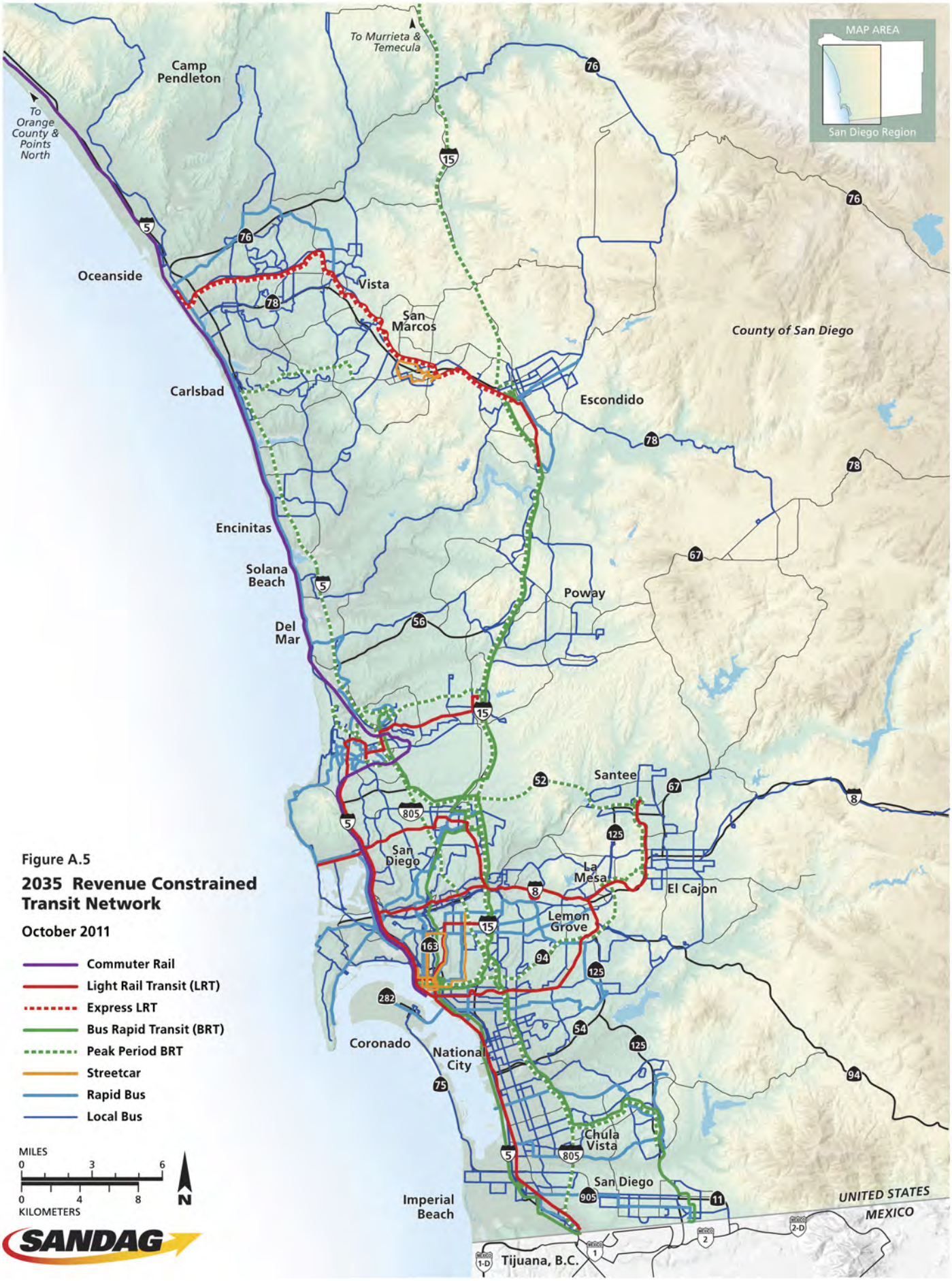
Conformity Analysis Year	SANDAG ID	Lead Agency	Project Title	Project Description
2018	SM32	San Marcos	Via Vera Cruz Bridge and Street Improvements - San Marcos Boulevard to Discovery Street	Widen to 4-lane secondary arterial and construct a bridge at San Marcos Creek
2018	SM42	San Marcos	Street Improvements: Discovery Street - Craven Road to West of Twin Oaks Valley Road	In the City of San Marcos, on Discovery Street from Craven Road to west of Twin Oaks Valley Road, construct approximately 5,100 lineal feet of a new 6-lane roadway
2018	SM43	San Marcos	Barham Drive - Twin Oaks Valley Road to La Moree Road	In the City of San Marcos, on Barham Drive between Twin Oaks Valley Road and La Moree Road, widen and reconstruct the north side of Barham Drive to a 6-lane prime arterial and associated work
2018	SM44	San Marcos	Eastbound SR 78 Auxiliary lane - Woodland Parkway to Nordahl Road	Construct auxiliary lanes along eastbound SR 78 between Woodland Parkway Interchange and Nordahl Road Interchange; includes widening of Mission Road undercrossing
2018	SM48	San Marcos	Creekside Drive	Construct approximately 3,000 feet of a 2-lane collector road from Via Vera Cruz to Grand Avenue in the City of San Marcos. The road will include two 12-foot lanes, diagonal parking on the north side, and parallel parking on the south side. In addition, the project also will include a 10-foot bike trail meandering along the south side.
2018	VISTA08A	Vista	W. Vista Way - Emerald Drive to Grapevine Road	The scope of this project is to provide right of way acquisition and construction for the widening of W. Vista Way a distance of 1,500 feet from the intersection with Emerald Drive to the intersection with Grapevine Road
2020	CNTY14A	San Diego County	South Santa Fe Avenue South - South of Woodland Drive to Smilax Road	Widening of South Santa Fe Avenue to a 5-lane major road with a center left turn lane, curb, gutter, sidewalk, bike lanes, and drainage improvements from 700 ft. south of Woodland Dr to Smilax Road
2020	O22	Oceanside	College Boulevard - Vista Way to Old Grove Road	In Oceanside, widen from the existing 4 lanes to 6 lanes with bike lanes and raised median
2020	O23	Oceanside	College Boulevard Bridge - San Luis Rey River	In Oceanside, widen from 4 to 6 lanes plus bike lanes and a striped-only median; widening includes the approach roadway and the bridge deck over the San Luis Rey River - Design Phase
2020	SD189	San Diego	Sea World Drive Widening and I- 5 Interchange Improvements	In San Diego, replace existing 4-lane bridge with an 8-lane bridge with new on/off ramps; widen approachways to add right turn lanes to improve access to I-5 (CIP 52-706.0)

Table A.8 – Phased Arterial Projects – Revenue Constrained Plan (Continued)

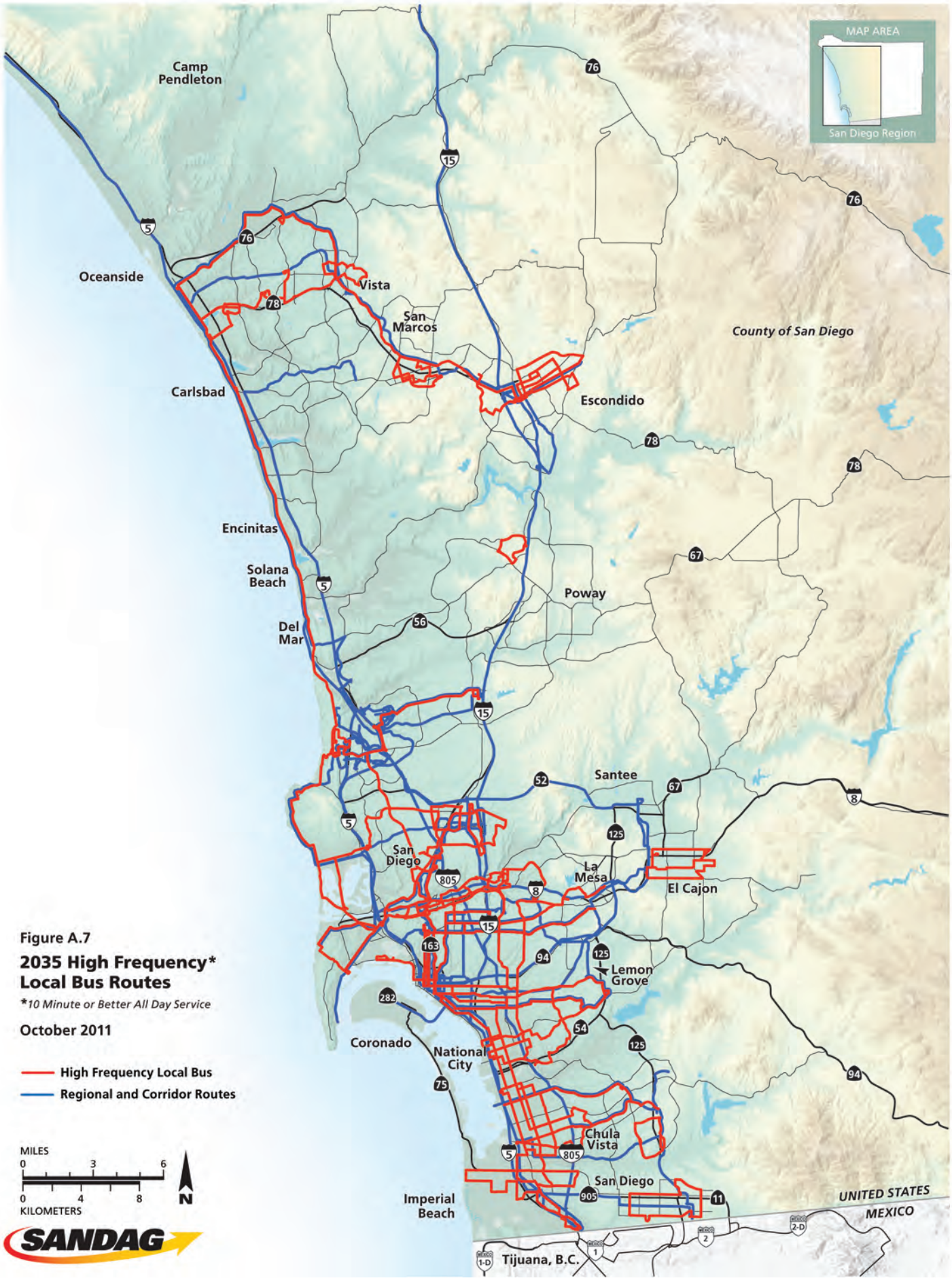
Conformity Analysis Year	SANDAG ID	Lead Agency	Project Title	Project Description
2020	SD190	San Diego	Palm Avenue/ I-805 Interchange	In San Diego, future widening of Palm Avenue Bridge including providing for repairs to the bridge approaches and abutments, installing sidewalks, signals, and striping ▪ Phase I was work pertaining to re-striping to reconfigure travel lanes; no actual modifications to the physical geometry of the bridge took place ▪ Phase II of the project will widen the bridge on the north side; in addition to this the scope of work will also contain restriping of the lanes and modifications to the on/off ramps ▪ Phase III of the project will widen the bridge on the south side; in addition to this the scope of work will also contain restriping of the lanes and modifications to the on/off ramps ▪ Both Phase II and III will have environmental documentation prepared and all technical studies performed before entering into full design signage modifications: also modify freeway on and off ramps (CIP 52-640.0)
2030	SD81	San Diego	Genesee Avenue - Nobel Drive to SR 52	In San Diego, future widening to 6-lane major street north of Decoro Street and to a 6-lane primary arterial south of Decoro Street and included Class II bicycle lanes (CIP 52-458.0)
2030	SM10	San Marcos	SR 78/Smilax	Construct new interchange at Smilax Road interchange and SR 78 improvements

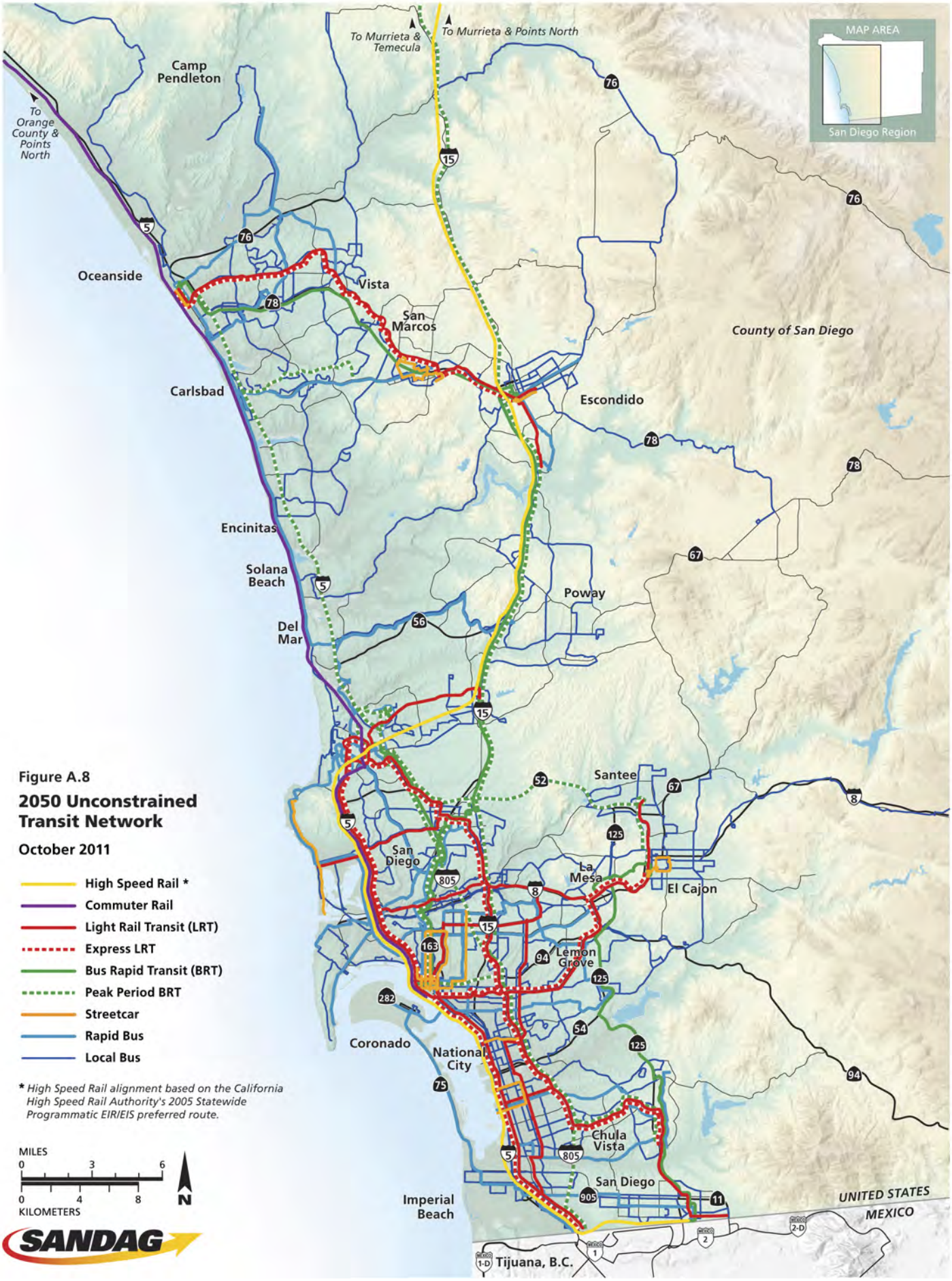

MAP AREA
San Diego Region
To Murrieta & Temecula
To Orange County & Points North
Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
County of San Diego
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Tijuana, B.C.
UNITED STATES
MEXICO
Figure A.3
2020 Revenue Constrained Transit Network
October 2011
Commuter Rail
Light Rail Transit (LRT)
Bus Rapid Transit (BRT)
Peak Period BRT
Streetcar
Rapid Bus
Local Bus
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG


MAP AREA
San Diego Region
Camp Pendleton
4C
Oceanside
Vista
78
6F+2ML/OPS
San Marcos
Carlsbad
8F+4ML
Escondido
County of San Diego
8F+2HOV/ML
Encinitas
Solana Beach
Del Mar
Poway
10F+4ML/MB
8F/14F + 2ML
8F/10F+4ML
Santee
8F+2ML
San Diego
La Mesa
El Cajon
8F+2TL
8F + 2ML
Lemon Grove
8F+4ML
Coronado
National City
2C
8F+4ML
Chula Vista
Imperial Beach
San Diego
6F
4T
UNITED STATES
MEXICO
Tijuana, B.C.
Figure A.4
2020
Revenue Constrained
Highway Network
October 2011
Improvements
Managed Lanes
Transit Lanes
General Purpose Lanes
Toll Lanes
Operational Improvements
Freeway Connectors
HOV Connectors
Freeway & HOV Connectors
C = Conventional Highway
F = Freeway
HOV = High Occupancy Vehicle
MB = Movable Barrier
ML = Managed Lanes
OPS = Operational Improvements
T = Toll Lanes
TL = Transit Lanes
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG


MAP AREA
San Diego Region
To Murrieta & Temecula
Camp Pendleton
To Orange County & Points North
Oceanside
Vista
San Marcos
County of San Diego
Carlsbad
Escondido
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure A.5
2035 Revenue Constrained Transit Network
October 2011
Commuter Rail
Light Rail Transit (LRT)
Express LRT
Bus Rapid Transit (BRT)
Peak Period BRT
Streetcar
Rapid Bus
Local Bus
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG


Camp Pendleton
MAP AREA
San Diego Region
4C
Oceanside
8F+4ML
Vista
6F+2ML/OPS
San Marcos
Carlsbad
8F+4ML
8F+4ML
Escondido
County of San Diego
Encinitas
Solana Beach
8F+4ML
Poway
4C
Del Mar
10F+4ML/MB
8F/14F + 4ML
8F/10F+4ML
8F/14F + 2ML
6F+2ML
Santee
8F/10F +4ML
8F+2ML
San Diego
La Mesa
El Cajon
10F
8F+2TL
Lemon Grove
8F + 2ML
Coronado
National City
8F+4ML
8F+ 2ML
Chula Vista
8F+4ML
Imperial Beach
San Diego
6F
4T
UNITED STATES
MEXICO
Tijuana, B.C.
Figure A.6
2035
Revenue Constrained
Highway Network
October 2011
Improvements
Managed Lanes
Transit Lanes
General Purpose Lanes
Toll Lanes
Operational Improvements
Freeway Connectors
HOV Connectors
Freeway & HOV Connectors
C = Conventional Highway
F = Freeway
HOV = High Occupancy Vehicle
MB = Movable Barrier
ML = Managed Lanes
OPS = Operational Improvements
T = Toll Lanes
TL = Transit Lanes
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG


MAP AREA
San Diego Region
Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
County of San Diego
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
San Diego
Tijuana, B.C.
UNITED STATES
MEXICO
Figure A.7
2035 High Frequency* Local Bus Routes
*10 Minute or Better All Day Service
October 2011
High Frequency Local Bus
Regional and Corridor Routes
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG


To Murrieta & Temecula
To Murrieta & Points North
MAP AREA
San Diego Region
Camp Pendleton
To Orange County & Points North
Oceanside
Vista
San Marcos
County of San Diego
Carlsbad
Escondido
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
San Diego
UNITED STATES
MEXICO
Tijuana, B.C.
Figure A.8
2050 Unconstrained Transit Network
October 2011
High Speed Rail *
Commuter Rail
Light Rail Transit (LRT)
Express LRT
Bus Rapid Transit (BRT)
Peak Period BRT
Streetcar
Rapid Bus
Local Bus
* High Speed Rail alignment based on the California High Speed Rail Authority's 2005 Statewide Programmatic EIR/EIS preferred route.
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG


Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
County of San Diego
Encinitas
Solana Beach
Poway
Del Mar
Santee
San Diego
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
San Diego
Tijuana, B.C.
UNITED STATES
MEXICO
MAP AREA
San Diego Region
8F+4T
4C+OPS
2C
4C
6C
6E
10F+4ML
6F+2ML/OPS
10F+4ML/MB
6F+2ML
14F+4ML
8F+4ML
6F+2ML(R)
6F
8F/10F +4ML
8F/10F + 2ML
8F + 2ML
8F+2ML
8F/10F+OPS
8F+OPS
8F+2TL
10F+2ML
6F/8F
6F/8F+OPS
4F
4T
8F
Figure A.9
2050 Unconstrained Highway Network
October 2011
Improvements
Managed Lanes
Transit Lanes
General Purpose Lanes
Toll Lanes
Operational Improvements
Freeway Connectors
HOV Connectors
Freeway & HOV Connectors
C = Conventional Highway
F = Freeway
HOV = High Occupancy Vehicle
MB = Movable Barrier
ML = Managed Lanes
OPS = Operational Improvements
T = Toll Lanes
TL = Transit Lanes
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG

Table A.9 – Major Capital Improvements – Unconstrained Network

Transit Facilities			
			($ Millions – 2010 Dollars)
Service	**Route**	**Description**	**Cost**
High Speed Rail	598	Commuter Rail Overlay (Temecula to Airport ITC)	$330
High Speed Rail	-	Extension from Airport ITC to International border	$3,557
COASTER	398	Double Tracking (includes all COASTER improvements, positive train control, and UTC tunnel)	$5,606
SPRINTER	399	Double Tracking (includes all SPRINTER improvements and extension to South Escondido)	$1,029
SPRINTER	588	SPRINTER Express	$284
Trolley	510	Mid-Coast LRT Extension	$1,642
Trolley	510 and 520	Trolley System Rehabilitation (Blue and Orange Lines)	$510
Trolley	510	Blue Line Rail Grade Separations	$550
Trolley	520	Orange Line Rail Grade Separations	$312
Trolley	522	Orange Line Express - El Cajon to downtown San Diego	$230
Trolley	540	Blue Line Express - UTC to San Ysidro via downtown	$455
Trolley	550	SDSU to San Ysidro via East San Diego, SE San Diego, National City	$1,665
Trolley	560	SDSU to downtown via El Cajon Blvd/Mid-City (transition of Mid-City Rapid to LRT)	$1,921
Trolley	561	UTC to Mira Mesa via Sorrento Mesa/Carroll Cyn (extension of route 510)	$1,140
Trolley	562	UTC to San Ysidro via Kearny Mesa, Mission Valley, Mid-City, National City/Chula Vista via Highland Ave/4th Ave	$2,548
Trolley	563	Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, SDSU	$1,262
Trolley	564	Otay Mesa East Border Crossing to Western Chula Vista via Otay Ranch/Millenia	$854
Trolley	566	Palomar Street Trolley Station to UTC via Mid-City, Kearny Mesa	$327
Trolley	510, 520, 540, 522 and 560	Downtown Trolley Tunnel	$2,592
Trolley	Various	Downtown Bus Tunnel and Hubs	$2,917
BRT	90	Santee/El Cajon Transit Centers to downtown via SR 94 (peak only) (interim service for Route 522 Orange Line Express)	$0
BRT	430	Oceanside to Escondido (peak only)	$234
BRT	470	Escondido to UTC via Mira Mesa Blvd	$20
BRT	610	Temecula (peak only)/Escondido to downtown (Sabre Springs/Mira Mesa PNRs, Mid-City Stations)	$89
BRT	628	South Bay BRT (Otay Mesa-downtown)	$200

Table A.9 – Major Capital Improvements – Unconstrained Network (Continued)

Transit Facilities (Continued)			
			($ Millions – 2010 Dollars)
Service	**Route**	**Description**	**Cost**
BRT	640	I-5 - San Ysidro to downtown & Kearny Mesa via I-5 shoulder lanes/HOV lanes, downtown, Hillcrest/Mission Valley Guideway (interim service for Route 540 Blue Line Express	$90
BRT	650	Chula Vista to Palomar Airport Road Business Park via I-805/I-5 (peak only)	$80
BRT	652	Downtown to UTC via Kearny Mesa Guideway/I-805	$2
BRT	653	Mid-City to Palomar Airport Road via Kearny Mesa/I-805/I-5	$10
BRT	870	El Cajon to UTC via Santee, SR 52, I-805	$7
BRT	890	El Cajon to Sorrento Mesa via SR 52, Kearny Mesa	$12
BRT	680 and 688/689	Otay Mesa/San Ysidro to Sorrento Mesa via I-805 Corridor, Otay Ranch/Millenia, National City, Southeastern San Diego, Mid-City, Kearny Mesa	$425
BRT	120, 610, and 640	Hillcrest to Mission Valley Transit Priority Measures, Full Guideway downtown to Kearny Mesa, and I-15 Green Line transfer station	$3,302
BRT	692	El Cajon to Otay Mesa via Spring Valley, SR 125, Millenia	$6
BRT	940	Oceanside to UTC via I-5, Carlsbad, Encinitas (peak only)	$38
BRT	-	South Bay Maintenance Facility	$51
BRT	-	Downtown BRT stations/layovers	$110
Rapid	2	North Park to downtown San Diego via 30th St	$38
Rapid	10	La Mesa to Ocean Beach via Mid-City, Hillcrest, Old Town	$85
Rapid	11	Spring Valley to SDSU via SE San Diego, downtown, Hillcrest, Mid-City	$110
Rapid	15	Mid-City Rapid SDSU to downtown (interim service for Route 560 Trolley)	$68
Rapid	28	Point Loma to Kearny Mesa via Old Town, Linda Vista	$48
Rapid	30	Old Town to Sorrento Mesa via Pacific Beach, La Jolla, UTC	$102
Rapid	41	Fashion Valley to UTC/UCSD via Linda Vista and Clairemont	$54
Rapid	103	Solana Beach to Sabre Springs BRT station via Carmel Valley	$70
Rapid	120	Kearny Mesa to downtown	$100
Rapid	440	Carlsbad to San Marcos via Palomar Airport Road	$50
Rapid	471	Downtown Escondido to East Escondido	$31
Rapid	473	Oceanside to UTC via Hwy 101 Coastal Communities, Carmel Valley	$127
Rapid	474	Oceanside to Vista via Mission Ave/Santa Fe Road Corridor	$49
Rapid	477	Camp Pendleton to Carlsbad Village via College Blvd, Plaza Camino Real	$78

Table A.9 – Major Capital Improvements – Unconstrained Network (Continued)

Transit Facilities (Continued)			
			($ Millions – 2010 Dollars)
Service	**Route**	**Description**	**Cost**
Rapid	635	Eastlake/EUC to Palomar Trolley via Main Street Corridor	$54
Rapid	636	SDSU to Spring Valley via East San Diego, Lemon Grove, Skyline	$39
Rapid	637	North Park to 32nd Street Trolley via Golden Hill	$32
Rapid	638	San Ysidro to Otay Mesa via Otay, SR 905 Corridor	$53
Rapid	639	Otay to North Island via Imperial Beach and Silver Strand, Coronado	$53
Rapid	709	H Street Trolley to Millenia via H Street Corridor, Southwestern College	$36
Rapid	910	Coronado to downtown via Coronado Bridge	$25
Streetcar	551	Chula Vista downtown	$1,340
Streetcar	552	National City downtown	$400
Streetcar	553	Downtown San Diego: Little Italy to East Village	$277
Streetcar	554	Hillcrest/Balboa Park/downtown San Diego Loop	$249
Streetcar	555	30th St to downtown San Diego via North Park/Golden Hill	$139
Streetcar	557	El Cajon downtown	$1,600
Streetcar	558	Escondido downtown	$500
Streetcar	559	Oceanside downtown	$450
Streetcar	565	Mission Beach to la Jolla via Pacific Beach	$2,390
Shuttle	-	San Marcos Shuttle[1]	$0
Airport Express		Airport Express Routes[2]	$51
Intermodal	-	Airport Intermodal Transit Center	$165
Intermodal	-	San Ysidro Intermodal Transit Center	$50
Intermodal	-	Otay Mesa East Intermodal Transit Center	$0
Other	-	Other Improvements (Vehicles/vehicle replacement, maintenance facilities, transit system rehab, regulatory compliance, park and ride, ITS)	$8,084
		Subtotal	$51,404

[1] Capital cost to be funded by the City of San Marcos

[2] Capital cost to be funded by aviation funds

Table A.9 – Major Capital Improvements – Unconstrained Network (Continued)

Managed Lanes/Highway Projects					
					($ Millions – 2010 Dollars)
Freeway	**From**	**To**	**Existing**	**Improvements**	**Cost**
I-5	SR 905	SR 54	8F	8F+2ML	$295
I-5	SR 54	I-15	8F+2ML	10F+2ML	$165
I-5	I-15	I-8	8F	8F+Operational	$1,130
I-5	I-8	La Jolla Village Dr	8F/10F	8F/10F+2ML	$530
I-5	La Jolla Village Drive	I-5/I-805 Merge	8F/14F	8F/14F+2ML	$300
I-5	I-5/I-805 Merge	SR 56	8F/14F+2HOV	8F/14F+4ML	$40
I-5	SR 56	Manchester Ave	8F+2HOV	10F+4ML	$655
I-5	Manchester Ave	Palomar Airport Road	8F	10F+4ML	$1,710
I-5	Palomar Airport Road	Vandegrift	8F	10F+4ML	$1,585
I-5	Vandegrift Blvd	Orange County	8F	8F+4T	$754
I-8	I-5	I-15	8F	8F+Operational	$440
I-8	I-15	SR 125	8F/10F	8F/10F+Operational	$125
I-8	SR 125	2nd Street	6F/8F	6F/8F+Operational	$125
I-8	2nd Street	Los Coches	4F/6F	6F	$54
I-8	Los Coches	Dunbar Rd	4F/6F	6F	$335
SR 11/Otay Mesa East Port of Entry (POE)	SR 905	Mexico	--	4T + POE	$755
SR 15	I-5	SR 94	6F	8F+2ML	$90
SR 15	SR 94	I-805	8F	8F+2ML	$20
SR 15	I-805	I-8	8F	8F+2TL	$45
I-15	Viaduct		8F	8F+2ML	$720
I-15	I-8	SR 163	8F	8F+2ML	$130
I-15	SR 163	SR 56	8F+2ML(R)	10F+4ML/MB	$419
I-15	Centre City Parkway	SR 78	8F+4ML	10F+4ML	$210
I-15	SR 78	Riverside County	8F	8F+4T	$1,005

Table A.9 – Major Capital Improvements – Unconstrained Network (Continued)

Managed Lanes/Highway Projects (Continued)					
				($ Millions – 2010 Dollars)	
Freeway	**From**	**To**	**Existing**	**Improvements**	**Cost**
SR 52	I-5	I-805	4F	6F	$110
SR 52	I-805	I-15	6F	6F+2ML	$223
SR 52	I-15	SR 125	4F	6F+3ML(R)	$440
SR 52	SR 125	SR 67	4F	6F	$120
SR 54	I-5	SR 125	6F	6F/8F+2ML	$140
SR 56	I-5	I-15	4F	6F+2ML	$220
SR 67	I-8	Mapleview St	4F/6F	6F/8F	$360
SR 67	Mapleview St	Dye Rd	2C/4C	4C	$570
SR 76	I-5	Melrose Drive	4E	6E	$225
SR 76	Melrose Drive	I-15	2C	4C	$404
SR 76	I-15	Couser Canyon	2C	4C/6C+Operational	$130
SR 78	I-5	I-15	6F	6F+2ML/Operational	$570
SR 94	I-5	I-805	8F	8F+2ML	$480
SR 94	I-805	College Ave	8F	10F+2ML	$290
SR 94	College Ave	SR 125	8F	8F+2ML	$230
SR 94	SR 125	Avocado Blvd	4F	6F	$90
SR 94	Avocado Blvd	Jamacha Rd	4C	6C	$30
SR 94	Jamacha Rd	Steele Canyon Rd	4C	6C	$20
SR 125	SR 905	San Miguel Rd	4T	8F	$110
SR 125	San Miguel Rd	SR 54	4F	8F	$60
SR 125	SR 54	SR 94	6F	8F+2ML	$140
SR 125	SR 94	I-8	8F	10F+2ML	$285
SR 163	I-805	I-15	8F	8F+2ML	$320
SR 241	Orange County	I-5	--	4T/6T	$501
I-805	SR 905	Carroll Canyon Rd	8F/10F	8F/10F+4ML	$3,781
I-805	Carroll Canyon Rd	I-5 (north)	8F/10F	8F/10F+2ML	$87
SR 905	I-5	I-805	4F	8F	$150
SR 905	I-805	Mexico	--	8F	$1,021
				Subtotal	$22,744

Table A.9 – Major Capital Improvements – Unconstrained Network (Continued)

HOV Connectors				
				($ Millions – 2010 Dollars)
Freeway	**Intersecting Freeway**	**Movement**		**Cost**
I-5	SR 15	North to North and South to South		$183
I-5	SR 54	West to South and North to East		$120
I-5	SR 54	South to East and West to North		$120
I-5	SR 56	South to East and West to North		$170
I-5	SR 56	North to East and West to South		$80
I-5	SR 78	South to East and West to North, North to East and West to South		$240
I-5	I-805	North to North & South to South		$116
I-15	SR 52	West to North and South to East		$140
I-15	SR 52	West to South and North to East		$140
I-15	SR 56	East to North and South to West		$180
I-15	SR 78	East to South & North to West		$105
I-15	SR 94	South to West & East to North		$80
I-15	SR 163	North to North and South to South		$160
I-15	I-805	North to North & South to South		$90
SR 52	SR 125	North to West and East to South		$100
SR 94	SR 125	East to North and South to West		$140
I-805	SR 52	West to North & South to East		$90
I-805	SR 54	North to West and East to South		$140
I-805	SR 94	West to South and North to East		$160
I-805	SR 94	East to North and South to East		$160
I-805	SR 163	North to North and South to South		$150
			Subtotal	$2,864

Table A.9 – Major Capital Improvements – Unconstrained Network (Continued)

Freeway Connectors				
				($ Millions – 2010 Dollars)
Freeway	**Intersecting Freeway**	**Movement**		**Cost**
I-5	I-8	East to North and South to West		$320
I-5	SR 56	West to North and South to East		$185
I-5	SR 78	South to East and West to South		$106
I-5	SR 94	North to East		$120
I-15	SR 56	North to West		$100
SR 94	SR 125	South to East and West to North		$319
			Subtotal	$830
Non-Highway Goods Movement				
				($ Millions – 2010 Dollars)
Vesta Street Bridge		Mobility connector over Harbor Drive at Naval Base San Diego		$60
32nd Street		Freeway access enhancement		$119
10th Avenue Marine Terminal Entrance		Rail line grade separation/Barrio Logan enhancement		$67
10th Avenue Marine Terminal Entrance		Enhance military project capacity, expand open storage		$19
National City Marine Terminal		Bay Marina Drive, Civic Center freeway access improvements		$7
National City Marine Terminal		Wharf extension, vehicle processing facility, berths 24-10 and 24-11		$151
National City Rail Yard				$7
Desert Line		Basic Service, rehabilitation		$182
Logistics Center - South County				$180
Logistics Center - North County				$2,130
Logistics Center - Mid County				$166
San Diego International Airport		Access to I-5		$32
San Diego International Airport		Aircraft/ground access, AC facilities, transload		$111
Future Expansion		Freeway/ground access N. field		$173
			Subtotal	$3,404
			Total	$79,986

KEY

C = Conventional Highway Lanes	MB = Movable barrier	T = Toll Lanes
F = Freeway Lanes	ML = Managed lanes (HOV & Value Pricing)	TL = Transit Lanes
HOV = High Occupancy Vehicle Lanes	ML(R) = Managed lanes (Reversible)	

Note: All HOV lanes would convert to Managed Lanes by 2035 with an HOV occupancy of 3+ people.

Table A.10 – Summary of 2050 Revenue Constrained Plan and Unconstrained Scenario – Transit Services and Headways

Service	Route	Description	Revenue Constrained Peak/Off-Peak	Unconstrained Peak/Off-Peak
HSR	598	Temecula to Lindbergh Intermodal Transit Center	N/A	15/15
COASTER	398	Increase in COASTER service (includes all improvements)	20/60	15/15
SPRINTER	399	Increase in SPRINTER Rail (includes all improvements)	10/10	7.5/7.5
SPRINTER	588	SPRINTER Express	10/15	10/10
Trolley	510	Increase in Existing Blue Line Trolley Service (includes all improvements)	7.5/7.5	7.5/7.5
Trolley	520	Increase in Existing Orange Line Trolley Service (includes all improvements)	7.5/7.5	7.5/7.5
Trolley	522	Orange Line Express - El Cajon to downtown San Diego	10/10	10/10
Trolley	530	Increase in Green Line Trolley Service	10/10	7.5/7.5
Trolley	540	Blue Line Express - UTC to San Ysidro via downtown	10/10	10/10
Trolley	550	SDSU to San Ysidro via East San Diego, SE San Diego, National City	N/A	7.5/7.5
Trolley	560	SDSU to downtown via El Cajon Blvd/Mid-City (transition of Mid-City Rapid to LRT)	7.5/7.5	7.5/7.5
Trolley	561	UTC to Mira Mesa via Sorrento Mesa/Carroll Canyon	Note A	7.5/7.5
Trolley	562	UTC to San Ysidro via Kearny Mesa, Mission Valley, Mid-City, National City/Chula Vista via Highland Ave/ 4th Ave	7.5/10	7.5/7.5
Trolley	563	Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, SDSU	7.5/10	7.5/7.5
Trolley	564	Otay Mesa East Border Crossing to Western Chula Vista via Otay Ranch/Millenia	7.5/7.5	7.5/7.5
Trolley	566	Express Palomar Street Trolley Station to UTC via Mid-City, Kearny Mesa	N/A	10/10
BRT	90	Santee/El Cajon Transit Centers to downtown via SR 94 (Peak Only)	Note B	Note B
BRT	430	Oceanside to Escondido via SR 78 Managed Lanes	N/A	10/10
BRT	470	Escondido-UTC via Mira Mesa Blvd	10/NA	10/NA
BRT	610	Temecula (peak only)/Escondido to downtown	10/NA	10/10
BRT	628	South Bay BRT (Otay Mesa-downtown)	15/15	15/15
BRT	640	San Ysidro to Kearny Mesa via I-5 shoulder lanes/HOV lanes, downtown, Hillcrest/Mission Valley Guideway (interim service for Blue Line Express Route 540)	Note C	Note C

Table A.10 – Summary of 2050 Revenue Constrained Plan and Unconstrained Scenario – Transit Services and Headways (Continued)

Service	Route	Description	Revenue Constrained Peak/Off-Peak	Unconstrained Peak/Off-Peak
BRT	650	Chula Vista to Palomar Airport Road Business Park via I-805/I-5 (Peak Only)	N/A	15/15
BRT	652	Downtown to UTC via Kearny Mesa Guideway/I-805	N/A	10/10
BRT	653	Mid-City to Palomar Airport Road via Kearny Mesa/I-805/ I-5	15/NA	15/NA
BRT	870	El Cajon to UTC via Santee, SR 52, I-805	10/NA	10/NA
BRT	890	El Cajon to Sorrento Mesa via SR 52, Kearny Mesa	10/NA	10/NA
BRT	680	Otay Mesa to Sorrento Mesa via I-805	15/15	-
BRT	688	Millenia/San Ysidro to Sorrento Mesa Express	15/NA	15/NA
BRT	689	Millenia/Otay Ranch to UTC/Torrey Pines Express	15/NA	15/NA
BRT	692	El Cajon to Otay Mesa via Spring Valley, SR 125, Millenia	N/A	10/10
BRT	940	Oceanside to UTC via I-5, Carlsbad, Encinitas (Peak Only)	N/A	10/10
Rapid	2	North Park to downtown San Diego via 30th St	10/10	10/10
Rapid	10	La Mesa to Ocean Beach via Mid-City, Hillcrest, Old Town	10/10	10/10
Rapid	11	Spring Valley to SDSU via SE San Diego, downtown, Hillcrest, Mid-City	10/10	10/10
Rapid	15	Mid-City Rapid SDSU - downtown	Note D	Note D
Rapid	28	Point Loma to Kearny Mesa via Old Town, Linda Vista	10/10	10/10
Rapid	30	Old Town to Sorrento Mesa via Pacific Beach, La Jolla, UTC	10/10	10/10
Rapid	41	Fashion Valley to UTC/UCSD via Linda Vista and Clairemont	N/A	10/10
Rapid	103	Solana Beach to Sabre Springs BRT station via Carmel Valley	N/A	15/15
Rapid	120	Kearny Mesa to downtown	10/10	10/10
Rapid	201/202	UTC Area Super Loop - Increase Frequencies	10/10	10/10
Rapid	350	Escondido to Del Lago via Escondido Blvd & Bear Valley	10/10	10/10
Rapid	440	Carlsbad to San Marcos via Palomar Airport Road Corridor	N/A	10/10
Rapid	471	Downtown Escondido to East Escondido	10/10	10/10
Rapid	473	Oceanside to UTC via Hwy 101 Coastal Communities, Carmel Valley	10/10	10/10
Rapid	474	Oceanside to Vista via Mission Ave/Santa Fe Road Corridor	10/10	10/10
Rapid	477	Camp Pendleton to Carlsbad Village via College Boulevard, Plaza Camino Real	N/A	10/10

Table A.10 – Summary of 2050 Revenue Constrained Plan and Unconstrained Scenario – Transit Services and Headways (Continued)

Service	Route	Description	Revenue Constrained Peak/Off-Peak	Unconstrained Peak/Off-Peak
Rapid	635	Eastlake/EUC to Palomar Trolley via Main Street Corridor	10/10	10/10
Rapid	636	SDSU to Spring Valley via East San Diego, Lemon Grove, Skyline	10/10	10/10
Rapid	637	North Park to 32nd Street Trolley via Golden Hill	10/10	10/10
Rapid	638	San Ysidro to Otay Mesa via Otay, SR 905 Corridor	10/10	10/10
Rapid	639	Otay to North Island via Imperial Beach and Silver Strand, Coronado	N/A	10/10
Rapid	709	H Street Trolley to Millenia via H Street Corridor, Southwestern College	10/10	10/10
Rapid	910	Coronado to downtown via Coronado Bridge	10/10	10/10
Streetcar	551	Chula Vista downtown	N/A	10/10
Streetcar	552	National City downtown	N/A	10/10
Streetcar	553	Downtown San Diego: Little Italy to East Village	10/10	10/10
Streetcar	554	Hillcrest/Balboa Park/downtown San Diego Loop	10/10	10/10
Streetcar	555	30th St to downtown San Diego via North Park/ Golden Hill	10/10	10/10
Streetcar	557	El Cajon downtown	N/A	10/10
Streetcar	558	Escondido downtown	N/A	10/10
Streetcar	559	Oceanside downtown	N/A	10/10
Streetcar	565	Mission Beach to La Jolla via Pacific Beach	N/A	10/10
Shuttle	448/449	San Marcos Shuttle	10/10	10/10
Airport Express		Airport Express Routes	30/30	30/30

Notes:

A Included as extensions to Route 510 Blue Line

B Interim service until implementation of Route 522 Orange Line Express

C Interim service until implementation of Route 540 Blue Line Express

D Interim service until implementation of Route 560 Trolley Line

Table A.11 – Summary of 2050 Revenue Constrained Plan and Unconstrained Scenario – Highway Projects

Managed Lanes/Highway Projects					
Freeway	**From**	**To**	**Existing**	**Revenue Constrained**	**Unconstrained**
I-5	SR 905	SR 54	8F	8F+2ML	8F+2ML
I-5	SR 54	SR 15	8F	10F+2ML	10F+2ML
I-5	I-15	I-8	8F	8F+Operational	8F+Operational
I-5	I-8	La Jolla Village Dr	8F/10F	8F/10F+2ML	8F/10F+2ML
I-5	La Jolla Village Dr	I-5/I-805 Merge	8F/14F	8F/14F+2ML	8F/14F+2ML
I-5	I-5/I-805 Merge	SR 56	8F/14F+2HOV	8F/14F+4ML	8F/14F+4ML
I-5	SR 56	Manchester Ave	8F/10F+2HOV	8F+4ML	10F+4ML
I-5	Manchester Ave	Palomar Airport Rd	8F	8F+4ML	10F+4ML
I-5	Palomar Airport Rd	Vandegrift	8F	8F+4ML	10F+4ML
I-5	Vandegrift Blvd	Orange County	8F	8F+4T	8F+4T
I-8	I-5	I-15	8F	8F+Operational	8F+Operational
I-8	I-15	SR 125	8F/10F	8F/10F+Operational	8F/10F+Operational
I-8	SR 125	2nd Street	6F/8F	6F/8F+Operational	6F/8F+Operational
I-8	2nd Street	Los Coches	4F/6F	6F	6F
I-8	Los Coches	Dunbar Rd	4F/6F	4F/6F	6F
SR 11/ Otay Mesa East POE	SR 905	Mexico	--	4T+POE	4T+POE
SR 15	I-5	SR 94	6F	8F+2ML	8F+2ML
SR 15	SR 94	I-805	8F	8F+2ML	8F+2ML
SR 15	I-805	I-8	8F	8F+2TL	8F+2TL
I-15	Viaduct		8F	8F+2ML	8F+2ML
I-15	I-8	SR 163	8F	8F+2ML	8F+2ML
I-15	SR 163	SR 56	8F+2ML(R)	10F+4ML/MB	10F+4ML/MB
I-15	SR 56	Centre City Parkway	10F+4ML/MB	10F+4ML/MB	10F+4ML/MB
I-15	Centre City Parkway	SR 78	8F	8F+4ML	10F+4ML
I-15	SR 78	Riverside County	8F	8F+4T	8F+4T
SR 52	I-5	I-805	4F	6F	6F
SR 52	I-805	I-15	6F	6F+2ML	6F+2ML
SR 52	I-15	SR 125	4F	6F+2ML(R)	6F+3ML(R)
SR 52	SR 125	SR 67	4F	4F	6F

Table A.11 – Summary of 2050 Revenue Constrained Plan and Unconstrained Scenario – Highway Projects (Continued)

Managed Lanes/Highway Projects (Continued)					
Freeway	**From**	**To**	**Existing**	**Revenue Constrained**	**Unconstrained**
SR 54	I-5	SR 125	6F	6F+2ML	6F/8F+2ML
SR 56	I-5	I-15	4F	6F	6F+2ML
SR 67	I-8	Mapleview St	4F/6F	4F/6F	6F/8F
SR 67	Mapleview St	Dye Rd	2C/4C	4C	4C
SR 76	I-5	Melrose Drive	4E	4E	6E
SR 76	Melrose Drive	I-15	2C	4C	4C
SR 76	I-15	Couser Canyon	2C	4C/6C+Operational	4C/6C+Operational
SR 78	I-5	I-15	6F	6F+2ML/Operational	6F+2ML/Operational
SR 94	I-5	I-805	8F	8F+2ML	8F+2ML
SR 94	I-805	College Ave	8F	8F+2ML	10F+2ML
SR 94	College Ave	SR 125	8F	8F+2ML	8F+2ML
SR 94	SR 125	Avocado Blvd	4F	6F	6F
SR 94	Avocado Blvd	Jamacha Rd	4C	6C	6C
SR 94	Jamacha Rd	Steele Canyon Rd	4C	6C	6C
SR 94	Steele Canyon Rd	Melody Rd	2C	2C	4C
SR 125	SR 905	San Miguel Rd	4T	8F	8F
SR 125	San Miguel Rd	SR 54	4F	8F	8F
SR 125	SR 54	SR 94	6F	6F+2ML	8F+2ML
SR 125	SR 94	I-8	8F	10F+2ML	10F+2ML
SR 163	I-805	I-15	8F	8F	8F+2ML
SR 241	Orange County	I-5	--	4T/6T	4T/6T
I-805	SR 905	Carroll Canyon Rd	8F/10F	8F/10F+4ML	8F/10F+4ML
I-805	Carroll Canyon Rd	I-5 (north)	8F/10F	8F/10F+2ML	8F/10F+2ML
SR 905	I-5	I-805	4F	4F	8F
SR 905	I-805	Mexico	--	6F	8F

Table A.11 – Summary of 2050 Revenue Constrained Plan and Unconstrained Scenario – Highway Projects (Continued)

HOV Connectors				
Freeway	**Intersecting Freeway**	**Movement**	**Revenue Constrained**	**Unconstrained**
I-5	SR 15	North to North and South to South		✓
I-5	SR 54	West to South and North to East		✓
I-5	SR 54	South to East and West to North		✓
I-5	SR 56	South to East and West to North		✓
I-5	SR 56	North to East and West to South		✓
I-5	SR 78	South to East and West to North, North to East and West to South	✓	✓
I-5	I-805	North to North & South to South	✓	✓
I-15	SR 52	West to North and South to East	✓	✓
I-15	SR 52	West to South and North to East		✓
I-15	SR 56	East to North and South to West		✓
I-15	SR 78	East to South & North to West	✓	✓
I-15	SR 94	South to West & East to North	✓	✓
I-15	SR 163	North to North and South to South		✓
I-15	I-805	North to North & South to South	✓	✓
SR 52	SR 125	North to West and East to South		✓
SR 94	SR 125	East to North and South to West		✓
I-805	SR 52	West to North & South to East	✓	✓
I-805	SR 54	North to West and East to South		✓
I-805	SR 94	West to South and North to East		✓
I-805	SR 94	East to North and South to East		✓
I-805	SR 94	North to West & East to South	✓	✓
I-805	SR 163	North to North and South to South		✓
Freeway Connectors				
Freeway	**Intersecting Freeway**	**Movement**	**Revenue Constrained**	**Unconstrained**
I-5	I-8	East to North and South to West		✓
I-5	SR 56	West to North and South to East	✓	✓
I-5	SR 78	South to East and West to South	✓	✓
I-5	SR 94	North to East		✓
I-15	SR 56	North to West	✓	✓
SR 94	SR 125	South to East and West to North	✓	✓

Table A.11 – Summary of 2050 Revenue Constrained Plan and Unconstrained Scenario – Highway Projects (Continued)

Non-Highway Goods Movement Projects			
Vesta Street Bridge	Mobility Connector over Harbor Drive at Naval Base San Diego	✓	✓
32nd Street	Freeway Access Enhancement	✓	✓
10th Avenue Marine Terminal Entrance	Rail Line Grade Separation/Barrio Logan Enhancement	✓	✓
10th Avenue Marine Terminal Entrance	Enhance military project capacity, expand open storage		✓
National City Marine Terminal	Bay Marina Drive, Civic Center Freeway Access Improvements	✓	✓
National City Marine Terminal	Wharf extension, vehicle processing facility, berths 24-10 and 24-11		✓
National City Rail Yard		✓	✓
Desert Line	Basic Service, rehabilitation		✓
Logistics Center - South County			✓
Logistics Center - North County			✓
Logistics Center - Mid County			✓
San Diego International Airport	Access to I-5		✓
San Diego International Airport	Aircraft/ground access, AC facilities, transload		✓
Future Expansion	Freeway/ground access N. field		✓

KEY

C = Conventional Highway Lanes
F = Freeway Lanes
HOV = High Occupancy Vehicle Lanes
MB = Movable barrier
ML = Managed lanes (HOV & Value Pricing)
ML(R) = Managed lanes (Reversible)
T = Toll Lanes
TL = Transit Lanes

Note: All HOV lanes would convert to Managed Lanes by 2035 with an HOV occupancy of 3+ people.

Table A.12 – 2050 No Build Projects

The following transportation projects were assumed to be built in the 2050 No Build Scenario.

Highway	From	To	Note
I-15	SR 163	SR 78	Under construction
SR 52	SR 125	SR 67	Opened to traffic March 2011
SR 76	Mission Road	I-15	Under construction/development
I-805	Carroll Cyn Road	I-5/I-805 Merge	Under construction
SR 905	I-805	Mexico	Under construction
Transit			
I-15 Bus Rapid Transit (BRT) (downtown and UTC)			Under construction
SuperLoop			In service
Mid-City Rapid Bus			Final design
South Bay BRT (downtown)			Environmental


MAP AREA
San Diego Region
Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
County of San Diego
Encinitas
Solana Beach
Del Mar
Poway
Santee
El Cajon
La Mesa
Lemon Grove
San Diego
Coronado
National City
Chula Vista
Imperial Beach
Tijuana, B.C.
UNITED STATES
MEXICO
Figure A.10
2008 Modeled Level of Service
(With Average Daily Traffic Volumes in Thousands)
October 2011
A to D
Free Flow
E
Intermittent Congestion
F (0–2 hours)
Congested Flow
F (2–4 hours)
Pronounced Congestion
F (>4 hours)
Sustained Congestion
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG


MAP AREA
San Diego Region
Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
County of San Diego
Encinitas
Solana Beach
Del Mar
Poway
Santee
San Diego
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Tijuana, B.C.
UNITED STATES
MEXICO
Figure A.11
2050 Modeled Level of Service
(With Average Daily Traffic Volumes in Thousands)
October 2011
A to D
Free Flow
E
Intermittent Congestion
F (0–2 hours)
Congested Flow
F (2–4 hours)
Pronounced Congestion
F (>4 hours)
Sustained Congestion
MILES
0 3 6
0 4 8
KILOMETERS
N
SANDAG

Appendix B

Air Quality Planning and Transportation Conformity

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Background

The federal Clean Air Act (CAA), which was last amended in 1990, requires the U.S. Environmental Protection Agency (EPA) to set national ambient air quality standards (NAAQS) for pollutants considered harmful to public health and the environment. California has adopted state air quality standards that are more stringent than the NAAQS. Areas with levels that exceed the standard for specified pollutants are designated as non-attainment areas.

The U.S. EPA requires that each state containing non-attainment areas develop plans to attain the NAAQS by a specified attainment deadline. These attainment plans are called State Implementation Plans (SIPs). The San Diego County Air Pollution Control District (APCD) prepares the San Diego portion of the California SIP. Once the standards are attained, further plans—called maintenance plans—are required to demonstrate continued maintenance of the NAAQS.

Pursuant to 176(c) of the federal Clean Air Act (42 USC §7506(c)), the San Diego Association of Governments (SANDAG) and the U.S. Department of Transportation (DOT) must make a determination that the Regional Transportation Plan (RTP) and the Regional Transportation Improvement Program (RTIP) conform to the SIP for air quality. Conformity to the SIP means that transportation activities will not create new air quality violations, worsen existing violations, or delay the attainment of the NAAQS.

The San Diego region attained the federal One-Hour Ozone Standard in 2001. The U.S. EPA redesignated the San Diego air basin as attainment/maintenance and approved the One-Hour Ozone Maintenance Plan as a SIP revision, effective on July 28, 2003. On June 15, 2005, the U.S. EPA revoked the federal One-Hour Ozone Standard after the 1997 Eight-Hour Ozone Standard became applicable.

On April 15, 2004, the U.S. EPA designated the San Diego air basin as non-attainment for the 1997 Eight-Hour Ozone Standard. This designation took effect on June 15, 2004.

The air basin initially was classified as a basic non-attainment area under Subpart 1 of the CAA, and the attainment date for the 1997 Eight-Hour Ozone Standard was set as June 15, 2009. However, the U.S. EPA, in response to a court decision, is expected to rule in 2011 that the San Diego basic non-attainment area be reclassified as a Subpart 2 Serious non-attainment area, with a maximum statutory attainment date of June 15, 2013. Final U.S. EPA action on this proposed reclassification has yet to be taken.

Several areas that are tribal lands in eastern San Diego County were excluded from the 1997 Eight-Hour Ozone Standard non-attainment designation. As shown in Figure B.1, the following are attainment areas for the 1997 Eight-Hour Ozone NAAQS: La Posta Areas #1 and #2, Cuyapaipe, Manzanita, and Campo Areas #1 and #2.

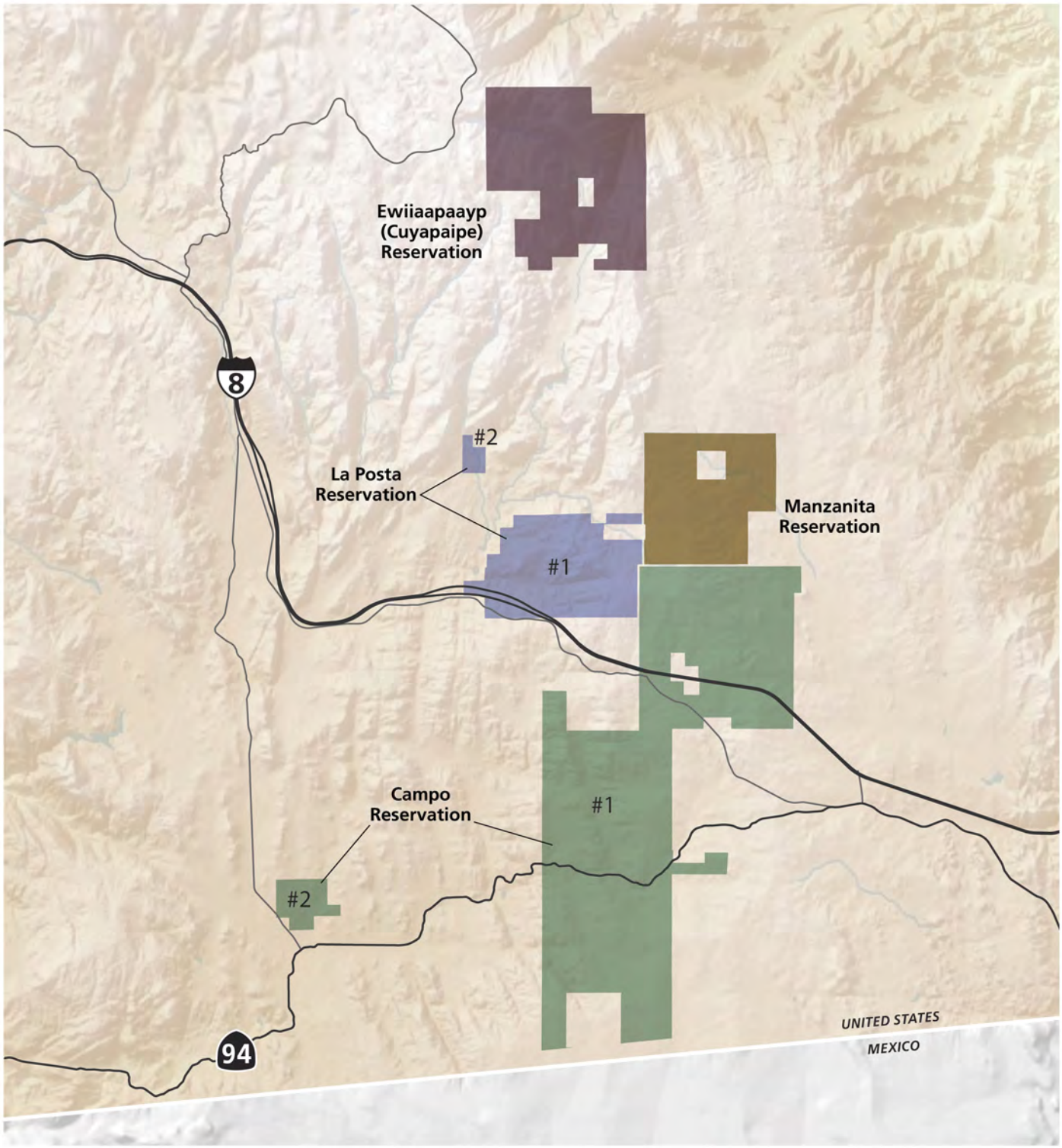


Figure B.1

Eastern San Diego County Attainment Areas for the Eight-Hour Ozone NAAQS

October 2011

Data Source: US EPA, Region 9 GIS Center
1997 Eight-Hour Ozone Standard

MILES
0 1 2 3
0 2 4
KILOMETERS
N

SANDAG



In cooperation with the San Diego APCD and SANDAG, the California Air Resources Board (CARB) developed an Eight-Hour Ozone Attainment Plan for the 1997 Eight-Hour Ozone Standard, which was submitted to the U.S. EPA on June 15, 2007. The budgets in the Eight-Hour Ozone Attainment Plan for San Diego County were found adequate for transportation conformity purposes by the U.S. EPA, effective June 9, 2008.

The San Diego region also has been designated by the U.S. EPA as a federal maintenance area for the Carbon Monoxide (CO) Standard. On November 8, 2004, CARB submitted the 2004 revision to the California SIP for CO to the U.S. EPA. Effective January 30, 2006, the U.S. EPA has approved this maintenance plan as a SIP revision.

Transportation Conformity: Modeling Procedures

Introduction

SANDAG has developed the Revenue Constrained Scenario of the 2050 San Diego RTP to meet the required air quality conformity analysis. Conformity of the 2010 RTIP Amendment No. 13 has been determined simultaneously for consistency purposes. Tables B.2 and B.4 include the conformity analysis for both the 2050 Revenue Constrained RTP and the 2010 RTIP Amendment No. 13. The 2050 RTP provides information on revenue assumptions and the Revenue Constrained Scenario (Chapter 5). In addition, this conformity determination fulfills the requirements of SB 375, which requires a Sustainable Communities Strategy that allows for compliance with Section 176 of the federal Clean Air Act. (California Government Code, Section 65080(b)(2)(B)(iii)).

2050 RTP Air Quality Conformity Methodology

While the horizon year of this RTP is 2050, the current version of the emissions model approved by the U.S. EPA, EMission FACtors (EMFAC) 2007 only contains emission factors to 2040. Because no other emissions model is approved for use in conformity determinations by metropolitan planning organizations (MPOs) in California, staff explored options under the Transportation Conformity Rule to conduct the air quality conformity determination for the 2050 RTP.

SANDAG staff conducted interagency consultation on the proposed methodology for preparing the 2050 RTP air quality conformity analysis with the San Diego Region Conformity Working Group (CWG) at its August 4 and September 1, 2010, meetings. The CWG is comprised of staff representatives from SANDAG, the San Diego APCD, Caltrans, CARB, the U.S. DOT and U.S. EPA.

The CWG concurred with the proposed methodology. On September 17, 2010, the SANDAG Transportation Committee accepted, for review and distribution, the draft proposed methodology for conducting the air quality conformity determination for the 2050 RTP for a 30-day comment period. A public hearing on shortening the conformity timeline and the proposed methodology for the regional emissions analysis was held at the October 15, 2010, SANDAG Transportation Committee meeting. No comments were received at the hearing or in writing. The SANDAG Board of Directors approved the proposed methodology for conducting the 2050 RTP air quality conformity analysis on November 19, 2010.

In concurrence with the approved methodology, SANDAG staff conducted the Air Quality Conformity Analysis for the 2050 RTP for 2011 through 2040, with the analysis years of 2018, 2020, 2030, and 2040. SANDAG conducted a regional emissions analysis (for information purposes only) for 2050. To perform the informational analysis for 2050, SANDAG used the 2050 travel data from the SANDAG transportation model as input into EMFAC 2007 for the last year of the EMFAC 2007 model (2040).

Growth Forecasts

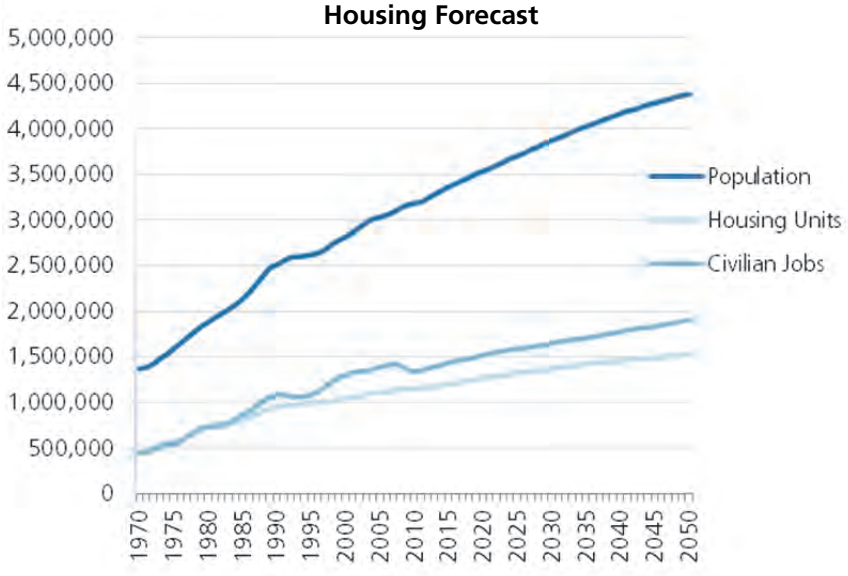
Every three to five years, SANDAG produces a long-range forecast of population, housing, and employment growth for the San Diego region. The most recent is the 2050 Regional Growth Forecast, which the SANDAG Board of Directors accepted on February 26, 2010, for planning purposes.

The forecast process relies on three integrated forecasting models. The first one, the Demographic and Economic Forecasting Model (DEFM), provides a detailed econometric and demographic forecast for the entire region. The second one, the Interregional Commuting Model, provides a forecast of commuting between the San Diego region, Orange County, southwest Riverside County, Imperial County, and Tijuana/Northern Baja California. The third one, the Urban Development Model, allocates the results of the first two models to subregional areas based upon the current plans and policies of the jurisdictions.

In April 2010, SANDAG consulted with the San Diego Region CWG on the use of the 2050 Regional Growth Forecast for the air quality conformity analysis for the 2050 RTP conformity determination and the CWG concurred. Previously, both the U.S. DOT and the U.S. EPA concurred that approved plans should be used as input in the air quality conformity process. Figure B.2 and Table B.1 show the regional population, jobs, and housing growth forecast for the San Diego region through 2050.

The 2050 Regional Growth Forecast is based largely on the adopted general plans and community plans and policies of the 18 cities, and in some cases, includes draft plans that are nearing completion. Because many of the local general plans have horizon years of 2030 – 20 years before the 2050 Growth Forecast horizon year – the later part of the forecast was developed in collaboration with each of the local jurisdictions through an iterative process that allowed each city to provide its projections for land uses in those later years. For unincorporated areas, the forecast is based on the County's referral alternative draft of the General Plan update, with additional constraints included for sensitive habitat areas.

Figure B.2 – San Diego Regional Population, Jobs, and Housing Forecast



Source: 2050 Regional Growth Forecast, SANDAG, February 2010

Table B.1 – San Diego Regional Population and Employment Forecast

2050 Regional Growth Forecast		
Year	**Population**	**Civilian Employment**
2008	3,131,552	1,411,811
2020	3,535,000	1,515,346
2030	3,870,000	1,648,361
2040	4,163,688	1,773,399
2050	4,384,867	1,898,769

Source: 2050 Regional Growth Forecast, SANDAG, February 2010

Transportation Modeling

SANDAG follows a widely used, four-step transportation modeling process of trip generation, trip distribution, mode choice, and assignment to forecast travel activity in the San Diego region. After a first pass through the four steps, a feedback process is used to pass congested travel conditions back into trip distribution and through to assignment. After several feedback iterations, a final pass is made through the mode choice and assignment steps to reflect congested travel conditions in mode decision-making. Travel model results are then combined with additional post-process input and output functions to form the complete modeling chain. For the first time, a truck model is run parallel to the four-step model. Truck origin-destination trip tables are merged with vehicle trip tables for highway assignment and air quality procedures.

The estimates of regional transportation-related emissions analyses meet the requirements established in the Transportation Conformity Rule, 40 CFR Sections 93.122(b) and 93.122(c). These requirements relate to the procedures to determine regional transportation-related emissions, including the use of network-based travel models, methods to estimate traffic speeds and delays, and the estimation of vehicle miles of travel. TransCAD 5.0 is the transportation planning computer package used by SANDAG to provide a framework for performing much of the computer processing involved with modeling, and it is used for the trip distribution and assignment steps. Another software package used extensively in the modeling process is ArcInfo. This Geographic Information System (GIS) maintains, manipulates, and displays transportation, land use, and demographic data. SANDAG has written numerous programs that provide a linkage between TransCAD and ArcInfo. Other custom programs perform some modeling functions, such as trip generation and mode choice. A number of data files and surveys are used to calibrate the transportation models. These include:

- 1995 San Diego Region Travel Behavior Study
- 2006 San Diego Household Travel Study
- 2001 Caltrans Statewide Travel Survey
- 2001-2003 San Diego Regional Transit Survey
- External Trip Surveys (2006 Interregional Travel Behavior Study)
- Traffic Generation Studies

- 1991 San Diego Visitor Survey
- 2000 Census Transportation Planning Package
- 2010 Freight Gateway Study
- 2002 Freight Analysis Framework

In addition to model parameters derived from these surveys and studies, there are three major inputs to the transportation models:

- Growth forecast inputs used to describe existing and planned land use patterns and demographic characteristics
- Highway networks used to describe existing roadway facilities and planned improvements to the roadway system
- Transit networks used to describe existing and planned public transit service

Highway Networks

The regional highway networks in the 2050 RTP include all roads classified by local jurisdictions in their general plan circulation elements. These roads include freeways, expressways, and the Regional Arterial System (RAS). The RAS consists of all conventional state highways, prime arterials, and selected major streets. In addition, some local streets are included in the networks for connectivity between zones.

The route improvements and additions in the 2050 RTP are developed to provide adequate travel service that is compatible with adopted regional policies for land use and population growth. All regionally significant projects are included in the quantitative emissions analysis. These include all state highways, all proposed national highway system routes, all regionally significant arterials, and all "other principal arterials" functionally classified by the Federal Highway Administration.

The networks also account for programs intended to improve the operation of the highway system, including High Occupancy Vehicle (HOV) lanes, Managed Lanes, and ramp metering. Existing and proposed toll facilities also are modeled to reflect time, cost, and capacity effects of these facilities. State Route 125 (SR 125) South, SR 11, SR 241, and additional lanes on Interstate 15 (I-15) north of SR 78 as well as additional lanes on I-5 north of Vandegrift Boulevard are modeled toll facilities included in the Revenue Constrained Plan for the San Diego region.

In addition, several managed/HOV lanes are included in the Revenue Constrained Plan. Facilities with proposed Managed Lanes include I-5, I-15, and I-805; and SR 52, SR 54, SR 78, SR 94, and SR 125. Managed Lanes are defined as reversible HOV routes or HOV routes with two or more lanes in the peak direction. Additionally, one-lane HOV facilities that operate as two-person carpool lanes in the earlier years of the plan transition to Managed Lanes by 2035. It is assumed that the excess capacity not used by carpools and transit on these facilities would be managed, so that single occupant vehicles could use these lanes under a pricing mechanism. Traffic flows would be managed so that the facility would operate at level of service D or better.

Based on the networks and programs described above, the transportation forecasts of the 2050 RTP differentiate among eight highway modes:

- Drive alone non-toll
- Drive alone toll
- Shared-ride non HOV/non-toll
- Shared-ride HOV/non-toll
- Shared-ride HOV/toll
- Light – heavy-duty
- Medium – heavy-duty
- Heavy – heavy-duty

SANDAG maintains a master highway network from which a specific-year network between the years 2008 (the 2050 Regional Growth Forecast base year) and 2050 can be built. Four networks were built and verified (2018, 2020, 2030, and 2040) for air quality conformity analyses of the 2050 RTP. A network also was built and verified for the year 2050 for an air quality analysis for informational purposes.

A list of the major highway and near-term regional arterial projects included in the conformity analysis, along with information on phasing for their implementation, is included in Tables A.4 and A.8, located in Appendix A. Locally funded, regionally significant projects also have been included in the air quality conformity analysis. These projects are funded with *TransNet* funds, a 20-year, half-cent local sales tax for transportation that expired in 2008; *TransNet* Extension funds, a 40-year, half-cent local sales tax extension approved by voters in 2004 that expires in 2048; and other local revenue sources.

Transit Networks

SANDAG also maintains transit network datasets for existing and proposed transit systems. Most transit routes run over the same streets, freeways, HOV lanes, and ramps used in the highway networks. As a result, the only additional facilities that are added to the transportation coverage for transit modeling purposes are:

- Trolley and commuter rail lines
- Streets used by buses that are not part of local general plan circulation elements

Seven transit modes group routes with similar operating characteristics. They are:

- Commuter Rail
- Trolley/Light Rail
- Bus Rapid Transit (BRT)
- Rapid Bus
- Limited-Express Bus
- Express Bus
- Local Bus

BRT service would have stations similar to commuter rail and light rail, and operating characteristics midway between rail and bus service. BRT service would be provided by advanced design buses operating on HOV lanes or Managed Lanes, some grade-separated transit ways, and surface streets with priority transit systems. Once TransCAD transit networks have been built, TransCAD finds minimum time paths between transit access points (TAPs). TAPs are selected transit stops that are used to represent walk and auto access to the transit system.

The following four sets of paths are created for modes:

- A.M. Peak-period local bus
- A.M. Peak-period premium service
- Midday local bus
- Midday premium service

Bus speeds assumed in the transit networks are derived from modeled highway speeds and reflect the effects of congestion. Regional and express transit routes on surface streets are assumed to operate out of congestion due to priority transit treatments. Higher bus speeds may result for transit vehicles operating on highways with HOV lanes and HOV bypass lanes at ramp meters, compared with those routes that operate on highways where these facilities do not exist.

In addition to transit travel times, transit fares are required as input to the mode choice model. TransCAD procedures replicate the San Diego region's complex fare policies which differ among:

- Buses, which collect a flat fare of between $1 and $4, depending on the type of service
- Trolleys, which charge $2.50 for all trips
- SPRINTER, which charges $2
- Commuter rail (COASTER), which has a zone-based fare of between $5 and $6.50
- Proposed regional BRT routes, which are assumed to charge $4
- Proposed Rapid Bus routes, which are assumed to charge $2.50

Fares are expressed in 1999 dollars (consistent with household incomes from the 2050 Regional Growth Forecast) and are assumed to remain constant in inflation-adjusted dollars over the forecast period.

Near-term transit route changes are drawn from the Coordinated Plan, which was produced in cooperation with the region's transit agencies. Longer-range improvements are proposed as a part of the RTP development and other transit corridor studies. In addition to federal and state funded projects, locally funded transit projects that are regionally significant have been included in the air quality conformity analysis of the 2050 RTP. These transit projects also are funded with *TransNet* funds or other local revenue sources. Once network coding is completed, the transportation models are run for the applicable scenarios (2018, 2020, 2030, 2040, and 2050 (for informational purposes)). A list of major regional transit projects included in the draft air quality conformity analysis, as well as information on phasing their implementation, is included in Table A.5, located in Appendix A.

Trip Generation

A trip generation analysis is the first step in the transportation modeling process. Average weekday trip ends, by all forms of transportation and starting and ending in each zone, are estimated for ten trip types:

- Home-to-work
- Home-to-college
- Home-to-school
- Home-to-shop
- Home-to-other

- Work-to-other
- Other-other
- Serve passenger
- Visitor
- Airport

The model computes person trips, which account for all forms of transportation – including automobiles, trucks, taxicabs, motorcycles, public transit, bicycling, and walking.

The trip-generation model works by applying trip rates to zone-level growth forecasts. The model calculates each of the trip ends separately as trip productions and attractions. Trip production rates are expressed as trips per household, while trip production rates vary by trip type and structure type. Trip attractions are expressed as trips per acre of nonresidential land use or trips per household. Trip attraction rates vary by trip type and land use category. The 2050 Regional Growth Forecast was used to produce trip-generation forecasts for the years 2018, 2020, 2030, 2040, and 2050. Trip generation rates were established by utilizing data from traffic generator studies, as well as expanding rates from the 1995 San Diego Region Travel Behavior Study, the 2006 San Diego Household Travel Study, and the 2001 Caltrans Statewide Travel Survey.

The model reduces future year person-trips by a small amount to reflect the increased use of teleworking and e-commerce. Reduction factors of 1, 3, or 5 percent were applied to selected trip purposes and land uses. Telework reduction factors depend on the likelihood that the land use type would have employee categories that could feasibly telecommute. Reduction factors start in the year 2020.

The truck model follows a process similar to the one followed by the person model. The model computes truck vehicle trips for heavy-duty trucks, including light heavy-duty, medium heavy-duty, and heavy heavy-duty trucks. The truck classifications correspond to the CARB truck classifications used in the air quality model EMFAC. Trip production and attraction rates are expressed as trips per employee, and the rates vary by employee industry category.

Trip Distribution

After the trip generation analysis is completed, trip movements between zones are determined using a form of the trip distribution model known as the doubly-constrained, gamma-function gravity model. Inputs to the trip distribution model include zone-level trip generation forecasts by trip type, zone-to-zone impedances, and gamma function parameters by trip type and 4D category. 4D index categories attempt to define locations by their density, diversity, distance, and urban design characteristics. A high 4D index value represents areas that would be considered smart growth and would result in shortened trip lengths. In this way, the model is designed to reflect changing trip patterns in response to the types of new development in land use scenarios. The model also modifies trip patterns as new roadways are added.

A truck trip distribution analysis is performed in a similar manner, but it is used to distribute vehicle trips rather than person-trips by purpose, as in the person model. The truck model also uses different distribution parameters by vehicle type, which are not segmented by 4D category.

The model is calibrated to match observed trip length frequencies from the 2006 Household Travel Study and the 2001 Caltrans Statewide Travel Survey. Zone-to-zone impedances are a composite measure of peak and off-peak travel times and costs by highway, transit, and non-motorized modes.

Mode Choice

At this point in the modeling process, total person-trip movements between zones are split into different forms of transportation by highway, transit, and non-motorized modes (bicycling and walking). Highway modes include drive-alone non-toll, drive-alone toll, shared-ride non HOV/non-toll, shared-ride HOV/non-toll, and shared-ride HOV/toll. Nine transit modes differentiate transit trips by three ride modes (rail, BRT, and bus) and three access modes (walk, drive, and drop-off). The mode choice model is designed to link mode use to demographic assumptions, highway network conditions, transit system configuration, land use alternatives, parking costs, transit fares, and auto operating costs. Trips between zone pairs are allocated to modes based on the cost and time of traveling by a particular mode, compared with the cost and time of traveling by other modes. For example, vehicle trips on a congested route would be more likely to be diverted to light rail than vehicle trips on an uncongested freeway.

Income level also is considered, because lower-income households tend to own fewer automobiles and therefore make more trips by transit and carpooling. People in higher income households tend to choose modes based on time and convenience rather than cost. The mode choice model is calibrated using the 1995 San Diego Travel Behavior Study and the 2006 Household Travel Study trip tables by mode and income, as well as 2001-2003 Regional Transit Survey transit trip characteristics. Regional-level Census 2000 work-trip mode shares also were used to fine tune mode-share estimates.

Highway and transit travel times reflect highway congestion effects from the final iteration of the feedback loop. The model produces a.m. peak, p.m. peak, and off-peak period trip tables for vehicles and transit riders. The a.m. peak period is from 6 to 9 a.m. and the p.m. peak period is from 3 to 6 p.m. The off-peak period covers the remaining 18 hours of the day.

Highway and Transit Assignment

Highway assignment produces traffic-volume estimates for all roadway segments in the system. These traffic volumes are an important input to emissions modeling. Similarly, transit trips are assigned to transit routes and segments.

Highway

SANDAG loads traffic using the TransCAD Multimodal Multiclass Assignment function. Before loading the traffic onto the network, the three truck modes are combined with the five passenger vehicle modes. Multi-class assignment allows SANDAG to assign the eight vehicle modes (as defined in the highway network section) in one combined procedure.

The highway assignment model works by finding roads that provide the shortest travel impedance between each zone pair. Trips between zone pairs are then accumulated on road segments making up minimum paths. Highway impedances consider posted speed limits, signal delays, congestion delays, and costs. The model computes congestion delays for each segment based on the ratio of the traffic volume to roadway capacity. Motorists may

choose different paths during peak hours, when congestion can be heavy and during off-peak hours, when roadways are typically free flowing. For this reason, traffic is assigned separately for a.m. peak, p.m. peak, and off-peak periods. Vehicle trip tables for each scenario reflect increased trip-making due to population growth and variations in travel patterns due to the alternative transportation facilities/ networks proposed.

Model accuracy is assessed by comparing model estimated traffic volumes with actual traffic counts obtained through the SANDAG traffic monitoring program and the Highway Performance Monitoring System estimates of Vehicle Miles of Travel (VMT).

After completing the highway assignments, additional processing is needed. Adjustments are made for calibration error volume, HOV/managed lane volume, bus volumes, hourly distribution factors, Level of Service, and travel time.

Transit

For transit assignment, TransCAD software assigns TAP-to-TAP transit trips to the network. Eight separate transit assignments are produced for peak and off-peak periods, walk and auto access, and local bus and premium service. These individual assignments are summed to obtain total transit ridership forecasts.

Before assigning transit trips, external transit trips coming into San Diego from outside the region need to be added to the internal transit trips estimated by the mode choice model. Currently, few transit trips enter from the north or east. However, more than 20,000 transit trips cross the Mexican border each day. To account for these trips, an external transit trip table for the base year is developed from on-board transit ridership surveys and factored to future years based on border crossing trends.

For accuracy, transit ridership forecasts from the transit assignment model are compared with transit counts from the SANDAG transit passenger counting program to determine whether transit modeling parameters need to be adjusted.

Some of these comparisons of model-estimated boardings with actual boardings include:

- System-level boardings, which may reveal transfer rate problems and lead to changes to the transfer wait time factor in the mode choice model
- Boardings by mode, which may reveal modal biases and lead to changes in mode choice modal constants
- Boardings by frequency of service, which may show biases that lead to changes in the first wait factor in the mode choice model
- A Centre City screenline crossing, which may lead to changes in parking costs and boardings by stop location, which may indicate problems with specific generators, such as a university

Post-TransCAD Processing

Standard TransCAD output needs to be reformatted and adjusted to be useful for emissions modeling. Several routines and computer programs have been written to accomplish the following major functions:

- Correcting link-specific traffic volume forecasts for calibration errors
- Adding in estimated travel on roads not in the transportation modeling process

- Computing link speeds based on corrected link volumes, highway capacity manual relationships between congestion and speed (or signal delay)
- Splitting link volumes into heavy-duty truck and other traffic to obtain speed distributions by vehicle class
- Preparing a data set that contains total VMT, number of trip starts, and VMT by speed category by time of day for each vehicle class

The travel demand modeling procedures used for the 2050 RTP differ from previous modeling procedures in three key ways, as described in the previous sections. To summarize, first a truck model is run parallel to the four-step model. Truck origin-destination trip tables are merged with vehicle trip tables for highway assignment and air quality procedures. Second, new inputs are used, including the recently completed 2010 Freight Gateway Study (a forecast of freight traffic in the region), 2002 Freight Analysis Framework data, and the 2050 Regional Growth Forecast projections. Third, a 4D (density, diversity, distance, and urban design characteristics) category is used as an input into the trip distribution model. These new inputs and procedures have contributed to changes in output for emissions modeling.

Motor Vehicle Emissions Modeling

Emissions Model

In November 2006, CARB released EMFAC 2007, an emissions inventory model that calculates emissions for motor vehicles operating in California. It is an integrated model that combines emission rate data with vehicle activity to calculate regional emissions. The U.S. EPA approved EMFAC 2007 for use in conformity determinations on January 18, 2008. The EMFAC 2007 model supports the calculation of emissions for the Burden mode. The Burden mode is used for calculating regional emission inventories. In this mode, the model reports total emissions as tons per day for each pollutant, by vehicle class, and the total vehicle fleet. The Burden mode uses emission factors that have been corrected for ambient conditions and speeds combined with vehicle activity to calculate emissions in tons per day. Vehicle activity includes the number of vehicles, daily VMT, and the number of daily trips.

The air quality analysis of the 2050 RTP was conducted using the EMFAC 2007 Burden mode. Projections of daily regional emissions were prepared for reactive organic gases (ROG), nitrogen oxides (NOx), and CO.

On-road motor vehicle emissions are attributed to several different processes:

- Starting exhaust
- Running exhaust
- Idle exhaust (calculated for heavy-duty trucks only)
- Resting and diurnal evaporation
- Running losses
- Hot soak evaporation

Emission factors vary by vehicle class, fuel usage, and technology. The fuels modeled are gasoline, diesel, and electricity-powered vehicles. Technology categories can be grouped into catalyst, non-catalyst, and diesel. Thirteen vehicle classes are modeled:

- Passenger car
- Two types of light-duty trucks

- Medium-duty truck
- Two types of light heavy-duty trucks
- Medium heavy-duty truck
- Heavy heavy-duty truck
- Line-haul vehicle
- Urban bus
- School bus
- Motorcycle
- Motor home

Emission factors for processes that vary by temperature (i.e., starting exhaust, hot soak, and running exhaust) are broken down further by specified temperature ranges. Exhaust emission factors also are broken down by speed range.

Regional Emissions Forecasts

Regional transportation forecasts were initiated in December 2010. Output from the TransCAD model was then reformatted and adjusted to be useful for emissions modeling.

Eight-Hour Ozone Standard

Effective June 9, 2008, the U.S. EPA found the eight-hour ozone budgets included in the Eight-Hour Ozone Attainment Plan for San Diego County adequate for transportation conformity purposes. Beginning in December 2010, SANDAG prepared countywide forecasts of average weekday ROG and NOx emissions for 2018, 2020, 2030, 2040, and 2050 (for informational purposes) using the EMFAC 2007 model. ROG and NOx emissions are based on the summer season.

The analysis years were selected to comply with 40 CFR Sections 93.106(a)(1) and 93.118(a) of the Transportation Conformity Rule and the approved methodology for conducting the 2050 RTP Air Quality Conformity Analysis, which shortened the conformity horizon to 2040 and requires an informational analysis of the plan horizon year (2050). According to these sections of the Conformity Rule, the first horizon year (2018) must be within ten years from the base year used to validate the regional transportation model (2008), the last horizon year must be the last year of the transportation plan's forecast period, or in the case of the 2050 RTP, the last year of the conformity determination (2040), and the horizon years may be no more than ten years apart (2020 and 2030).

CO Standard

CO regional emissions were projected for 2018, 2020, 2030, 2040, and 2050 (for informational purposes) for the conformity determination of the 2050 RTP. CO emissions are based on the winter season.

Emissions Modeling Results

An emissions budget is the part of the SIP that identifies emissions levels necessary for meeting emissions reduction milestones, attainment, or maintenance demonstrations.

To determine conformity of the 2050 RTP, the plan must comply with the emissions analysis described in the Regional Emissions Forecast section. Table B.2 shows that projected ROG and NOx emissions from the 2050 RTP are below the ROG and Nox budgets.

Adjustment factors for ROG and NOx were provided by CARB to account for recently-adopted emission control programs not reflected in EMFAC 2007 and other corrections. Table B.3 includes the adjustment factors by analysis year.

Table B.2 – 2050 Revenue Constrained RTP – Air Quality Conformity Analysis for Eight-Hour Ozone (EMFAC 2007)

			ROG		NOx	
Year	Average Weekday Vehicle Starts (1,000s)	Average Weekday Vehicle Miles (1,000s)	SIP Emissions Budget Tons/Day	ROG Emissions Tons/Day	SIP Emissions Budget Tons/Day	NOx Emissions Tons/Day
2018	14,760	85,073	53	26	98	42
2020	14,979	86,155	53	24	98	38
2030	16,396	98,912	53	19	98	28
2040	17,676	107,715	53	18	98	28
2050[1]	18,942	117,825	53	19	98	31

[1] The emission data for 2050 was prepared using 2040 emission factors, as emission factors for 2050 are not available. The 2050 RTP air quality conformity analysis was conducted for the years 2011 – 2040. Emissions data for 2050 is included for informational purposes only.

Note: Emissions budgets are from the Eight-Hour Ozone Attainment Plan for San Diego County, which were found adequate for transportation conformity purposes by the U.S. EPA, effective June 9, 2008.

Table B.3 – EMFAC 2007 Adjustment Factors

Year	ROG Adjustment Factor (Tons/Day)	NOx Adjustment Factor (Tons/Day)
2018	0.25	2.48
2020	0.33	2.40
2030	0.71	2.80

Note: Adjustment factors were provided by CARB. The tons listed are subtracted from the EMFAC 2007 output of tons per day for ROG and NOx.

Table B.4 shows that projected CO emissions from the 2050 RTP are below the 2003 CO budget of 730 tons per day.

Exempt Projects

Section 93.126 of the Transportation Conformity Rule exempts certain highway and transit projects from the requirement to determine conformity. The categories of exempt projects include safety, mass transit, air quality (ridesharing and bicycle and pedestrian facilities), and other (such as planning studies).

Table B.5 illustrates the exempt projects considered in the 2050 Revenue Constrained RTP. This table shows short-term exempt projects. Additional unidentified projects could be funded with revenues expected to be available from the continuation of existing state and federal programs.

Table B.4 – 2050 Revenue Constrained RTP Air Quality Conformity Analysis for Carbon Monoxide (EMFAC 2007)

			CO	
Year	Average Weekday Vehicle Starts (1,000s)	Average Weekday Vehicle Miles (1,000s)	SIP Emissions Budget Tons/Day	CO Emissions Tons/Day
2018	14,760	85,073	730	231
2020	14,979	86,115	730	207
2030	16,396	98,912	730	158
2040	17,676	107,715	730	144
2050[(2)]	18,942	117,825	730	157

[(2)] The emission data for 2050 was prepared using 2040 emission factors, as emission factors for 2050 are not available. The 2050 RTP air quality conformity analysis was conducted for the years 2011 – 2040. Emissions data for 2050 is included for informational purposes only.

Note: Emissions budgets for the San Diego region are from 2004 Revision to California State Implementation Plan for Carbon Monoxide, Updated Maintenance Plan for Ten Federal Planning Areas (Approved as a SIP revision in January 2006).

Implementation of Transportation Control Measures

There are four federally-approved Transportation Control Measures (TCMs) that must be implemented in San Diego, which the SIP refers to as transportation tactics. They include ridesharing, transit service improvements, traffic-flow improvements, and bicycle facilities and programs.

These TCMs were established in the 1982 SIP, which identified general objectives and implementing actions for each tactic. The TCMs have been fully implemented. Ridesharing, transit, bicycling, and traffic-flow improvements continue to be funded, although the level of implementation established in the SIP has been surpassed.

Table B.5 – Exempt Projects

Project/Program Description	Project/Program Description
Bikeway, Rail Trail, and Pedestrian Projects	
Bayshore Bikeway	Maple Street Pedestrian Plaza
Bay-to-Ranch Bikeway	Mid-County Bikeway
Border Access Bicycle Corridor	Mira Mesa Bicycle Corridor
Camp Pendleton Trail	Mission Valley – Chula Vista Bicycle Corridor
Carlsbad – San Marcos Bicycle Corridor	North Park – Centre City Bicycle Corridor
Central Coast Bicycle Corridor	Otay Mesa Port of Entry Pedestrian/Bicycle Facilities
Chula Vista Greenbelt	Park Boulevard Bicycle Connector
City Heights – Old Town Bicycle Corridor	Poway Bicycle Loop
Clairemont – Centre City Bicycle Corridor	San Diego Regional Bicycle Plan
Coastal Rail Trail	San Diego River Multi-Use Bicycle and Pedestrian Path
East County Northern Bicycle Loop	San Luis Rey River Trail
East County Southern Bicycle Loop	Santee – El Cajon Bicycle Corridor
El Camino Real Bicycle Corridor	SR 52 Bikeway
Encinitas – San Marcos Bicycle Corridor	SR 56 Bikeway
Escondido Creek Bike Path Bridge and Bikeway	SR 56/Black Mountain Road Bikeway Interchange
Gilman Bicycle Connector	SR 125 Bicycle Corridor
Hillcrest – El Cajon Bicycle Corridor	SR 905 Bicycle Corridor
Imperial Beach Bicycle Connector	Sweetwater River Bikeway
Inland Rail Trail	Tecate International Border Crossing Pedestrian Facilities
Interstate 8 Bicycle Corridor	Ted Williams Parkway Pedestrian Bridge at Shoal Creek
Interstate 15 Bikeway	Third Avenue Bicycle and Pedestrian Access
Interstate 805 Bicycle Corridor	Vista Way Bicycle Connector
Kearny Mesa – Beaches Bicycle Corridor	West Bernardo Bike Path
Kensington – Balboa Park Bicycle Corridor	

Table B.5 – Exempt Projects (Continued)

Project/Program Description	Project/Program Description
Safety Improvement Program	**Transportation Systems Management**
Bridge Rehabilitation/Preservation/Retrofit	Automated Traveler Information System (ATIS)
Collision Reduction	Bus on Shoulder Service
Emergency Response	Compass Card
Hazard Elimination/Safe Routes to School	FasTrak®
Highway Maintenance	Freeway Service Patrol
Safety Improvement Program	Connected Vehicle Roadside Devices
Roadway/Roadside Preservation	Intermodal Transportation Management System (IMTMS)
Smart Growth Incentive Program	ITS Operations
Transit Terminals	Joint Transportation Operations Center (JTOC)
Airport Intermodal Transit Center/Terminal	Trolley Fiber Communication Network
San Ysidro Intermodal Transit Center/Terminal	Universal Transportation Account
	Various Traffic Signal/Prioritization

Interagency Consultation Process and Public Input

The consultation process followed to prepare the Air Quality Conformity Analysis for the 2050 RTP complies with the San Diego Transportation Conformity Procedures adopted in July 1998. In turn, these procedures comply with federal requirements under 40 CFR 93. Interagency consultation involves SANDAG (as the MPO for San Diego County), APCD, Caltrans, CARB, U.S. DOT, and U.S. EPA. In addition, pursuant to Government Code Section 14522.2, the methodology and key assumptions of travel demand models are provided in Technical Appendix 15.

Consultation is a three-tier process that:

- Formulates and review drafts through a conformity working group
- Provides local agencies and the public with opportunities for input through existing regional advisory committees and workshops
- Seeks comments from affected federal and state agencies through participation in the development of draft documents and the circulation of supporting materials prior to formal adoption

SANDAG consulted on the development of the Air Quality Conformity Analysis of the 2050 RTP at meetings of the San Diego Region CWG, as follows:

- On August 4, 2010, SANDAG staff presented the RTP process and timeline, schedule for the 2050 RTP development, and information on some of the RTP conformity procedures, including the Public Involvement Plan, pollutant budgets and Transportation Control Measures. Additionally, staff presented the 2050 RTP Draft Proposed Conformity Analysis Methodology for review and comment by the CWG and requested any comments in writing by August 20, 2010.

- On September 1, 2010, SANDAG presented information on the 2050 Growth Forecast and the 2050 RTP Travel Demand Model. Staff also presented once more the 2050 RTP Draft Proposed Conformity Analysis Methodology, to provide the group with another opportunity to review the information and provide any comments. No comments were received.
- On September 17, 2010, the SANDAG Transportation Committee accepted for review and distribution the draft proposed methodology for conducting the air quality conformity determination for the 2050 RTP for a 30-day comment period.
- On October 6, 2010, SANDAG staff presented information on several conformity criteria and procedures for the development of the 2050 RTP, including 2050 RTP public outreach, latest emissions model, and draft revenue constrained financial assumptions.
- On October 15, 2010, the SANDAG Transportation Committee held a public hearing to solicit public comments on shortening the conformity timeline and on the proposed methodology for the regional emissions analysis. No comments were received at the hearing or in writing.
- On November 19, 2010, the SANDAG Board of Directors approved the 2050 RTP Conformity Analysis Methodology for use in the Draft 2050 RTP and its air quality conformity determination.
- On December 17, 2010, the SANDAG Board of Directors selected the Revenue Constrained Transportation Network to be included in the Draft 2050 RTP and its Air Quality Conformity Analysis.
- SANDAG staff initiated the air quality conformity modeling for the Draft 2050 RTP on December 17, 2010.
- At the January 5, 2011, CWG meeting, SANDAG staff presented the 2050 RTP revenue constrained and exempt project lists.
- On February 25, 2011, the Draft 2050 RTP Air Quality Conformity Analysis was released to the CWG for a 30-day review period.
- At the March 2, 2011, CWG meeting, the Draft 2050 RTP Air Quality Conformity Analysis was discussed.
- On April 22, 2011, the SANDAG Board of Directors released the Draft 2050 RTP, including its air quality conformity analysis, for a public review period that closed on July 8, 2011.
- On July 26, 2011, the revised air quality conformity analysis document was released to the CWG for a 30-day review period that closed on August 26, 2011.
- On August 1, 2011, the revised air quality conformity analysis document was released to the public for a 30-day review period that ended on August 31, 2011. No comments were received.

Members of the public have been welcomed to provide comments at meetings of the San Diego Region CWG, the Transportation Committee, and the SANDAG Board of Directors.

Appendix C

Tribal Consultation

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Introduction

The U.S. Constitution and treaties recognize Native American communities as separate and independent political communities within the territorial boundaries of the United States – nations within a nation. In the San Diego region, there are 17 federally recognized tribal nations with jurisdiction over 18 reservations – the most in any county in the United States, as shown in Figure C.1.[i]

Federal legislation requires that federally recognized tribal governments be consulted in the development of Regional Transportation Plans (RTP) and programs (Title 23, U.S.C. 450.312 and 316(c)). In particular, the current federal transportation authorization, the Safe, Accountable, Flexible, and Efficient Transportation Act: A Legacy for Users (SAFETEA-LU) reinforces the federal emphasis on tribal government participation. President Obama in his November 5, 2009, Memorandum on Tribal Consultation (Federal Register, vol. 74, No. 215, 11/9/09) reiterated the directive for public agencies to incorporate tribal consultation into their plans and programs in a timely and meaningful manner. In February 2010 the Department of Transportation led the way with a revised Tribal Consultation Plan that resulted from extensive consultation with tribal leadership across the country.[ii]

How this consultation should occur is left to the Metropolitan Planning Organizations (MPOs) and the tribal governments. SANDAG, as an MPO, has forged a strong working relationship with the tribal nations in our region, based on a regional framework of communication, coordination, and collaboration in the regional transportation planning process. This appendix documents the tribal consultation process for the 2050 RTP. It includes: the background on the transportation needs, as the tribal nations in the region identified them; a discussion of the development of the regional government-to-government framework that has emerged in recent years; documentation of milestones in collaborative transportation planning that have occurred since the 2030 RTP; and the tribal transportation strategies for the 2050 RTP discussed and agreed upon at the 2010 San Diego Regional Tribal Summit. The objectives for the 2050 RTP, with regard to tribal nations and regional transportation planning, were to:

- Engage federally recognized tribal governments in the region in the transportation planning process in a timely, meaningful, and effective manner
- Strengthen the current framework for government-to-government engagement at a regional level
- Based on a government-to-government dialogue and negotiation, pursue a set of mutually agreed upon prioritized strategies to improve tribal transportation in the region in four areas: roadways, transit, funding, and information sharing/technical assistance

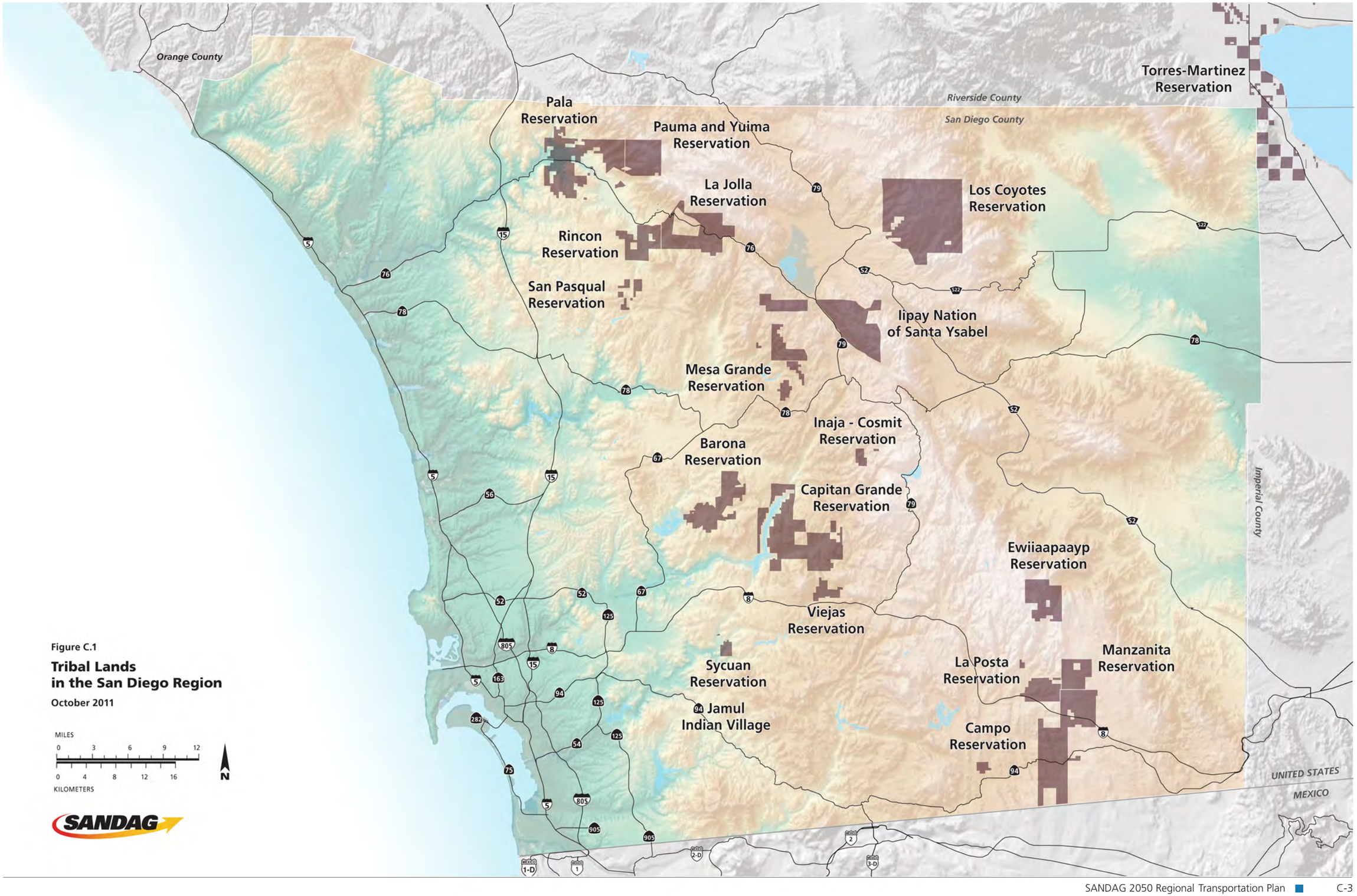


Figure C.1

Tribal Lands in the San Diego Region

October 2011

Background

Historically, the relationship between local governments and federally recognized tribal governments has been contentious. While the federal-tribal relationship is well established, the local-tribal government relationship has not been as clearly defined. Despite efforts to reach out to local governments, tribal governments indicate that for many years they were not well received. This has changed considerably in recent years. With the advent of gaming, local perceptions have changed, according to various tribal leaders. As a condition of the development of more recent gaming compacts, some tribes are required to negotiate mitigation agreements with the local land use authorities adjacent to them. What has not been clearly delineated by the state or federal government is the mechanism for including tribal input into the regional transportation planning process. The federal government requires "consultation" with tribal governments. However, the definition of meaningful consultation, or more in-depth coordination and cooperation, is being developed on a case-by-case basis in various parts of the country. There is clearly an increasing need to better coordinate and assess the impacts of tribal development and future plans on the regional transportation system, as well as how regional plans and planning principles, such as smart growth strategies, affect tribal development.

Tribal Nations in San Diego

Of the 107 federally recognized Indian tribes in California, 17 are located in San Diego County. Historically, the tribal members of today's bands represent four Indian cultural/linguistic groups that have populated this entire region for more than 10,000 years, taking advantage of its abundant natural resources and diverse ecological system for their livelihoods. The four nations are: the Luiseño, who traditionally inhabited the land along the San Luis Rey River in north and northwestern San Diego County; the Cahuilla, who live in the mountains in the northeastern part of the county and into the Coachella and Imperial Valleys; the Cupeño, who live in the Warner Springs area; and the Kumeyaay (Northern Ipai/Southern Tipai), who live in the southern part of the county from the coast to the mountains and all the way to what is today Baja California.

In the years just prior to California becoming a state, the federal government developed treaties with Native Nations in the region in an effort to reduce tribal and settler violence at the end of the U.S.-Mexican War and during the onset of the Gold Rush. However, these treaties were never ratified; they were thwarted on the U.S. Senate floor by pressure from the new California Senators, and the tribal nations that had signed the treaties were never informed. In 1875, President Ulysses S. Grant signed an Executive Order based on several of the "lost treaties," creating the Santa Ysabel, Pala, Sycuan, La Jolla, Rincon, and Capitan Grande[iii] tribal reservations. Most of the current tribal reservations were established by the end of the 19th century; however, several were established well into the 20th century.[iv] Today, these four ethnic groups are distributed across 18 reservations and are represented by 17 federally recognized tribal governments as shown in Table C.1.[v]

As domestic sovereign nations, tribes are subject to federal regulations, but they are not subject to local or state regulations unless the U.S. Congress delegates implementation of federal law to the state. From a governance perspective, tribal governments are considered a separate category of government from the federal, state, and local governments. In addition to the standard governmental functions of regulating, taxing, and delivering services, tribal governments act to preserve

Table C.1 – Federally Reconized Indian Reservations and Tribal Governments in the San Diego Region

Reservation Name	Tribal Government
Barona*	Barona Band of Mission Indians
Campo*	Campo Band of Mission Indians of the Kumeyaay Nation
Capitan Grande	Joint Power Authority between Barona and Viejas
Ewiiaapaayp***	Ewiiaapaayp Band of Kumeyaay Indians
Inaja and Cosmit	Inaja Cosmit Band of Diegueño Mission Indians
Jamul Indian Village	Jamul Indian Village. A Kumeyaay Nation
La Jolla	La Jolla Band of Luiseño Indians
La Posta**	La Posta Band of the Kumeyaay Nation
Los Coyotes	Los Coyotes Band of Cahuilla/Cupeño Indians
Manzanita	Manzanita Band of Diegueño Mission Indians
Mesa Grande	Mesa Grande Band of Diegueño Mission Indians
Pala*	Pala Band of Mission Indians
Pauma and Yuima*	Pauma Band of Luiseño Indians
Rincon*	Rincon Band of Luiseño Indians
San Pasqual*	San Pasqual Band of Diegueno Mission Indians
Santa Ysabel**	Iipay Nation of Santa Ysabel
Sycuan*	Sycuan Band of the Kumeyaay Nation
Viejas*	Viejas Band of Kumeyaay Indians

Source: SANGIS, Bureau of Indian Affairs
*tribe with gaming facility
**tribe with less than 350 slot facility
***Previously known as 'Cuyapaipe'

and protect tribal culture and the tribal community, including determining tribal membership. Tribal governments also are responsible for the development, management, and operation of tribal economic enterprises. Most of the land within the boundaries of reservations is owned by tribes and held in trust by the federal government.[vi] Tribes are a distinct category of land use authority. Native American reservations currently cover more than 116,000 acres in the San Diego region, approximately four percent of the region's land base.

Current Conditions

A number of planning issues surround these reservations, as they are all located in remote areas outside of incorporated areas. The degree of remoteness ranges from those that are outside the urban transportation system but near major highways such as Viejas, to those that are not even fully connected to county roads, such as Los Coyotes. Inadequate access to and from the

reservations often results in a lack of economic opportunity, as well as insufficient health, social, and cultural services.

Tribal Economic Development

Gaming is a traditional social activity among many tribal nations. However, tribal gaming enterprises expanded exponentially nationwide in the early 1990s as a result of the passage of the Federal Indian Gaming Regulatory Act (IGRA). The IGRA was the result of a legal battle between the Cabazon Band of Mission Indians and the State of California over the issue of the definition of sovereignty.[vii] The State claimed that Cabazon was violating the state's anti-gambling laws, while the tribe asserted its sovereign right to pursue its own economic interests. In 1987, the U.S. Supreme Court ruled in favor of Cabazon, prompting Congress to pass a federal gaming regulatory act to define how gaming should be conducted nationwide and what role states should have in that activity.[viii] Although several tribes in the San Diego region already had well-established bingo facilities, by the 1990s most of the tribes had developed or had agreements to develop gaming facilities as a means of economic development. San Diego County now has ten tribal gaming facilities, which is the greatest concentration of Indian gaming facilities in any county in the United States (refer to Table C.1).[ix]

Gaming-related and other types of development have led to rapid economic growth for these tribes, while also providing jobs and stimulating the regional economy.[x] In the San Diego region, statistics show that the

Indian gaming industry as a whole has created more than 12,000 permanent jobs in the region, resulting in a $1 billion industry with about $500 million in goods and services purchased annually and $500 million in payroll. It should be noted, however, that the poverty level among the Native American population remains below the national average. Some gaming tribes have been much more successful than others, and there are six tribes in the region that are not involved in gaming.

This economic growth has been accompanied by increases in traffic, jobs-housing accessibility issues, and the need for additional resources such as water and energy. Even those tribes that do not have gaming facilities continue to have economic development, transportation, and infrastructure needs that have not been met.



Since the mid-1990s, tribal governments in San Diego have been developing gaming compacts with the State of California that have allowed them to plan and develop gaming facilities on their reservations. The planning framework used for the RTP is one of concentrating development in existing, more urban areas and connecting public transit to appropriate smart growth opportunity areas. The 2050 RTP considered existing tribal land use patterns in land use and transportation forecast modeling. But it did not consider forecast land use because limited information was available from

tribal governments. As part of the gaming compact process, tribal governments are required to submit to the State a Tribal Environmental Impact Report. The findings are subject to negotiation between the tribal government and the land use authority adjacent to it. However, there are currently no protocols for exchanging information about long-term land use and transportation plans on tribal lands for the regional planning process.

The County of San Diego, in its capacity as the adjacent land use authority to all tribal developments in the San Diego region, conducted traffic needs assessments related to tribal developments, which intensified after the enactment of the federal IGRA. In its 2003 report on the impact of tribal development on its roadways, the County requested that SANDAG consider the impacts of tribal development on the regional transportation system.[xi]

"It is estimated that 38.5 miles of County-maintained arterials in the vicinity of the Reservations will need additional road capacity improvements. Of those 38.5 miles, about 15.6 were identified under Baseline Conditions as needing improvements solely due to non-tribal development in the unincorporated area. The additional 22.9 miles is due to existing and near-term development of tribal projects."

Based on that information, the County negotiated cooperative agreements with several tribes for "fair share" funding to mitigate traffic impacts. Nonetheless, according to the County report, level of service (LOS) on several road segments in the State Route (SR) 76, SR 67, and SR 94 corridors was estimated to deteriorate because of increased traffic volumes associated with the gaming facilities. Both Caltrans and the County called for additional corridor studies in the unincorporated area associated with gaming facilities.

Currently, the main input required to accurately incorporate tribal land use into transportation forecast modeling for the RTP is the square footage of gaming area which produces the estimate of Average Daily Trips (ADT). Currently, ten tribal gaming facilities are in operation. The estimated square footage of each facility is shown in Table C.2. It is anticipated that through government-to-government discussions with tribal governments, more accurate protocols can be developed for assessing traffic impacts. The available 2009 data on square footage devoted to gaming was incorporated into the travel forecasting for the 2050 RTP.

At the same time that there are concerns about the impact of gaming facilities on the regional transportation system, some tribal lands are isolated from the regional transportation system because they are situated in unincorporated portions of the county. All non-gaming tribes[xii] in San Diego County receive funding from gaming tribes in the form of a Revenue Sharing Trust Fund (RSTF)[xiii] to support the administration of their nations. But their isolation from the transportation system – in terms of infrastructure and transit services – limits their ability to improve the health and well-being of tribal members who reside on the reservation, as well as their ability to explore alternative means of self-sufficiency. As more tribal members return to their reservations to live, this will continue to be an issue regardless of the success of tribal enterprises. Regardless of the overall goal of the 2050 RTP, the region's tribes must be serviced by the federally funded regional transportation system. It is critical to balance the needs of the region with the needs of the tribal nations for a system that serves everyone.

Table C.2 – Square Footage of Gaming Facilities for Trip Generation Estimates

Name	Casino Name	Year Opened	Square Footage of Existing Operation	Number of Restaurants	Square Footage of Gaming Floor	Number of Gaming Machines; Tables	Number of Employees
SR 76 Corridor							
Pala Band of Mission Indians	Pala Casino Resort & Spa	2001	650,000	10	210,000	2,000; 80	1,775
Pauma Band of Luiseño-Yuima Indians	Casino Pauma	2001	65,000	3	37,000	1,090; 18	500
Rincon Band of Luiseño Indians	Harrah's Rincon Casino & Resort	2002	263,000	8	55,000	1,600; 59	1,500
San Pasqual Band of Diegueño Indians	Valley View Casino	2001	124,000	3	75,000	2,016; 30	1,100
SR 79 Corridor							
Iipay Nation of Santa Ysabel*	Santa Ysabel Casino Resort	2007	30,000	1	15,000	349; 8	169
I-8 Corridor							
Barona Band of Mission Indians	Barona Resort & Casino	2003**	305,000	11	101,550	2,000; 85	3,000
Campo Band of Kumeyaay Mission Indians	Golden Acorn Casino	2001	60,000	1	40,000	750; 12	325
La Posta Band of the Kumeyaay Nation***	La Posta Casino	2007	20,000	1	20,000	349; 0	90
Sycuan Band of the Kumeyaay Nation	Sycuan Casino & Resort	1983	238,000	4	100,000	2,271; 85	2,000
Viejas Band of Kumeyaay Indians	Viejas Casino & Turf Club	1991	333,000	6	210,000	2,000; 85	2,000
		Totals 2009:	**2,088,000**	**46**	**1,072,000**	**14,425; 447**	**12,459**

Source: Cruz, Manny, "San Diego Indian Gaming," *San Diego Metropolitan Magazine, April 2009*

* Not considered a gaming tribe for the purposes of the Special Distribution Trust Fund.

** Barona Big Top opened in January 1994

*** Not considered a gaming tribe for the purposes of the Special Distribution Trust Fund.

Tribal Transportation Needs Assessment

To better understand the transportation needs of tribal nations in the region, Caltrans District 11 and SANDAG designed, developed, and implemented a joint Tribal Transportation Needs Assessment in 2005, as part of the 2030 RTP process. It served as a component of an overall transportation needs assessment. The goal of this component was to: (a) initiate a process of building better relationships with tribes in San Diego and Imperial Counties; (b) establish a baseline of awareness of the transportation issues affecting each tribe in order to facilitate partnerships among Caltrans, tribal governments, and the regional transportation agencies; and (c) promote more efficient identification of mutual transportation concerns and the development of appropriate solutions.

For the purpose of examining long-range transportation issues, tribal nations in the region were grouped into three clusters based on key transportation corridors: SR 76, which runs east-west in North County; SR 79, which runs north-south in the eastern half of the county; and, Interstate 8 (I-8), which runs east-west in the southern area of the county (Figure C.2).



Technical Workshop – Identifying Strategies

In preparation for the 2006 San Diego Regional Tribal Summit, staff from SANDAG, Caltrans, the County of San Diego, the Southern California Tribal Chairmen's Association (SCTCA), and the Reservation Transportation Authority (RTA) worked together to hold a technical transportation workshop hosted by the Viejas Band of Kumeyaay Indians. The goal was to discuss the results of the Tribal Transportation Needs Assessment and provide an opportunity for tribal transportation managers to discuss issues and strategies to improve tribal transportation programs in the region with transportation planning staff from SANDAG, Caltrans, the County of San Diego, the Metropolitan Transit System (MTS), the North County Transit District (NCTD), and the Bureau of Indian Affairs (BIA).

The group analyzed the current state of transportation programs in the region. It first discussed the obstacles to overcome in order to improve tribal transportation programs. It then discussed those strengths in the region that could be leveraged for improvement. Among the obstacles tribal representatives mentioned were: (a) the lack of communication and follow-up from agencies; (b) complex government processes and a lack of understanding of tribal processes; (c) the lack of understanding of the transportation funding process and how to access it; (d) disconnects between transportation planning priorities of local and regional agencies and tribal governments; and (e) rigid organizational cultures and legal constraints that limit collaboration.

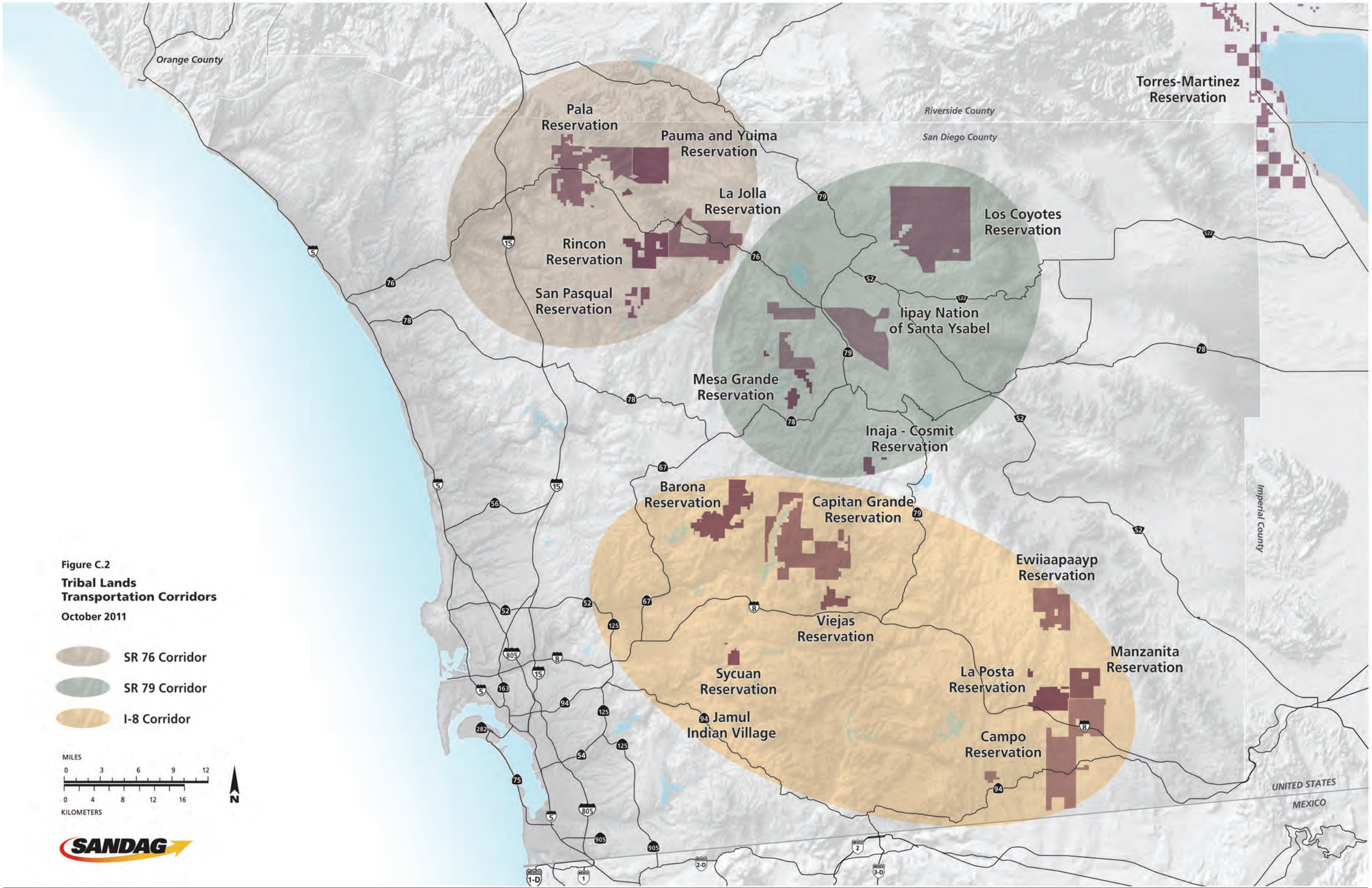


Figure C.2
Tribal Lands Transportation Corridors
October 2011

SR 76 Corridor
SR 79 Corridor
I-8 Corridor

Among the strengths that could be leveraged to improve tribal transportation-related programs, the group mentioned the following: (a) tribal governments acknowledged that agencies are recognizing the problems and are willing to work on them; (b) agencies have been working together more effectively in recent years, and there is an increased mutual respect; (c) the existence of tribal liaisons in the agencies has facilitated communication and coordination; (d) policy mandates from the federal and state level are helping to create the political will to cooperate; (e) intertribal councils such as the RTA and the SCTCA are focusing more on policy-level tribal needs and partnerships; and (f) there is increasing evidence of a desire on both parts to understand one another and work on collaborative solutions.

The group then developed a set of strategies to improve tribal transportation programs in the San Diego region, including: (a) government-to-government framework; (b) transportation infrastructure; (c) transit; (d) transportation funding; (e) information sharing/technical assistance. The policy-level strategies were submitted to the SCTCA and SANDAG Boards for consideration as part of the 2006 San Diego Regional Tribal Summit organized by the two intergovernmental councils and hosted by the Pala Band of Mission Indians.

2006 San Diego Regional Tribal Summit

At the 2006 Tribal Summit, the SANDAG and SCTCA Boards went through the strategies, discussed them, and then participated in an interactive polling exercise to determine where there were areas of mutual concern, in order to identify possible areas of collaboration. The resulting cooperative action agenda approved by both the SANDAG and SCTCA Boards has served as the focus of collaborative planning since that time.

A Regional Government-to-Government Framework

The integrated work plan, which was developed in collaboration with the RTA, SCTCA, Caltrans, and the County of San Diego for the planning of the 2006 Tribal Summit, demonstrated that working collaboratively, public agencies and tribal governments can create a mechanism for timely, meaningful, and effective involvement of tribal governments in the regional transportation planning process. One of the major outcomes of the Summit was the commitment among various regional partner agencies to strengthen the current government-to-government framework for engaging tribal nations in the planning process.



Regional Partners

The core of the framework is an ongoing institutional dialogue among key stakeholders at the regional level. Today, all three principal transportation planning agencies in the region have full-time tribal liaisons: SANDAG, Caltrans, and the County of San Diego.

Public Agencies

Caltrans District 11: Caltrans was the first state agency in California to enact an agency-wide policy on tribal consultation. The Native American Liaison program was established in 2002 to work with the 19 tribes in its jurisdiction. Its objectives are to: (a) establish close coordination and early project involvement with tribal governments to streamline funding, environmental, and project delivery processes in areas on or near reservations; (b) ensure that Caltrans programs do not adversely affect important California Native American sites, traditions, or practices; (c) encourage cooperation between other agencies and local tribal governments; (d) assist with training, information dissemination, and project delivery; and (e) consider the Tribal Employment Rights Ordinance (TERO) from individual tribes for employment and contracting opportunities for Native Americans on Caltrans projects on or near reservations.

County of San Diego: The County's Tribal Liaison was established in 2001. Liaison responsibilities include: identifying and resolving issues related to impacts of tribal economic development projects on infrastructure and other county services in unincorporated areas; providing support and tracking legislation and policy matters related to tribes for the County Board of Supervisors and the Chief Administrative Officer; participating in regional land use and transportation planning, economic and services forecasting, funding, and development activities; and assisting tribes with permitting and other issues.

San Diego Association of Governments (SANDAG): SANDAG has been pursuing government-to-government relations with tribal governments in the region through the Borders Committee. This committee discusses policy issues related to borders-related planning from three perspectives: interregional, binational, and tribal. In 2005, the Southern California Tribal Chairmen's Association joined the Borders Committee as an Intertribal Council of Governments to engage in a dialogue on tribal planning issues with other neighboring Councils of Government, including Imperial, Riverside, and Orange Counties, as well as the Republic of Mexico (as represented by the Consul General in San Diego). The SANDAG Tribal Liaison is a member of the Land Use and Transportation Planning Department, which provides technical support to the Borders Committee as well as to the Board of Directors and other Policy Advisory Committees.

Intertribal Organizations

Intertribal organizations play a key role as facilitators for this regional government-to-government framework. SANDAG has a strong working relationship with two key intertribal associations to strengthen communication, coordination, and collaboration with area tribes.

Southern California Tribal Chairmen's Association (SCTCA): The SCTCA is a multiservice, nonprofit corporation established in 1972 by a consortium of 19 federally recognized Indian tribes in Southern California. As an intertribal council, the SCTCA serves as a forum for a wide variety of issues for its member tribes. In June 2005, the SCTCA joined as an advisory member of the Borders Committee, similar to SANDAG's relationships with other associations of governments, including the Imperial County Transportation Commission and Western Riverside Council of Governments. The SCTCA now has a legislative analyst who serves as staff counterpart to the SANDAG Tribal Liaison to facilitate follow through on the directives of elected officials.

Reservation Transportation Authority (RTA): The RTA, founded in 1998, is a consortium of Southern California Indian tribal governments designated as a Public Law 93-638 contracting entity that provides transportation education, planning, and program administration for tribal government members. Their intertribal service area includes tribes in San Bernardino, Riverside, San Diego, and Imperial Valley (Figure C.3). At a technical level, SANDAG and the RTA have collaborated on a number of tribal transportation planning projects, particularly in the area of mobility management in recent years.

Framework – Policy Level

The regional government-to-government framework for working with tribal nations in the region has been strengthened during the last several years. The priority was to build the institutional trust that would form the basis for future cooperation. It was important to work together on action items that were identified at the 2006 Tribal Summit that would have immediate results, as well as to build strategic alliances for more long-term solutions.

Periodic Summits

An overarching element of the government-to-government framework is having periodic summits between the Boards of Directors of the two principal intergovernmental agencies – SCTCA and SANDAG. By bringing together the entire board of each agency, it offers an opportunity for tribal and non-tribal elected officials from the region to engage in a diplomatic dialogue, identify issues of mutual concern, and develop priority actions that can be carried out through the partnership framework.

SCTCA Representation on SANDAG

One of the key issues raised by the tribal leaders at the 2006 Summit was tribal representation on SANDAG. The SANDAG Board of Directors and the tribal governments recognized the benefits to be gained by taking a cooperative approach to planning for an improved quality of life for the San Diego region. The leadership of SANDAG and SCTCA had discussions over several months in 2006 regarding the development of a formula for tribal representation which would involve tribal governments in policy decisions at SANDAG, while respecting tribal sovereignty. At a policy level, SCTCA and the SANDAG signed a Memorandum of Understanding (MOU) on January 26, 2007 memorializing the agreement to have the SCTCA join the SANDAG Board of Directors and Policy Advisory Committees, including the Transportation, Borders, Regional Planning, and Public Safety Committees, as advisory members. As meetings are scheduled monthly or twice a month (Board/Transportation Committee) and last for two to three hours, the commitment of the tribal leadership to participate is significant. Tribal leaders are now part of the regional decision-making process at a policy level, offering a tribal perspective to complex regional issues on an ongoing basis.



Tribal Liaison to SCTCA Board of Directors

At the policy level, the representatives of the SCTCA sit on the various SANDAG Policy Advisory Committees. However, the SCTCA also wanted to ensure that major initiatives in which SANDAG was engaged also were shared directly with the entire tribal leadership. Therefore, the SANDAG Tribal Liaison coordinates with the SCTCA representatives to SANDAG to bring briefings on major, agency-wide initiatives to inform the tribal leadership and obtain feedback from all tribal nations to the process. This has included diverse SANDAG work efforts, such as the Coordinated Public Transit Plan – Human Services Transportation, the Regional Energy Strategy, and the *TransNet* Environmental Mitigation Program, among others. This creates a systematic feedback loop to ensure that all tribal nations are involved in the process and have an opportunity to raise issues and provide feedback.

Tribal Issues brought to SANDAG Policy Advisory Committees

As members of the various SANDAG Policy Advisory Committees, SCTCA representatives have brought tribal issues to their respective committees. Several presentations on a number of issues have been made, including: background on Public Law 280 and its impact on tribal nations in California; the Intertribal Court System among San Diego tribes; tribal energy planning efforts; intertribal initiatives on fire recovery; and tribal transit initiatives, among others. On a periodic basis, the SANDAG Tribal Liaison meets with the SCTCA representatives to discuss current issues, develop an agenda of presentations, and provide technical assistance when requested to bring these briefings to the appropriate Policy Advisory Committees. In 2010, the SCTCA approved its legislative analyst to become a counterpart staff member for facilitating follow up on tribal issues.

Framework – Technical Level

Interagency Technical Working Group on Tribal Transportation Issues

One of the critical technical outcomes of the 2006 Tribal Summit was the strategic action of creating an ongoing forum for discussion on tribal transportation issues between the tribal nations and public agencies that have an influence on tribal transportation. The Boards of SCTCA and SANDAG approved the charter for the Interagency Technical Working Group on Tribal Transportation Issues (Working Group) during the summer of 2006. The Barona Band of Mission Indians hosted the Working Group's kick off meeting in October 2006. The Working Group reports to the Borders Committee and all tribes in San Diego can be members. Currently, 14 of the 17 tribes in the region are formal members of the Working Group (Table C.3 – Current Membership Roster).[xiv] At the request of the tribal nations, the Working Group has two co-chairs, a tribal leader, and the Chief Deputy Executive Director of SANDAG. Tribes stated that this would ensure that their concerns and issues were discussed directly at the executive level. The Working Group is staffed by SANDAG, meets quarterly, and tribal nations alternate hosting the meetings at different reservations. Since 2006, Pala, Pauma, Rincon, San Pasqual, Barona, Campo, and Viejas have hosted the Working Group meetings.

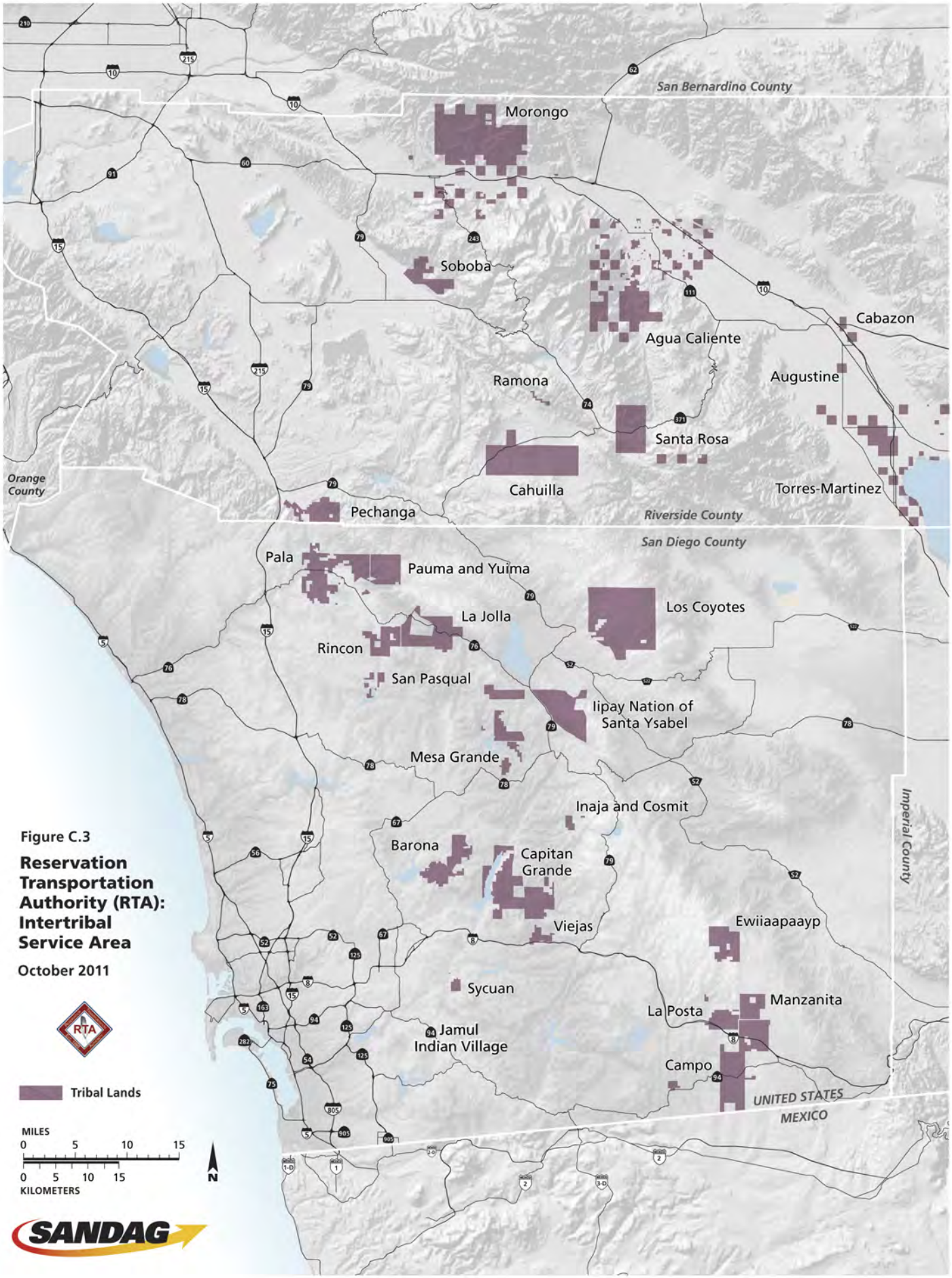

San Bernardino County
Morongo
Soboba
Agua Caliente
Cabazon
Augustine
Ramona
Santa Rosa
Cahuilla
Torres-Martinez
Orange County
Pechanga
Riverside County
San Diego County
Pala
Pauma and Yuima
Los Coyotes
La Jolla
Rincon
San Pasqual
Iipay Nation of Santa Ysabel
Mesa Grande
Inaja and Cosmit
Imperial County
Barona
Capitan Grande
Viejas
Ewiiaapaayp
Sycuan
Manzanita
La Posta
Jamul Indian Village
Campo
UNITED STATES
MEXICO
Figure C.3
Reservation Transportation Authority (RTA): Intertribal Service Area
October 2011
RTA
Tribal Lands
MILES
0 5 10 15
0 5 10 15
KILOMETERS
N
SANDAG

Table C.3 – Current Membership Roster: Interagency Technical Working Group on Tribal Transportation Issues

MEMBERS (Tribal Governments)

Albert 'Boxie' Phoenix
Barona Band of Mission Indians

Monique LaChappa (Tribal Chair)
Campo Band of Mission Indians

William Micklin (Executive Director)
Ewiiaapaayp Band of the Kumeyaay Nation

Virgil Perez (Tribal Chair)
Iipay Nation of Santa Ysabel

Ray Hunter (Tribal Councilmember)
Jamul Indian Village. A Kumeyaay Nation

La Vonne Peck (Tribal Chair)
La Jolla Band of Luiseño Indians

Eric LaChappa (Tribal Secretary/Treasurer)
La Posta Band of the Kumeyaay Nation

Milton Campbell (Tribal Councilmember)
Los Coyotes Band of Cahuilla/Cupeño Indians

Mark Romero (Tribal Chair)
Mesa Grande Band of Mission Indians

Ana Venegas (Tribal Consultant)
Pala Band of Mission Indians

Marlaine Bojorquez (Tribal Vice Chair)
Pauma Band of Luiseño Indians

Bo Mazzetti (Tribal Chair)
Rincon Band of Luiseño Indians

Carmen Mojado (Tribal Secretary)
San Luis Rey Band of Luiseño Indians

Dave Toler (Tribal Delegate; Co-Chair, Working Group)
San Pasqual Band of Diegueño Indians

Robert 'Cita' Welch (Tribal Vice Chairman)
Viejas Band of Kumeyaay Nation

ADVISORY (Public Agencies)

Superintendent Robert 'RJ' Eben
Bureau of Indians Affairs (BIA), Southern California Agency

Gustaf Silva (Tribal Liaison)
Caltrans, District 11

Teresa Brownyard (Tribal Liaison)
County of San Diego

Devin Braun (Senior Transportation Planner)
Metropolitan Transit System (MTS)

Timothy McCormick (Director of Service Planning)
North County Transit District (NCTD)

Tony Largo (Construction Manager)
Reservation Transportation Authority (RTA)

Renée Wasmund (Chief Deputy Executive Director; Co-Chair, Working Group)
San Diego Association of Governments (SANDAG)

The purpose of the Interagency Technical Working Group on Tribal Transportation Issues is to serve as a forum for tribal governments in the region to discuss and coordinate transportation issues of mutual concern with the various public planning agencies in the region, including SANDAG, Caltrans, the County of San Diego, and the transit operators. In partnership with the RTA, the Working Group monitors and provides input on implementing strategies and planning activities related to transportation, which were mutually developed through the San Diego Regional Tribal Summit.

The Working Group responsibilities include reviewing current activities and plans being implemented by SANDAG and the tribal governments in an effort to coordinate programs, address issues of concern, and ensure that the needs and issues of tribal governments are being incorporated into the transportation planning process at the regional level. The Working Group provides feedback and comments on current and planned activities, and provides technical advice on the implementation of these activities. The Working Group also assists with the associated outreach to the tribal community on transportation issues of regional significance.

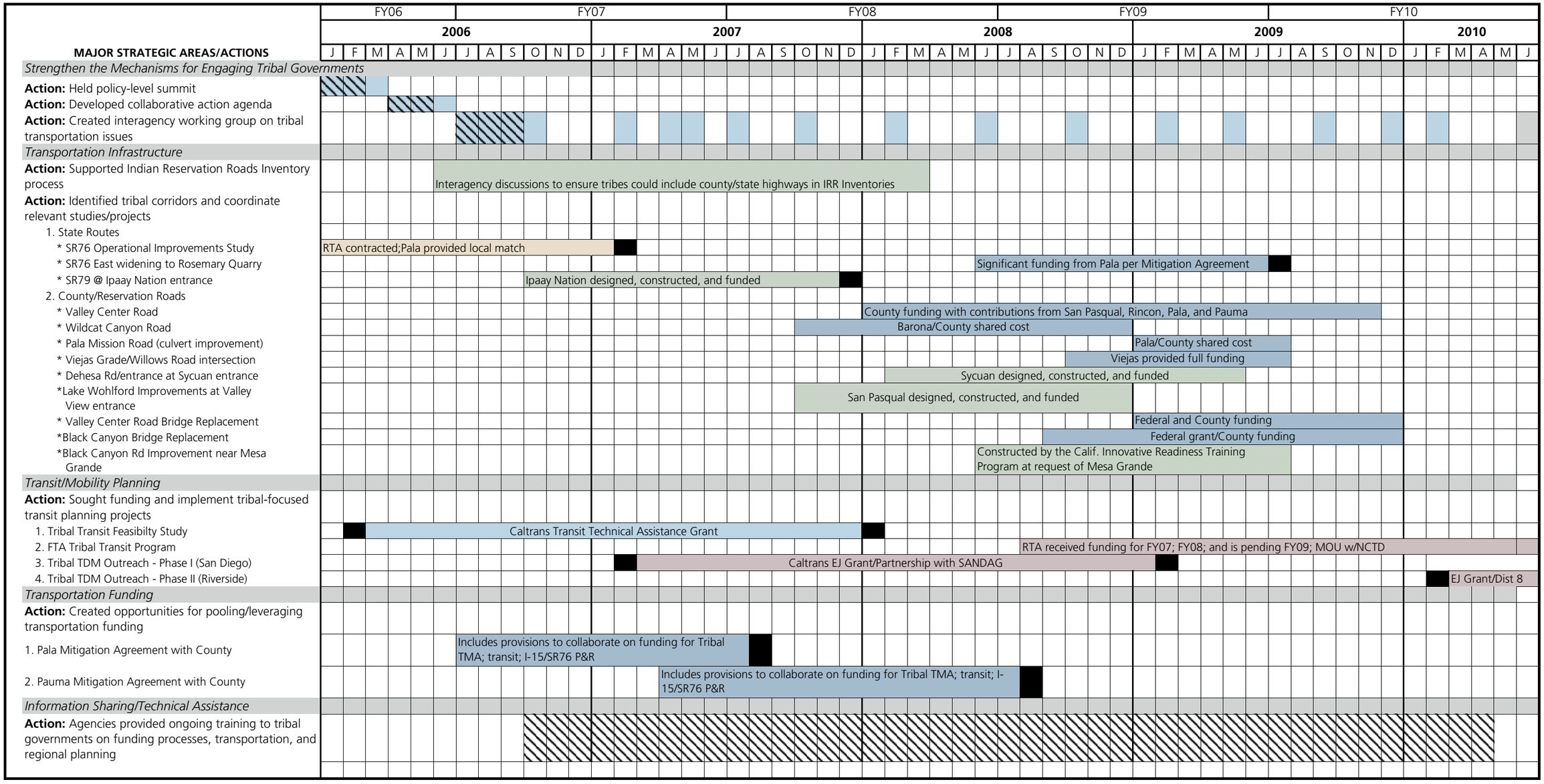
SANDAG-RTA Partnership for Tribal Transportation Planning

SANDAG and the Reservation Transportation Authority signed a Memorandum of Understanding (MOU) in 2005 to collaborate on tribal transportation. SANDAG and the RTA have pursued and obtained funding for a number of tribal transportation planning projects since the 2006 Summit, which are detailed in the next section. The focus of much of the collaborative planning work between the RTA and SANDAG has been in expanding the RTA's mission from transportation infrastructure on tribal reservations to mobility, including transit and transportation demand management (TDM). In so doing, the RTA has become one of several mobility partners of SANDAG, taking the lead on integrating tribal mobility projects into the system. This has benefited not only tribes, but rural population as well.

Milestones in Collaborative Tribal Transportation Planning

For the 2030 RTP, a set of objectives was established for tribal transportation planning. Through the consultation process, which included a survey of tribal transportation needs, a joint technical workshop to analyze the results, and a policy-level summit, a set of cooperative strategies to improve tribal transportation was developed between the SCTCA and the SANDAG Board of Directors. Table C.4 is a timeline of activities that shows the recommendations, actions, and milestones achieved through the period since the adoption of the 2030 RTP. There are four principal transportation-related policy areas that were considered in the 2030 RTP as a result of the consultation process with tribal governments, and these have continued as areas for future collaboration. They are: roadway infrastructure, funding, transit, and information sharing/data gathering. The matrix highlights the collaborative nature of all of the various efforts. In some cases, tribal nations took the lead, while in other areas the County of San Diego, Caltrans, SANDAG, or the RTA led the effort.

Table C.4 – Collaborative Tribal Transportation Planning Milestones/Accomplishments (2006–2010)



Transportation Infrastructure

As with all land use authorities, improvements in transportation infrastructure are key to improving the potential of each tribal nation's ability to compete in a global economy and provide its citizens with access to housing, jobs, education, healthcare, and entertainment. Efforts have been made to help tribes increase funding for their own transportation planning, by updating their Indian Reservation Roads (IRR) Inventory through the BIA. Tribal governments also have made significant contributions to county and state road infrastructure as part of their mitigation agreements with the County of San Diego.

Supported the Indian Reservation Roads Inventory

One major change for tribal nations that occurred as part of SAFETEA-LU was the change to the IRR program. Traditionally, the formula for tribes to receive transportation funding through the BIA had been based on the number reservation road miles. For small land-based tribes like those in California, the prior IRR formula resulted in only minimal IRR funding. However, SAFETEA-LU acknowledged that tribal transportation systems for many tribes include access to state highways as well as county and city roads. Therefore, under SAFETEA-LU, tribes can include segments of roads and highways not owned by them in their inventory. In order to do that, a letter of acknowledgement is required from the owner of the road.

In 2008, Caltrans headquarters received a grant from the Federal Highway Administration (FHWA) to support tribal efforts in California to update IRR inventories to increase tribal shares of federal funding. Most of the tribal nations in the San Diego region participated in that initiative. The tribes and agencies that form the Working Group collaborated to ensure that all tribes in the region that wanted to update their inventory in order to increase their federal transportation planning funding had the support to do so. Caltrans hired a consultant to work with tribes to complete the technical inventories. Caltrans then sent every participating tribe a compact disc with all of the completed data. Each tribe, then, was responsible for submitting a Tribal Transportation Plan, a council resolution indicating the road segments to be considered in their inventory, and letters of acknowledgement from the owners of the non-tribal road segments to be included. Caltrans and the County of San Diego, through the Working Group, provided to the tribes that requested them letters of acknowledgement for the segments of roads or state highways that are critical to their tribal transportation system.



Despite some regional setbacks, California tribes have so far increased their share of IRR funding from 1 to 5 percent. The current funding formula has been so successful for California tribes that there is now a controversy among large land-based tribes and small land-based tribes over whether to maintain the current formula. The National Tribal Advisory Committee to the BIA IRR program continues to discuss whether the formula should be continued or modified in the next federal surface transportation reauthorization. Currently, the Pacific Region of the BIA is working with the tribes in the San Diego region to correct their inventories and submit for funding. The RTA is taking the lead in coordinating these efforts with the BIA.

As tribal nations are developing and updating their reservation roads inventories, competition has increased exponentially among tribal nations across the country. The BIA now requires tribes to prioritize their projects through a long-range Tribal Transportation Plan (TTP) that justifies the request for funding and shows how the road will contribute to their long-range goals and objectives. Often, tribes (especially small land-based tribes) do not have these. As such, their IRR inventories are incomplete. In an effort to set tribal transportation systems in the context of the RTP, SANDAG is including the TTPs of any tribes that would like them included, as a diplomatic courtesy. Technical Appendix 8 includes TTPs or summary TTPs for those tribes that provided them to SANDAG, along with a map that shows how each tribe is connected to the regional transportation system.

Identified Tribal Corridors and Coordinated Relevant Studies/Projects

State Routes*:* A number of collaborative projects undertaken since 2006 affected the SR 76, SR 79, and SR 67 corridors. One particular project highlights the importance of collaboration for infrastructure improvements, and it has received national attention as a model for how state Departments of Transportation (DOTs) should work on a government-to-government basis with tribal nations. Caltrans and the RTA conducted a study of SR 76 east of the I-15 to determine what kinds of operational improvements could be made to improve the safety of the SR 76 East corridor. The study identified estimated costs for potential operational improvements, as well as a methodology for allocating fair share contributions to the developing property owners in the corridor. Additionally, this study identified potential alternative funding options from federal, state, local, and private sources. The study was funded in part by a statewide Caltrans grant. The Pala Band of Mission Indians provided the local match, and the RTA conducted the study. By bringing together the State (through Caltrans), the tribes, the County of San Diego, SANDAG, environmental resource agencies, and the public during the study process, new and innovative measures were explored for strengthening the State's existing ability to plan and fund transportation improvements. The recommendations from the study were incorporated into the 2050 RTP.

County/Reservation*:* A number of infrastructure projects have been planned, designed, and implemented since 2007. These projects are a combination of Caltrans-permitted projects, County-permitted projects, and County Capital Improvement Program (CIP) projects. These were all projects that involved collaborations between the County Department of Public Works and various tribes. For example, the Valley Center Road Widening project (completed in 2009) was designed and constructed by the County with funding contributions from San Pasqual, Rincon, Pauma, and Pala. In some cases, the tribe was the lead, such as for the

Lake Wohlford improvements at the entrance to Valley View, or the improvements to Black Canyon Road near Mesa Grande funded by a grant Mesa Grande received. Another example is the Viejas Grade/Willows Road intersection improvement project. The recommendations for road improvements were the result of the Viejas Band's collaboration with adjoining property owners and San Diego County Supervisor Dianne Jacob. The County Department of Public Works (DPW) designed the project, and construction was funded in full by the Viejas Band.

Transit/Mobility Planning

Another area of tribal transportation planning that emerged since the 2006 Tribal Summit was a focus on transit and mobility planning. Transit and mobility management are two areas in which more short-term solutions to access the transportation system can be addressed. Through collaborative planning in this area, the tribes, SANDAG, and the two transit agencies have developed innovative projects, which are contributing to improved mobility in tribal communities and for other rural residents.

Tribal Transit Feasibility Study

Caltrans awarded SANDAG a transit assistance planning grant to determine the feasibility of implementing transit service in one or two key transportation corridors between selected tribal reservations and cities and/or urbanized community planning areas in the unincorporated area of San Diego County. This report examined traditional public transit services, as well as the potential for nontraditional services that could be funded by private sources and/or public-private partnerships.

The study was a collaborative effort among SANDAG, the RTA, and the region's transit agencies — the Metropolitan Transit System and the North Country Transit District. SANDAG contracted with a consultant to conduct the technical analysis for this study, which provided the information needed to leverage additional funding for transit service for the 17 federally recognized tribal governments in San Diego County. The Working Group provided guidance to the consultant throughout the study.

The study identified transportation corridors and service options to improve connections between the tribal reservations and the urban transit system. Recommendations included potential service enhancements to existing services, and new rural transit routes focused on connecting the tribal community (Figures C.4 and C.5). The study provided a financial assessment and identified potential sources of funding.

FTA Tribal Transit Grant Program

The Tribal Transit Feasibility Study provided the technical basis for the Working Group to pursue funding to implement the recommendations. The RTA applied successfully for FY 2007 through FY 2010 funding, for a total of $1.6 million. Although the RTA received the highest level of funding for each cycle, the awards were significantly less than the total project costs to fund the entire plan. The Working Group discussed the options available and decided to focus the funds on supporting an enhanced service on one of the NCTD routes, Route 388/389, which runs from the Escondido Transit Center through Valley Center to Pala. One of the principal recommendations for the Northern Corridor was to enhance that service and create an express portion of the route that would run up and down the I-15 corridor from the Escondido Transit Center to Pala, completing a service loop and permitting those on the SR 76 corridor (including members of five tribes) to take an express bus to and from the Escondido Transit Center.

In addition to the operating funds provided by the FTA Tribal Transit program, the RTA successfully applied for American Recovery and Reinvestment Act of 2009 (ARRA) funds associated with the FY 2009 funding cycle. Only FY 2008 Tribal Transit grant recipients could compete for these ARRA funds. The RTA received $1.1 million for transit capital improvements for the region through this program, and it is now collaborating with the transit agencies and SANDAG to implement the projects. This includes improvements to the Park and Ride on the I-15/SR 76 interchange. The proposal was based on the recommendations in the Tribal Transit Feasibility Study.

Tribal TDM Outreach – Phase I (San Diego)

The objective of this collaborative project between the RTA and SANDAG was to strengthen the participation of tribal nations in the San Diego region in the regional TDM program.

The tribal gaming facilities are now major employers in the region, yet their involvement in the region's commuter services program (iCommute) was limited. Sycuan, Viejas, Barona, and Campo in the I-8 corridor employ about 9,000 people. In the SR 76 corridor, Pala, Pauma, Rincon, and San Pasqual employ 5,500 people. It is estimated that each gaming facility attracts 7,000 to 15,000 guests daily. Although many tribal members now live on the reservations, non-tribal employees travel from all over the region and other counties, including Riverside, Imperial, and Orange counties, to jobs on the reservations. These commutes would be considered 'reverse' commutes because urban residents are traveling to rural employment opportunities.

SANDAG, the RTA, and the SCTCA collaborated on an assessment of the needs of tribal employers and developed a strategy to meet these needs. SANDAG assisted the RTA in developing a business marketing plan for establishing a Tribal Transportation Management Association (TTMA) that would coordinate with the SANDAG iCommute program. The tribal TMA, a private, nonprofit, member-controlled organization, would provide the institutional framework for the recommended TDM programs and services that were developed as a result of the study. Six tribal enterprises participated in the study and completed commuter surveys in their facilities. They included: Pala, Pauma, Rincon, Viejas, Sycuan, and Santa Ysabel. In FY 2009/2010, the RTA successfully applied for a grant for Phase II of this project. The goal was to focus efforts on their tribal members in the Riverside area through a Caltrans planning grant provided to them through District 8.

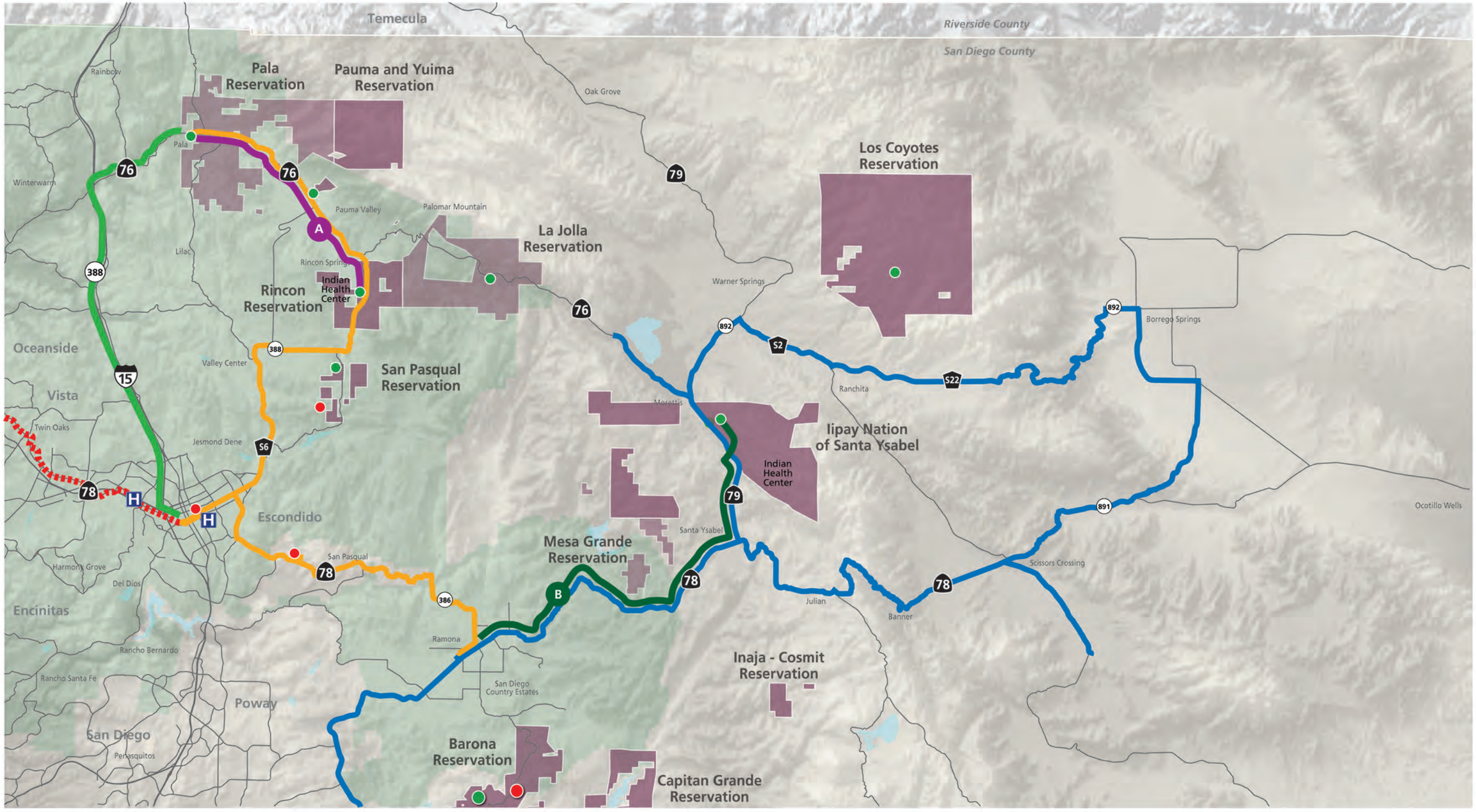


Figure C.4

2007 Tribal Transit Feasibility Study (proposed service for North Tribal Corridor)

October 2011

Transit Agency Boundaries
- MTS
- NCTD

Existing Transit Services
- MTS Routes
- NCTD Routes
- SPRINTER

Proposed New Services
- A Pala/Rincon
- B Santa Ysabel/Ramona
- 388 1-15 Extension

- H Hospitals
- Major Employers
- Tribal Employment Centers

RTA

MILES 0 3 6

KILOMETERS 0 4 8

N

SANDAG

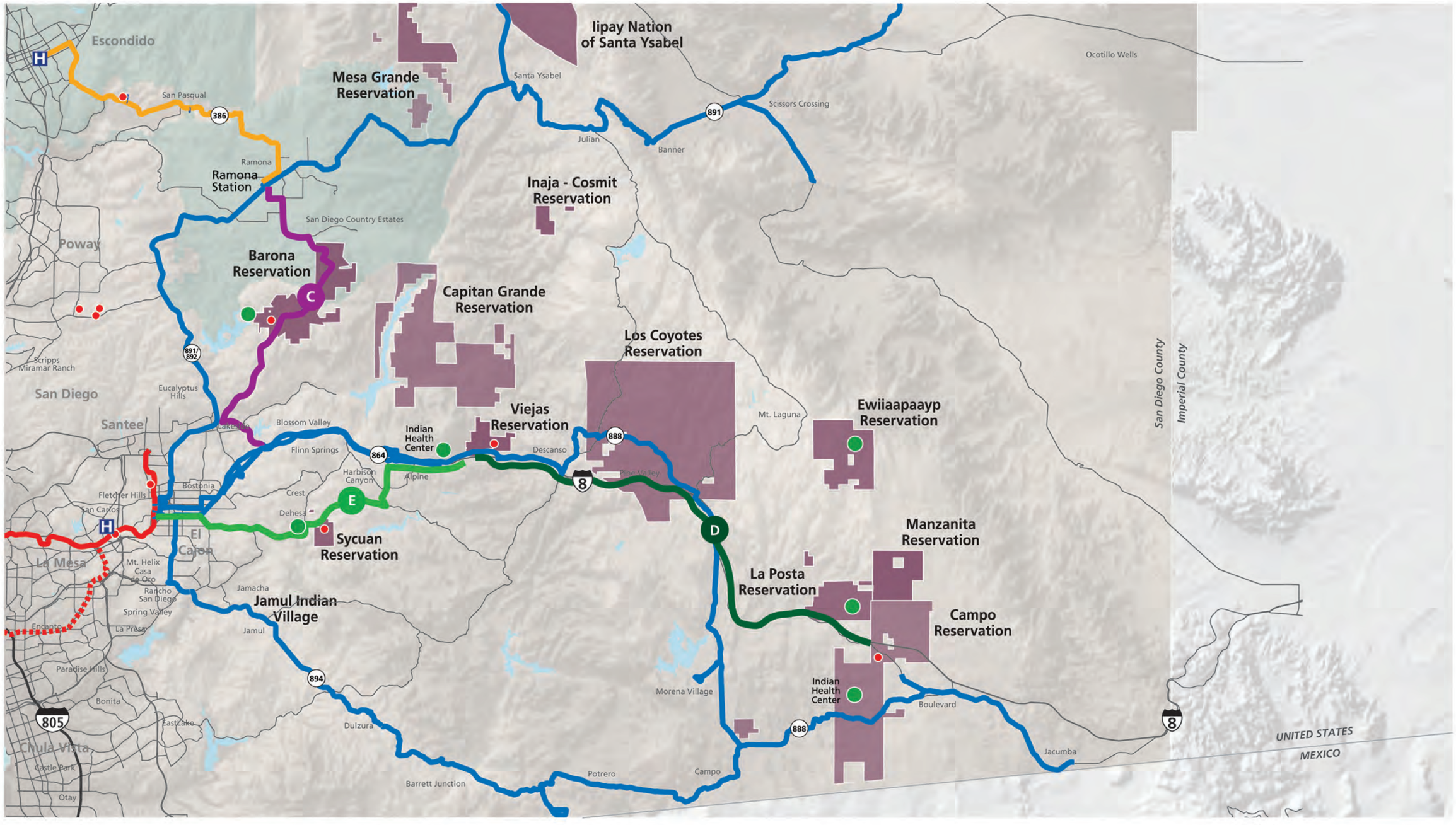


Figure C.5

2007 Tribal Transit Feasibility Study (proposed service for South Tribal Corridor)

October 2011

Transit Agency Boundaries
- MTS
- NCTD

Existing Transit Services
- MTS Routes
- NCTD Routes
- Green Line
- Orange Line

Proposed New Services
- C Barona
- D Campo/Viejas/Indian Health Ctr
- E Sycuan/Viejas/Indian Health Ctr

- Hospitals
- Major Employers
- Tribal Employment Centers

MILES 0 3 6
KILOMETERS 0 4 8
N

Transportation Funding

One of the action items established at the 2006 Tribal Summit was to create opportunities for pooling or leveraging transportation funding. Since the 2006 Summit, the County of San Diego and several tribal nations have negotiated innovative mitigation agreements, which include components for supporting collaborative transit and TDM initiatives.

Pala Mitigation Agreement with County of San Diego

In 2007, the County of San Diego and the Pala Band of Mission Indians entered into an agreement related to the expansion of their gaming facility, which included considering future TDM and transit improvements. They include: (a) a TDM program being developed by the RTA with assistance from SANDAG; (b) a possible Park-and-Ride facility at the I-15/SR 76 junction; (c) a possible Interregional Transit Service Plan being developed by SANDAG and the Riverside County Transportation Commission (RCTC); and (d) support for an NCTD bus stop. Pala was an active member of the RTA's initial TDM Outreach program.

Pauma Mitigation Agreement with County of San Diego

In 2008, the County of San Diego and the Pauma Band of Luiseño Indians entered into an agreement related to the building of a gaming facility and hotel, which included support for TDM and transit as well as fair share contributions for the operational improvements on SR 76 East, as determined from the Caltrans Operational Improvements Study. The agreement included a commitment to support the tribal effort to create a TTMA. It included consideration of membership with a specific contribution based on the RTA's business plan, should the TTMA be formed. Pauma also committed to having 20 percent of its employees participate daily in carpools, vanpools, or other rideshare programs.

Information Sharing/Technology Assistance

One of the commitments that resulted from the 2006 Tribal Summit was to provide ongoing training to tribal governments on funding processes, as well as transportation and regional planning. SANDAG has worked closely with the Tribal Transportation Assistance Program (TTAP), currently managed by the National Indian Justice Center (NIJC) under contract with Caltrans, to ensure that tribal nations in San Diego are aware of and have appropriate and timely information for taking advantage of funding opportunities and other training for tribal transportation planning.[xv]

The NIJC has been invited to the Working Group on a number of occasions to share information and training opportunities with area tribes. The Working Group has become an important venue for discussing statewide transportation issues with San Diego tribes.

In addition, SANDAG, through its Service Bureau, has made available to tribal governments technical support for planning and data analysis services. A number of tribes have taken advantage of these services for their own planning efforts.

2050 RTP Process – Integration of Tribal Nations

Building on the successes of the last RTP, members of the Working Group were asked to review the tribal transportation planning objectives and strategies developed during the last cycle for the 2030 RTP. The objective was to determine which of them have been accomplished and which ones continue to be issues that should be addressed; and to identify any new areas that should be

considered. The Working Group developed a tribal consultation work plan, beginning as soon as the SANDAG Board approved the overall 2050 RTP work plan. The Working Group and the SCTCA Board were involved in each step of the development of the 2050 RTP.



Recommended Strategies

Several workshops were held with the Working Group, as well as the RTA and the SCTCA Board, between September and November 2009 to obtain input on updating the 2030 Tribal Transportation Strategies for the 2050 RTP planning process. Their recommendations are listed in Table C.5, and they were discussed at the 2010 San Diego Regional Tribal Summit between the Boards of SANDAG and the SCTCA. The objective was to identify and prioritize a set of strategies to be considered in the development of the 2050 RTP.

2010 San Diego Regional Tribal Summit

On April 9, 2010, the Rincon Band of Luiseño Indians hosted the 2010 San Diego Regional Tribal Summit. The summit was the result of collaboration among SANDAG, SCTCA, Caltrans, and the County of San Diego. The purpose was to bring together elected leaders from local governments who make up the SANDAG Board of Directors and the 17 federally recognized tribal governments in the San Diego region. Their goal was to identify policy-level issues of mutual concern related to transportation and regional planning, and to formulate a set of priority areas for actions that can be addressed over the next few years. In particular, the Tribal Summit provided a timely opportunity to discuss tribal input regarding transportation and important regional planning issues for inclusion in the 2050 RTP. The Tribal Summit drew more than 100 participants, including elected officials from 13 tribal governments in the region, the SANDAG Board of Directors, members of SANDAG's policy advisory committees, various public agencies that work with tribal governments, and interested organizations and stakeholders.

Among the key issues raised were:

- The value of the SCTCA being represented on the SANDAG Board and Policy Advisory Committees

- The critical importance of working together on statewide issues
- The importance of developing a collaborative legislative agenda
- The importance of nontribal elected officials understanding tribal sovereignty
- Opportunities for developing a collaborative funding strategy for transportation

After a plenary discussion among the SANDAG and SCTCA boards, during which recommended strategies were clarified and considered, the Board members prioritized their "Top Five" strategies for consideration in the 2050 RTP using interactive polling technology. The overall top five strategies, identified by combining the scores of the SANDAG and SCTCA Boards to form the collaborative agenda, were:

- Developing a collaborative legislative agenda that benefits the region (83 percent)
- Identifying critical regional arterials serving Tribal Nations that should be incorporated into the 2050 RTP (83 percent)
- Incorporating existing Tribal Transportation Plans into the 2050 RTP (71 percent)
- Coordinating the funding and implementation of planning studies, in order to identify critical transportation corridors to tribal reservations and adjacent communities (58 percent)
- Providing ongoing information to tribal governments on funding processes, transportation, and regional planning (50 percent)

Integration of Tribal Governments into the 2050 RTP

Through the government-to-government framework in place, tribal nations in the San Diego region were able to have an unprecedented voice in the process of the development of the 2050 RTP.

As with other stakeholder groups, input was sought from tribal nations during each step of the process that led to the selection of the Revenue Constrained Transportation Scenario which forms the basis of the 2050 RTP, including:

- Goals/Objectives
- Project Evaluation Criteria
- Performance Measures
- Corridors for travel times
- Sustainable Communities Strategy
- Alternative Scenarios

With input from the Tribal Working Group, the SANDAG Board on June 11, 2010, approved the 2050 RTP Project Evaluation Criteria, incorporating tribal lands into the overall set of criteria for transit and highway corridors and connectors, as well as the movement of goods. When considering the selection of travel time corridors, options were discussed with tribal leaders, leading to two of the ten corridors focusing on tribal connections. All revenue constrained scenarios were discussed with the Working Group and with the SCTCA Board in detail. Their issues and concerns were incorporated, and the SCTCA Board endorsed the Hybrid Scenario — which was accepted by the SANDAG Board as the Preferred Alternative for the 2050 RTP.

Table C.5 – 2050 RTP – Recommended Strategies for Tribal Transportation

Strategic Area	Action
Government-to-Government Framework	Public agencies should understand tribal plans, how they are developed and implemented Develop collaborative legislative agenda that benefits the region
Transportation Infrastructure	Identify corridors critical to tribal reservations and coordinate the funding and implementation of relevant studies Identify critical regional arterials serving tribal nations which should be included in the RTP Coordinate the incorporation of existing Tribal Transportation Plans (TTP) into the current RTP
Transit	Collaborate on the issue of reverse commuting for tribal enterprise employees and pursuing funding opportunities Collaborate on the pursuit of funding opportunities to implement the recommendations from the *Tribal Transit Feasibility Study* Collaborate on the development of a Tribal Transportation Management Association (TTMA) for increased tribal participation in TDM programs regionwide.
Transportation Funding	Create opportunities for pooling/leveraging transportation funding for mutually important projects Collaborate and advocate for new transportation funding in the region, including transit and TDM Identify mechanisms for providing ongoing funding for new or additional transportation programs, including transit services and TDM
Information Sharing/Technical Assistance	Agencies will provide ongoing training to tribal governments on funding processes, transportation, and regional planning Provide information on technical support for planning and data analysis services to tribal governments parallel to member agencies

[i] Barona and Viejas have joint power authority over the 18th reservation – Capitan Grande.

[ii] http://www.fhwa.dot.gov/tribal/consultation.htm

[iii] The Capitan Grande Reservation included the Bands that would later become the Barona Band of Mission Indians relocated to the Barona Valley Ranch (1932) and subsequently the Barona Indian Reservation, and the Viejas Band of Kumeyaay Indians that relocated to Baron Long Ranch (1934) and subsequently the Viejas Indian Reservation.

[iv] The Jamul Indian Village did not receive federal recognition until 1975; other landless California tribes such as the San Luis Rey Band of Mission Indians continue to seek federal recognition.

[v] The original inhabitants of the still federally recognized Capitan Grande reservation established in the 1890s were moved to two different ranches in 1932 when the City of San Diego, by act of the U.S. Congress, acquired more than 7,000 acres of land inside that reservation territory to build the El Capitan Reservoir. Capitan Grande is currently uninhabited and jointly managed by the Barona and Viejas tribal governments.

[vi] For many tribal governments, land ownership is complex because reservations often have non-Indian owned in-holdings and/or allotments or individual land parcels owned by tribal members. This complicates land and resource management for tribal governments.

[vii] Neuman, Lisa. 2005. "Commentary: From Clean Water to Casinos: Why Sovereignty is Important to Native Americans." Maine Policy Review. Vol. 13(2): 30-32

[viii] California vs. Cabazon Band of Mission Indians, 480 US 202 (1987).

[ix] Several new projects or expansions have been approved, but put on hold due to the current economy.

[x] For additional discussion on the impact of tribal gaming in California, see The Center for California Native Nations, "An Impact Analysis of Tribal Government Gaming in California." University of California at Riverside. January 2006

[xi] For a comprehensive overview, see San Diego County study "Update on Impacts of Tribal Economic Development Projects in San Diego County," April 2003. Contact the Department of Land Use and Planning for a copy of this document.

[xii] The 1999 Compact defines a 'non-gaming' tribe as a tribe that has no gaming or operates less than 350 gaming devices. Gaming devices are defined to be Class III devices. Class II devices, or bingo gaming devices, are not included in this count.

[xiii] The State Controller's Office began distributing checks to tribal governments in August 2001. "Eighty-five of the 109 federally recognized tribes in California (those that have either small or no gaming operations) will receive checks that will provide these Tribes with funds to help meet the critical needs of their communities. Tribes will manage the RSTF distributions in a variety of ways, including providing per capita distributions of direct cash benefits." Source: www.calindian.org/nl_fall2001.htm

[xiv] The Working Group includes one California tribe, the San Luis Rey Band of Luiseño Indians, which has state recognition but is currently not federally recognized as they are landless. That brings the Working Group membership to fifteen tribes.

[xv] For more information on the CA/Nevada TTAP program through the National Indian Justice Center (NIIJC), see www.nijc.org/ttap.html

Appendix D

Sustainable Communities Strategy Background Documentation

Appendix Contents

Sustainable Communities Strategy (SCS) Documentation D-2

Sustainable Communities Strategy (SCS) Documentation

Appendix D provides the documentation to support conclusions identified in the Sustainable Communities Strategy (Chapter 3) of the 2050 Regional Transportation Plan (RTP or the Plan). The SCS is a new element of the RTP, the goal of which is to show how integrated land use and transportation planning will help the region reduce its greenhouse gas (GHG) emissions from light trucks and automobiles and meet the targets established by the California Air Resources Board (CARB).

A reference tool included in Appendix D is a matrix that demonstrates where the requirements of the SCS contained in SB 375 can be found in the SCS (Chapter 3). The matrix specifies the page number of the SCS and other sections of the 2050 RTP where each of the requirements of SB 375 can be found.

Other documents in this Appendix include the SANDAG Board report regarding the alternative scenarios and the RHNA allocation report. See Appendix B and Technical Appendix 15 for additional travel demand model information.

The following documents are included in Appendix D:

1. Figure D.1 – 2020 Planned Land Use North County Subregional Map
2. Figure D.2 – 2020 Planned Land Use North City Subregional Map
3. Figure D.3 – 2020 Planned Land Use Mid-City and East County Subregional Map
4. Figure D.4 – 2020 Planned Land Use South County Subregional Map
5. Figure D.5 – 2035 Planned Land Use North County Subregional Map
6. Figure D.6 – 2035 Planned Land Use North City Subregional Map
7. Figure D.7 – 2035 Planned Land Use Mid-City and East County Subregional Map
8. Figure D.8 – 2035 Planned Land Use South County Subregional Map
9. Figure D. 9 – 2050 Transit Network and Higher Density Land Uses North County Subregional Area
10. Figure D.10 – 2050 Transit Network and Higher Density Land Uses North City Subregional Area
11. Figure D.11 – 2050 Transit Network and Higher Density Land Uses Mid-City and East County Subregional Area
12. Figure D.12 – 2050 Transit Network and Higher Density Land Uses South County Subregional Area
13. Sustainable Communities Strategy Content/Government Code Section Requirements Matrix
14. SANDAG Board of Directors Report - 2050 RTP Alternative Scenarios
15. SANDAG Methodology Memo to CARB
16. CARB Response to SANDAG Methodology Memo
17. CEQA Exemption Criteria
18. SANDAG Regional Housing Needs Determination from HCD
19. Draft RHNA for the 2013 – 2020 Housing Element Cycle – Report to SANDAG Board of Directors and RHNA Fact Sheet

Figure D.1

2020 Land Use for North County Subregional Area

October 2011



Figure D.2

2020 Land Use for North City Subregional Area

October 2011

2020 Transit Network

- Regional Transit
- Streetcar/Shuttle/Local Bus

Residential

- Spaced Rural Residential*
- Single Family Residential
- Mobile Home Park
- Multi-Family Residential

Mixed Use, Commercial, and Industrial

- Mixed Use
- Commercial and Office
- Heavy and Light Industry

Public Facilities and Utilities

- Transportation, Communications, Utilities
- Education and Institutions
- Public/Semi-Public
- Military

Open Space Parks and Recreation

- Open Space Parks
- Recreation

Agriculture

- Agriculture

Indian Reservations

- Indian Reservations

Other

- Vacant

*Low density, single family, approximately one housing unit per 1-10 acres

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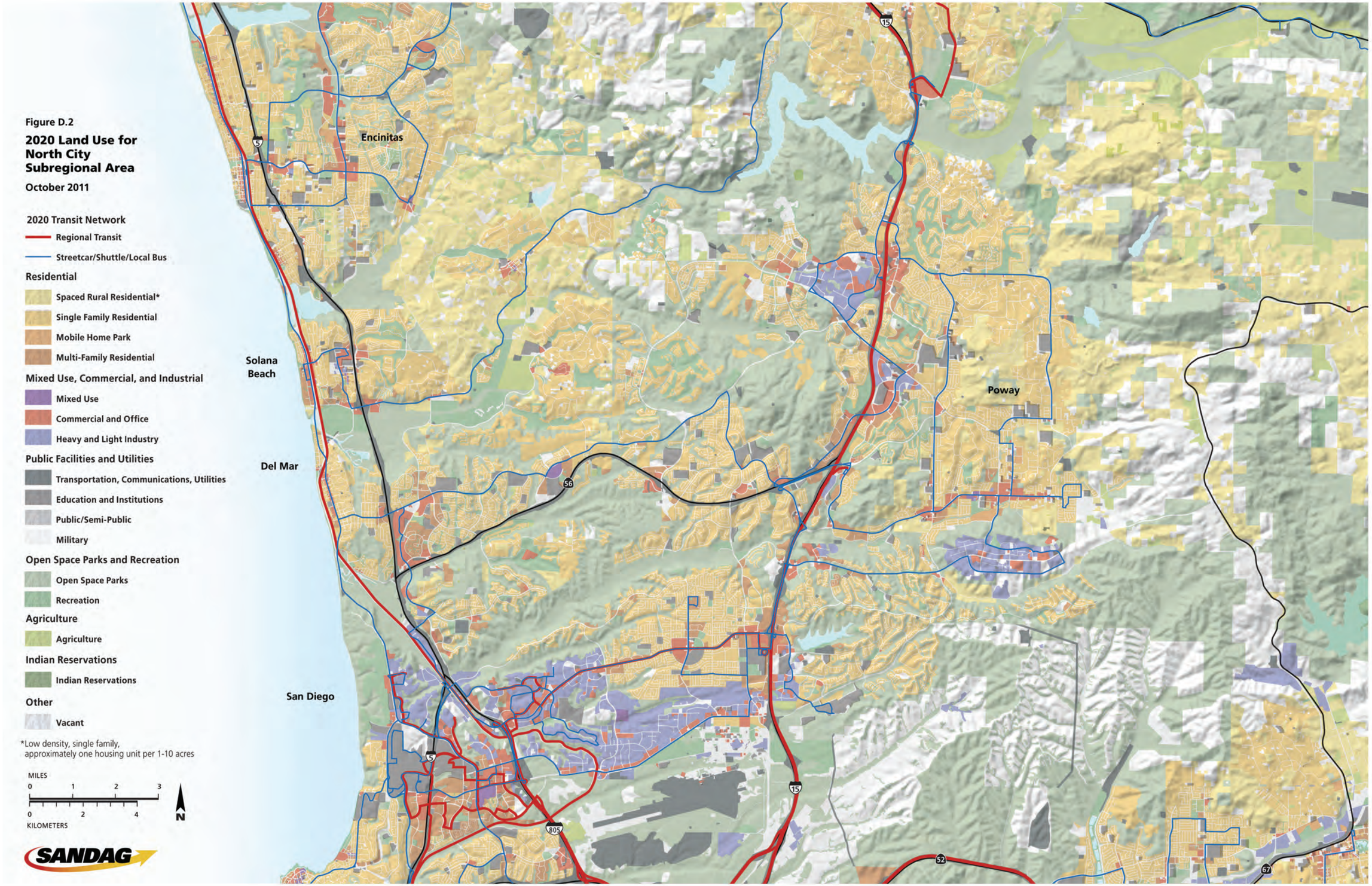

Figure D.3

2020 Land Use for Mid-City and East County Subregional Areas

October 2011

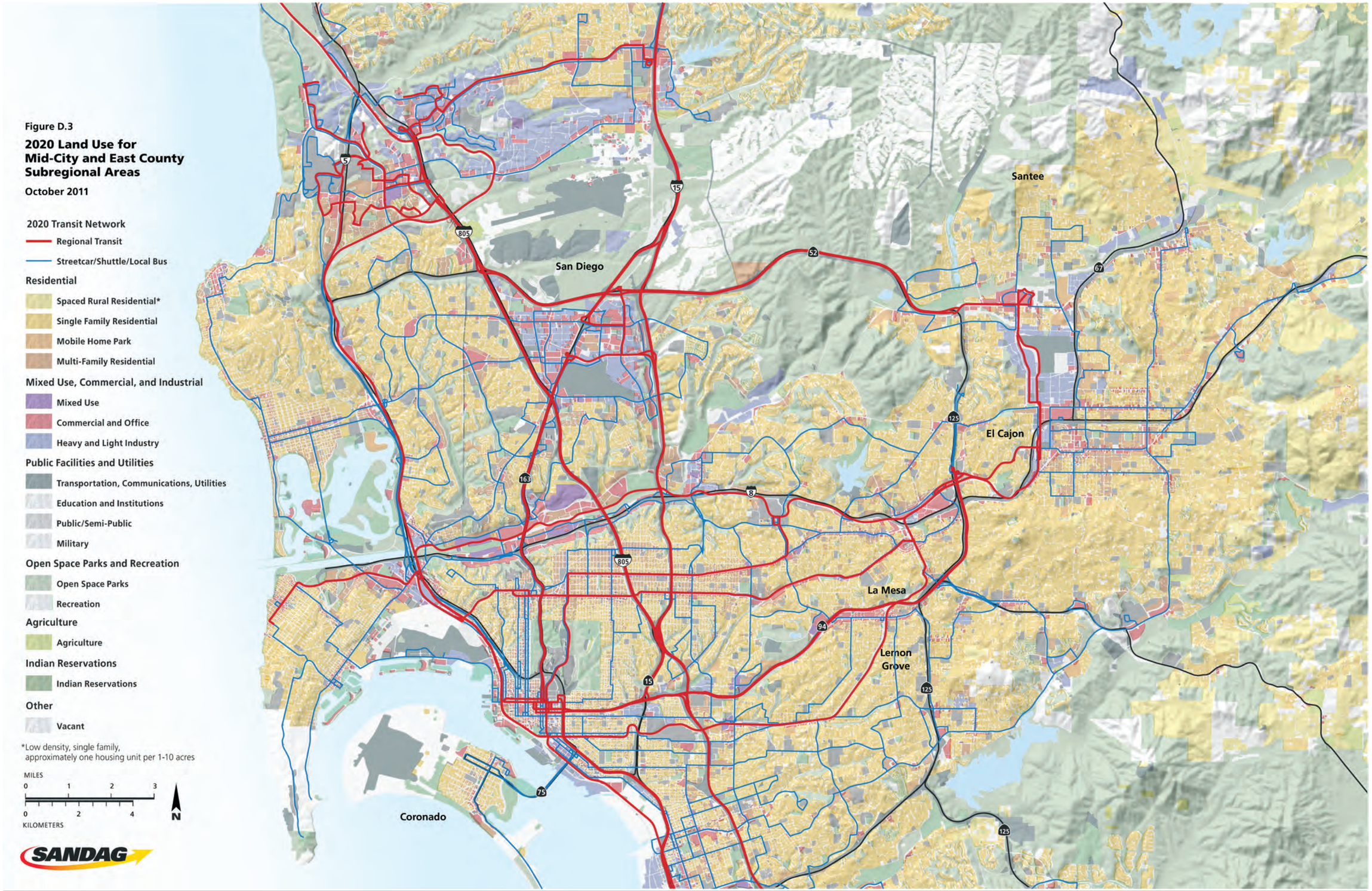

Figure D.4

2020 Land Use for South County Subregional Area

October 2011

2020 Transit Network

- Regional Transit
- Streetcar/Shuttle/Local Bus

Residential

- Spaced Rural Residential*
- Single Family Residential
- Mobile Home Park
- Multi-Family Residential

Mixed Use, Commercial, and Industrial

- Mixed Use
- Commercial and Office
- Heavy and Light Industry

Public Facilities and Utilities

- Transportation, Communications, Utilities
- Education and Institutions
- Public/Semi-Public
- Military

Open Space Parks and Recreation

- Open Space Parks
- Recreation

Agriculture

- Agriculture

Indian Reservations

- Indian Reservations

Other

- Vacant

*Low density, single family, approximately one housing unit per 1-10 acres

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UNITED STATES
MEXICO

Figure D.5

2035 Land Use for North County Subregional Area

October 2011

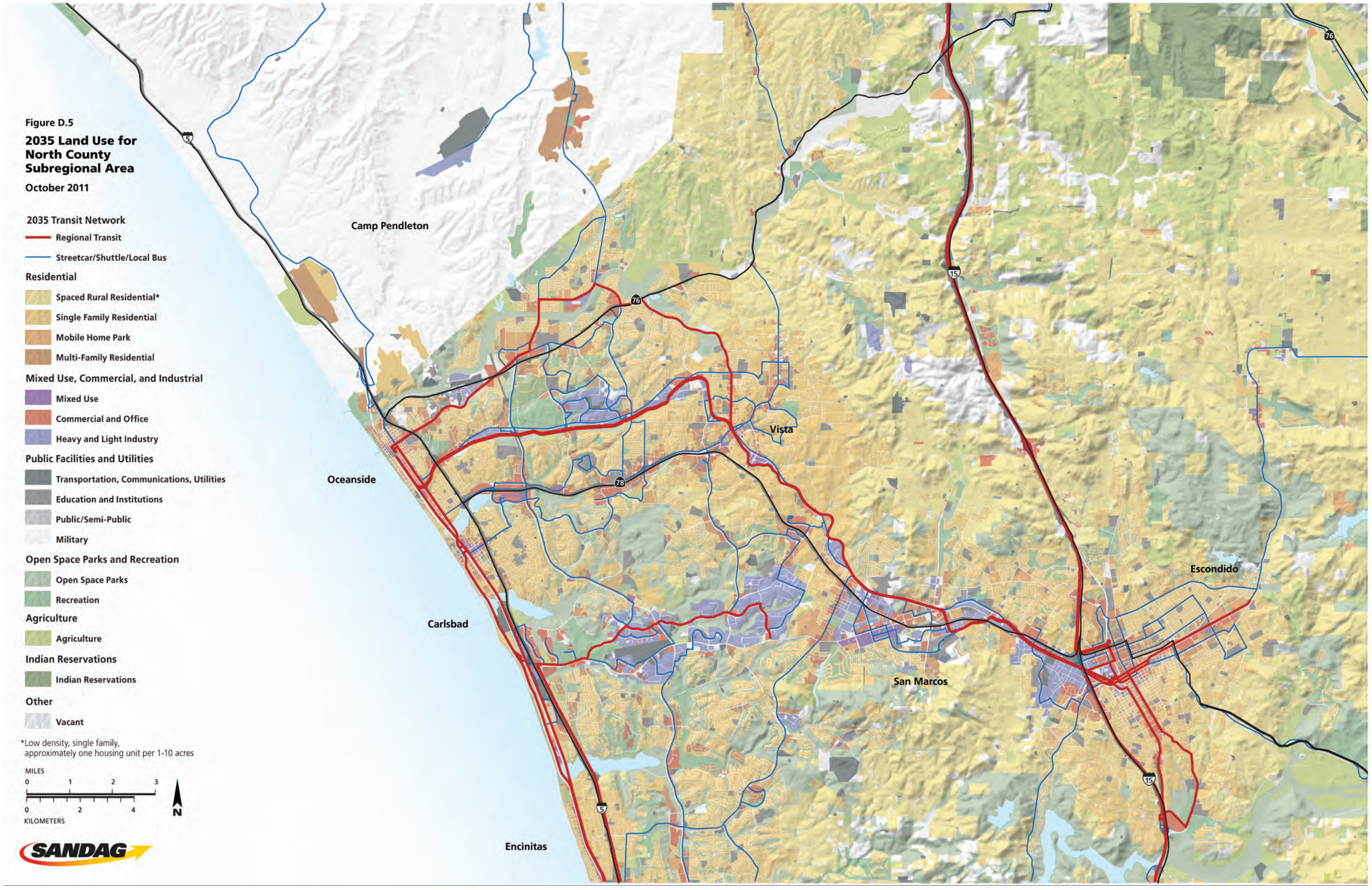

Figure D.6

2035 Land Use for North City Subregional Area

October 2011



Figure D.7

2035 Land Use for Mid-City and East County Subregional Areas

October 2011

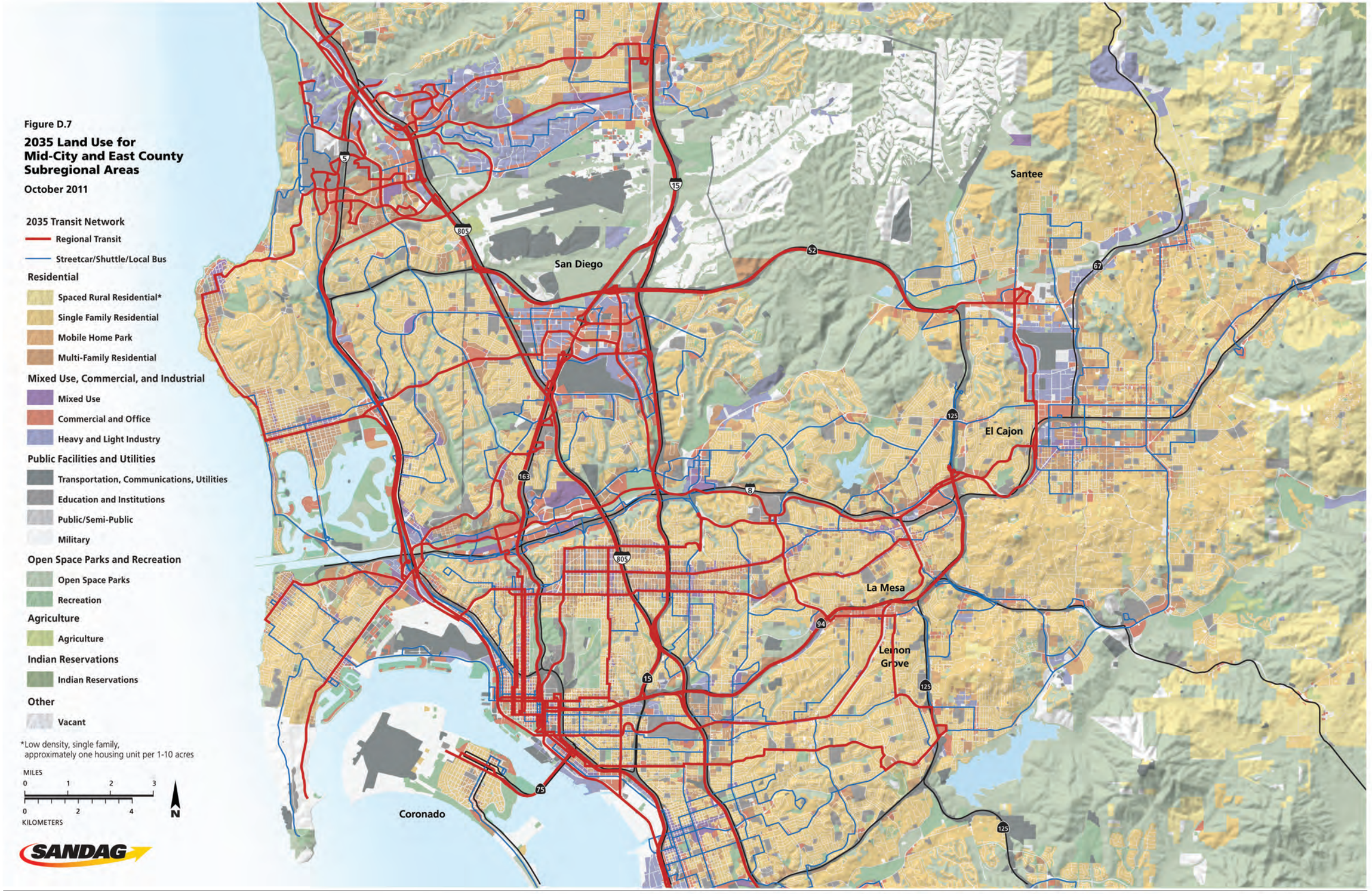

Figure D.8

2035 Land Use for South County Subregional Area

October 2011

2020 Transit Network
- Regional Transit
- Streetcar/Shuttle/Local Bus

Residential
- Spaced Rural Residential*
- Single Family Residential
- Mobile Home Park
- Multi-Family Residential

Mixed Use, Commercial, and Industrial
- Mixed Use
- Commercial and Office
- Heavy and Light Industry

Public Facilities and Utilities
- Transportation, Communications, Utilities
- Education and Institutions
- Public/Semi-Public
- Military

Open Space Parks and Recreation
- Open Space Parks
- Recreation

Agriculture
- Agriculture

Indian Reservations
- Indian Reservations

Other
- Vacant

*Low density, single family, approximately one housing unit per 1-10 acres

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Figure D.9
2050 Transit Network and Higher Density Land Uses North County Subregional Area
October 2011

Figure D.11

2050 Transit Network and Higher Density Land Uses Mid-City and East County Subregional Areas

October 2011

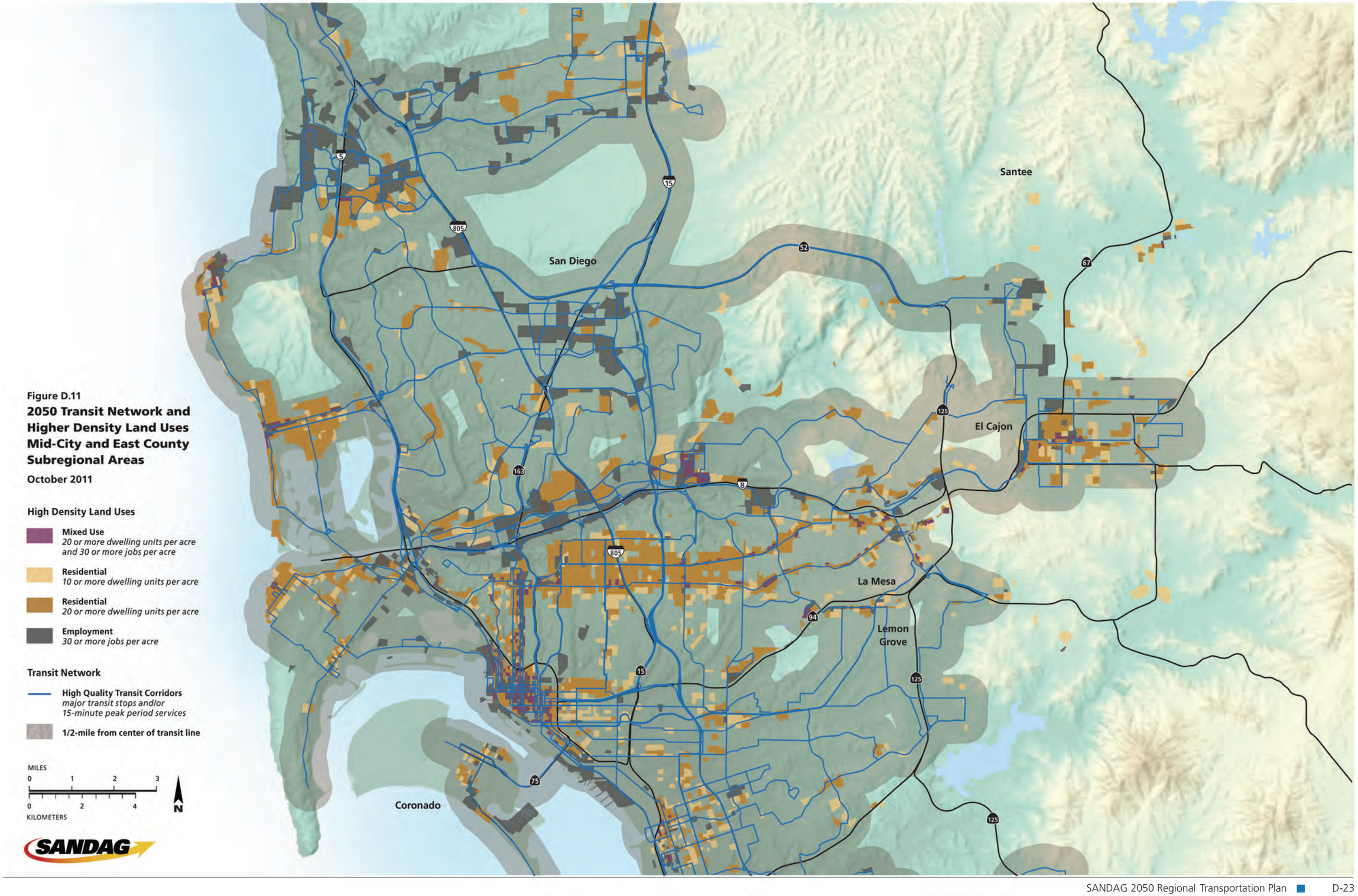

Figure D.11

2050 Transit Network and Higher Density Land Uses Mid-City and East County Subregional Areas

October 2011

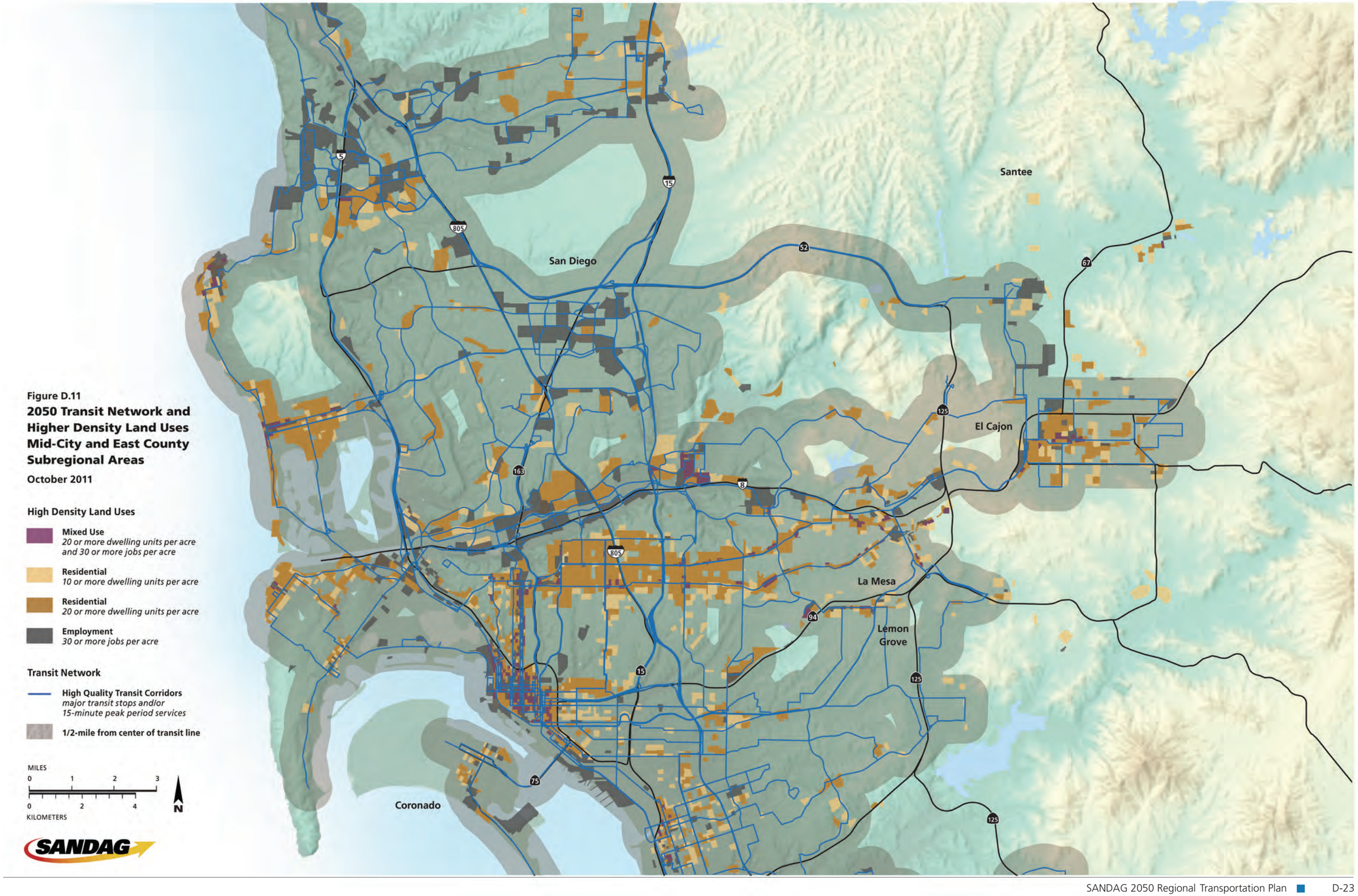

Figure D.12

2050 Transit Network and Higher Density Land Uses South County Subregional Area

October 2011

High Density Land Uses

- **Mixed Use**
  20 or more dwelling units per acre and 30 or more jobs per acre
- **Residential**
  10 or more dwelling units per acre
- **Residential**
  20 or more dwelling units per acre
- **Employment**
  30 or more jobs per acre

Transit Network

- **High Quality Transit Corridors**
  major transit stops and/or 15-minute peak period services
- **1/2-mile from center of transit line**

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SANDAG Sustainable Communities Strategy - SB 375/SB 575 Requirements

Subject Area	SB 375 / SB 575 Requirements	Addressed
SCS Requirement	**CGC Section 65080(b)(2)(B)** *Each metropolitan planning organization shall prepare a sustainable communities strategy, subject to the requirements of Part 450 of Title 23 of, and Part 93 of Title 40 of, the Code of Federal Regulations, including the requirement to utilize the most recent planning assumptions considering local general plans and other factors. The sustainable communities strategy shall:*	SCS pg. 3-2
Land Use	**CGC Section 65080(b)(2)(B)(i)** *identify the general location of uses, residential densities, and building intensities within the region;*	SCS pg. 3-7
Housing Goals	**CGC Section 65080(b)(2)(B)(vi)** *consider the state housing goals specified in Sections 65580 and 65581;*	SCS pg. 3-39
	CGC Section 65080(b)(2)(B)(ii) *identify areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period of the regional transportation plan taking into account net migration into the region, population growth, household formation and employment growth;.*	SCS pg. 3-39
	CGC Section 65080(b)(2)(B)(iii) *identify areas within the region sufficient to house an eight-year projection of the regional housing need for the region pursuant to Section 65584;*	SCS pg. 3-39
Natural Resources	**CGC Section 65080(b)(2)(B)(v)** *gather and consider the best practically available scientific information regarding resource areas and farmland in the region as defined in subdivisions (a) and (b) of Section 65080.01;*	SCS pg. 3-44
Transportation Network	**CGC Section 65080(b)(2)(B)(iv)** *identify a transportation network to service the transportation needs of the region;*	SCS pg. 3-61

SANDAG Sustainable Communities Strategy - SB 375/SB 575 Requirements

Subject Area	SB 375 / SB 575 Requirements	Addressed
Meeting Greenhouse Gas Reduction Targets	**CGC Section 65080(b)(2)(B)(vii):** *set forth a forecasted development pattern for the region, which, when integrated with the transportation network, and other transportation measures and policies, will reduce the greenhouse gas emissions from automobiles and light trucks to achieve, if there is a feasible way to do so, the greenhouse gas emission reduction targets approved by the state board;*	SCS pg. 3-64
Meeting Federal Air Quality Requirements	**CGC Section 65080(b)(2)(B)(viii)** *allow the regional transportation plan to comply with Section 176 of the federal Clean Air Act (42 U.S.C. Sec. 7506).*	SCS pg. 3-70
Informational Meetings	**CGC Section 65080(b)(2)(E)** *The metropolitan planning organization shall conduct at least two informational meetings in each county within the region for members of the board of supervisors and city councils on the sustainable communities strategy and alternative planning strategy, if any.*	Technical Appendix 6: Public Participation Plan, Public Involvement Plan
Public Participation Plan	**CGC Section 65080(b)(2)(F)** *Each metropolitan planning organization shall adopt a public participation plan, for development of the sustainable communities strategy and an alternative planning strategy, if any, that includes all of the following: etc.*	Technical Appendix 6: Public Participation Plan, Public Involvement Plan
Public Participation Plan – outreach	**CGC Section 65080(b)(2)(F)(i)** *Outreach efforts to encourage the active participation of a broad range of stakeholder groups in the planning process, consistent with the agency's adopted Federal Public Participation Plan, including, but not limited to, affordable housing advocates, transportation advocates, neighborhood and community groups, environmental advocates, home builder representatives, broad-based business organizations, landowners, commercial property interests, and homeowner associations.*	Technical Appendix 6: Public Participation Plan, Public Involvement Plan
Public Participation Plan – consultation	**CGC Section 65080(b)(2)(F)(ii)** *Consultation with congestion management agencies, transportation agencies, and transportation commissions.*	Technical Appendix 6: Public Participation Plan, Public Involvement Plan
Public Participation Plan - workshops	**CGC Section 65080(b)(2)(F)(iii)** *Three workshops throughout the region to provide the public with the information and tools necessary to provide a clear understanding of the issues and policy choices. Each workshop, to the extent practicable, shall include urban simulation computer modeling to create visual representations of the SCS and the alternative planning strategy.*	Technical Appendix 6: Public Participation Plan, Public Involvement Plan

SANDAG Sustainable Communities Strategy - SB 375/SB 575 Requirements

Subject Area	SB 375 / SB 575 Requirements	Addressed
Public Participation Plan – SCS public review	**CGC Section 65080(b)(2)(F)(iv)** *Preparation and circulation of a draft SCS and an alternative planning strategy, if one is prepared, not less than 55 days before adoption of a final regional transportation plan.*	Technical Appendix 6: Public Participation Plan, Public Involvement Plan
Public Participation Plan – public hearings	**CGC Section 65080(b)(2)(F)(v)** *At least three public hearings on the draft sustainable communities strategy in the regional transportation plan and alternative planning strategy, if one is prepared. If the metropolitan transportation organization consists of a single county, at least two public hearings shall be held. To the maximum extent feasible, the hearings shall be in different parts of the region to maximize the opportunity for participation by members of the public throughout the region.*	Technical Appendix 6: Public Participation Plan, Public Involvement Plan
Public Participation Plan – public notice	**CGC Section 65080(b)(2)(F)(vi)** *A process for enabling members of the public to provide a single request to receive notices, information, and updates.*	Technical Appendix 6: Public Participation Plan, Public Involvement Plan
Consultation with Local Agency Formation Commission	**CGC Section 65080(b)(2)(G)** *In preparing a sustainable communities strategy, the metropolitan planning organization shall consider spheres of influence that have been adopted by the local agency formation commissions within its region.*	SCS pg. 3-73
CARB Greenhouse Gas Reduction Targets for San Diego Region	**CGC Section 65080(b)(2)(H)** *Prior to adopting a sustainable communities strategy, the metropolitan planning organization shall quantify the reduction in greenhouse gas emissions projected to be achieved by the sustainable communities strategy and set forth the difference, if any, between the amount of that reduction and the target for the region established by the state board.*	SCS pg. 3-3

SANDAG Sustainable Communities Strategy - SB 375/SB 575 Requirements

Subject Area	SB 375 / SB 575 Requirements	Addressed
Relationship between SCS and Local Government Land Use Authority	**CGC Section 65080(b) (2) (K)** *Neither a sustainable communities strategy nor an alternative planning strategy regulates the use of land, nor, except as provided by subparagraph (J), shall either one be subject to any state approval. Nothing in a sustainable communities strategy shall be interpreted as superseding the exercise of the land use authority of cities and counties within the region. Nothing in this section shall be interpreted to limit the state board's authority under any other provision of law. Nothing in this section shall be interpreted to authorize the abrogation of any vested right whether created by statute or by common law. Nothing in this section shall require a city's or county's land use policies and regulations, including its general plan, to be consistent with the regional transportation plan or an alternative planning strategy.* *Nothing in this section requires a metropolitan planning organization to approve a sustainable communities strategy that would be inconsistent with Part 450 of Title 23 of, or Part 93 of Title 40 of, the Code of Federal Regulations and any administrative guidance under those regulations.* *Nothing in this section relieves a public or private entity or any person from compliance with any other local, state, or federal law.*	SCS pg. 3-71

SANDAG Sustainable Communities Strategy - SB 375/SB 575 Requirements

Subject Area	SB 375 / SB 575 Requirements	Addressed
Exemption of Projects Contained in Previously Approved Plans and Programs	**CGC Section 65080(b) (2) (L)** *Nothing in this section requires projects programmed for funding on or before December 31, 2011, to be subject to the provisions of this paragraph if they (i) are contained in the 2007 or 2009 Federal Statewide Transportation Improvement Program, (ii) are funded pursuant to Chapter 12.49 (commencing with Section 8879.20) of Division 1 of Title 2, or (iii) were specifically listed in a ballot measure prior to December 31, 2008, approving a sales tax increase for transportation projects. Nothing in this section shall require a transportation sales tax authority to change the funding allocations approved by the voters for categories of transportation projects in a sales tax measure adopted prior to December 31, 2010. For purposes of this subparagraph, a transportation sales tax authority is a district, as defined in Section 7252 of the Revenue and Taxation Code, that is authorized to impose a sales tax for transportation purposes.*	SCS pg. 3-62
Consideration of Financial Incentives for Cities and Counties with Resource Areas or Farmlands	**CGC Section 65080(b) (4)(C)** *The metropolitan planning organization or county transportation agency, whichever entity is appropriate, shall consider financial incentives for cities and counties that have resource areas or farmland, as defined in Section 65080.01, for the purposes of, for example, transportation investments for the preservation and safety of the city street or county road system and farm to market and interconnectivity transportation needs. The metropolitan planning organization or county transportation agency, whichever entity is appropriate, shall also consider financial assistance for counties to address countywide service responsibilities in counties that contribute towards the greenhouse gas emission reduction targets by implementing policies for growth to occur within their cities.*	SCS pg. 3-46

SANDAG Sustainable Communities Strategy - SB 375/SB 575 Requirements

Subject Area	SB 375 / SB 575 Requirements	Addressed
Consideration of Alternative Planning Scenario	**CGC Section 65080.3.** *(a) Each transportation planning agency with a population that exceeds 200,000 persons may prepare at least one "alternative planning scenario" for presentation to local officials, agency board members, and the public during the development of the triennial regional transportation plan and the hearing required under subdivision (c) of Section 65080.* *(b) The alternative planning scenario shall accommodate the same amount of population growth as projected in the plan but shall be based on an alternative to attempts to reduce the growth in traffic congestion, make more efficient use of existing transportation infrastructure, and reduce the need for costly future public infrastructure.* *(c) The alternative planning scenario shall be developed in collaboration with a broad range of public and private stakeholders, including local elected officials, city and county employees, relevant interest groups, and the general public. In developing the scenario, the agency shall consider all of the following:* *(1) Increasing housing and commercial development around transit facilities and in close proximity to jobs and commercial activity centers.* *(2) Encouraging public transit usage, ridesharing, walking, bicycling, and transportation demand management practices.* *(3) Promoting a more efficient mix of current and future job sites, commercial activity centers, and housing opportunities.* *(4) Promoting use of urban vacant land and "brownfield" redevelopment.* *(5) An economic incentive program that may include measures such as transit vouchers and variable pricing for transportation.* *(d) The planning scenario shall be included in a report evaluating all of the following:* *(1) The amounts and locations of traffic congestion.* *(2) Vehicle miles traveled and the resulting reduction in vehicle emissions.* *(3) Estimated percentage share of trips made by each means of travel specified in subparagraph (C) of paragraph (1) of subdivision (b) of Section 65080.* *(4) The costs of transportation improvements required to accommodate the population growth in accordance with the alternative scenario.* *(5) The economic, social, environmental, regulatory, and institutional barriers to the scenario being achieved.* *(e) If the adopted regional transportation plan already achieves one or more of the objectives set forth in subdivision (c), those objectives need not be discussed or evaluated in the alternative planning scenario.* *(f) The alternative planning scenario and accompanying report shall not be adopted as part of the regional transportation plan, but it shall be distributed to cities and counties within the region and to other interested parties, and may be a basis for revisions to the transportation projects that will be included in the regional transportation plan.* *(g) Nothing in this section grants transportation planning agencies any direct or indirect authority over local land use decisions.* *(h) This section does not apply to a transportation plan adopted on or before September 1, 2001, proposed by a transportation planning agency with a population of less than 1,000,000 persons.*	Technical Appendix 9: November 19, 2010, Board Report, December 17, 2010, Board Report

SANDAG

BOARD OF DIRECTORS
NOVEMBER 19, 2010

AGENDA ITEM NO. 10-11-13
ACTION REQUESTED – DISCUSSION

2050 REGIONAL TRANSPORTATION PLAN: REVENUE CONSTRAINED TRANSPORTATION NETWORK SCENARIOS

File Number 3100500

Introduction

During the past few months, staff presented the draft 2050 Regional Transportation Plan (RTP) Unconstrained Highway and Transit Networks at meetings of the Board of Directors; the Regional Planning, Transportation, and Borders Committees; various SANDAG working groups; and at other public meetings for input. At its July 23, 2010, meeting, the Board accepted the draft Unconstrained Transportation Network for use in the development of the draft 2050 RTP.

Based on revenue projections through 2050, four Revenue Constrained Transportation Network Scenarios (Scenarios) have been developed using prioritized project lists and other factors. The Scenarios attempt to build and operate as much of the Unconstrained Transportation Network as possible, given revenue availability and flexibility, and project priorities. These Scenarios were presented at the September, October, and November Board meetings.

This report provides: (1) a summary of the Scenarios' performance, including economic impact, social equity, and greenhouse gas (GHG) emissions analyses, and (2) a summary of feedback received from stakeholders, several working groups and Policy Advisory Committees (PACs), and at the November 5, 2010, Board meeting. The Board of Directors is asked to consider this information and provide further input and direction on the Scenarios, leading toward the selection of a potential preferred Scenario at its December 17, 2010 meeting.

Discussion

Alternative Revenue Constrained Transportation Network Scenarios

As described above, based on revenue projections to 2050, four Scenarios with a range of modal emphases were developed using prioritized project lists and other factors. The Scenarios are Transit Emphasis, Rail/Freight Emphasis, Highway Emphasis, and Fusion.

Descriptions of the four Scenarios were included in the September 24, 2010; October 22, 2010; and November 5, 2010, Board reports. At the November Board meeting, staff made a presentation that provided clarifying information on the Scenarios, such as the proposed full implementation of the Transportation Demand Management, Transportation Systems Management, and Active Transportation programs and projects. Additional information on the rail grade separations also was provided.

Scenario Performance

SANDAG evaluated the various Scenarios based upon Board-approved plan performance measures. Draft results for the performance measures, including new data that were previously under development, are included in Attachment 1 for 2008 existing conditions, the 2050 No Build Alternative, and the four Scenarios. *The Big Picture* and *The Details* below present an overview of the findings of the evaluation of draft results for those performance measures that showed more significant differences compared to the 2050 No Build alternative. *What will be different from today?* highlights the outcomes of indicators that are projected to change the most compared to current (2008) conditions. Attachment 2 contains projected travel times in key corridors. Findings of the Cost-Benefit Analysis of the four Scenarios will be presented at the December 17, 2010, Board meeting.

The Big Picture

In fall 2009, to set the stage for the development of the 2050 RTP, the Board established the vision for the Plan, as follows.

> *A transportation system that supports a prosperous economy, promotes a healthy and safe environment, including climate change protection, and provides a higher quality of life for all San Diego County residents. The transportation system should better link jobs, homes, and major activity centers by enabling more people to use transit and to walk and bike; efficiently transport goods; and provide fast, convenient, effective transportation options for all people.*

First, the 2050 Unconstrained Transportation Network was developed with this vision at the forefront. Subsequently, four financially constrained Scenarios that include all projects, programs, and services from the *TransNet* Extension Ordinance through 2048 were crafted from the Unconstrained Transportation Network.[1] These Scenarios were developed taking into account the allowable uses of the projected local, state, federal, and private revenues anticipated through 2050.

The intent in developing these four Scenarios was to compare and contrast the systemwide performance of networks that emphasize different mixes of projects, geographic distribution of projects, and modal choices. For example, both the Transit Emphasis and Fusion Scenarios propose substantial investments in light rail transit (LRT) services; and while Transit Emphasis focuses on reinforcing and upgrading existing LRT routes, Fusion proposes new LRT routes to serve a wider geographic area. Highway Emphasis includes the highest investments in bus rapid transit (BRT) and Rapid Bus services.

All Scenarios are multimodal in nature. A greater modal emphasis that provides some differentiation among the Scenarios results from a small share estimated at three percent of the total projected revenues (approximately $3 billion to $3.5 billion out of a total of $100 billion to $110 billion) that has the flexibility to be allocated for transit, highway, or other capital projects. For example, while the Transit Emphasis Scenario assumes all flexible funding toward transit projects, the Highway Emphasis Scenario assumes all flexible funding for highway projects.

[1] *TransNet* projects are included in all Scenarios with the exception of the I-805 corridor where different improvements are being tested in some Scenarios.

A substantial share of the total projected revenues through 2050, or approximately 40 percent, would be needed for maintenance and rehabilitation of the existing and proposed transportation infrastructure and for road operational improvements. The Rail/Freight Emphasis Scenario would have a slightly lower investment in this category since it includes fewer operational improvements on the Interstate 8 (I-8) corridor.

Compared to the 2050 No Build alternative[2], which includes projects under construction or in advance stages of development, all Scenarios are projected to improve the performance of the transportation system and conform to the goals and policy objectives set forth by the Board, as described below.

- All Scenarios show modest improvements in reducing vehicle collisions per capita. This indicator is calculated using historical accident data, which does not reflect implementation of Intelligent Transportation System (ITS) initiatives proposed in the Scenarios. Currently, there is no accepted methodology for capturing the potential effects of Transportation System Management (TSM) improvements on safety.
- Compared to the 2050 No Build alternative, all Scenarios would result in a strong improvement in the percentage of work and higher education trips than can be made within 30 minutes during peak periods. Three out of four trips would take 30 minutes or less if driving alone or carpooling. Approximately 14 percent to 15 percent of work and higher education trips could be accessed within 30 minutes by transit, compared to eight percent in the No Build alternative.
- The proportion of peak period travel in congested conditions by auto and by transit would be reduced significantly across all Scenarios. Congested auto travel would drop from 28 percent to about 10 percent to 12 percent, with the Highway Emphasis Scenario resulting in the greatest reduction of congested auto travel. Transit travel in congested conditions would go down from 9 percent to 4 percent in all Scenarios for local and rapid buses traveling on shared facilities. Similarly, truck delays would be reduced from about 34,000 daily hours to fewer than 14,000 daily hours in all Scenarios, or a 60 percent to 65 percent reduction.
- Vehicle miles traveled (VMT) per capita would be reduced by 12 percent to 13 percent in all Scenarios. The Highway Emphasis Scenario would reduce VMT per capita by the least percentage of the four Scenarios.
- The amount of daily travel by transit is projected to nearly double across all Scenarios, with the Highway Emphasis scenario showing slightly lower gains.
- Access to transit also is projected to improve compared to the No Build alternative. The percent of peak period and daily trips within half a mile of a transit stop would increase by five percentage points. More than three out of four trips could access transit within half a mile.

[2] The 2050 No Build Alternative includes the following projects: I-15 from SR 163 to SR 78, SR 52 from SR 125 to SR 67, SR 76 from Mission Road to I-15, I-805 HOV lanes from Carroll Canyon Road to the I-5/I-805 Merge, SR 905 from I-805 to Mexico, I-15 BRT to Downtown and UTC, SuperLoop, Mid-City Rapid Bus, South Bay BRT (Downtown).

- The four Scenarios show a substantial increase in carpooling, use of transit, and biking/walking for work trips (both peak period and all day). Mode share for carpooling would increase by half, and it would more than double for both work trips by transit and by bike/walk. Given more robust travel choices in all Scenarios, overall, mode share for commuting using alternative modes (carpool, transit, bike/walk) is projected to increase from 18 percent to 31 percent. Nearly one out of three commute trips would be made by alternative modes compared to fewer than one out of five trips in the No Build alternative.
- All Scenarios are projected to more than double the share of work trips by bike/walk compared to the No Build alternative (from 2.4 percent to more than 5 percent).

The Details

Indicators that display more contrast across the Scenarios are highlighted below.

- The Highway Emphasis and Transit Emphasis Scenarios overall would provide the highest level of interregional transit services to neighboring counties and Mexico.
- As explained above, the Highway Emphasis Scenario would reduce the percentage of peak period travel in congested conditions by auto from 28 percent to about 10 percent. The other three Scenarios would reduce that proportion to 12 percent.
- The Transit Emphasis Scenario would result in the lowest acreage of constrained lands[3] used for proposed transit and highway projects (245 acres), and the Highway Emphasis Scenario would consume the highest number of acres (362 acres).
- The initial Social Equity analysis (pages 6 through 9) suggests that the Transit Emphasis Scenario appears to be the most beneficial for low income and minority (LIM) populations in terms of the distribution of proposed RTP expenditures per capita. The data for all Social Equity performance measures indicate, however, that none of the Scenarios would create a substantial statistical disparity for LIM populations when compared to non-LIM populations.

What will be different from today?

- Regionwide, the commute to work would look quite a bit different: carpooling to work would increase by nearly 80 percent (from 116,000 trips in 2008 to more than 200,000 trips in 2050), use of transit would more than double, and biking/walking to work would go up 2.5 times in peak periods.
- On a daily basis, the number of trips made by biking or walking would increase by more than two and a half times compared to current levels.
- Air quality in the region would continue to improve as pollutants that create smog would be reduced significantly due to cleaner fuels and more fuel-efficient vehicles.

Economic Analysis

A key addition to the 2050 RTP is the inclusion of an economic analysis of alternative transportation strategies. This analysis helps to determine the overall contribution to the economy from the proposed $100 billion to $110 billion transportation investment and the most economically effective Scenario over the long-term (40 years). To accomplish the analysis, SANDAG used two separate and very different types of analytical techniques: a traditional Economic Impact Analysis (EIA) that

[3] Constrained lands include resource areas as defined in Senate Bill 375 (Steinberg, 2008), such as parks and open space, habitat in conservation plans, and agricultural areas.

estimates the value of the proposed RTP expenditures on the regional economy, and a Cost-Benefit Analysis (CBA) that highlights the transportation choices and phasing of the planned improvements for each alternative and compares those values against a baseline alternative (in this case the No Build alternative). Preliminary results of the EIA are presented in this section. An evaluation of the CBA on the alternative Scenarios is underway and will be completed as the projects, services, and programs proposed in the Scenarios are phased for 2020 and 2035. This evaluation is anticipated to be available in December 2010.

Economic Impact Analysis

The economic impact analysis estimates how much of the regional economy is supported by the proposed RTP expenditures and uses a modeling tool called input-output analysis. The direct impacts from the proposed RTP expenditures come from both construction (one-time) expenditures and annual operation and maintenance costs totaling about $100 billion to $110 billion over the next 40 years. These direct expenditures set in motion a sequence of indirect and induced expenditures that ripple through the economy creating additional economic activity. The sequence of the impacts, as the expenditures ripple through the economy, is tracked using the direct, indirect, and induced categories. These three categories together represent the ability of the region to respond to the direct expenditures. If some part of the product or service cannot be supplied from the regional economy, it (part of the expenditure) "leaks" out of the region and is spent in the location where the part of the product or service originates from (e.g. transit vehicles). The total value of the expenditures accommodated by the regional economy is measured in terms of output, jobs, and wages. The input-output (I-O) model that SANDAG uses is the IMPLAN model.

Because there is a great deal of funding overlap between the alternative Scenarios the results produced from the I-O model should be similar. In addition to funding similarity, there are other characteristics of the I-O model that would lead to similar results. First, the I-O model is not sensitive to project expenditure schedules, so the impact on the economy from a project completed in year 20 is the same as completing the project in year 1. Second, the model is not sensitive to changes that may occur after the project is complete and is not connected to fluctuations in the performance of the transportation system, so the model would not account for the value of improved travel times, or for the reduction in travel time benefits as congestion builds over time. Last, the I-O model is based on a set of linear relationships, so more expenditures in the same transportation area (roadways, buses, railcars) will result in a linear and proportional outcome or impact. These limitations of the I-O model are addressed and considered in the CBA. Together the EIA and the CBA present a more complete picture of the RTP's contribution to the regional economy.

A 2050 RTP Economic Analyses Ad Hoc Technical Working Group was convened to review the CBA and EIA methodologies, inputs, and preliminary results. This group includes representatives from all San Diego County regional economic development councils, regional universities and research organizations, the City of San Diego Planning and Community Investment Department, and the County Department of Health and Human Services.

The results from the draft EIA indicate that the Highway Emphasis Scenario would result in the greatest average annual jobs, payroll impacts, and output over the 40-year life of the RTP, followed by the Transit Emphasis Scenario (Table 3). Total annual jobs in the Highway Emphasis Scenario are estimated at 36,700, which is comparable, for example, to the size of the Information industry (which includes telecommunications) in San Diego, and is larger than the Computer and Electronics Manufacturing, Architecture and Engineering, and Research and Development industries in

San Diego. The Highway Emphasis scenario results in total annual average payroll impacts estimated at $1.9 billion (this includes direct, indirect, and induced), and output impacts estimated at $4.8 billion. Given that Gross Regional Product was approximately $169 billion in 2008, the average annual output impact of the proposed RTP expenditures, which ranges from $4.6 billion to $4.8 billion, is equivalent to nearly three percent of the total regional economy.

The economic impact measures for the highest and lowest ranked alternatives differ by about 6 percent. The draft analyses estimate that the Rail/Freight Emphasis Scenario could result in about 2,000 fewer total jobs annually, $100 million less in payroll impacts, and $200 million less output value when compared to the Highway Emphasis Scenario. The differences are relatively small, and reflect the effect of different expenditures across Scenarios, particularly with respect to the mix of infrastructure constructed, vehicles purchased, ongoing operations, and right-of-way acquired. For example, right-of-way acquisition is a land-transfer that does not generate any local jobs. Thus, Scenarios that require more right-of-way acquisition may have a lower overall job impact estimate. In addition, project design, construction, and operations generate different levels of jobs per dollar spent. Therefore, to the extent that the mix of projects varies across Scenarios (more right-of-way purchased in one, more light rail lines built in another, more transit vehicles procured outside the region) the results will differ.

Table 1
2050 RTP Revenue Constrained Scenarios
Economic Impact Analyses: Preliminary Results (in $ billions)

	Transit Emphasis	Rail/Freight Emphasis	Highway Emphasis	Fusion
Average Annual Jobs	35,500	34,700	36,700	35,300
Payroll impacts	$1.8	$1.8	$1.9	$1.8
Output	$4.7	$4.6	$4.8	$4.6

Social Equity

The Social Equity performance measures require some elaboration as the data must be evaluated in several ways. As part of the performance evaluation of the Revenue Constrained Transportation Network Scenarios, using Board-approved performance measures, preliminary social equity analyses have been conducted for all Social Equity indicators, as follows:

1. Average travel time;
2. Percent of work trips accessible in 30 minutes in peak periods by drive alone, carpool, and transit;
3. Percent of homes within a half-mile of a transit stop;
4. Percent of population within 30 minutes of schools (colleges, vocational, and job training)[4];
5. Percent of population within 30 minutes of San Diego International Airport (SDIA);
6. Percent of population within 15 minutes of healthcare (hospitals and clinics);

[4] Access to schools, SDIA, healthcare and parks/beaches was calculated for auto travel times. Data for transit travel times is under development.

7. Percent of population within 15 minutes of parks or beaches (excluding neighborhood parks); and
8. Distribution of proposed RTP expenditures per capita.

Attachment 1 shows preliminary draft results for these indicators (performance measures 32 through 39 for low-income and minority [LIM] populations and non-LIM populations). Additional social equity performance indicators for other populations also are included. In some discussion areas of this report, LIM populations are referenced in the aggregate, but in Attachment 1 and certain sections of this report the low-income and minority populations are analyzed and referenced separately since there is not a direct overlap of these populations.

Preliminary analyses of the Scenarios have been conducted to determine whether any of the Scenarios would conflict with requirements in Title VI of the Civil Rights Act or other applicable social equity laws, which require that the benefits and burdens of the projects in the various Scenarios be equitably distributed between the LIM and non-LIM populations. A threshold question is whether each of the Scenarios will improve conditions for LIM populations, relative to the 2050 No Build alternative or 2008 existing conditions.

2050 No Build Analysis

The initial modeling results for the performance indicators referenced above show that all of the Scenarios will maintain or improve conditions for LIM populations compared to the 2050 No Build alternative. LIM populations would fare better in the mobility and accessibility indicators with the investments proposed in every Scenario. RTP investments per capita for LIM populations would range from an increase of nearly 90 percent to more than doubling for each of the 2050 Scenarios compared to the 2050 No Build Alternative. Moreover, none of the Scenarios when compared to one another has a significantly different impact on LIM populations.

The next question analyzed was whether LIM populations would receive a similar or greater benefit compared to non-LIMs under each of the Scenarios relative to the No Build alternative. Key findings are outlined below:

1. The preliminary modeling results show no difference in average travel times between LIM and non-LIM populations for each of the Scenarios in 2050.
2. LIM populations would receive slightly greater accessibility gains for drive alone, carpool, and transit peak period work trips (within 30 minutes) compared to non-LIM populations.
3. The percent of homes within a half-mile of a transit stop shows accessibility gains for the LIM populations, but those gains are slightly higher for non-LIM populations.
4. Access to schools within a 30-minute period would remain virtually constant for both LIM and non-LIM populations,
5. Access to SDIA shows similar levels of accessibility for both minority and non-minority populations, and marginally higher gains for non-low income populations.
6. The percent of population within 15 minutes of healthcare facilities is projected to remain at virtually the same levels for both LIM and non-LIM populations.
7. No difference in access to parks/beaches is projected for both LIM and non-LIM populations.

Distribution of proposed RTP expenditures per Capita

The analysis for low-income populations shows that all Scenarios would result in higher increases in RTP investment per capita for low-income populations compared to non-low income populations, as follows:

a) Transit Emphasis Scenario: the rate of growth in investment per capita would increase by 121 percent for low-income populations compared to 93 percent for non-low income populations.

b) Highway Emphasis Scenario: the rate of growth in investment per capita would go up by 133 percent for low-income populations compared to 107 percent for non-low income populations.

c) Fusion Scenario: it would result in a 116 percent increase in investment per capita for low-income populations compared to 97 percent for non-low income populations.

d) Rail/Freight Emphasis Scenario: the rate of increase in investment per capita would increase by 104 percent for low-income populations compared to 90 percent for non-low income populations.

Conversely, the analysis for minority populations shows that all Scenarios would result in higher increases in RTP investment per capita for non-minority populations compared to minority populations, as follows:

a) Transit Emphasis Scenario: the rate of growth in investment per capita would be 97 percent for minority populations compared to 101 percent for non-minority populations.

b) Fusion Scenario: the rate of increase in investment per capita is projected at 96 percent for minority populations compared to 106 percent for non-minority populations.

c) Highway Emphasis Scenario: it would result in 109 percent increase in investment per capita for minority populations compared to 116 percent for non-minority populations.

d) Rail/Freight Emphasis Scenario: the rate of increase in investment per capita is projected at 85 percent for minority populations compared to 99 percent for non-minority populations.

When the low income and minority populations are combined, the Transit Emphasis Scenario would result in a slightly higher growth in investment per capita for LIM populations compared to non-LIM populations (101 percent increase for LIM populations versus 96 percent increase for non-LIM populations). The Highway Emphasis Scenario results in an equal growth in investment per capita for LIM and non-LIM populations, with both populations seeing a 113 percent increase. The other Scenarios show a slightly lower growth in investment per capita for LIM populations compared to non-LIM populations, in the following order:

a) Fusion Scenario: the rate of growth in investment per capita would go up by 100 percent for LIM populations compared to 102 percent for non-LIM populations.

b) Rail/Freight Emphasis Scenario: it would result in 90 percent growth in investment per capita for LIM populations compared to 95 percent for non-LIM populations.

None of these figures are divergent enough to constitute a statistically significant disparate impact based on state and federal social equity laws such as Title VI.

As described above, LIM populations are projected to maintain or gain slightly higher access benefits compared to non-LIM populations, with the exception of the share of homes within a half-mile of a transit stop. Any of the 2050 Scenarios would result in increased access to schools, healthcare, and parks/beaches for at least 98 percent of the LIM population. All 2050 Scenarios are projected to increase investment per capita for LIM populations between 90 percent and 113 percent.

2008 Existing Conditions Analysis

In addition, the draft results of the social equity performance measures outlined above for each of the Scenarios were compared to 2008 existing conditions to find out how mobility and accessibility indicators would change over time (2050) for LIM populations compared to non-LIM populations. Data for 2008 investment per capita is not available for LIM and non-LIM populations; therefore, an analysis of this performance measure was not possible. Key findings for the other performance measures are outlined below:

1. The draft modeling results suggest similar levels of mobility (travel time) for both LIM and non-LIM populations.
2. The percent of drive alone and carpool peak period work trips accessible within 30 minutes would decline for both LIM and non-LIM populations in a similar fashion, while access using transit would increase for both populations, with slightly higher gains for the LIM population.
3. The percent of homes within a half-mile of a transit stop shows gains for LIM and non-LIM populations, but slightly higher accessibility gains for non-LIM populations when compared to accessibility conditions for LIM populations. None of the Scenarios has a significantly different impact on LIM populations when they are compared to each other.
4. The percent of population within 30 minutes of schools would remain at similar levels for both LIM and non-LIM populations.
5. The percent of population within 30 minutes of SDIA would stay at current levels for LIM populations. However, non-LIM populations would experience a decline in accessibility to SDIA.
6. The percent of population within 15 minutes of healthcare for LIM populations would continue at similar levels in 2050.
7. The percent of LIM and non-LIM populations that could access parks/beaches within 15 minutes in 2050 would remain at virtually the same levels as in 2008.

A similar analysis of the initial modeling results indicates all 2050 Scenarios would result in similar performance compared to 2008 existing conditions. None of the Scenarios when compared to one another has a considerably different impact on LIM populations.

As described above, even though several accessibility metrics for LIM populations are projected to remain at current levels with any of the 2050 Scenarios, convenient access to schools, healthcare, and parks/beaches would range between 98 percent and 100 percent for LIM populations. In addition, for all 2050 Scenarios, 81 percent to 91 percent of homes for LIM populations would be within a half-mile of a transit stop. Data suggests that non-LIM populations would achieve higher accessibility gains in the number of homes near transit due to new transit services being proposed in areas not currently served by transit.

Based on this initial analysis, the Transit Emphasis Scenario appears to be the most beneficial for LIM populations in terms of the distribution of RTP expenditures. The data for all Social Equity performance measures indicate, however, that none of the Scenarios would create a substantial statistical disparity for LIM populations compared to non-LIM populations. Since none of the Scenarios would create a prohibited disparate impact, the Board should have the flexibility to choose any of the Scenarios without running awry of Title VI or other equity laws.

Sustainable Communities Strategy and Greenhouse Gas Emission Targets

In accordance with Senate Bill 375 (SB 375), the 2050 RTP must include a Sustainable Communities Strategy (SCS) to guide the San Diego region toward meeting greenhouse gas (GHG) emission targets related to cars and light trucks (passenger vehicles) by integrating land use, housing, and transportation planning to create more sustainable, walkable, transit-oriented compact development patterns and communities that reduce the need to drive. These targets – a 7 percent per-capita reduction in passenger vehicle GHG emissions by 2020 from a 2005 baseline, and 13 percent reduction by 2035 – were set by the California Air Resources Board (CARB) on September 23, 2010, and are consistent with the recommendation made by the SANDAG Board at the July 23, 2010, meeting.

Preliminary phasing of the Revenue Constrained Scenarios suggests that all Revenue Constrained Transportation Network Scenarios would meet the GHG emission targets for 2020 and 2035 established by CARB, as shown in Table 2.

Table 2
2050 RTP Revenue Constrained Scenarios
Preliminary Results of Greenhouse Gas Emissions
Per Capita CO2 Reductions for Passenger Vehicles from 2005 in Average Weekday Pounds

Target Year	CARB Target	Scenarios			
		Transit Emphasis	Rail/Freight Emphasis	Highway Emphasis	Fusion
Per Capita Reductions from 2005 (26 lbs/person)					
2020	7%	13%	13%	13%	13%
2035	13%	19%	19%	18%	19%

All Scenarios include the proposed full implementation of the TDM and TSM programs and projects, as well as Active Transportation programs identified through 2050. These programs provide flexible and cost-effective solutions to help reduce GHG emissions in the short-term compared to longer-term capital improvements, There also is an opportunity to consider providing options for

advancing the implementation of TDM, TSM, and Active Transportation projects and programs. For example, a funding and financing program that includes borrowing against future *TransNet* Active Transportation funds is under development as a means of completing the regional network of bicycle corridors as early as possible. The proposed implementation and financing strategy will be presented to the Transportation Committee in the coming months for recommendation to the Board of Directors.

Once the preferred Revenue Constrained Transportation Network Scenario is selected by the Board, the focus will turn to refining the phasing of the preferred scenario and completing the final GHG target analysis required by SB 375 and the air quality conformity analysis of the draft 2050 RTP.

Transportation Modeling for the 2050 RTP compared to SB 375 Target Setting

As SANDAG noted to CARB in July, "SANDAG staff modeled each [target setting] alternative using the SANDAG Regional Travel Demand Model. In the past, SANDAG has not conducted model runs for policy discussion using a draft [uncalibrated] RTP model. However, because SANDAG wanted to incorporate the latest planning and land use assumptions [from the 2050 Regional Growth Forecast] into the SB 375 target setting analysis, SANDAG used its draft model for target setting analysis."[5]

Since the target setting process, SANDAG staff finalized the calibration of the Regional Travel Demand Model. The calibration reduced daily VMT by approximately 5 million miles in the 2008 base year.[6] The reduction is a result of the continued effects of the economic recession on personal and commercial travel in the region. The downward calibration propagates throughout the forecast years resulting in lower VMT and CO_2 projections for 2020 and 2035.

The base year model calibration is validated against the Caltrans Performance Monitoring System (PeMS), Highway Performance Monitoring System (HPMS), local traffic counts, and observed transit boardings. Compared to Caltrans' HPMS the calibrated SANDAG model still estimates 5 percent more daily VMT than Caltrans in 2008 (Table 3).[7]

Table 3
2008 Estimates of Daily VMT

	SANDAG Estimate	Caltrans Estimate
Daily VMT in San Diego County	80,311,755 miles	76,492,445 miles

In addition, the recommendations from the target setting process relied on the reasonably expected network from the 2030 RTP: Pathways for the Future. In the reasonably expected scenario, the I-5 North Coast project, SR 52 Managed Lanes, and I-805 South HOV were expected to be completed by 2020. Preliminary phasing of the Scenarios for the 2050 RTP includes the development of these projects after 2020. Overall, highway capacity in the preliminary phasing for 2020 and 2035 varies in the draft 2050 RTP Scenarios compared to the 2030 RTP reasonably expected scenario resulting in reduced CO_2 emissions.

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[5] Kroninger, K. (2010, July). Model Updates Related to Senate Bill 375 Target Setting [Letter to D. Ito, California Air Resources Board]. Retrieved from http://www.arb.ca.gov/cc/sb375/mpo/sandag/tech_updates_sandag72910.pdf.

[6] The SB 375 Base Year (2005) CO_2 estimates were calculated using the fully calibrated transportation model from the 2030 Regional Transportation Plan.

[7] Caltrans (2009). *2008 California Public Road Data*. Sacramento, CA. Retrieved from http://www.dot.ca.gov/hq/tsip/hpms/datalibrary.php.

Finally, each of the draft 2050 RTP Scenarios includes more transit revenue miles by 2035 than the 2030 reasonably expected transit network. For example, the Fusion Scenario includes a new trolley line from Pacific Beach to El Cajon via Kearny Mesa, while other Scenarios include increased local bus service and new BRT and Rapid bus routes.

Feedback Received on the Alternative Revenue Constrained Transportation Network Scenarios

Working groups, PACs, and the Board have been providing feedback on the alternative Scenarios and draft performance measures results. In addition, at its November 12, 2010, meeting, the Transportation Committee requested that the list of projects that make up each Scenario be presented in a way that clearly shows the projects common to all Scenarios (Attachment 3), those that are included in specific Scenarios (Attachment 4), and those that only are part of the Unconstrained Transportation Network and are not included in any Revenue Constrained Transportation Network Scenario (Attachment 4). This information is summarized in Table 4. The following summarizes the major input received.

Scenarios

- Support for various projects that are included in the Transit Emphasis, Highway Emphasis, and Fusion Scenarios
- Concern that specific transit routes were not included in all Scenarios
- Interest in including additional transit routes in certain communities
- Support for both BRT and LRT projects
- Support for removing redundant transit routes
- Recognition of expense associated with UTC COASTER Station and Tunnel, but support for providing access to the UTC area as a major employment area
- Evaluate possible changes to the project mix, such as including the UTC COASTER station and tunnel, removing the Kearny Mesa Guideway, and removing the I-5 North BRT
- Recognition of the public opinion survey results indicating that the public favors transit investments
- Support for full funding of Active Transportation programs (bike/pedestrian programs) consistent with the region's smart growth programs
- Support for the Smart Growth Incentive Program
- Need for further inclusion of technology
- Support for including only Managed Lanes improvements in the I-5 North Coast corridor in all Scenarios

This feedback will be used to assist in developing a preferred Revenue Constrained Transportation Network Scenario.

Table 4
2050 RTP Revenue Constrained Scenarios
Summary of Estimated Major Capital Expenditures
(in $ 2010 millions)

	Transit Emphasis	Rail/Freight Emphasis	Highway Emphasis	Fusion
Transit/Highway Projects				
TransNet Projects	$21,126	$21,126	$21,126	$21,126
Other Constant Projects	$10,442	$10,442	$10,442	$10,442
Variable Projects	$11,639	$10,748	$11,691	$9,720
Local Streets & Roads	$25,319	$25,319	$25,319	$25,319
TDM/TSM/Active Transportation	$4,110	$4,110	$4,110	$4,110
Rail Grade Separations	$1,377	$1,377	$1,377	$2,493
Operations/Maintenance	$35,000	$35,000	$35,000	$35,000
Total	$109,013	$108,122	$109,065	$108,210
Unconstrained Only Capital Projects	$9,954	$9,954	$9,954	$9,954
Operations/Maintenance/Misc. Capital Projects	$25,000	$25,000	$25,000	$25,000
Total	$34,954	$34,954	$34,954	$34,954

Next Steps

The Board of Directors will be asked to select a preferred Revenue Constrained Transportation Network Scenario at its December 17, 2010, meeting. Once a preferred Revenue Constrained Transportation Network Scenario is selected, continued refinements to the transportation network and TDM, TSM, and Active Transportation programs and further performance evaluations will be made throughout the Draft 2050 RTP review period in 2011 to ensure an effective and efficient transportation network is developed for final approval.

GARY L. GALLEGOS
Executive Director

Attachments: 1. Draft 2050 RTP: Performance Measures Draft Results
2. Draft 2050 RTP: Projected Travel Times in Key Corridors
3. 2050 RTP Revenue Constrained Scenarios: Constant Projects List
4. 2050 RTP Revenue Constrained Scenarios: Variable Projects List

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Funds are budgeted in Work Element #3100500

DRAFT 2050 RTP: PERFORMANCE MEASURES DRAFT RESULTS - ATTACHMENT 1

	Goals and Performance Measures	Existing (2008)	No Build (2050)	Transit Emphasis (2050)	Rail/Freight Emphasis (2050)	Highway Emphasis (2050)	Fusion Emphasis (2050)
	SYSTEM PRESERVATION AND SAFETY						
1	Annual projected number of vehicle injury/fatal collisions per 1,000 persons	3.98	4.05	3.73	3.73	3.75	3.74
2	Annual projected number of bicycle/pedestrian injury/fatal collisions per 1,000 persons	0.65	0.56	2.64	2.65	2.64	2.64
3	Percent of transportation investements toward maintenance and rehabilitation	N/A	36%	40%	39%	40%	40%
4	Percent of transportation investments toward operational improvements						
	MOBILITY						
5	Average work trip travel time (in minutes)	26	28	27	27	27	27
6	Average work trip travel speed by mode (in m.p.h.)						
	Drive alone	34	28	29	29	30	29
	Carpool	34	30	31	31	31	31
	Transit	10	10	13	13	13	13
7	Percent of work and higher education trips accessible in 30 minutes in peak periods by mode						
	Drive alone	74%	68%	73%	73%	74%	74%
	Carpool	75%	69%	75%	75%	76%	76%
	Transit	7%	8%	15%	14%	15%	14%
8	Percent of non work-related trips accessible in 15 minutes by mode						
	Drive alone	72%	67%	68%	68%	68%	68%
	Carpool	72%	68%	68%	69%	68%	68%
	Transit	4%	4%	8%	8%	8%	8%
9	Out-of-pocket user costs per trip	$2.10	$2.19	$2.20	$2.20	$2.22	$2.20
10	Number of interregional transit routes by service type	9	16	41	30	46	35
11	Network enhancements by freight mode						
	Freight capacity acreage	470	470	580	580	580	580
	Freight capacity mileage	3,200	3,400	3,600	3,600	3,900	3,600
	PROSPEROUS ECONOMY						
12	Net benefits	DATA UNDER DEVELOPMENT					
	Benefit/Cost Ratio						
	Net Present Value (in millions)						
13	Return on investment						
14	Economic impacts						
	Job Impacts (average number per year)	N/A	1,000	35,500	34,700	36,700	35,300
	Output Impacts (gross regional product in millions)	N/A	130	$4,700	$4,600	$4,800	$4,600
	Payroll Impacts (in millions)	N/A	50	$1,800	$1,800	$1,900	$1,800
	RELIABILITY						
15	Congested vehicle miles of travel (VMT)						
	Percent of total auto travel in congested conditions (peak periods)	14%	28%	12%	12%	10%	12%
	Percent of total auto travel in congested conditions (all day)	6%	18%	8%	8%	7%	8%
	Percent of total transit travel in congested conditions (peak periods)	5%	10%	4%	4%	4%	4%
	Percent of total transit travel in congested conditions (all day)	5%	9%	4%	4%	4%	4%
16	Daily vehicle delay per capita (minutes)	3	9	4	4	3	4
17	Daily truck hours of delay	6,100	34,200	13,700	13,500	11,800	13,500
18	Percent of freeway VMT by travel speed by mode						
	Drive alone						
	Percent of VMT traveling from 0 to 35 mph	4.6%	20.0%	5.7%	5.6%	4.6%	5.3%
	Percent of VMT traveling from 35 to 55 mph	7.4%	15.0%	9.1%	9.4%	7.7%	9.1%
	Percent of VMT traveling greater than 55 mph	88.0%	64.9%	85.3%	85.0%	87.7%	85.6%
	Carpool						
	Percent of VMT traveling from 0 to 35 mph	3.3%	17.7%	5.6%	5.5%	4.6%	5.2%
	Percent of VMT traveling from 35 to 55 mph	6.1%	14.8%	8.5%	8.9%	7.4%	8.7%
	Percent of VMT traveling greater than 55 mph	90.6%	67.5%	85.8%	85.6%	88.1%	86.1%
	Truck						
	Percent of VMT traveling from 0 to 35 mph	3.1%	15.4%	4.1%	4.0%	3.0%	3.8%
	Percent of VMT traveling from 35 to 55 mph	5.7%	15.3%	8.7%	8.9%	6.7%	8.9%
	Percent of VMT traveling greater than 55 mph	91.2%	69.4%	87.3%	87.1%	90.4%	87.3%
	HEALTHY ENVIRONMENT						
19	Gross acres of constrained lands consumed for transit and highway infrastructure	N/A	98	245	275	362	264
20	On-road fuel consumption (all day) per capita*	1.45	1.02	0.89	0.89	0.90	0.89
21	Smog-forming pollutants (pounds/year) per capita*	66.32	22.54	22.05	22.01	22.21	22.06
22	Systemwide VMT (all day) per capita*	25.65	26.98	23.38	23.41	23.68	23.46
23	Transit passenger miles (all day) per capita	0.50	0.40	0.78	0.79	0.76	0.78
24	Percent of peak-period trips within 1/2 mile of a transit stop	76%	72%	77%	77%	77%	77%
25	Percent of daily trips within 1/2 mile of transit stop	78%	74%	79%	79%	79%	79%
26	Work trip mode share (peak periods)						
	Drive alone	80.6%	82.4%	68.9%	68.8%	69.0%	68.8%
	Carpool	10.8%	10.2%	15.4%	15.4%	15.4%	15.4%
	Transit	6.0%	5.0%	10.6%	10.5%	10.4%	10.7%
	Bike/Walk	2.5%	2.4%	5.1%	5.3%	5.1%	5.1%
27	Work trip mode share (all day)						
	Drive alone	80.7%	82.6%	69.1%	69.1%	69.2%	69.1%
	Carpool	10.8%	10.1%	15.3%	15.3%	15.4%	15.3%
	Transit	5.7%	4.7%	10.1%	9.9%	9.8%	10.1%
	Bike/Walk	2.8%	2.6%	5.6%	5.8%	5.6%	5.6%

*** Notes:**

20 and 21: Values based on 2050 SANDAG Transportation Model Outputs using 2040 Emission Factors from 2007 EMFAC.

No emission factors are available for 2050 (smog-forming pollutants include reactive organic gases [ROG] and oxides of nitrogen [NOx]).

22 and 31: Includes all vehicle types.

DRAFT 2050 RTP: PERFORMANCE MEASURES DRAFT RESULTS - ATTACHMENT 1

	Goals and Performance Measures	Existing (2008)	No Build (2050)	Transit Emphasis (2050)	Rail/Freight Emphasis (2050)	Highway Emphasis (2050)	Fusion Emphasis (2050)
	HEALTHY ENVIRONMENT						
28	Non work trip mode share (peak periods)						
	Drive alone	45.7%	46.4%	43.0%	43.0%	43.0%	43.0%
	Carpool	50.0%	50.0%	49.3%	49.4%	49.3%	49.3%
	Transit	0.8%	0.6%	0.8%	0.8%	0.8%	0.8%
	Bike/Walk	3.5%	3.1%	6.8%	6.8%	6.8%	6.8%
29	Non work trip mode share (all day)						
	Drive alone	49.3%	50.2%	47.0%	47.0%	47.0%	47.0%
	Carpool	46.8%	46.6%	46.2%	46.2%	46.2%	46.2%
	Transit	0.8%	0.6%	0.9%	0.8%	0.9%	0.9%
	Bike/Walk	3.1%	2.6%	5.9%	5.9%	5.9%	5.9%
30	Total bike and walk trips	523,000	617,000	1,357,000	1,364,000	1,357,000	1,357,000
31	CO2 emissions per capita*	28.0	20.1	17.6	17.6	17.8	17.7
	SOCIAL EQUITY						
32	Average travel time per person trip (in minutes)						
	Low-income population	15	17	16	16	16	16
	Non low-income population	16	17	16	16	16	16
	Minority population	15	17	16	16	16	16
	Non minority population	16	17	16	16	16	16
	Mobility population	16	18	17	17	17	17
	Non mobility population	15	17	16	16	16	16
	Community engagement population	15	17	16	16	16	16
	Non community engagement population	16	17	16	16	16	16
33	Percent of work trips accessible in 30 minutes in peak periods by mode						
	Low-income population						
	Drive alone	80%	71%	77%	77%	77%	77%
	Carpool	80%	72%	78%	79%	79%	79%
	Transit	15%	15%	24%	23%	23%	23%
	Non low-income population						
	Drive alone	72%	67%	72%	72%	73%	72%
	Carpool	74%	69%	74%	74%	75%	74%
	Transit	5%	5%	12%	11%	12%	12%
	Minority population						
	Drive alone	77%	70%	76%	76%	76%	76%
	Carpool	78%	71%	77%	78%	78%	78%
	Transit	9%	10%	18%	17%	17%	17%
	Non minority population						
	Drive alone	72%	66%	71%	71%	72%	71%
	Carpool	73%	68%	73%	73%	74%	73%
	Transit	5%	6%	12%	12%	12%	12%
	Mobility population						
	Drive alone	78%	70%	76%	76%	76%	76%
	Carpool	79%	71%	77%	78%	78%	78%
	Transit	12%	13%	21%	20%	20%	20%
	Non mobility population						
	Drive alone	73%	67%	72%	72%	73%	73%
	Carpool	74%	69%	74%	75%	75%	75%
	Transit	6%	6%	13%	12%	13%	13%
	Community engagement population						
	Drive alone	78%	70%	76%	76%	77%	76%
	Carpool	78%	71%	78%	78%	79%	78%
	Transit	12%	12%	22%	20%	21%	20%
	Non community engagement population						
	Drive alone	72%	67%	72%	72%	73%	72%
	Carpool	74%	69%	74%	74%	75%	74%
	Transit	5%	5%	12%	11%	12%	12%
34	Percent of homes within 1/2 mile of a transit stop						
	Low-income population	93%	90%	91%	91%	91%	91%
	Non low-income population	59%	57%	62%	62%	62%	63%
	Minority population	81%	78%	81%	81%	81%	81%
	Non minority population	55%	55%	59%	60%	59%	60%
	Mobility population	72%	73%	75%	74%	75%	75%
	Non mobility population	65%	63%	68%	68%	68%	68%
	Community engagement population	90%	86%	89%	88%	89%	88%
	Non community engagement population	57%	56%	61%	61%	61%	62%

*** Notes:**

22 and 31: Includes all vehicle types.

32 - 39: Mobility (zero-car households, disabled, and 75+) and Community engagement (linguistic isolation and low educational attainment)

DRAFT 2050 RTP: PERFORMANCE MEASURES DRAFT RESULTS - ATTACHMENT 1

Goals and Performance Measures	Existing (2008)	No Build (2050)	Transit Emphasis (2050)	Rail/Freight Emphasis (2050)	Highway Emphasis (2050)	Fusion Emphasis (2050)
SOCIAL EQUITY						
35 Percent of population within 30 minutes of schools						
Low-income population	98%	98%	100%	99%	99%	99%
Non low-income population	98%	97%	100%	98%	98%	98%
Minority population	98%	98%	100%	98%	98%	98%
Non minority population	98%	97%	100%	98%	98%	98%
Mobility population	96%	95%	100%	96%	96%	96%
Non mobility population	98%	98%	100%	99%	99%	99%
Community engagement population	97%	98%	100%	98%	98%	98%
Non community engagement population	98%	97%	100%	98%	98%	98%
36 Percent of population within 30 minutes of the San Diego International Airport						
Low-income population	75%	75%	75%	75%	75%	75%
Non low-income population	71%	61%	68%	66%	68%	66%
Minority population	75%	72%	76%	75%	76%	75%
Non minority population	69%	57%	64%	61%	64%	62%
Mobility population	70%	65%	69%	67%	68%	67%
Non mobility population	72%	65%	71%	69%	71%	69%
Community engagement population	69%	68%	70%	69%	69%	69%
Non community engagement population	73%	63%	70%	68%	70%	68%
37 Percent of population within 15 minutes of healthcare						
Low-income population	99%	99%	99%	99%	99%	99%
Non low-income population	97%	96%	96%	96%	96%	96%
Minority population	99%	99%	99%	99%	99%	99%
Non minority population	96%	94%	95%	95%	95%	95%
Mobility population	97%	96%	96%	96%	96%	96%
Non mobility population	98%	97%	97%	97%	97%	97%
Community engagement population	99%	99%	99%	99%	99%	99%
Non community engagement population	97%	95%	96%	96%	96%	96%
38 Percent of population within 15 minutes of parks or beaches						
Low-income population	100%	100%	100%	100%	100%	100%
Non low-income population	99%	99%	100%	100%	100%	100%
Minority population	100%	100%	100%	100%	100%	100%
Non minority population	99%	99%	100%	100%	100%	100%
Mobility population	100%	100%	100%	100%	100%	100%
Non mobility population	99%	99%	100%	100%	100%	100%
Community engagement population	100%	100%	100%	100%	100%	100%
Non community engagement population	99%	99%	100%	100%	100%	100%
39 Distribution of RTP expenditures per capita						
Low-income population	N/A	$6,700	$14,800	$13,700	$15,600	$14,500
Non low-income population	N/A	$6,700	$12,900	$12,700	$13,900	$13,200
Minority population	N/A	$6,800	$13,400	$12,600	$14,200	$13,300
Non minority population	N/A	$6,700	$13,500	$13,300	$14,500	$13,800
Mobility population	N/A	$6,700	$14,000	$13,000	$14,500	$13,900
Non mobility population	N/A	$6,700	$13,200	$13,000	$14,300	$13,400
Community engagement population	N/A	$6,700	$13,900	$12,900	$14,800	$13,600
Non community engagement population	N/A	$6,700	$13,200	$13,000	$14,200	$13,500

*** Notes:**

32 - 39: Mobility (zero-car households, disabled, and 75+) and Community engagement (linguistic isolation and low educational attainment)

DRAFT 2050 RTP: PROJECTED TRAVEL TIMES IN KEY CORRIDORS

	Goals and Performance Measures	Existing (2008)	No Build (2050)	Transit Emphasis (2050)	Rail/Freight Emphasis (2050)	Highway Emphasis (2050)	Fusion Emphasis (2050)
	Average travel time (peak periods) by mode for selected corridors (in minutes door to door)						
1	**Oceanside - Downtown San Diego**						
	By auto	59	66	60	60	56	60
	By transit (walk access)	104	106	88	83	92	92
	By transit (park and ride access)	93	93	83	75	83	83
	By carpool	55	64	59	59	54	59
2	**Escondido - Downtown San Diego**						
	By auto	47	52	50	50	50	50
	By transit (walk access)	74	75	62	72	62	62
	By transit (park and ride access)	75	71	53	53	56	56
	By carpool	47	47	49	49	49	49
3	**El Cajon - Kearny Mesa**						
	By auto	29	32	30	29	28	31
	By transit (walk access)	76	92	57	48	57	50
	By transit (park and ride access)	62	77	46	38	46	38
	By carpool	29	32	29	27	27	31
4	**Mid City - UTC**						
	By auto	26	39	30	29	30	30
	By transit (walk access)	65	79	38	28	38	34
	By transit (park and ride access)	56	67	40	30	40	36
	By carpool	25	39	27	27	27	27
5	**Western Chula Vista - Mission Valley**						
	By auto	26	35	28	28	26	26
	By transit (walk access)	71	72	52	51	53	55
	By transit (park and ride access)	68	69	49	48	50	53
	By carpool	26	35	27	27	25	25
6	**Carlsbad - Sorrento Mesa**						
	By auto	41	38	34	34	32	34
	By transit (walk access)	85	99	53	93	53	87
	By transit (park and ride access)	60	61	55	55	55	55
	By carpool	34	33	32	31	29	31
7	**Oceanside - Escondido**						
	By auto	32	37	32	32	31	32
	By transit (walk access)	81	90	62	62	62	62
	By transit (park and ride access)	88	87	57	66	57	56
	By carpool	32	37	31	31	30	31
8	**San Ysidro - Downtown San Diego**						
	By auto	28	32	29	30	29	28
	By transit (walk access)	44	44	40	40	44	44
	By transit (park and ride access)	46	46	42	42	46	46
	By carpool	28	32	29	29	29	29
9	**Otay Ranch - UTC**						
	By auto	45	66	46	45	45	44
	By transit (walk access)	135	123	52	65	52	52
	By transit (park and ride access)	151	121	50	63	50	50
	By carpool	45	65	44	43	44	43
10	**Pala/Pauma - Oceanside Transit Center**						
	By auto	53	54	53	53	51	53
	By transit (walk access)	180	164	99	98	98	98
	By transit (park and ride access)	99	75	64	64	62	63
	By carpool	53	54	53	53	51	53
11	**SR 67 (Ramona) - Downtown San Diego**						
	By auto	60	69	61	62	61	61
	By transit (walk access)	156	166	96	96	113	113
	By transit (park and ride access)	113	98	79	78	78	79
	By carpool	60	66	61	62	61	61

Draft 2050 RTP Revenue Constrained Network Scenarios
Constant Projects List
November 19, 2010

	***TransNet* Projects**					Estimated UNC Cost* ($2010)	Project Ranking	Scenario #1 Transit Emphasis	Scenario #2 Rail/Freight Emphasis	Scenario #3 Highway Emphasis	Scenario #4 Fusion
	FREEWAY/HIGHWAY IMPROVEMENT PROJECTS										
	Route	**From**	**To**	**Existing**	**Improvement**						
1	I-5	SR 905	SR 54	8F	8F+2ML	$220	15	✓	✓	✓	✓
2	I-5	SR 54	I-15	8F	8F+2ML	$100	14	✓	✓	✓	✓
3	I-5	I-15	I-8	8F	8F+Operational	$1,130	17	✓	✓	✓	✓
4	I-5	I-8	La Jolla Village Dr	8F/10F	8F/10F+2ML	$530	6	✓	✓	✓	✓
5	I-5	La Jolla Village Dr	I-5/I-805 Merge	8F/14F	8F/14F+2ML	$303	28	✓	✓	✓	✓
6	I-5	I-5/I-805 Merge	Manchester Ave	8F/14F+ 2HOV	8F/14F+4ML	$427	32	✓	✓	✓	✓
7	I-5	Manchester Ave	Palomar Airport Rd	8F	8F+4ML	$2,059	4	✓	✓	✓	✓
8	I-5	Palomar Airport Rd	Vandegrift Boulevard	8F	8F+4ML	$1,311	25	✓	✓	✓	✓
9	I-8	2nd Street	Los Coches	4F/6F	6F	$54	41	✓	✓	✓	✓
10	SR 15	SR 94	I-8	8F	8F+2ML	$120	19	✓	✓	✓	✓
11	I-15	Viaduct		8F	8F+2ML	$720	42	✓	✓	✓	✓
12	I-15	I-8	SR 163	8F	8F+2ML	$130	3	✓	✓	✓	✓
13	I-15	SR 163	SR 56	8F+2ML(R)	10F+4ML/MB	$419	N/A	✓	✓	✓	✓
14	I-15	Centre City Pkwy	SR 78	8F	8F+4ML	$210	N/A	✓	✓	✓	✓
15	SR 52	I-805	I-15	6F	6F+2ML	$190	30	✓	✓	✓	✓
16	SR 52	I-15	SR 125	4F	6F+2ML(R)	$325	11	✓	✓	✓	✓
17	SR 54	I-5	SR 125	6F	6F+2ML	$100	37	✓	✓	✓	✓
18	SR 56	I-5	I-15	4F	6F	$221	46	✓	✓	✓	✓
19	SR 67	Mapleview St	Dye Rd	2C/4C	4C	$570	8	✓	✓	✓	✓
20	SR 76	Melrose Drive	I-15	2C	4C	$404	N/A	✓	✓	✓	✓
21	SR 78	I-5	I-15	6F	6F+2ML/Ops	$570	5	✓	✓	✓	✓
22	SR 94	I-5	I-805	8F	8F+2ML	$480	22	✓	✓	✓	✓
23	SR 94	I-805	College Ave	8F	8F+2ML	$220	27	✓	✓	✓	✓
24	SR 94	College Ave	SR 125	8F	8F+2ML	$230	44	✓	✓	✓	✓
25	SR 94	SR 125	Avocado Blvd	4F	6F	$90	34	✓	✓	✓	✓
26	SR 94	Avocado Blvd	Jamacha Rd	4C	6C	$30	45, 24	✓	✓	✓	✓
27	SR 94	Jamacha Rd	Steele Canyon Rd	4C	6C	$20	45, 24	✓	✓	✓	✓
28	SR 125	SR 54	SR 94	6F	6F+2ML	$100	16	✓	✓	✓	✓
29	SR 125	SR 94	I-8	8F	8F+2ML	$70	2	✓	✓	✓	✓
30	I-805	Palomar St	Carroll Canyon Rd	8F/10F	8F+2ML	$2,003	18, 9, 10, 1	✓	✓	✓	✓
31	I-805	Mission Valley Viaduct		8F	8F+2ML	$401	10	✓	✓	✓	✓
32	I-805	Carroll Canyon Rd	I-5 (north)	8F/10F	8F+2ML	$86	7	✓	✓	✓	✓

	TransNet Projects					Estimated UNC Cost* ($2010)	Project Ranking	Scenario #1 Transit Emphasis	Scenario #2 Rail/Freight Emphasis	Scenario #3 Highway Emphasis	Scenario #4 Fusion
	FREEWAY CONNECTORS										
	Fwy	**Intersecting Freeway**	**Movement**								
33	I-5	SR 56	West to North			$33	9	✓	✓	✓	✓
34	I-5	SR 56	South to East			$98	10	✓	✓	✓	✓
35	I-5	SR 78	South to East			$60	2	✓	✓	✓	✓
36	I-5	SR 78	West to South			$46	4	✓	✓	✓	✓
37	SR 94	SR 125	West to North			$180	1	✓	✓	✓	✓
38	SR 94	SR 125	South to East			$139	5	✓	✓	✓	✓
	HOV CONNECTORS										
	Route	**Intersecting Freeway**	**Movement**								
39	I-5	I-805	North to North and South to South			$170	3	✓	✓	✓	✓
40	I-15	SR 78	East to South and North to West			$105	1	✓	✓	✓	✓
41	I-15	SR 94	East to North and South to West			$80	19	✓	✓	✓	✓
	TRANSIT PROJECTS										
42	COASTER - Double Tracking (including Fairgrounds and Convention Center Stations, and rail grade separation at Leucadia) (Rte 398)					$1,684	10	✓	✓	✓	✓
43	Trolley - Mid-Coast LRT Extension (Rte 510)					$1,350	N/A	✓	✓	✓	✓
44	Trolley - Trolley System Rehabilitation					$510	N/A	✓	✓	✓	✓
45	SPRINTER - Double Tracking (Oceanside-Escondido); rail grade separations assumed at El Camino Real, Vista Village, Melrose, and Mission/San Marcos Stations (Rte 399)					$678	21	✓	✓	✓	✓
46	BRT - North I-15 (Sabre Springs/Mira Mesa PNRs, Mid-City Stations) (Rte 610)					$103	3	✓	✓	✓	✓
47	BRT - Escondido-UTC via Mira Mesa Blvd (Rt 470 Project)					$20	N/A	✓	✓	✓	✓
48	BRT - South Bay BRT (Otay Mesa-Downtown) (Rte 628)					$200	N/A	✓	✓	✓	✓
49	BRT - South Bay Maintenance Facility					$51	N/A	✓	✓	✓	✓
50	BRT - Downtown BRT stations/layovers					$110	N/A	✓	✓	✓	✓
51	BRT - Otay Mesa to Sorrento Mesa via I-805, Kearny Mesa (TransNet Rt 680)					$200	N/A	✓	✓	✓	✓
52	Rapid - Mid-City Rapid - Phase 1					$44	N/A	✓	✓	✓	✓
53	Rapid - Mid-City Rapid – Phase 2 Balboa Park (Rte 15)					$24	N/A	✓	✓	✓	✓
54	Rapid - UTC Area Super Loop (Rte 180)					$0	N/A	✓	✓	✓	✓
				Total				**$21,126**	**$21,126**	**$21,126**	**$21,126**

	OTHER CONSTANT PROJECTS					Estimated UNC Cost* ($2010)	Project Ranking	Scenario #1 Transit Emphasis	Scenario #2 Rail/Freight Emphasis	Scenario #3 Highway Emphasis	Scenario #4 Fusion
	FREEWAY/HIGHWAY IMPROVEMENT PROJECTS										
	Route	**From**	**To**	**Existing**	**Improvement**						
55	I-5	Vandegrift Boulevard	Orange County	8F	8F+4T	$754	N/A	✓	✓	✓	✓
56	I-8	SR 125	2nd Street	6F/8F	6F/8F+Operational	$125	13	✓	✓	✓	✓
57	SR 11	SR 905	Mexico	--	4T	$356	N/A	✓	✓	✓	✓
58	SR 15	I-5	SR 94	6F	8F+2ML	$90	23	✓	✓	✓	✓
59	I-15	SR 78	Riverside County	8F	8F+4T	$1,005	N/A	✓	✓	✓	✓
60	SR 52	I-5	I-805	4F	6F	$110	31	✓	✓	✓	✓

	OTHER CONSTANT PROJECTS					Estimated UNC Cost* ($2010)	Project Ranking	Scenario #1 Transit Emphasis	Scenario #2 Rail/Freight Emphasis	Scenario #3 Highway Emphasis	Scenario #4 Fusion
61	SR 125	SR 905	San Miguel Rd	4T	8F	$110	N/A	✓	✓	✓	✓
62	SR 125	San Miguel Rd	SR 54	4F	8F	$60	N/A	✓	✓	✓	✓
63	SR 241	Orange County	I-5	--	4T/6T	$443	N/A	✓	✓	✓	✓
64	SR 905	I-805	Mexico	--	6F	$595	N/A	✓	✓	✓	✓
	FREEWAY CONNECTORS										
	Fwy	**Intersecting Freeway**	**Movement**								
65	I-15	SR 56	North to West			$100	7	✓	✓	✓	✓
	HOV CONNECTORS										
	Route	**Intersecting Freeway**	**Movement**								
66	I-15	I-805	North to North and South to South			$90	4	✓	✓	✓	✓
67	I-805	SR 52	West to North and South to East			$90	2	✓	✓	✓	✓
68	I-805	SR 94	East to South and North to West			$160	6	✓	✓	✓	✓
	TRANSIT PROJECTS										
69	High Speed Rail (HSR) Intercity - Temecula to Lindbergh Field ITC					$0	N/A	✓	✓	✓	✓
70	High Speed Rail (HSR) Commuter Rail Overlay - Temecula to Lindbergh ITC (Rte 598)					$330	8**	✓	✓	✓	✓
71	COASTER - Tunnel (Del Mar) (Rte 398)					$1,184	N/A	✓	✓	✓	✓
72	COASTER - Positive Train Control					$108	N/A	✓	✓	✓	✓
73	Trolley - Blue Line Frequency Enhancements (rail grade seps at: Taylor, Palomar St, H St, E St, 32nd St, 28th St, Washington St/Sassafras St) (Rte 510)					$552	1	✓	✓	✓	✓
74	Trolley - Orange Line Frequency Enhancements (rail grade seps at: Allison/University, Severin Dr, Broadway/Lemon Grove Ave, Euclid Ave) (Rte 520)					$312	11	✓	✓	✓	✓
75	Trolley - Green Line Frequency Enhancements (Rte 530)					$0	2	✓	✓	✓	✓
76	Rapid - La Mesa to Ocean Beach via Mid-City, Hillcrest, Old Town (Rte 10)					$85	15	✓	✓	✓	✓
77	Rapid - Point Loma to Kearny Mesa via Old Town, Linda Vista (Rte 28)					$48	27	✓	✓	✓	✓
78	Rapid - Kearny Mesa to Downtown via KM Guideway (Rte 120)					$0	12	✓	✓	✓	✓
79	Rapid - Escondido to Del Lago via Escondido Blvd & Bear Valley (Rte 350)					$0	N/A	✓	✓	✓	✓
80	Shuttles - San Marcos					$0	N/A	✓	✓	✓	✓
81	Local Bus Routes - 10 min in key corridors					$0	N/A	✓	✓	✓	✓
82	Feeder Bus System					$0	N/A	✓	✓	✓	✓
83	Lindbergh Intermodal Transit Center (ITC)					$215	N/A	✓	✓	✓	✓
84	Bike/Pedestrian Access Improvements					$500	N/A	✓	✓	✓	✓
85	Other (Maintenance facilities, transit system rehab, park and ride, ITS)					$3,020	N/A	✓	✓	✓	✓
					Total			**$10,442**	**$10,442**	**$10,442**	**$10,442**

Note: All Managed Lane facilities will have a HOV-3+ occupancy requirement after 2020. HOV-2 and SOVs will be required to pay a fee to use these facilities.

TransNet projects are included in all scenarios with the exception of the I-805 corridor where different improvements are being tested in some scenarios.

* Capital costs only. Operating costs, which include vehicle and vehicle replacement costs, will be based on phasing.

** Project Rankings was from Temecula to International Border.

Draft 2050 RTP Revenue Constrained Network Scenarios
Variable Projects List
November 19, 2010

	VARIABLE PROJECTS					Estimated UNC Cost* ($2010)	Project Ranking	Scenario #1 Transit Emphasis	Scenario #2 Rail/Freight Emphasis	Scenario #3 Highway Emphasis	Scenario #4 Fusion
	FREEWAY/HIGHWAY IMPROVEMENT PROJECTS										
	Route	**From**	**To**	**Constant**	**Add'l Improvement**						
86	I-5	SR 54	I-15	8F+2ML	10F+2ML	$100	14	-	-	✓	✓
87	I-5	SR 56	Palomar Airport Rd	8F+4ML	10F+4ML	$136	4	-	-	✓	-
88	I-5	Palomar Airport Rd	Vandegrift	8F+4ML	10F+4ML	$87	25	-	-	✓	-
89	I-8	I-5	I-15	8F	8F+Operational	$440	33	✓	-	✓	✓
90	I-8	I-15	SR 125	8F/10F	8F/10F+Operational	$125	40	✓	-	✓	✓
91	I-8	Los Coches	Dunbar Rd	4F/6F	6F	$335	41	-	-	✓	-
92	SR 52	I-15	SR 125	6F+2ML(R)	6F+3ML/MB	$115	11	-	-	✓	-
93	SR 52	SR 125	SR 67	4F	6F	$120	36	-	-	✓	-
94	SR 54	I-5	SR 125	6F+2ML	6F/8F+2ML	$40	37	-	-	✓	-
95	SR 56	I-5	I-15	6F	6F+2ML	$69	46	-	-	✓	-
96	SR 67	I-8	Mapleview St	4F/6F	6F/8F	$180	29	-	✓	✓	-
97	SR 76	I-5	Melrose Drive	4E	6E	$225	39	-	-	✓	-
98	SR 76	Melrose Drive	Mission Rd	4C	6C	$190	20	-	-	✓	-
99	SR 76	I-15	Couser Canyon	2C	4C/6C + Ops	$130	26	-	-	✓	✓
100	SR 94	I-805	College Ave	8F+2ML	10F+2ML	$70	27	-	-	✓	✓
101	SR 94	Steele Canyon Rd	Melody Rd	2C	4C	$90	45, 24	-	✓	✓	-
102	SR 125	SR 54	SR 94	6F+2ML	8F+2ML	$40	16	-	-	✓	-
103	SR 125	SR 94	I-8	8F+2ML	10F+2ML	$215	2	-	-	✓	✓
104	SR 125	I-8	SR 52	6F	6F+2ML	$440	38	-	✓	✓	-
105	SR 163	I-805	I-15	8F	8F+2ML	$320	35	-	-	✓	-
106	I-805	SR 905	Telegraph Canyon Rd.	8F	8F+4ML	$140	12	-	-	✓	-
107	I-805	Telegraph Canyon Rd.	SR 54	8F+2ML	8F+4ML	$100	18	-	-	✓	-
108	I-805	SR 54	I-8	8F+2ML	8F+4ML	$160	9	-	-	✓	-
109	I-805	Mission Valley Viaduct		8F+2ML	8F+4ML	$160	10	-	-	✓	-
110	I-805	I-8	La Jolla Village Dr	8F/10F+2ML	8F/10F+4ML	$100	1	-	-	✓	-
111	I-805	Palomar St	SR 94	8F+2ML	8F+4ML	$516	18	✓	-	-	-
112	I-805	SR 52	Carroll Canyon Rd	8F/10F+2ML	8F/10F+4ML	$180	1	✓	-	-	-
113	I-805	SR 905	Palomar St	8F	8F+2ML	$200	12	-	✓	-	-
114	SR 905	I-5	I-805	4F	8F	$150	43	-	✓	✓	-
115	SR 905	I-805	Mexico	6F	8F	$426	21	-	✓	✓	-

	VARIABLE PROJECTS				Estimated UNC Cost* ($2010)	Project Ranking	Scenario #1 Transit Emphasis	Scenario #2 Rail/Freight Emphasis	Scenario #3 Highway Emphasis	Scenario #4 Fusion
	FREEWAY CONNECTORS									
	Fwy	**Intersecting Freeway**	**Movement**							
116	I-5	I-8	East to North		$220	6	-	-	✓	-
117	I-5	I-8	South to West		$100	3	-	-	✓	-
118	I-5	SR 94	North to East		$120	8	-	✓	-	-
	HOV CONNECTORS									
	Route	**Intersecting Freeway**	**Movement**							
119	I-5	SR 56	North to East and West to South		$80	5	-	-	✓	-
120	I-5	SR 78	South to East and West to North		$120	8	✓	-	✓	-
121	I-5	SR 78	North to East and West to South		$120	7	✓	-	✓	-
122	I-15	SR 52	West to North and South to East		$140	10	✓	-	-	✓
	TRANSIT PROJECTS									
123	COASTER - UTC Tunnel and UTC COASTER Station (Rte 398)				$2,989	See Note A	-	✓	-	-
124	SPRINTER - Branch Extensions to North County Fair (Rte 399)				$678	See Note B	✓	✓	-	✓
125	SPRINTER Express (Rte 588)				$284	23	-	✓	-	✓
126	Trolley - Downtown Trolley Tunnel betw. Park/Island and Ash St (facilitates frequency enhancements for Blue/Orange Lines and Blue/Orange Express) (Rtes 510 & 520)				$2,592	See Note C	✓	✓	-	-
127	Trolley Express - Blue Line Express - UTC to San Ysidro via Downtown (Rte 540)				$455	4	✓	✓	-	-
128	Trolley Express - Orange Line Express - El Cajon to Downtown San Diego via Euclid (Rte 522)				$230	6	✓	✓	-	-
129	Trolley Express - H St Trolley Station (formerly EUC) to UTC via Mid-City, Kearny Mesa (Rte 566)				$327	5	-	✓	-	-
130	Trolley - SDSU to Downtown via El Cajon Blvd/Mid-City (transition of Mid-City Rapid to LRT) (Rte 560)				$1,230	13	✓	-	-	-
131	Trolley - Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, SDSU (Rte 563)				$1,262	9	-	✓	-	✓
132	Trolley - SDSU to San Ysidro via East San Diego, SE San Diego, National City (Rte 550)				$1,665	20	✓	-	✓	-
133	Trolley - UTC to H St Trolley Station via Kearny Mesa, Mission Valley, Mid-City, National City (Rte 562)				$1,935	14	-	✓	-	✓
134	Trolley - UTC to Mira Mesa via Sorrento Mesa (Rte 561)				$1,408	28	-	-	✓	✓
135	Guideway- Kearny Mesa Guideway (facilitates direct access for BRT, Rapid Bus, and local bus - Rtes 120, 610, 640, 652)				$3,302	See Note D	✓	-	✓	✓
136	BRT - I-5 - San Ysidro to Kearny Mesa via I-5 shoulder lanes/HOV lanes, Downtown, Kearny Mesa Guideway (Rte 640)				$0	N/A	-	-	✓	✓
137	BRT - Downtown to UTC via Kearny Mesa Guideway/I-805 (Rte 652)				$2	16	✓	-	✓	✓
138	BRT - El Cajon to UTC/Campus Pt via Santee, SR 52, I-805 (Rte 870) (Peak Only)				$7	7	✓	-	✓	-
139	BRT - Oceanside to Escondido via SR 78 HOV Lanes (Rte 430)				$234	17	✓	-	✓	-
140	BRT - Chula Vista to Palomar Airport Road Bus. Park via I-805/5 (Rte 650) (Peak Only)				$80	25	-	-	✓	-
141	BRT - El Cajon to Sorrento Mesa via SR 52, Kearny Mesa (Rte 890) (Peak Only)				$12	39	✓	-	✓	-

	VARIABLE PROJECTS	Estimated UNC Cost* ($2010)	Project Ranking	Scenario #1 Transit Emphasis	Scenario #2 Rail/Freight Emphasis	Scenario #3 Highway Emphasis	Scenario #4 Fusion
142	BRT - El Cajon to Otay Mesa via Spring Valley, SR 125, Millenia (Rte 692)	$6	22	-	-	✓	✓
143	BRT - Mid City to Palomar Airport Road via Kearny Mesa/I-805/I-5 (Rte 653) (Peak Only)	$10	33	✓	-	✓	-
144	BRT - Oceanside to UTC via I-5, Carlsbad, Encinitas (Rte 940) (Peak Only)	$38	N/A	✓	-	✓	✓
145	BRT - Santee/El Cajon Transit Centers to Downtown via SR 94 (Rte 90) (Peak Only)	$0	N/A	-	-	✓	✓
146	BRT - Millenia/Otay Ranch to Sorrento Mesa Express (Rte 688) (Peak Only)	$0	N/A	✓	-	✓	✓
147	BRT - Millenia/Otay Ranch to UTC/Torrey Pines Express (Rte 689) (Peak Only)	$0	N/A	✓	-	✓	✓
148	Rapid - Oceanside to UTC via Hwy 101 Coastal Communities, Carmel Valley (Rte 473)	$127	19	✓	-	✓	✓
149	Rapid - Old Town to Sorrento Mesa via Pacific Beach, La Jolla, UTC (Rte 30)	$102	24	✓	-	✓	✓
150	Rapid - Carlsbad to San Marcos via Palomar Airport Road Corridor (Rte 440)	$50	40	✓	-	✓	-
151	Rapid - Coronado to Downtown via Coronado Bridge (Rte 910)	$25	18	✓	-	✓	-
152	Rapid - Spring Valley to SDSU via SE San Diego, Downtown, Hillcrest, Mid-City (Rte 11)	$110	26	-	✓	✓	✓
153	Rapid - Fashion Valley to UTC/UCSD via Linda Vista and Clairemont (Rte 41)	$54	34	✓	-	✓	-
154	Rapid - SDSU to Spring Valley via East San Diego, Lemon Grove, Skyline (Rte 636)	$39	38	✓	✓	✓	-
155	Rapid - North Park to 32nd Street Trolley via Golden Hill (Rte 637)	$32	43	✓	-	✓	-
156	Rapid - Downtown Escondido to East Escondido (Rte 471)	$31	47	✓	-	✓	-
157	Rapid - Eastlake/EUC to Palomar Trolley via Main Street Corridor (Rte 635)	$54	41	✓	-	✓	-
158	Rapid - San Ysidro to Otay Mesa via Otay, SR 905 Corridor (Rte 638)	$53	48	✓	-	✓	-
159	Rapid - Otay to North Island via Imperial Beach and Silver Strand, Coronado (Rte 639)	$53	51	-	-	✓	-
160	Rapid - H Street Trolley to Millenia via H Street Corridor, Southwestern College (Rte 709)	$36	37	✓	-	✓	-
161	Rapid - North Park to Downtown San Diego via 30th St (Rte 2)	$38	35	✓	-	✓	-
162	Rapid - Oceanside to Vista via Mission Ave/Santa Fe Road Corridor (Rte 474)	$49	46	-	-	✓	-
163	Rapid - Camp Pendleton to Carlsbad Village via College Blvd, Plaza Camino Real (Rte 477)	$78	53	-	-	✓	-
164	Streetcar - Hillcrest/Balboa Park/Downtown San Diego Loop (Rte 554)	$277	31	✓	-	✓	✓
165	Streetcar - 30th St to Downtown San Diego via North Park/Golden Hill (Rte 555)	$249	29	✓	-	-	✓
166	Streetcar - Downtown San Diego: Little Italy to East Village (Rte 553)	$135	30	✓	-	✓	✓
167	Streetcar - El Cajon Downtown (Rte 557)	$160	44	-	-	-	✓
168	Streetcar - Chula Vista Downtown (Rte 551)	$134	42	-	-	-	✓
169	Streetcar - Escondido Downtown (Rte 558)	$50	47	-	-	-	✓
	Total			**$11,639**	**$10,748**	**$11,691**	**$9,720**

	UNCONSTRAINED PROJECTS ONLY				Estimated UNC Cost* ($2010)	Project Ranking	Scenario #1 Transit Emphasis	Scenario #2 Rail/Freight Emphasis	Scenario #3 Highway Emphasis	Scenario #4 Fusion
	HOV CONNECTORS									
	Route	**Intersecting Freeway**	**Movement**							
170	I-5	SR 15	North to North and South to South		$183	11	-	-	-	-
171	I-5	SR 54	West to South and North to East		$120	21	-	-	-	-
172	I-5	SR 54	South to East and West to North		$120	22	-	-	-	-
173	I-5	SR 56	South to East and West to North		$170	13	-	-	-	-
174	I-15	SR 52	West to South and North to East		$140	23	-	-	-	-
175	I-15	SR 56	East to North and South to West		$180	13	-	-	-	-

	UNCONSTRAINED PROJECTS ONLY				Estimated UNC Cost* ($2010)	Project Ranking	Scenario #1 Transit Emphasis	Scenario #2 Rail/Freight Emphasis	Scenario #3 Highway Emphasis	Scenario #4 Fusion
176	I-15	SR 163	North to North and South to South		$160	9	-	-	-	-
177	SR 52	SR 125	North to West and East to South		$100	16	-	-	-	-
178	SR 94	SR 125	East to North and South to West		$140	12	-	-	-	-
179	I-805	SR 54	South to East and West to North		$140	15	-	-	-	-
180	I-805	SR 94	West to South and North to East		$160	20	-	-	-	-
181	I-805	SR 94	East to North and South to East		$160	14	-	-	-	-
182	I-805	SR 163	North to North and South to South		$150	17	-	-	-	-
	TRANSIT PROJECTS									
183	High Speed Rail (HSR) Extension from Lindbergh Field ITC to International Border				$3,557	N/A	-	-	-	-
184	SPRINTER - Branch Extensions to East Escondido (Rte 399)				$59	N/A	-	-	-	-
185	Trolley - Otay Mesa East Border Crossing to western Chula Vista via Otay Ranch/Millenia (Rte 564)				$854	32	-	-	-	-
186	Trolley - Downtown Bus Tunnel and Hubs				$2,917	N/A	-	-	-	-
187	Streetcar - National City Downtown (Rte 552)				$40	49	-	-	-	-
188	Streetcar - Oceanside Downtown (Rte 559)				$45	52	-	-	-	-
189	Streetcar - Mission Beach to La Jolla via Pacific Beach (Rte 565)				$239	50	-	-	-	-
190	San Ysidro Intermodal Center				$320	N/A	-	-	-	-
191	Otay Mesa East Intermodal Transit Center				-	N/A	-	-	-	-
				Total			**$9,954**	**$9,954**	**$9,954**	**$9,954**

Note: All Managed Lane facilities will have a HOV-3+ occupancy requirement after 2020. HOV-2 and SOVs will be required to pay a fee to use these facilities.

TransNet projects are included in all scenarios with the exception of the I-805 corridor where different improvements are being tested in some scenarios.

* Capital costs only. Operating costs, which include vehicle and vehicle replacement costs, will be based on phasing.

** Project Ranking was from Temecula to International Border

Note A: Included in COASTER double-tracking ranking

Note B: Included in SPRINTER double-tracking ranking

Note C: Included in several LRT project rankings

Note D: Included in several BRT project rankings

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May 5, 2010

File Number 2300000

Ms. Mary Nichols
Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95812

Dear Ms. Nichols:

SUBJECT: San Diego Association of Governments (SANDAG) Sustainable Communities Strategy Technical Methodology

SANDAG presents the "technical methodology it intends to use to estimate the greenhouse gas emissions from its sustainable communities strategy and, if appropriate, its alternative planning strategy" as required under California Government Code 65080(b)(2)(I)(i).

SANDAG is a nationally recognized leader in transportation and land use planning and modeling. SANDAG intends to set a positive example for the rest of the state and nation as the first metropolitan planning organization to adopt a Sustainable Communities Strategy under Senate Bill 375 (SB 375) (Steinberg, 2008). The 2050 Regional Transportation Plan and its Sustainable Communities Strategies will build upon previous successes and will include expanded public outreach, enhanced environmental justice analysis, coordination with the public and private partners, and a comprehensive economic analysis. These efforts and others are described in the attached report describing how SANDAG will develop a plan that complies with SB 375.

If you have any questions about the SANDAG Technical Methodology, please feel free to contact me or Clint Daniels of my staff at (619) 699-6946.

Sincerely,

GARY L. GALLEGOS
Executive Director

CDAN/EAR/ama

Enclosure

MEMBER AGENCIES
Cities of
Carlsbad
Chula Vista
Coronado
Del Mar
El Cajon
Encinitas
Escondido
Imperial Beach
La Mesa
Lemon Grove
National City
Oceanside
Poway
San Diego
San Marcos
Santee
Solana Beach
Vista
and
County of San Diego

ADVISORY MEMBERS
Imperial County
California Department of Transportation
Metropolitan Transit System
North San Diego County Transit Development Board
United States Department of Defense
San Diego Unified Port District
San Diego County Water Authority
Mexico

The planning efforts described in this report are key inputs or components for the development of a San Diego Association of Governments (SANDAG) 2050 Regional Transportation Plan (RTP) that will comply with SB 375 and federal air quality conformity. This document also includes an overview of the SANDAG transportation and land use model platform.

Developing the 2050 RTP and SCS

With each RTP update, SANDAG starts the planning process by establishing a framework of goals, policy objectives, and performance measures to guide the development of the Plan. The Board of Directors discussed the 2050 RTP vision, goals, and policy objectives to help reach the 2050 RTP goals in fall 2009.

The 2050 RTP goals are structured into two overarching themes: Quality of Travel & Livability, and Sustainability. Quality of Travel & Livability relates to how the transportation system functions from the individual customer perspective (Mobility, Reliability, and System Preservation & Safety), while Sustainability relates to making progress simultaneously in each of the Three "Es" (Social Equity, Healthy Environment, and Prosperous Economy) from a regional perspective.

The 2050 Regional Growth Forecast is the foundation for the transportation analyses conducted for the development of the 2050 RTP. Additionally, numerous studies currently underway will be incorporated into various RTP alternatives, including recommendations from the Urban Area Transit Strategy, Climate Action Strategy, collaborative projects with Tribal Nations, interregional and binational strategies, and other transportation studies. Additionally, the RTP transportation project evaluation criteria are being revised and are expected to be approved by the SANDAG Board of Directors in May, 2010. The evaluation criteria will be used to rank all transportation projects. This will assist the Board of Directors in determining projects to be included in the 2050 RTP and Sustainable Communities Strategy (SCS). Additionally, revenue projections and project cost estimates will be updated.

Scenario testing as part of the greenhouse gas (GHG) target setting also is underway. It is expected that some elements of any of these scenarios being tested could be used in the development of the SCS. While the scenario testing process is being completed to determine the impact on per capita GHG reduction, further analysis would be required if any of these measures were to be adopted as part of the 2050 RTP.

The SCS must demonstrate how the development patterns and the transportation network, policies, and programs can work together to achieve the GHG emission reduction targets, if there is a feasible way to do so. If a Metropolitan Planning Organization (MPO) cannot meet the targets through the SCS, then the MPO is required to develop an Alternative Planning Strategy (APS) that demonstrates how the emission reduction targets could be achieved.

In essence, the SCS includes four building blocks:

1. Land use component that accommodates regional housing needs and includes protection of habitat and farmland;
2. Transportation networks including highways, transit, and local streets and roads;
3. Transportation demand management strategies; and
4. Transportation system management programs and policies.

Initial RTP and SCS alternatives will be developed in summer/fall 2010 in conjunction with receiving the draft GHG reduction target from the California Air Resources Board (ARB) in June 2010. Plan performance measures are expected to be approved by the SANDAG Transportation Committee in June, 2010. In summer 2010, these performance measures will be used to evaluate the initial RTP/SCS alternatives, including an economic analysis. SANDAG will receive the final GHG reduction target from ARB in September 2010.

Based on input from SANDAG Policy Advisory Committees, working groups, and the public, the preferred 2050 RTP/SCS scenario will be finalized in fall 2010 and will be incorporated into the Draft 2050 RTP and Environmental Impact Report (EIR) which are scheduled to be released in early 2011.

2050 Regional Growth Forecast

SANDAG has completed preliminary land use and economic forecast extending to 2050 that will serve as the initial foundation for the region's first SCS. The regional forecast is based on local land use plans and policies, and is meant to reasonably identify where growth is projected to occur in the region over the long-term. The forecast is completed through a multi-step, collaborative process that involves input from local jurisdictions, citizens, and elected officials.

Recognizing that many of the region's general plans will be updated at least once between now and 2050, SANDAG staff worked with each jurisdiction to aggressively identify areas in the region where general plan designations could potentially change before the forecast horizon.

Urban Area Transit Strategy

An important, new component of the 2050 RTP is the development of an innovative and visionary Urban Area Transit Strategy to significantly increase the attractiveness and use of transit, walking, and biking in the region, and to make transit time-competitive with driving a car. Through this project, three transit network alternatives will be developed and tested with ultimate incorporation

of one of the networks (or a combination or variation thereof) into the development of the 2050 RTP.

Airport Multimodal Accessibility Plan (AMAP)

SANDAG is working with the San Diego County Regional Airport Authority (Authority) on the development of a Regional Aviation Strategic Plan (RASP) and an Airport Multimodal Accessibility Plan (AMAP). The Authority is lead for the RASP, which will identify workable strategies to improve the performance of the regional airport system. SANDAG is the lead for the AMAP, which will develop a multimodal strategy to improve surface transportation access to airports. The development of the RASP and AMAP will be a coordinated process between the Authority and SANDAG. The overall schedule is designed to allow the RASP and AMAP to be incorporated into the 2050 RTP.

Other Key 2050 RTP Tasks

Other major tasks include updates to the project evaluation criteria and plan performance measures, economic analysis of investment strategies, enhanced environmental justice analysis, new revenue projections, revised cost estimates for projects and services, and integration of technology and TDM measures into investment strategies. Additionally, the 2050 RTP will be subject to any new requirements established in the upcoming federal surface transportation reauthorization, which is anticipated to be passed in 2010/2011, and will follow updated California Transportation Commission RTP Guidelines.

RTP Public Participation Plan

SANDAG regularly involves the public in regional planning efforts. A public involvement plan has been prepared for the 2050 RTP, and it will be updated as needed as outreach and involvement strategies are underway. On May 22, 2009, the Board of Directors approved the creation of a new Regional Planning Stakeholders Working Group (SWG) to provide input on the development of key work elements in the planning process, including public involvement opportunities. Additionally, there will be a series of public presentations and workshops and other means for involving the public and receiving input on the work products and draft 2050 RTP. The Board of Directors approved the overall agency-wide Public Participation Plan in December 2009. As a cross-section of stakeholders from various sectors and subregions, the SWG contributed to the development of a 2050 RTP Public Involvement Plan and will assist in its implementation.

Modeling for the 2050 RTP

SANDAG anticipates using five models to estimate the greenhouse gas emissions from its SCS and, if appropriate, its APS: (1) Demographic and Economic Forecasting Model (DEFM), (2) Interregional Commute Model (IRCM), (3) Urban Development Model (UDM), (4) San Diego Regional Travel Demand Model (a four-step transportation forecasting model), and (5) the latest EMission FACtors (EMFAC) model from ARB.[1] Depending on model sensitivity to certain transportation policies, SANDAG will consider using off-model factors (or ARB defined Policies and Practices) as recommended by the Regional Targets Advisory Committee (RTAC). The 2050 RTP model will have a base year of 2008.

The first model component, DEFM, is an econometric forecasting model with a demographic module. DEFM produces an annual forecast of the size and structure of the region's economy and a demographic forecast consistent with that future economy. For the economic forecast, DEFM relates historical changes in the region's economy to historical changes in the United States' economy using input-output and econometric methodologies. The demographic module uses a cohort survival model to forecast population by age, gender, and ethnicity. DEFM produces a wealth of data about the region's future economic and demographic characteristics. Among the more important elements are the size and composition of the population, employment by industry sector, household and personal income, housing units by structure type, vacancy status and persons per household, labor force, and school enrollment.

The second model component is the Interregional Commute Model (IRCM). The purpose of the IRCM is to account for individuals who work in the region but live outside its boundaries.[2] The IRCM predicts the residential location of workers based upon accessibility to job sites, home prices, and the availability of residential land. Inputs to the IRCM include future job sites within our region and

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[1] See *2030 Regional Growth Forecast Update: Process and Model Documentation* for an in-depth discussion of SANDAG's modeling platform. < http://www.sandag.org/uploads/publicationid/publicationid_833_3750.pdf>. SANDAG has also has included a new truck model, 4-D indicators, and improved tolling methodology in its models since the last RTP and publication of the model documentation.

[2] The updated guidelines of California Government Code 65080(b)(2)(B) require "each metropolitan planning organization [to] prepare a sustainable communities strategy...identify[ing] areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period of the regional transportation plan." The IRCM does not contradict the intent of the statute. The 2050 Regional Growth Forecast identifies areas within the region sufficient to house all the forecasted population, but many workers will continue to choose to live outside the San Diego region and commute to jobs in the region based upon accessibility to job sites, home prices, and quality of life issues.

potential residential sites located in the San Diego region, Orange County, southwestern Riverside County, Imperial County, and Tijuana/Northern Baja California. The model also accounts for relative home prices across the comparison areas. Additional factors include the forecast of housing unit and employment growth from DEFM and commuting probabilities that vary based on the length of the commute. The output from the IRCM is future housing units containing San Diego region workers that would be built in the region, and those that would be built in surrounding regions.

As the third model component, the Urban Development Model (UDM) allocates growth in the region's economic and demographic characteristics to jurisdictions and other geographic areas within the region. UDM satisfies the federal requirements specified in the Clean Air Act and the Safe, Accountable, Flexible, Efficient Transportation Act: A Legacy for Users (SAFETEA-LU). These legislative acts mandate that transportation plans consider the long-range effects of the interaction between land uses and the transportation system. Among UDM inputs are the current spatial distribution of jobs, housing units, income, and population, land use inputs that include the plans and policies of the 18 cities and the County of San Diego, and the current and future transportation infrastructure. Three major premises underlie the UDM forecast of residential activities: employment location is a primary determinant of residential activity location; the longer a work trip, the less likely a person makes the trip; and increased residential development opportunities translate to greater residential growth potential. Lastly, the interactions between UDM and the transportation model are handled in a sequential manner.

The San Diego Regional Travel Demand Model, the fourth model component, uses the TransCAD software package to forecast travel activity. The transportation model requires two major inputs. The first input is the forecast of housing and nonresidential land uses from UDM. The other key input is the highway and transit system networks. The transportation model uses travel behavior surveys as the basis for the mathematical models in each of the steps. There are four steps to the transportation model. The model generates person trips, then determines trip destinations using a gravity-based model, allocates these trips to various modes, and finally assigns vehicle trips to highway networks and transit trips to transit networks.

SANDAG strives to stay in the forefront of forecasting technology by subjecting its efforts to peer review and presenting the methodology at relevant meetings and conferences.

Emissions Modeling

The latest version of EMFAC (currently EMFAC 2007) and the Pavley I / Low Carbon Fuel Standard post-processing tool will be used to calculate the greenhouse gas emissions for the SCS based on the transportation model outputs. The transportation model post processes highway and transit assignment information to create EMFAC input files containing vehicle trips by vehicle class and fuel type, VMT by vehicle class and fuel type, and VMT speed distributions by vehicle class and hour. The

current version of EMFAC projects the following greenhouse gas pollutants: carbon dioxide (CO_2), carbon monoxide (CO), nitrous oxides (NO_x), total hydrocarbons (THC), and methane (CH_4). SCS targets will be measured in tons of CO_2.

Feedback in the Regional Travel Demand Model

A noteworthy feature of the forecasting and modeling process is the feedback of information from one model to another. For example, information from DEFM is used in the IRCM and then the output from the IRCM is used to modify the output from DEFM. Similarly, data from UDM are major inputs to the transportation model, and then transportation model data are used in subsequent UDM calculations. A key feature of our modeling system is the central role that land use and transportation policies play in determining future travel patterns and the associated location of people, houses, and jobs.

SANDAG Modeling Constraints

While SANDAG strives to stay at the forefront of the state of the practice in modeling, some transportation and land use policy decisions to manage GHG emissions cannot be modeled in the SANDAG Regional Travel Demand Model. These policy scenarios fall into four main categories: cultural shifts, technology breakthroughs, aesthetic (or perception) improvements, and exogenous variables.

Cultural shifts in travel are events that can not be predicted based on historical data. For example, traditional travel demand models in the 1960s and 1970s were not able to accurately model long term travel trends because they did not appropriately account for women entering the labor force in substantial numbers. Future potential cultural trends that are difficult to model include a delayed retirement age or travel activities of large retired population.

Technology breakthroughs are events or eras when travel is affected by major technological advancement. This advancement can be in the form of a new mode choice introduction (e.g. steam locomotive to air travel to high-speed rail) or new technology revolution that affects people's daily activities. The Internet has significantly impacted travel behavior around the world through e-commerce and telecommuting. Future technology breakthroughs include more fuel efficient cars, low cost, high-speed long-distance point-to-point service, and further advancements in telecommunications.

Aesthetic improvements are where future trends cannot be measured well. For example, SANDAG recently completed a Transit Impediments Study identifying personal perceptions of transit including safety, cleanliness, and surroundings. The SANDAG Travel Demand Model is primarily an econometric model that balances travel choices on the basis of cost and time. Adding additional

law enforcement or maintenance staff to monitor transit facilities may impact personal perceptions of safety and cleanliness aboard transit and positively affect transit mode share, but those impacts would not be captured within the SANDAG Travel Demand Model. Similar perception changes would be equally hard to model for highway, bicycle, and pedestrian mode choices.

Finally, exogenous variables impact travel in the San Diego region, but San Diego policymakers have little to no control their implementation or effect. Exogenous variables include the relative economic strength of Mexico, international border security, changes in international trading patterns, global warming, and natural disasters. For example, travel patterns across the international border between San Diego and Baja California changed dramatically after September 11, 2001 as result of increased border security. These impacts could not be adequately predicted in the SANDAG travel model or land use model.

Off-Model Techniques to Measure GHG

While the impacts of certain policy scenarios cannot be measured in the Travel Demand Model, SANDAG may use these policy scenarios to meet its GHG targets established by ARB. In these instances, SANDAG will rely on "off-model" techniques based on academic literature reviews, collaboration with other MPOs, and consultation with ARB's Policies and Practices Guidelines. Any off-model techniques used will be fully documented and justified in the final RTP, SCS, and / or model documentation.

RTP Consistency with RTAC Target Setting Process

SANDAG anticipates using the same methodology described in this report to calculate GHG emissions for the RTP and its SCS as well as the current GHG target setting process as outlined by the RTAC. SANDAG may revise the methodology used in the RTP in consultation with ARB if updated software (e.g. EMFAC 2010) or a more accurate methodology becomes available after the RTAC target-setting process.

Addressing GHG Emissions in the 2050 RTP

SANDAG will use the modeling methodology outlined in this document to calculate GHG emission for 2020 and 2035 for the SCS as required by California Government Code 65080. The time period after 2035 of the SANDAG 2050 RTP is not subject to SB 375 at this time. As the RTP is being developed, SANDAG will work with the appropriate federal and state agencies to ensure its RTP conforms to all applicable state and federal regulations for the entire time period of the Plan.

Methodology for Identifying Emissions from Interregional Trips

SANDAG gathered data for VMT percentages by trip end location (internal or external) that could be applied to EMFAC output for VMT and CO_2 by vehicle classification. The primary purpose of this exercise was to evaluate emission sources by trip end location as identified in the RTAC report.[3]

First, all vehicle trip tables from the TransCAD 4-Step model are aggregating across all time periods and vehicle modes. In the case of SANDAG, each of three temporal trip tables (AM peak, PM peak, off peak), with four automobile mode choices (single-occupancy vehicle (SOV) toll, SOV non-toll, high-occupancy vehicle (HOV) toll, HOV non-toll), are aggregated to create a total traffic analysis zone to traffic analysis zone (TAZ to TAZ) trip table. To determine a VMT percentage by trip end SANDAG develops an approximate VMT estimate by multiplying the TAZ to TAZ trip table by the TAZ to TAZ network distance. The resultant matrix is partitioned by X-X, I-I, I-X, and X-I by extracting the sections that corresponded to external or internal TAZs. Finally, the summed total VMT by trip end is divided by the total regional VMT to determine the percentage of each trip end type as a percentage of total VMT.

Using the latest version of EMFAC, SANDAG computes the regional travel across all vehicle types and extracts the total VMT and CO_2 emissions for LDA, LDT1, LDT2, and MDV. The values for VMT and CO_2 are multiplied by the regional percentages from the four-step model to produce the VMT and CO_2 by trip end location and EMFAC vehicle class.

Model Improvement Plan

The SANDAG Travel Demand Model is maintained and operated in a two-phase cycle based on the federal RTP requirements. SANDAG is required to adopt an RTP every four years to comply with federal air quality conformity requirements. During the four-year interval, model runs and analysis for the RTP development take approximately 18 months to complete. While model runs for the RTP are being performed, the modeling process (software and methodology) are effectively "frozen" from change. This process allows SANDAG technical and planning staff to compare model results from early in the process with results at the end of the process with consistent modeling assumptions. In the two and a half years between modeling for the RTP, SANDAG staff embarks on an ambitious update schedule for its land use and transportation models. Since the completion of the last RTP, SANDAG has added a truck travel model, enhanced pricing and mode share analysis, and implemented an integrated 4-D model.[4]

[3] Regional Targets Advisory Committee. "Recommendations of the Regional Targets Advisory Committee (RTAC) Pursuant to Senate Bill 375: A Report to the California Air Resources Board." Page 26.

[4] Additional information is available on SANDAG's long-term model improvement program in the SANDAG Model Improvement Plan. <http://www.sandag.org/uploads/publicationid/publicationid_1451_10066.pdf>

Air Resources Board

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Linda S. Adams
Secretary for
Environmental Protection

Arnold Schwarzenegger
Governor

December 22, 2010

Mr. Gary L. Gallegos
Executive Director
San Diego Association of Governments
401 B Street, Suite 800
San Diego, California 92101-4231

Dear Mr. Gallegos:

Thank you for your letter to Chairman Mary D. Nichols submitting the San Diego Association of Government's Senate Bill 375 (SB 375) technical methodology document to the Air Resources Board (ARB). Your submittal fulfills the requirement that each Metropolitan Planning Organization submit to ARB a description of the technical methodology it will use to estimate greenhouse gas emissions from Sustainable Communities Strategies (SCS). We look forward to continuing our technical collaboration as SB 375 implementation shifts into the next phase of SCS development at the local and regional level. Because of the significant efforts underway, the state-of-the-art in modeling and its associated methods is rapidly evolving. We understand that the technical method will continue to evolve and improve over time.

If you have any questions, please contact me at (916) 445-4383 or your staff can contact Ms. Lynn Terry, Deputy Executive Officer at (916) 322-2739.

Sincerely,

James N. Goldstene
Executive Officer

cc: Ms. Lynn Terry
Deputy Executive Officer
Executive Office

bcc: (via email)

Linda Murchison, PTSD
Sylvia Oey, PTSD
Ravi Ramalingam, PTSD
Jonathan Taylor, PTSD
Lezlie Szeto Kimura, PTSD
Dennis Wade, PTSD

SB 375 Planning Liaisons

(via hardcopy)

EO Chron
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From the California Environmental Quality Act
California Public Resources Code
Division 13. Environmental Quality
Chapter 4: Local Agencies
Chapter 4.2: Implementation of the Sustainable Communities Strategy
§21155.1

If the legislative body finds, after conducting a public hearing, that a transit priority project meets all the requirements of subdivision (a) and (b) and one of the requirements of subdivision (c), the transit priority project is declared to be a sustainable communities project and shall be exempt from this divison..

(a) The transit priority project complies with all of the following environmental criteria:

(1) The transit priority project and other projects approved prior to the approval of the transit priority project but not yet built can be adequately served by existing utilities, and the transit priority project applicant has paid, or has committed to pay, all applicable in-lieu or development fees.

(2) (A) The site of the transit priority project does not contain wetlands or riparian areas and does not have significant value as a wildlife habitat, and the transit priority project does not harm any species protected by the federal Endangered Species Act of 1973 (16 U.S.C. Sec. 1531 et seq.), the Native Plant Protection Act (Chapter 10 (commencing with Section 1900) of Division 2 of the Fish and Game Code), or the California Endangered Species Act (Chapter 1.5 (commencing with Section 2050) of Division 3 of the Fish and Game Code), and the project does not cause the destruction or removal of any species protected by a local ordinance in effect at the time the application for the project was deemed complete.

(B) For the purposes of this paragraph, "wetlands" has the same meaning as in the United States Fish and Wildlife Service Manual, Part 660 FW 2 (June 21, 1993).

(C) For the purposes of this paragraph:

(i) "Riparian areas" means those areas transitional between terrestrial and aquatic ecosystems and that are distinguished by gradients in biophysical conditions, ecological processes, and biota. A riparian area is an area through which surface and subsurface hydrology connect waterbodies with their adjacent uplands. A riparian area includes those portions of terrestrial ecosystems that significantly influence exchanges of energy and matter with aquatic ecosystems. A riparian area is adjacent to perennial, intermittent, and ephemeral streams, lakes, and estuarine-marine shorelines.

(ii) "Wildlife habitat" means the ecological communities upon which wild animals, birds, plants, fish, amphibians, and invertebrates depend for their conservation and protection.

(iii) Habitat of "significant value" includes wildlife habitat of national, statewide, regional, or local importance; habitat for species protected by the federal Endangered Species Act of 1973 (16 U.S.C. Sec. 1531, et seq.), the California Endangered Species Act (Chapter 1.5 (commencing with Section 2050) of Division 3 of the Fish and Game Code), or the Native Plant

Protection Act (Chapter 10 (commencing with Section 1900) of Division 2 of the Fish and Game Code); habitat identified as candidate, fully protected, sensitive, or species of special status by local, state, or federal agencies; or habitat essential to the movement of resident or migratory wildlife.

(3) The site of the transit priority project is not included on any list of facilities and sites compiled pursuant to Section 65962.5 of the Government Code.

(4) The site of the transit priority project is subject to a preliminary endangerment assessment prepared by a registered environmental assessor to determine the existence of any release of a hazardous substance on the site and to determine the potential for exposure of future occupants to significant health hazards from any nearby property or activity.

(A) If a release of a hazardous substance is found to exist on the site, the release shall be removed or any significant effects of the release shall be mitigated to a level of insignificance in compliance with state and federal requirements.

(B) If a potential for exposure to significant hazards from surrounding properties or activities is found to exist, the effects of the potential exposure shall be mitigated to a level of insignificance in compliance with state and federal requirements.

(5) The transit priority project does not have a significant effect on historical resources pursuant to Section 21084.1.

(6) The transit priority project site is not subject to any of the following:

(A) A wildland fire hazard, as determined by the Department of Forestry and Fire Protection, unless the applicable general plan or zoning ordinance contains provisions to mitigate the risk of a wildland fire hazard.

(B) An unusually high risk of fire or explosion from materials stored or used on nearby properties.

(C) Risk of a public health exposure at a level that would exceed the standards established by any state or federal agency.

(D) Seismic risk as a result of being within a delineated earthquake fault zone, as determined pursuant to Section 2622, or a seismic hazard zone, as determined pursuant to Section 2696, unless the applicable general plan or zoning ordinance contains provisions to mitigate the risk of an earthquake fault or seismic hazard zone.

(E) Landslide hazard, flood plain, flood way, or restriction zone, unless the applicable general plan or zoning ordinance contains provisions to mitigate the risk of a landslide or flood.

(7) The transit priority project site is not located on developed open space.

(A) For the purposes of this paragraph, "developed open space" means land that meets all of the following criteria:

(i) Is publicly owned, or financed in whole or in part by public funds.

(ii) Is generally open to, and available for use by, the public.

(iii) Is predominantly lacking in structural development other than structures associated with open spaces, including, but not limited to, playgrounds, swimming pools, ballfields, enclosed child play areas, and picnic facilities.

(B) For the purposes of this paragraph, "developed open space" includes land that has been designated for acquisition by a public agency for developed open space, but does not include lands acquired with public funds dedicated to the acquisition of land for housing purposes.

(8) The buildings in the transit priority project are 15 percent more energy efficient than required by Chapter 6 of Title 24 of the California Code of Regulations and the buildings and landscaping are designed to achieve 25 percent less water usage than the average household use in the region.

(b) The transit priority project meets all of the following land use criteria:

(1) The site of the transit priority project is not more than eight acres in total area.
(2) The transit priority project does not contain more than 200 residential units.
(3) The transit priority project does not result in any net loss in the number of affordable housing units within the project area.
(4) The transit priority project does not include any single level building that exceeds 75,000 square feet.
(5) Any applicable mitigation measures or performance standards or criteria set forth in the prior environmental impact reports, and adopted in findings, have been or will be incorporated into the transit priority project.
(6) The transit priority project is determined not to conflict with nearby operating industrial uses.
(7) The transit priority project is located within one-half mile of a rail transit station or a ferry terminal included in a regional transportation plan or within one-quarter mile of a high-quality transit corridor included in a regional transportation plan.

(c) The transit priority project meets at least one of the following three criteria:

(1) The transit priority project meets both of the following:
(A) At least 20 percent of the housing will be sold to families of moderate income, or not less than 10 percent of the housing will be rented to families of low income, or not less than 5 percent of the housing is rented to families of very low income.
(B) The transit priority project developer provides sufficient legal commitments to the appropriate local agency to ensure the continued availability and use of the housing units for very low, low-, and moderate-income households at monthly housing costs with an affordable housing cost or affordable rent, as defined in Section 50052.5 or 50053 of the Health and Safety Code, respectively, for the period required by the applicable financing. Rental units shall be affordable for at least 55 years. Ownership units shall be subject to resale restrictions or equity sharing requirements for at least 30 years.
(2) The transit priority project developer has paid or will pay in-lieu fees pursuant to a local ordinance in an amount sufficient to result in the development of an equivalent number of units that would otherwise be required pursuant to paragraph (1).
(3) The transit priority project provides public open space equal to or greater than five acres per 1,000 residents of the project.

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
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November 23, 2010

Mr. Gary L. Gallegos
Executive Director
San Diego Association of Governments
401 B Street, Suite 800
San Diego, CA 95101-4231

Dear Mr. Gallegos:

RE: Regional Housing Need Determination

This letter provides the San Diego Association of Governments (SANDAG) its Regional Housing Need Determination. Pursuant to State housing element law (Government Code Section 65584, et seq.), the Department of Housing and Community Development (Department) is required to provide the determination of SANDAG's existing and projected housing need.

As you know, recent legislation amended State laws impacting regional housing and transportation planning. SB 375 (Chapter 728, Statutes of 2008) strengthened coordination of housing and transportation planning and requires Metropolitan Planning Organizations (MPOs) to prepare a sustainable communities strategy to achieve greenhouse gas emission reductions. Among other things, SB 575 (Chapter 354, Statutes of 2009) included amendments establishing the due date for San Diego local governments to update the fifth revision of their housing elements. In assessing SANDAG's regional housing need, the Department considered the importance of these legislative amendments in connection with the critical role housing plays in creating sustainable communities and providing jobs.

In determining SANDAG's regional housing need, the Department and SANDAG staff completed an extensive consultation process. On June 21, 2010, the Department met with the following SANDAG staff: Mr. Muggs Stoll, Ms. Coleen Clementson, Ms. Susan Baldwin, and Ms. Beth Jarosz. The Department, along with Ms. Baldwin and Ms. Jarosz, also consulted with Ms. Mary Heim, State Department of Finance (DOF) Deputy Director of the Demographic Research Unit. Consultations between June and November included data generation and review by SANDAG, DOF, and the Department.

Attachment 1 displays the minimum regional housing need allocation (RHNA) of 161,980 total units among four income categories for SANDAG to distribute among its local governments. Attachment 2 explains the methodology applied pursuant to Government Code Section 65584.01. As you know, SANDAG is responsible for adopting a methodology and RHNA Plan for the *projection* period beginning January 2010 and

ending December 2020. Within 30 days from adopting the Plan, SANDAG must submit the Plan to the Department for approval. Local governments are required to update their Housing Element for the *planning* period beginning January 2013 and ending December 2020 to accommodate the share of RHNA for each income category.

Pursuant to Government Code Section 65584, the methodology to prepare SANDAG's RHNA plan must be consistent with the following objectives:

(1) increasing the housing supply and mix of housing types, tenure, and affordability;
(2) promoting infill development and socioeconomic equity, protecting environmental and agricultural resources, and encouraging efficient development patterns;
(3) promoting an improved intraregional relationship between jobs and housing;
(4) balancing the distribution of households by income category.

The Department commends SANDAG for its leadership and efforts in fulfilling its important role in advancing the State's housing, transportation, and environmental goals. SANDAG is also recognized for successfully undertaking the challenging task of being the first MPO in the State to begin implementing SB 375 including efforts to develop its RHNA and sustainable communities strategy. The Department especially thanks Ms. Baldwin and Ms. Jarosz for their significant efforts and assistance. The Department looks forward to its continued partnership with SANDAG and its member jurisdictions and assisting SANDAG in its planning efforts to accommodate the region's share of housing need.

If the Department can provide any additional assistance, or if you, or your staff, have any questions, please contact Glen Campora, Assistant Deputy Director, at (916) 445-4728.

Sincerely,

Cathy E. Creswell

Cathy E. Creswell
Deputy Director

Enclosures

ATTACHMENT 1

HCD REGIONAL HOUSING NEED DETERMINATION

SANDAG GOVERNMENTS: JANUARY 2010 through DECEMBER 2020

Income Category	Percent	Housing Unit Need
Very-Low	22.5%	36,450
Low	17.1%	27,700
Moderate	18.9%	30,610
Above-Moderate	41.5%	67,220
Total	**100.0%**	**161,980**

Notes:

Housing Need Determination:
Refer to Attachment 2 for a description and explanation of methodology.

The Department and SANDAG staff acknowledge important differences between the "projection" methodology specified in statute to determine housing need versus the "forecasting" methodology SANDAG used for its 2050 Growth Forecast. The planning objective of the RHNA is to accommodate housing "capacity" for projected household growth. However, among the objectives of SANDAG's Growth Forecast is to estimate housing "production" based on policy considerations (including potential constraints) and assumptions regarding variables such as housing prices, resource limitations and market trends, etc. Differences in estimates of the number of housing units can occur from applying different methodologies.

Income Categories:
Each category is defined by California Health and Safety Code (Section 50093, et seq.). Percent is derived based on Census reported household income brackets and county median income. Housing unit need is derived from multiplying income category percent against total.

ATTACHMENT 2

HCD REGIONAL HOUSING NEED DETERMINATION: SANDAG January 2010-December 2020

Methodology

Projected Population, Households, and New Housing Unit Need: December 31, 2020					
1.	**Population: December 31, 2020 (SANDAG's Estimate):**				**3,568,556**
2.	*less: Group Quarter Population (SANDAG's Estimate)*				*-130,973*
3.	**Household (HH) Population:**				**3,437,583**
4.	**Projected Households (HHs):**	**HH Population**	***HH Formation or Headship Rate (DOF)***	**Households**	
	Age Groups (DOF):	**3,437,583**		**1,258,980**	
	Under 15 years	710,371	*0.00%*		
	15 - 24 years	427,306	*14.5589%*	62,211	
	25 - 34 years	495,193	*41.9984%*	207,973	
	35 - 44 years	422,529	*50.1651%*	211,962	
	45 - 54 years	425,138	*53.5210%*	227,538	
	55 - 64 years	433,523	*54.8790%*	237,913	
	65 plus years	523,523	*59.4782%*	311,383	
	Projected Households (HHs):				**1,258,980**
5.	*less: Existing Households at Beginning of Projection Period (January 1, 2010)*				*-1,103,320*
6.	**Household (HH) Growth: 11-Year Projection Period (New Housing Unit Need):**				**155,660**
7.	**Vacancy Allowance:**	**Owners**	**Renters**	**Total**	
	Tenure Percentage	55.4%	44.6%		
	New Unit Need	86,304	69,356	155,660	
	Vacancy Rate	2.0%	5.0%		
	Vacancy Allowance	1,726	3,468	5,194	5,194
8.	**Replacement Allowance:**	0.70%		160,853	1,126
REGIONAL HOUSING NEED DETERMINATION (New Housing Unit Need):					**161,980**

Explanation and Data Sources

1. Population: Population reflects SANDAG's January 1, 2021 projection from its 2050 Growth Forecast. Per Government Code 65584.01(b), HCD accepted SANDAG's projection upon determining it was within 3 percent of the population projected by State Department of Finance (DOF) for the same period.
2. Group Quarter Population: Figure is SANDAG's estimate of persons residing in group home/institution/ military/dormatory quarters. As this population doesn't constitute a "household" population generating demand for a housing unit, the group quarter population is subtracted from total population to derive household population or the number of persons generating a housing need for a owner or renter unit.
3. Household (HH) Population: The population projected to reside in housing units after subtracting the group quarter population from total projected population.
4. Projected Households (HHs): Projected HHs are derived by applying (to HH population) estimated HH formation rates determined by DOF among displayed age groups. *HH formation or headship rates reflect the propensity of different population groups (by age, ethnicity, etc.) to form new households.*
5. Existing Households: This figure reflects DOF's estimate of "occupied" units at start of period of January 2010 (per DOF E-5 report released May 2010 by the Demographic Research Unit). Existing HHs (units) are subtracted from projected HHs at end of period (December 31, 2020) to derive household growth.
6. Household (HH) Growth: This figure reflects projected HH growth and need for new units.
7. Vacancy Allowance: An adjustment (unit increase) is made to facilitate availability among owner and renter units. Owner/Renter % is based on Census data. A smaller rate is applied to owner units due to less frequent movement. Information from different authoritative sources support an acceptable range of 1-4% for owner units and 4-8% for renter units depending on market conditions. The 2% owner rate was reduced from the 3% rate used in 2005. No change was made to the 5% renter rate.
8. Replacement Allowance: Rate (.7%) reflects housing losses localities annually reported to DOF each January for years 2000-2010.

SANDAG

BOARD OF DIRECTORS
MAY 27, 2011

AGENDA ITEM NO. 11-05-10
ACTION REQUESTED – ACCEPT

DRAFT REGIONAL HOUSING NEEDS ASSESSMENT FOR THE 2013 – 2020 HOUSING ELEMENT CYCLE

File Number 3100000

Introduction

The Regional Housing Needs Assessment (RHNA) process is being conducted by SANDAG in conjunction with the development of the 2050 Regional Transportation Plan (2050 RTP) and its Sustainable Communities Strategy (SCS) in accordance with Senate Bill 375 (Steinberg, 2008) (SB 375) and SB 575 (Steinberg, 2009). SANDAG is assigned the RHNA responsibility by state housing element law, and undertakes this process prior to each housing element cycle.

Recommendation

On May 6, 2011, the Regional Planning Committee forwarded the Draft Regional Housing Needs Assessment (RHNA) Methodology and Allocation Options 2b and 3d for consideration by the Board of Directors. SANDAG staff recommends that the Board of Directors accept Draft RHNA Methodology and Allocation Option 2b for distribution and a 60-day public review.

The RHNA process started in April 2010. It will culminate in the adoption of a RHNA Plan that allocates RHNA numbers in four income categories (very low, low, moderate, and above moderate) to the 18 cities and the unincorporated area of the County of San Diego. This RHNA is for the fifth housing element cycle (January 1, 2013 – December 31, 2020) and covers an eleven-year planning period (January 1, 2010 – December 31, 2020). Key dates in the RHNA process are shown in Attachment 1.

Discussion

RHNA Methodology and Allocation Options

Six RHNA Methodology and Allocation Options and background data used in their development are included in Attachment 2 of this report. All six of the RHNA Methodology and Allocation Options use the land use and housing capacity data provided by the 18 cities and the County of San Diego in the preparation of the 2050 Regional Growth Forecast.

The RHNA Allocation Options are organized into two categories: Regional Share Options and Lower Income Capacity Options. These categories express two general philosophies: one that respects housing capacities in local general plans as reflected in the 2050 Regional Growth Forecast (Options 2b and 2c); and one that further improves the balance of housing for very low and low income households throughout the region based on planning principles that include income, jobs/housing balance, and proximity to transit (Options 1c, 3a, 3c, and 3d).

- Regional Share Options - based on the regional income percentages in the RHNA Determination (22.5 percent Very Low Income, 17.1 percent Low Income, 18.9 percent Moderate Income, and 41.5 percent Above Moderate Income):
  - Regional Share Option (Table 1c)
  - Regional Share Option with Jobs/Housing Balance and Income Adjustment (Table 3a)
  - Regional Share Option with Jobs/Housing Balance, Income, and Transit Adjustment (Table 3c)
  - **Regional Share Option with Jobs/Housing Balance, Income, Transit and Unincorporated Capacity Adjustment (Table 3d)** *(Forwarded by Regional Planning Committee)*
- Lower Income Capacity Options - does not exceed or minimally exceeds local jurisdiction existing plan 20+ dwelling units per acre capacity:
  - **Lower Income Capacity Option (Table 2b)** *(Forwarded by Regional Planning Committee, and Staff recommendation)*
  - Lower Income Capacity Option with Jobs/Housing Balance Adjustment (Table 2c)

These options were discussed by the Regional Planning Committee at its April and May meetings, and at joint meetings of the Regional Planning Technical Working Group (TWG) and Regional Housing Working Group (RHWG) (Working Groups) over the last several months. Two issues discussed by both groups were (1) the concept of limiting the lower income RHNA units allocated to the County of San Diego unincorporated area based on smart growth planning principles (and reflected in Options 2b and 3d), and (2) the potential of providing incentives to jurisdictions that take a larger share of lower income units.

Consistency of RHNA Methodology and Allocation Options with State Housing Element Law

SANDAG staff analyzed the RHNA options shown in Attachment 2 and has determined that all six options meet the RHNA objectives and consider the RHNA factors as required by state housing element law. Underlying this analysis is the fact that the distribution of housing in the 2050 Regional Growth Forecast is based on these same factors. Specifically, pursuant to Government Code Section 65584, the regional housing needs allocation plan must be consistent with all of the following objectives:

> (1) Increasing the housing supply and the mix of housing types, tenure, and affordability in all cities and counties within the region in an equitable manner, which shall result in each jurisdiction receiving an allocation of units for low and very low income households.
>
> (2) Promoting infill development and socioeconomic equity, the protection of environmental and agricultural resources, and the encouragement of efficient development patterns.
>
> (3) Promoting an improved intraregional relationship between jobs and housing.

(4) Allocating a lower proportion of housing need to an income category when a jurisdiction already has a disproportionately high share of households in that income category, as compared to the countywide distribution of households in that category from the most recent decennial United States census.

A more detailed description of the RHNA objectives and factors is provided in Attachment 3 (with other RHNA background information), and RHNA-related excerpts from housing element law (Government Code Sections 65584 and 65584.04) are included in Attachment 4.

Staff Recommendation to Regional Planning Committee

At the May 6, 2011, meeting, SANDAG staff recommended that the Regional Planning Committee forward Option 2b (Lower Income Capacity Option) to the Board of Directors. This option most closely aligns with the 2050 Regional Growth Forecast, which was used to prepare the Draft 2050 RTP and its Sustainable Communities Strategy (SCS) and demonstrates the region's progress toward planning for significantly more multifamily housing (approximately 80 percent) than past forecasts. Option 2b distributes housing based on the RHNA factors and in accordance with the four RHNA objectives in state housing element law, reflecting the region's commitment to planning for housing for all income levels in all jurisdictions, balancing jobs and housing, making efficient use of our transportation infrastructure and public transit improvements, focusing development in our urban areas, and protecting our rural areas, open space, and habitat. Option 2b also improves the likelihood that the 18 cities and County of San Diego will all successfully complete their housing elements.

Although the staff-recommended RHNA Methodology and Allocation Option 2b shown in Table 2b does not exceed the 20 dwelling unit per acre (du/ac) or greater capacity reflected in each jurisdiction's general/community plans, jurisdictions may need to rezone land, or adopt a rezoning program, to address their lower income RHNA housing allocations when they prepare their housing elements.[1] In addition to multifamily sites, jurisdictions can use existing units that will be acquired/rehabilitated and rent restricted, second/accessory units, and farmworker housing, among others, when identifying lower income sites in their housing elements.

Regional Planning Committee Recommendation to Board of Directors

On May 6, 2011, the Regional Planning Committee approved a motion to forward Options 2b (Lower Income Capacity Option) and 3d (Regional Share Option with Jobs/Housing Balance, Income, Transit and Unincorporated Capacity Adjustment) to the Board of Directors.

Board Policy Meeting on RHNA Methodology and Allocation Options

On May 13, 2011, the Board of Directors held a Board Policy meeting to discuss the RHNA Methodology and Allocation Options.

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[1] The determination of lower income housing capacity in the RHNA tables is based on the Existing Plan 20 dwelling units per acre (du/ac) or greater capacity of each local jurisdiction. The 20 du/ac or greater capacity was used, because although the default density in state housing element law used to identify adequate sites for lower income housing is 30 du/ac or greater for all jurisdictions in the San Diego region (except for Coronado and Del Mar whose default density is 20 du/ac or greater), if jurisdictions can demonstrate that lower income housing can be built at densities lower than 30 (or 20) du/ac, they can identify lower income housing sites in their housing elements at those lower densities.

During the discussion, a number of questions were posed by Board members and answered by staff. SANDAG staff confirmed that all the RHNA options were in compliance with state law and addressed overconcentration to varying degrees in each option. The question of the use of incentives for competitive grant programs (e.g. the *TransNet* Smart Growth Incentive Program [SGIP]) in relation to the RHNA was raised. SANDAG staff and the Working Groups will be reviewing the criteria for allocating the next SGIP funding cycle in the next several months, and will consider housing-related criteria and Board Policy No. 033: Implementation Guidelines for the SANDAG Regional Housing Needs Assessment Memorandum during that process, and will return to the Board of Directors with options for consideration. Staff also explained that the 2050 Regional Growth Forecast addresses the RHNA factors through use of a model, which distributes jobs and housing based on projected growth, local land use plans, and the transportation network using an iterative process.

Board members made the following comments:

- All jurisdictions care about planning for housing for households of all income levels;
- Balanced communities are important, but definitions of what is "balanced" differ;
- The fairest option is option 1c;
- RHNA is focused on planning for housing, not on production;
- Incentives should go to the jurisdictions assigned the highest numbers;
- Our region has one of the best plans in the state;
- Multifamily capacity limits are self-imposed;
- Subsidies are needed to build lower income housing units;
- Need to view RHNA from the perspective of SB 375 and consider how the allocation and housing planning is affected by open space, habitat plans, floodplains, airports, and other constraints;
- The 2050 Regional Growth Forecast reflects both constraints and development potential on vacant and redevelopment/infill land;
- Inclusionary housing programs have helped some jurisdictions produce affordable lower income housing units;
- Equity is an important RHNA objective;
- Lower income households impact jurisdiction finances – jurisdictions with fewer lower income households have more money available to spend;
- Option 2b takes the constraints of local jurisdiction plans into account;
- Density is sometimes used as a surrogate for affordability;
- Transit lines such as the SPRINTER are logical locations to build higher density housing;
- All jurisdictions are doing the best job they can with what they have;
- Local jurisdiction history with respect to lower income housing/households should be taken into account in RHNA;
- A hybrid scenario somewhere between Options 2b and 3c or 3d might make sense; and

- We want to work with the California Department of Housing and Community Development (HCD) on issues such as taking a regional approach to the identification of adequate sites in local housing elements.

Next Steps

After the Board of Directors accepts a Draft RHNA Methodology and Allocation, SANDAG will be holding subregional public workshops and public hearings during June on the Board's selected option(s) as well as the Draft 2050 RTP and its SCS and Draft Environmental Impact Report (EIR). Comments received on the Draft RHNA Methodology and Allocation will be provided to the Working Groups and Regional Planning Committee prior to being presented to the Board of Directors for its consideration prior to its final adoption.

During June and July, staff will prepare the RHNA Plan, which in addition to the RHNA Methodology and Allocation, will summarize housing element law; document how the regional housing need was determined; and describe the RHNA Methodology, its various components, how it meets the objectives of state law, and the process used to develop it. The results of this process will be brought back to the Board of Directors in the fall in conjunction with the summary of comments received during the Draft 2050 RTP/SCS/EIR circulation.

The adoption of the RHNA Plan for the fifth housing element cycle by the Board of Directors is scheduled to occur on October 28, 2011, in conjunction with the adoption of the 2050 RTP and its SCS and EIR.

Housing elements in the San Diego region are required to be completed within 18 months of adoption of the 2050 RTP. Therefore, local housing elements for the San Diego region must be completed (with a finding of compliance from HCD) by April 27, 2013.

GARY L. GALLEGOS
Executive Director

Attachments: 1. Key Dates for RHNA Fifth Housing Element Update
2. RHNA Methodology and Allocation Option Tables and Descriptions (May 27, 2011)
3. RHNA Background Information
4. Excerpts from Housing Element Law (Government Code Sections 65584 and 65584.04) – RHNA Objectives, Methodology, and Factors

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Key Dates for Regional Housing Needs Assessment (RHNA)
Fifth Housing Element Update
May 27, 2011

February 2010	SANDAG Board of Directors accepts 2050 Regional Growth Forecast for planning purposes for use in preparing the Draft 2050 Regional Transportation Plan (2050 RTP), its Sustainable Communities Strategy (SCS), and RHNA
January 1, 2010	Eleven-year RHNA projection period for fifth housing element cycle starts (January 1, 2010 – December 31, 2020)
June 1 2010	Joint meeting between the Regional Planning Technical Working Group (TWG) and Regional Housing Working Group (RHWG) to kick off RHNA methodology discussion: RHNA background, schedule, and principles
June 2010 – April 2011	TWG/RHWG develop RHNA allocation methodology
July 9, 2010	SANDAG Board holds policy meeting to discuss RHNA
July 23, 2010	SANDAG provides California Department of Housing and Community Development (HCD) and Caltrans date of expected adoption of 2050 RTP in writing as required by Senate Bill 575 (Steinberg, 2009)
November 2010	HCD provides SANDAG with regional housing need determination for eleven-year RHNA projection period: January 1, 2010 – December 31, 2020
April 2011	RHNA allocation options forwarded by TWG and RHWG to Regional Planning Committee
May 2011	Regional Planning Committee makes recommendation on Draft RHNA methodology and allocation to SANDAG Board; Board accepts Draft RHNA methodology and allocation for 60-day public review
June 2011	Public workshops held in conjunction with 2050 RTP and its SCS
July/September	RHNA Plan to TWG/RHWG, Regional Planning Committee, and Board, including public hearing on RHNA Methodology
October 28, 2011	Final 2050 RTP, its SCS, and RHNA adopted by SANDAG Board
April 27, 2013	Due date for eight-year January 1, 2013 – December 31, 2020, housing elements (due within 18 months after RTP is adopted)*

*Housing elements are due every four years for:

1. Jurisdictions that did not adopt their fourth housing element revisions by January 1, 2009, and did not adopt the fourth revision by March 31, 2010, and complete any rezoning contained in the housing element program by June 30, 2010; and
2. Jurisdictions that do not adopt their housing element within 120 days from next housing element due date.

RHNA Methodology and Allocation Option Tables and Descriptions
May 27, 2011

Attached are background tables and RHNA Methodology and Allocation tables that have been developed during the RHNA process for the Regional Planning Technical Working Group (TWG), Regional Housing Working Group (RHWG), Regional Planning Committee, and SANDAG Board of Directors.

Tables 1a, 1b, 1c, 2b, 2c, 3a, 3c, 3d, 4, and 5 are included. Tables 2a and 3b were dropped from consideration at the March 10, 2011, joint meeting of the TWG and RHWG.

RHNA Option Tables

During the RHNA process, the two working groups (TWG and the RHWG) meeting jointly reviewed background information from the 2050 Regional Growth Forecast, and developed a number of RHNA methodology and allocation options, which considered the RHNA factors in state housing element law, meet the RHNA objectives in state law, and are consistent with the Sustainable Communities Strategy (SCS) of the Draft 2050 Regional Transportation Plan (2050 RTP).

Brief descriptions of the background information contained in Tables 1a, 1b, 4, and 5, and the remaining RHNA options shown in Tables 1c, 2b, 2c, 3a, 3c, and 3d are provided below.

To assist in understanding the RHNA allocation options, some additional information is provided below.

- The 2050 Regional Growth Forecast is the foundation for the background data and RHNA allocation options in the attached tables. Each jurisdiction's 11-year RHNA number in Table 1a, Column (e) is based on the 2050 Regional Growth Forecast.

- The numbers shown in the RHNA allocation options tables have been revised based on the technical update of the 2050 Regional Growth Forecast, and further revisions may occur based on any future changes to the transit network in the Final 2050 RTP.

- The lower income housing capacities shown in the tables are based on densities of 20 dwelling units per acre (du/ac) or greater. In state housing element law, the density associated with the identification of adequate lower income housing sites is 30 du/ac or greater for all jurisdictions in the San Diego region, except Coronado and Del Mar, which can use sites zoned for 20 du/ac or greater to identify lower income sites. State housing element law allows a jurisdiction to identify sites at lower densities if jurisdictions can demonstrate that affordable housing has been built at those densities. In addition to multifamily zoned land, jurisdictions can identify sites for farmworker housing, second units, and/or existing units that jurisdictions identify and commit funding for acquiring and rehabilitating units.

- The Very Low and Low Income (also known as lower income) RHNA numbers have been grouped together in the RHNA allocation option tables and are shown as VL+L in the table headings.

- The RHNA options in Tables 1c, 2c, 3a, 3c, and 3d exceed the existing plan lower income capacities of several jurisdictions (numbers shown in bold). (Only the RHNA option in Table 2b does not exceed the existing lower income capacities for each of the local jurisdictions.) The

TWG and RHWG discussed the potential of using incentives, such as the *TransNet* Smart Growth Incentive Program and Active Transportation Program grant funds and Board Policy No. 033 in conjunction with the methodology ultimately selected. The two groups propose to continue discussing the potential use of incentives at upcoming joint meetings and report back to the Regional Planning Committee and the Board of Directors at future meetings.

Table 1a. Distribution of Total RHNA-Determination, Jobs/Housing Data, and Percent of Very Low and Low Income Households by Jurisdiction

Table 1a addresses anticipated housing unit growth by jurisdiction over the 11-year RHNA period. To determine the 11-year RHNA projected housing unit growth, the table shows actual housing unit counts as of January 1, 2010, and housing units projected as of January 1, 2020, and January 1, 2025, based on the 2050 Regional Growth Forecast. The projected housing unit growth over the 15-year period (169,528) is then prorated to the 11-year RHNA period by jurisdiction to meet the RHNA-Determination from the California Department of Housing and Community Development (HCD) of 161,980 housing units. Existing and projected civilian jobs in 2008 and 2020 are shown and used to calculate jobs/housing ratios for those two years.

The table also includes each jurisdiction's number of agricultural jobs, and percentage and share of jobs in lower-wage industries (including retail, wholesale, leisure, and hospitality jobs). The percentages of Very Low and Low Income (VL+L) households by jurisdiction from the 2000 Census also are shown.

Table 1b. 2050 Estimated Housing Capacity

Table 1b shows the estimated housing capacity by jurisdiction in 2050 at <10, 10-19, 20-29, 30+, and 20+ dwelling units per acre (du/acre) based on the 2050 Regional Growth Forecast.

Table 1c. Regional Share Option

Table 1c allocates the 11-year RHNA projected housing unit number by jurisdiction based on the regionwide income distribution percentages assigned by HCD. The differences between the Very Low and Low Income Allocation and each jurisdiction's Existing Plan and 2050 20+ du/ac Capacity are shown in Columns (g) and (j).

This table serves as the starting point for all the remaining RHNA options (Tables 2b, 2c, 3a, 3c, and 3d).

Table 2b. Lower Income Capacity Option – ***SANDAG Staff Recommendation; Forwarded to Board of Directors by Regional Planning Committee on May 6, 2011***

Table 2b takes the 11-year RHNA projected housing numbers by jurisdiction and distributes them into the four income groups based on HCD regionwide income percentages (22.5% Very Low, 17.1% Low, 18.9% Moderate, and 41.5% Above Moderate). The Existing Plan 20+ du/ac capacity reflected in each jurisdiction's general/community plans was not exceeded to calculate the Very Low and Low Income RHNA numbers in this option. A total of 5,736 units from the jurisdictions in which existing plan capacity was exceeded in Table 1c (Carlsbad by 375 units, Del Mar by 12 units, Poway by 143 units, and the County Unincorporated Area by 5,206 units) were redistributed proportionately to jurisdictions with remaining capacity by applying an adjustment factor of 1.10871.

Table 2c. Lower Income Capacity Option with Jobs/Housing Balance Adjustment – ***Forwarded to Regional Planning Committee by Working Groups on April 14, 2011***

Table 2c adjusts the Very Low and Low Income housing unit allocations from the December 9, 2010, RHNA Allocation Proposal (Table 2a) (which was not forwarded to the Regional Planning Committee) to address the issue of jobs/housing balance using variance calculations from the regional jobs/housing ratio and a controlled adjustment. The differences between the Very Low and Low Income Allocation and each jurisdiction's Existing Plan and 2050 20+ du/ac Capacity are shown in Columns (i) and (l).

Table 3a. Regional Share Option with Jobs/Housing Balance and Income Adjustment

Table 3a demonstrates a RHNA allocation option that allocates the Very Low and Low Income units using Table 1c, and applying a jobs/housing balance adjustment and income adjustment. The percentage and numerical differences between the Very Low and Low Income Allocation and each jurisdiction's Existing Plan capacity are shown in Columns (l) and (m), and the numerical difference between the Very Low and Low Income Allocation and each jurisdiction's 2050 20+ du/ac capacity is shown in Column (p).

Table 3c. Regional Share Option with Jobs/Housing Balance, Income, and Transit Adjustment - ***Forwarded to Regional Planning Committee by Working Groups on April 14, 2011***

Table 3c demonstrates a RHNA allocation concept that allocates the Very Low and Low Income units using Table 1c and applying three adjustments: jobs/housing balance, income, and transit (based on the housing capacity within a quarter-mile radius of the transit stations and bus stops shown on the attached 2020 peak-period high-frequency transit service map). The percentage and numerical difference between the Very Low and Low Income Allocation and each jurisdiction's Existing Plan 20+ du/ac capacity are shown in Columns (p) and (q), and the numerical difference between the Very Low and Low Income Allocation and each jurisdiction's 2050 20+ du/ac capacity is shown in Column (t).

Table 3d. Regional Share Option with Jobs/Housing Balance, Income, Transit and Unincorporated Area Capacity Adjustment - ***Forwarded to Regional Planning Committee by Working Groups on April 14, 2011; Forwarded to Board of Directors by Regional Planning Committee on May 6, 2011***

Table 3d builds on Table 3c by adding a capacity adjustment that limits the Very Low and Low Income housing capacity (20+ du/ac) of the Unincorporated Area to 3,670 units and redistributes units proportionately to all the cities by applying an adjustment factor of 1.09417.

Table 4. Households by Income and Very Low and Low Income Allocation Percentages for RHNA Concepts

Table 4 shows the percentages of Very Low and Low Income Households based on the 2000 Census and the six RHNA allocation options forwarded to the Regional Planning Committee. This table shows how each RHNA allocation option addresses the RHNA income overconcentration objective in housing element law by showing the relationship between the RHNA Very Low and Low Income allocations and the percentage of existing Very Low and Low Income households in each jurisdiction. For example, Option 2b reflects an increase of 5 percentage points in Very Low and Low Income housing for Carlsbad, and a decrease of 17 percentage points in Very Low and Low

Income housing for National City in relation to the percentage of existing Very Low and Low Income households in these jurisdictions.

Table 5 Very Low and Low Income Allocation Numbers for RHNA Options

Table 5 compares the lower income RHNA allocations for the six RHNA options as well as the estimated existing lower income capacities for each of the local jurisdictions.

Summary of RHNA Allocation Options
May 27, 2011

Options	Characteristics	Notes
Option 1c: Regional Share Option	• Applies income distribution percentages assigned by HCD • Based on 2050 Regional Growth Forecast	Exceeds lower income general plan capacities of four jurisdictions – Carlsbad, Del Mar, Poway, and Unincorporated Area
Option 2b: Lower Income Capacity Option	• Applies income distribution percentages assigned by HCD, but does not exceed 20 du/ac capacity of any local jurisdiction • Redistributes lower income RHNA from four jurisdictions where capacity is exceeded to jurisdictions with remaining capacity	Only option where no lower income general plan capacities are exceeded Carlsbad, Del Mar, Poway, and Unincorporated Area lower income general plan capacities are not exceeded
Option 2c: Lower Income Capacity Option with Jobs/Housing Balance Adjustment	• Applies jobs/housing balance adjustment to December 9, 2010, RHNA Proposal (Option 2a) • Limits Unincorporated Area lower income RHNA to 3,670 units	Exceeds lower income general plan capacities of three jurisdictions (by smallest amounts) – Carlsbad, Del Mar, and Poway Unincorporated Area lower income general plan capacity not exceeded
Option 3a: Regional Share Option with Jobs/Housing Balance and Income Adjustments	• Starts with Option 1c and applies two adjustments: jobs/housing balance and income	Exceeds lower income general plan capacities of four jurisdictions – Carlsbad, Del Mar, Poway, and Unincorporated Area
Option 3c: Regional Share Option with Jobs/Housing Balance, Income, and Transit Adjustments	• Starts with Option 1c and applies three adjustments: jobs/housing balance, income, and transit accessibility within quarter mile radius of high-frequency transit stops in 2020	Exceeds lower income general plan capacities of four jurisdictions – Carlsbad, Del Mar, Poway, and Unincorporated Area
Option 3d Regional Share Option with Jobs/Housing Balance, Income, Transit and Unincorporated Area Capacity Adjustment	• Starts with Option 3c and adds an adjustment that limits the Unincorporated Area lower income RHNA to 3,670 units	Exceeds lower income general plan capacities of three jurisdictions – Carlsbad, Del Mar, and Poway Unincorporated Area lower income general plan capacity not exceeded

Table 1a. Distribution of Total RHNA-Determination, Jobs/Housing Data, and Percent of Very Low & Low Income Households by Jurisdiction

2050 Regional Growth Forecast (Technical Update)

	Existing and Projected Housing Units					Civilian Jobs								
	1/1/2010	1/1/2020	1/1/2025	2010-25 Growth (15 years)	Pro-rated to 11 years	Existing Jobs (2008)	Jobs / Housing Ratio (2008)	Projected Jobs (2020)	Jobs / Housing Ratio (2020)	Agri. Jobs (2008)	% Sales & Tourism Jobs (2008)	Number of Sales & Tourism Jobs	Jurisdiction Share of Regional Sales and Tourism Jobs	Percent VL+ L Households (2000 Census)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(l)	(m)
Carlsbad	43,844	48,104	49,076	5,232	4,999	61,999	1.4254	70,228	1.4599	360	30%	18,621	5%	26.57%
Chula Vista	78,244	88,186	91,704	13,460	12,861	70,230	0.9064	82,146	0.9315	--	29%	20,623	6%	41.65%
Coronado	9,562	9,580	9,614	52	50	8,166	0.8557	8,265	0.8627	--	45%	3,692	1%	25.31%
Del Mar	2,542	2,587	2,606	64	61	4,065	1.6036	4,149	1.6038	--	56%	2,285	1%	25.16%
El Cajon	35,644	39,187	41,719	6,075	5,805	41,686	1.1711	44,463	1.1346	--	28%	11,688	3%	52.60%
Encinitas	24,877	26,331	27,339	2,462	2,353	26,985	1.0879	28,711	1.0904	640	31%	8,415	2%	26.99%
Escondido	47,682	50,370	52,051	4,369	4,175	61,143	1.2902	66,803	1.3262	470	24%	14,889	4%	43.82%
Imperial Beach	9,860	9,866	10,126	266	254	7,187	0.7296	7,479	0.7581	--	9%	678	0%	52.40%
La Mesa	25,614	26,785	27,416	1,802	1,722	27,579	1.1023	28,813	1.0757	--	27%	7,467	2%	44.37%
Lemon Grove	8,868	9,076	9,191	323	309	7,640	0.8662	7,890	0.8693	--	27%	2,092	1%	46.75%
National City	15,787	17,052	17,737	1,950	1,863	21,060	1.3352	21,994	1.2898	--	39%	8,185	2%	61.14%
Oceanside	64,758	69,630	71,257	6,499	6,210	43,977	0.6823	48,464	0.6960	910	33%	14,435	4%	39.51%
Poway	16,364	17,233	17,675	1,311	1,253	31,176	1.9111	32,386	1.8793	60	22%	6,811	2%	21.14%
San Diego	511,820	577,416	604,016	92,196	88,096	790,252	1.5543	838,909	1.4529	1,610	21%	167,122	48%	41.26%
San Marcos	27,744	30,065	32,122	4,378	4,183	37,383	1.3566	40,843	1.3585	--	26%	9,837	3%	40.00%
Santee	19,837	22,312	23,667	3,830	3,660	15,304	0.7833	16,949	0.7596	--	31%	4,764	1%	31.54%
Solana Beach	6,521	6,646	6,877	356	340	7,533	1.1573	7,823	1.1771	--	34%	2,559	1%	26.99%
Vista	30,716	31,602	32,154	1,438	1,374	41,315	1.3480	44,693	1.4142	100	23%	9,694	3%	42.49%
Unincorporated	169,142	180,460	192,597	23,455	22,412	107,131	0.6420	114,338	0.6336	6,820	34%	36,443	10%	34.01%
Region	**1,149,426**	**1,262,488**	**1,318,944**	**169,518**	**161,980**	**1,411,811**	**1.2377**	**1,515,346**	**1.2003**	**11,100**	**25%**	**350,300**	**100%**	**39.60%**
11-YEAR RHNA					**161,980**									

Regionwide Distribution of Total RHNA Target by Income Category

	%	units
Very Low	22.5%	36,450
Low	17.1%	27,700
Moderate	18.9%	30,610
Above Moderate	41.5%	67,220
Total		**161,980**

Notes:

(a) Actual housing unit counts (January 1, 2010)
(b) Projected housing units January 1, 2020 from 2050 Regional Growth Forecast (Technical Update)
(c) Projected housing units January 1, 2025 from 2050 Regional Growth Forecast (Technical Update)
(d) Projected 15-year housing forecast (1/1/2010-1/1/2025)
(e) Forecast pro-rated to 11-year RHNA Determination
(f) Civilian jobs in 2008
(g) Jobs / housing ratio in 2008
(h) Projected civilian jobs in 2020
(i) Projected jobs/housing ratio in 2020
(j) Number of jobs in agriculture and mining sector in 2008, rounded to nearest 10. (Values not shown if fewer than 50 jobs.)
(k) Percent of civilian jobs in lower-wage industries (retail, wholesale, leisure & hospitality) by jurisdiction.
(l) Percentage share of regional sales and tourism jobs
(m) Percent of Very Low and Low Income Households in each jurisdiction from 2000 Census

Table 1b. 2050 Estimated Housing Capacity* by Jurisdiction

2050 Regional Growth Forecast (Technical Update)

	< 10 du/ac	10-19 du/ac	20-29 du/ac	30+ du/ac	TOTAL	20+ du/ac Capacity
	(a)	(b)	(c)	(d)	(e)	(f)
Carlsbad	3,968	1,528	885	720	7,101	1,605
Chula Vista	4,189	7,347	9,354	13,738	34,628	23,092
Coronado	12	6	148	122	288	270
Del Mar	31	28	10	2	71	12
El Cajon	-772	1,352	504	12,721	13,805	13,225
Encinitas	1,578	838	899	394	3,709	1,293
Escondido	2,543	783	493	3,550	7,369	4,043
Imperial Beach	5	745	378	1,406	2,534	1,784
La Mesa	231	220	159	7,862	8,472	8,021
Lemon Grove	135	176	190	1,220	1,721	1,410
National City	167	488	4,275	14,892	19,822	19,167
Oceanside	2,992	1,528	1,452	3,299	9,271	4,751
Poway	1,563	13	0	353	1,929	353
San Diego	10,671	22,084	51,266	149,784	233,805	201,050
San Marcos	2,292	944	2,049	882	6,167	2,931
Santee	2,587	728	484	1,166	4,965	1,650
Solana Beach	86	39	408	0	533	408
Vista	832	932	604	10,988	13,356	11,592
Unincorporated	53,938	5,314	1,179	5,223	65,654	3,670
Region	**87,048**	**45,093**	**74,737**	**228,322**	**435,200**	**300,327**

* 2050 Capacity is for discussion purposes only. 2050 Capacity includes visionary inputs beyond existing, adopted general plans.

* The 20+ du/ac capacity for the Unincorporated Area was revised to reflect the County of San Diego's assessment of its lower income capacity.

Notes:
(a) Estimated housing capacity at less than 10 dwelling units per acre based on input provided by local jurisdictions for the 2050 Regional Growth Forecast
(b) Estimated housing capacity at 10-19 dwelling units per acre
(c) Estimated housing capacity at 20-29 dwelling units per acre
(d) Estimated housing capacity at 30+ dwelling units per acre
(e) Estimated total housing capacity
(f) Estimated housing capacity at 20+ du/ac (c) + (d)
(The 20+ du/ac capacity in column (f) for the Unincorporated Area was adjusted to reflect the County of San Diego's assessment of its lower income capacity.)

Table 1c. Regional Share Option

11-Year RHNA (1/1/2010 - 12/31/2020)

		RHNA Allocation Based on Regionwide %						*Est. Existing Plan Capacity*	*Est. 2050 Capacity**	
	11 years	Very Low	Low	Moderate	Above Moderate	VL + Low	Difference between VL+L Allocation and 20+ Capacity (Existing)	20+ du/ac Capacity	20+ du/ac Capacity	Difference between VL+L Allocation and 20+ Capacity (2050)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Carlsbad	4,999	1,125	855	945	2,074	1,980	**375**	1,605	1,605	**375**
Chula Vista	12,861	2,894	2,200	2,430	5,337	5,094	-16,805	21,899	23,092	-17,998
Coronado	50	11	9	9	21	20	-250	270	270	-250
Del Mar	61	14	10	12	25	24	**12**	12	12	**12**
El Cajon	5,805	1,306	993	1,097	2,409	2,299	-10,926	13,225	13,225	-10,926
Encinitas	2,353	530	402	445	976	932	-361	1,293	1,293	-361
Escondido	4,175	939	714	789	1,733	1,653	-929	2,582	4,043	-2,390
Imperial Beach	254	57	43	48	106	100	-1,684	1,784	1,784	-1,684
La Mesa	1,722	388	294	325	715	682	-5,816	6,498	8,021	-7,339
Lemon Grove	309	70	53	58	128	123	-705	828	1,410	-1,287
National City	1,863	419	319	352	773	738	-17,462	18,200	19,167	-18,429
Oceanside	6,210	1,398	1,062	1,173	2,577	2,460	-2,291	4,751	4,751	-2,291
Poway	1,253	282	214	237	520	496	**143**	353	353	**143**
San Diego	88,096	19,823	15,065	16,649	36,559	34,888	-123,385	158,273	201,050	-166,162
San Marcos	4,183	941	715	791	1,736	1,656	-1,275	2,931	2,931	-1,275
Santee	3,660	824	626	691	1,519	1,450	-200	1,650	1,650	-200
Solana Beach	340	77	58	64	141	135	-127	262	408	-273
Vista	1,374	309	235	260	570	544	-1,187	1,731	11,592	-11,048
Unincorporated	22,412	5,043	3,833	4,235	9,301	8,876	**5,206**	3,670	3,670	**5,206**
Region	**161,980**	**36,450**	**27,700**	**30,610**	**67,220**	**64,150**				
11-YEAR RHNA		*36,450*	*27,700*	*30,610*	*67,220*					
Distribution		22.5%	17.1%	18.9%	41.5%	39.6%				

* 2050 Capacity is for discussion purposes only. 2050 Capacity includes visionary inputs beyond existing, adopted general plans.

Notes:

(a) 2050 Regional Growth Forecast pro-rated to 11-year RHNA Determination. The Forecast is based on information from local jurisdictions regarding existing and future land use policies and inputs.

(b) Very Low Income unit allocation by jurisdiction (based on 22.5% of total)

(c) Low Income unit allocation by jurisdiction (based on 17.1% of total)

(d) Moderate Income unit allocation by jurisdiction (based on 18.9% of total)

(e) Above Moderate Income unit allocation by jurisdiction (based on 41.5% of total)

(f) Sum of Very Low + Low Income unit allocation (b) + (c)

(g) Difference between Low + Very Low Income unit allocation and estimated capacity at 20+ du/acre = (f) - (h)

(h) Estimated Existing Plan housing capacity at 20+ du/ac

(i) Estimated 2050 housing capacity at 20+ du/ac

(j) Difference between Low + Very Low Income unit allocation and estimated 2050 capacity at 20+ du/acre = (f) - (i)

Table 2b. Lower Income Capacity Option ***SANDAG STAFF RECOMMENDATION***

11-Year RHNA (1/1/2010 - 12/31/2020) ***FORWARDED TO BOARD BY RPC ON 5/6/11***

		RHNA Allocation by Income Category					*Est. Existing Plan Capacity*	*Est. 2050 Capacity**
	11 years	Very Low	Low	Moderate	Above Moderate	VL + Low**	20+ du/ac	20+ du/ac
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Carlsbad	4,999	912	693	1,062	2,332	1,605	1,605	1,605
Chula Vista	12,861	3,209	2,439	2,257	4,956	5,648	21,899	23,092
Coronado	50	13	9	9	19	22	270	270
Del Mar	61	7	5	15	34	12	12	12
El Cajon	5,805	1,448	1,101	1,019	2,237	2,549	13,225	13,225
Encinitas	2,353	587	446	413	907	1,033	1,293	1,293
Escondido	4,175	1,042	791	733	1,609	1,833	2,582	4,043
Imperial Beach	254	63	48	45	98	111	1,784	1,784
La Mesa	1,722	430	326	302	664	756	6,498	8,021
Lemon Grove	309	77	59	54	119	136	828	1,410
National City	1,863	465	353	327	718	818	18,200	19,167
Oceanside	6,210	1,549	1,178	1,090	2,393	2,727	4,751	4,751
Poway	1,253	201	152	282	618	353	353	353
San Diego	88,096	21,977	16,703	15,462	33,954	38,680	158,273	201,050
San Marcos	4,183	1,043	793	734	1,613	1,836	2,931	2,931
Santee	3,660	914	694	642	1,410	1,608	1,650	1,650
Solana Beach	340	85	65	59	131	150	262	408
Vista	1,374	343	260	241	530	603	1,731	11,592
Unincorporated	22,412	2,085	1,585	5,864	12,878	3,670	3,670	3,670
Region	**161,980**	**36,450**	**27,700**	**30,610**	**67,220**	**64,150**		
11-YEAR RHNA		*36,450*	*27,700*	*30,610*	*67,220*	*64,150*		
		22.5%	17.1%	18.9%	41.5%			

* 2050 Capacity is for discussion purposes only. 2050 Capacity includes visionary inputs beyond existing, adopted general plans.

**Allocation proposal is based on Existing Plan capacity, or regional allocation, whichever is lower in jurisdictions where Existing Plan capacity is exceeded (see bolded numbers in Table 1c, column (j))

Notes:
(a) 2050 Regional Growth Forecast pro-rated to 11-year RHNA Determination. The Forecast is based on information from local jurisdictions regarding existing and future land use policies and inputs.
(b) Very Low Income unit allocation by jurisdiction (based on 22.5% of total, or Existing Plan capacity for 20+ du/acre).
(c) Low Income unit allocation by jurisdiction (based on 17.1% of total, or Existing Plan capacity for 20+ du/acre).
(d) Moderate Income unit allocation by jurisdiction (balance of total minus other Income categories) = (a) - (b) - (c) - (e)
(e) Above Moderate Income unit allocation by jurisdiction (based on 41.5% of total, or balance of units).
(f) Sum of Very Low + Low Income unit allocation = (b) + (c)
(g) Estimated Existing Plan housing capacity at 20+ du/ac
(h) Estimated 2050 housing capacity at 20+ du/ac

Table 2c: Lower Income Capacity Option with Jobs/Housing Balance Adjustment

11-Year RHNA (1/1/2010 - 12/31/2020)

		Jobs/Housing Balance Adjustment								*Est. Existing Plan Capacity*	*Est. 2050 Capacity**	
	11 year RHNA	VL + Low Units (Dec 9 Proposal)*	Jobs/Housing Ratio (2020)	Variance from Regional Average	Half of Variance	Basic Variance Calculation	Controlled Adjustment for Jobs/Housing Ratio	VL + Low Allocation After Jobs/Housing Adjustment**	Difference between VL+L Allocation and 20+ Capacity (Existing)	20+ du/ac Capacity	20+ du/ac Capacity	Difference between VL+L Allocation and 20+ Capacity (2050)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Carlsbad	4,999	1,605	1.4599	0.2596	0.12980	208	191	1,796	**191**	1,605	1,605	**191**
Chula Vista	12,861	5,384	0.9315	-0.2688	-0.13440	-724	-798	4,586	-17,313	21,899	23,092	-18,506
Coronado	50	21	0.8627	-0.3376	-0.16880	-4	-5	16	-254	270	270	-254
Del Mar	61	12	1.6038	0.4035	0.20175	2	2	14	**2**	12	12	**2**
El Cajon	5,805	2,430	1.1346	-0.0657	-0.03285	-80	-88	2,342	-10,883	13,225	13,225	-10,883
Encinitas	2,353	985	1.0904	-0.1099	-0.05495	-54	-60	925	-368	1,293	1,293	-368
Escondido	4,175	1,747	1.3262	0.1259	0.06295	110	101	1,848	-734	2,582	4,043	-2,195
Imperial Beach	254	106	0.7581	-0.4422	-0.22110	-23	-26	80	-1,704	1,784	1,784	-1,704
La Mesa	1,722	721	1.0757	-0.1246	-0.06230	-45	-50	671	-5,827	6,498	8,021	-7,350
Lemon Grove	309	130	0.8693	-0.3310	-0.16550	-22	-24	106	-722	828	1,410	-1,304
National City	1,863	780	1.2898	0.0895	0.04475	35	32	812	-17,388	18,200	19,167	-18,355
Oceanside	6,210	2,600	0.6960	-0.5043	-0.25215	-656	-723	1,877	-2,874	4,751	4,751	-2,874
Poway	1,253	353	1.8793	0.6790	0.33950	120	110	463	**110**	353	353	**110**
San Diego	88,096	36,873	1.4529	0.2526	0.12630	4,657	4,262	41,135	-117,138	158,273	201,050	-159,915
San Marcos	4,183	1,750	1.3585	0.1582	0.07910	138	127	1,877	-1,054	2,931	2,931	-1,054
Santee	3,660	1,533	0.7596	-0.4407	-0.22035	-338	-373	1,160	-490	1,650	1,650	-490
Solana Beach	340	143	1.1771	-0.0232	-0.01160	-2	-2	141	-121	262	408	-267
Vista	1,374	575	1.4142	0.2139	0.10695	61	56	631	-1,100	1,731	11,592	-10,961
Unincorporated	22,412	6,402	0.6336	-0.5667	-0.28335	-2,479	-2,732	3,670	0	3,670	3,670	0
Region	**161,980**	**64,150**	**1.2003**			**904**	**0**	**64,150**				

*Original December 9 Proposal methodology (Table 2a) with changes based on technical update of 2050 Regional Growth Forecast

**Adjustment made to cap the Unincorporated Area at 3,670 units

Notes:

(a) 2050 Regional Growth Forecast pro-rated to 11-year RHNA Determination.
The Forecast is based on information from local jurisdictions regarding existing and future land use policies and inputs.

(b) Sum of Very Low + Low Income unit allocation from Table 2a column (f)

(c) Projected jobs/housing ratio in 2020

(d) Variance of each jurisdiction's jobs/housing ratio from the regional average = 1.2003 (regional average) - (c)

(e) Half of Variance = (d) * 1/2

(f) Uncontrolled Adjustment of jobs/housing ratio = (b) * (e)

(g) Adjustment of jobs/housing balance = (b) * (e) controlled to a net balance of zero reigonwide

(h) New Very Low + Low Income unit allocation with controlled jobs/housing factor = (b) + (g)

(i) Difference between Very Low + Low Income unit allocation and estimated 20+ du/ac capacity

(j) Estimated Existing Plan housing capacity at 20+ du/ac

(k) Estimated 2050 housing capacity at 20+ du/ac

(l) Difference between Very Low + Low Income unit allocation and estimated 2050 capacity at 20+ du/acre = (h) - (k)

Table 3a: Regional Share Option with Jobs/Housing Balance and Income Adjustment

11-Year RHNA (1/1/2010 - 12/31/2020)

			Jobs/Housing Balance Adjustment				Income Adjustment							*Est. Existing Plan Capacity*	*Est. 2050 Capacity**	
	11 year RHNA	VL+ Low (Regionwide Shares)	Jobs/Housing Ratio (2020)	Variance from Regional Average	Half of Variance	Controlled Adjustment for Jobs/Housing Ratio	Households by Income - VL + L	Variance from Regional Average	Half of Variance	Controlled Adjustment for Income	VL + L Allocation After Jobs/Housing & Income Adjustment	VL + L Allocation as Percentage of 20+ du/acre Capacity (Existing)	Difference between VL+L Allocation and 20+ Capacity (Existing)	20+ du/ac Capacity	20+ du/ac Capacity	Difference between VL+L Allocation and 20+ Capacity (2050)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
Carlsbad	4,999	1,980	1.4599	0.2596	0.12980	237	26.57%	13.03%	6.515%	140	2,357	**147%**	**752**	1,605	1,605	**752**
Chula Vista	12,861	5,094	0.9315	-0.2688	-0.13440	-749	41.65%	-2.05%	-1.025%	-49	4,296	20%	-17,603	21,899	23,092	-18,796
Coronado	50	20	0.8627	-0.3376	-0.16880	-4	25.31%	14.29%	7.145%	1	17	6%	-253	270	270	-253
Del Mar	61	24	1.6038	0.4035	0.20175	5	25.16%	14.44%	7.220%	2	31	**258%**	**19**	12	12	**19**
El Cajon	5,805	2,299	1.1346	-0.0657	-0.03285	-83	52.60%	-13.00%	-6.500%	-139	2,077	16%	-11,148	13,225	13,225	-11,148
Encinitas	2,353	932	1.0904	-0.1099	-0.05495	-56	26.99%	12.61%	6.305%	64	940	73%	-353	1,293	1,293	-353
Escondido	4,175	1,653	1.3262	0.1259	0.06295	96	43.82%	-4.22%	-2.110%	-33	1,716	66%	-866	2,582	4,043	-2,327
Imperial Beach	254	100	0.7581	-0.4422	-0.22110	-24	52.40%	-12.80%	-6.400%	-6	70	4%	-1,714	1,784	1,784	-1,714
La Mesa	1,722	682	1.0757	-0.1246	-0.06230	-46	44.37%	-4.77%	-2.385%	-15	621	10%	-5,877	6,498	8,021	-7,400
Lemon Grove	309	123	0.8693	-0.3310	-0.16550	-22	46.75%	-7.15%	-3.575%	-4	97	12%	-731	828	1,410	-1,313
National City	1,863	738	1.2898	0.0895	0.04475	31	61.14%	-21.54%	-10.770%	-74	695	4%	-17,505	18,200	19,167	-18,472
Oceanside	6,210	2,460	0.6960	-0.5043	-0.25215	-678	39.51%	0.09%	0.045%	2	1,784	38%	-2,967	4,751	4,751	-2,967
Poway	1,253	496	1.8793	0.6790	0.33950	155	21.14%	18.46%	9.230%	50	701	**199%**	**348**	353	353	**348**
San Diego	88,096	34,888	1.4529	0.2526	0.12630	4,063	41.26%	-1.66%	-0.830%	-269	38,682	24%	-119,591	158,273	201,050	-162,368
San Marcos	4,183	1,656	1.3585	0.1582	0.07910	121	40.00%	-0.40%	-0.200%	-3	1,774	61%	-1,157	2,931	2,931	-1,157
Santee	3,660	1,450	0.7596	-0.4407	-0.22035	-349	31.54%	8.06%	4.030%	63	1,164	71%	-486	1,650	1,650	-486
Solana Beach	340	135	1.1771	-0.0232	-0.01160	-2	26.99%	12.61%	6.305%	10	143	55%	-119	262	408	-265
Vista	1,374	544	1.4142	0.2139	0.10695	54	42.49%	-2.89%	-1.445%	-8	590	34%	-1,141	1,731	11,592	-11,002
Unincorporated	22,412	8,876	0.6336	-0.5667	-0.28335	-2,749	34.01%	5.59%	2.795%	268	6,395	**174%**	**2,725**	3,670	3,670	**2,725**
Region	**161,980**	**64,150**	**1.2003**	0.0000	0.00000	**0**	**39.60%**	0.00%	0.000%	**0**	**64,150**					

Notes:

(a) 2050 Regional Growth Forecast pro-rated to 11-year RHNA Determination. The Forecast is based on information from local jurisdictions regarding existing and future land use policies and inputs.

(b) Very Low + Low Income unit allocation based on regionwide shares

(c) Projected jobs/housing ratio in 2020

(d) Variance of each jurisdiction's jobs/housing ratio from the regional average = 1.2003 (regional average) - (c)

(e) Half of Variance = (d) * 1/2

(f) Adjustment for jobs/housing balance = (b) * (e) controlled to a net balance of 0 regionwide

(g) Percentage of Very Low + Low Income Households in each jurisdiction (2000 Census)

(h) Variance from regional average of VL + L Income Households = 39.6% - (g)

(i) Half of Variance = (h) * 1/2

(j) Adjustment for Income distribution = (b) * (i) controlled to a net balance of 0 regionwide

(k) New Very Low + Low Income unit allocation with controlled jobs/housing factor & controlled Income adjustment= (b) + (f) + (j)

(l) New Very Low + Low Income unit allocation expressed as percentage of 20+ du/acre capacity = (k)/(n)

(m) Difference between Very Low + Low Income unit allocation and estimated 20+ du/ac capacity (k)- (n)

(n) Estimated Existing Plan housing capacity at 20+ du/ac

(o) Estimated 2050 housing capacity at 20+ du/ac

(p) Difference between Very Low + Low Income unit allocation and estimated 2050 capacity at 20+ du/acre = (k) - (o)

May 27, 2011

Table 3c: Regional Share Option with Jobs/Housing Balance, Income, and Transit Adjustment

11-Year RHNA (1/1/2010 - 12/31/2020)

			Jobs/Housing Balance Adjustment				Income Adjustment				Transit Adjustment							*Est. Existing Plan Capacity*	*Est. 2050 Capacity*	
	11 year RHNA	VL+ Low (Regionwide Shares)	Jobs/Housing Ratio (2020)	Variance from Regional Average	Half of Variance	Controlled Adjustment for Jobs/Housing Balance	Households by Income - VL + L	Variance from Regional Average	Half of Variance	Controlled Adjustment for Income	Percent Housing Unit Capacity within a Qtr Mi of Transit*	Variance from Incorporated Average**	Half of Variance	Controlled Adjustment for Transit	VL + L Allocation After Jobs/Housing,Income & Transit Adjustment	VL + L Allocation as Percentage of 20+ du/acre Capacity (Existing)	Difference between VL+L Allocation and 20+ Capacity (Existing)	20+ du/ac Capacity	20+ du/ac Capacity	Difference between VL+L Allocation and 20+ Capacity (2050)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)
Carlsbad	4,999	1,980	1.4599	0.2596	0.12980	237	26.57%	13.03%	6.52%	140	36.29%	-31.98%	-15.99%	-187	2,170	**135%**	**565**	1,605	1,605	**565**
Chula Vista	12,861	5,094	0.9315	-0.2688	-0.13440	-749	41.65%	-2.05%	-1.03%	-49	60.88%	-7.39%	-3.70%	-111	4,185	19%	-17,714	21,899	23,092	-18,907
Coronado	50	20	0.8627	-0.3376	-0.16880	-4	25.31%	14.29%	7.15%	1	83.68%	15.41%	7.71%	5	22	8%	-248	270	270	-248
Del Mar	61	24	1.6038	0.4035	0.20175	5	25.16%	14.44%	7.22%	2	74.65%	6.38%	3.19%	2	33	**275%**	**21**	12	12	**21**
El Cajon	5,805	2,299	1.1346	-0.0657	-0.03285	-83	52.60%	-13.00%	-6.50%	-139	77.28%	9.01%	4.51%	338	2,415	18%	-10,810	13,225	13,225	-10,810
Encinitas	2,353	932	1.0904	-0.1099	-0.05495	-56	26.99%	12.61%	6.31%	64	53.90%	-14.37%	-7.19%	-39	901	70%	-392	1,293	1,293	-392
Escondido	4,175	1,653	1.3262	0.1259	0.06295	96	43.82%	-4.22%	-2.11%	-33	64.34%	-3.93%	-1.97%	-19	1,697	66%	-885	2,582	4,043	-2,346
Imperial Beach	254	100	0.7581	-0.4422	-0.22110	-24	52.40%	-12.80%	-6.40%	-6	94.20%	25.93%	12.97%	42	112	6%	-1,672	1,784	1,784	-1,672
La Mesa	1,722	682	1.0757	-0.1246	-0.06230	-46	44.37%	-4.77%	-2.39%	-15	90.20%	21.93%	10.97%	244	865	13%	-5,633	6,498	8,021	-7,156
Lemon Grove	309	123	0.8693	-0.3310	-0.16550	-22	46.75%	-7.15%	-3.58%	-4	68.91%	0.64%	0.32%	1	98	12%	-730	828	1,410	-1,312
National City	1,863	738	1.2898	0.0895	0.04475	31	61.14%	-21.54%	-10.77%	-74	94.29%	26.02%	13.01%	314	1,009	6%	-17,191	18,200	19,167	-18,158
Oceanside	6,210	2,460	0.6960	-0.5043	-0.25215	-678	39.51%	0.09%	0.05%	2	42.00%	-26.27%	-13.14%	-191	1,593	34%	-3,158	4,751	4,751	-3,158
Poway	1,253	496	1.8793	0.6790	0.33950	155	21.14%	18.46%	9.23%	50	0.00%	-68.27%	-34.14%	-100	601	**170%**	**248**	353	353	**248**
San Diego	88,096	34,888	1.4529	0.2526	0.12630	4,063	41.26%	-1.66%	-0.83%	-269	71.40%	3.13%	1.57%	1,785	40,467	26%	-117,806	158,273	201,050	-160,583
San Marcos	4,183	1,656	1.3585	0.1582	0.07910	121	40.00%	-0.40%	-0.20%	-3	50.63%	-17.63%	-8.82%	-86	1,688	58%	-1,243	2,931	2,931	-1,243
Santee	3,660	1,450	0.7596	-0.4407	-0.22035	-349	31.54%	8.06%	4.03%	63	2.87%	-65.40%	-32.70%	-280	884	54%	-766	1,650	1,650	-766
Solana Beach	340	135	1.1771	-0.0232	-0.01160	-2	26.99%	12.61%	6.31%	10	32.08%	-36.19%	-18.10%	-14	129	49%	-133	262	408	-279
Vista	1,374	544	1.4142	0.2139	0.10695	54	42.49%	-2.89%	-1.45%	-8	73.83%	5.56%	2.78%	50	640	37%	-1,091	1,731	11,592	-10,952
Unincorporated	22,412	8,876	0.6336	-0.5667	-0.28335	-2,749	34.01%	5.59%	2.80%	268	1.33%	-66.94%	-33.47%	-1,754	4,641	**126%**	**971**	3,670	3,670	**971**
Region	**161,980**	**64,150**	**1.2003**	0.0000	0.00000	**0**	**39.60%**	0.00%	0.00%	**0**				**0**	**64,150**					

*For this analysis, the transit types included are: Bus Rapid Transit (BRT), rail, and local and express bus routes with 15 minute headways or better during peak periods

**For this calculation, the incorporated area housing capacity average was used instead of the regional average. This is based on the fact that the Unincorporated Area has litte transit service and very low density land which significantly reduces the regional average housing capacity within a quarter mile of transit

Notes:

(a) 2050 Regional Growth Forecast pro-rated to 11-year RHNA Determination.
The Forecast is based on information from local jurisdictions regarding existing and future land use policies and inputs.
(b) Very Low + Low Income unit allocation based on regionwide shares
(c) Projected jobs/housing balance in 2020
(d) Variance of each jurisdiction's jobs/housing ratio from the regional average = 1.2003 (regional average) - (c)
(e) Half of Variance = (d) * 1/2
(f) Adjustment for jobs/housing balance = (b) * (e) controlled to a net balance of 0 regionwide
(g) Percentage of Very Low + Low Income Households in each jurisdiction (2000 Census)
(h) Variance from regional average of VL+ L Income Households = 39.6% - (g)
(i) Half of Variance = (h) * 1/2
(j) Percent of each jurisdiction's capacity within 1/4 mile of a transit stop
(k) Variance of each jurisdiction's transit accessible housing unit capacity from incorporated average = (k) - 69%
(l) Half of variance = (l) * 1/2
(m) Adjustment for transit = (m) * (b) controlled to a net balance of 0 regionwide
(n) Very Low + Low Income unit allocation with controlled Jobs/Housing, Income, & Transit adjustment= (b) + (f) + (j) + (n)
(o) Very Low + Low Income unit allocation expressed as percentage of 20+ du/acre capacity = (o)/(r)
(p) Adjustment for income distribution = (b) * (i) controlled to a net balance of 0 regionwide
(q) Difference between VL+L Income Income unit allocation and existing 20+ du/ac capacity = (o) - (r)
(r) Estimated Existing Plan housing capacity at 20+ du/ac
(s) Estimated 2050 Capacity at 20+ du/acre
(t) Difference between Very Low + Low Income unit allocation and estimated 2050 capacity at 20+ du/acre = (o) - (s)

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Table 3d: Regional Share Option with Jobs/Housing Balance, Income, Transit and Unincorporated Area Capacity Adjustment

FORWARDED TO BOARD BY RPC ON 5/6/11

11-Year RHNA (1/1/2010 - 12/31/2020)

				Jobs/Housing Balance Adjustment				Income Adjustment				Transit Adjustment							*Est. Existing Plan Capacity*	*Est. 2050 Capacity**	
	11 year RHNA	VL+ Low (Regionwide Shares)	New Starting Shares*	Jobs/Housing Ratio (2020)	Variance from Regional Average	Half of Variance	Controlled Adjustment for Jobs/ Housing Balance	Households by Income - VL + L	Variance from Regional Average	Half of Variance	Controlled Income Adjustment	Percent Housing Unit Capacity w/in a Qtr Mi of Transit**	Variance from Incorporated Average***	Half of Variance	Controlled Adjustment for Transit	VL + L Allocation After Jobs/Housing, Income & Transit Adjustment	VL + L Allocation as Percentage of 20+ du/acre Capacity (Existing)	Difference between VL+L Allocation and 20+ Capacity (Existing)	20+ du/ac Capacity	20+ du/ac Capacity	Difference between VL+L Allocation and 20+ Capacity (2050)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)
Carlsbad	4,999	1,980	2,166	1.4599	0.2596	0.12980	191	26.57%	13.03%	6.515%	220	36.29%	-31.98%	-15.99%	-258	2,319	**144%**	**714**	1,605	1,605	**714**
Chula Vista	12,861	5,094	5,574	0.9315	-0.2688	-0.13440	-1,424	41.65%	-2.05%	-1.025%	-42	60.88%	-7.39%	-3.70%	-153	3,955	18%	-17,944	21,899	23,092	-19,137
Coronado	50	20	22	0.8627	-0.3376	-0.16880	-8	25.31%	14.29%	7.145%	3	83.68%	15.41%	7.71%	3	20	7%	-250	270	270	-250
Del Mar	61	24	26	1.6038	0.4035	0.20175	4	25.16%	14.44%	7.220%	3	74.65%	6.38%	3.19%	1	34	**283%**	**22**	12	12	**22**
El Cajon	5,805	2,299	2,516	1.1346	-0.0657	-0.03285	-158	52.60%	-13.00%	-6.500%	-121	77.28%	9.01%	4.51%	173	2,410	18%	-10,815	13,225	13,225	-10,815
Encinitas	2,353	932	1,020	1.0904	-0.1099	-0.05495	-107	26.99%	12.61%	6.305%	100	53.90%	-14.37%	-7.19%	-55	958	74%	-335	1,293	1,293	-335
Escondido	4,175	1,653	1,809	1.3262	0.1259	0.06295	78	43.82%	-4.22%	-2.110%	-28	64.34%	-3.93%	-1.97%	-27	1,832	71%	-750	2,582	4,043	-2,211
Imperial Beach	254	100	109	0.7581	-0.4422	-0.22110	-46	52.40%	-12.80%	-6.400%	-5	94.20%	25.93%	12.97%	22	80	4%	-1,704	1,784	1,784	-1,704
La Mesa	1,722	682	746	1.0757	-0.1246	-0.06230	-88	44.37%	-4.77%	-2.385%	-13	90.20%	21.93%	10.97%	125	770	12%	-5,728	6,498	8,021	-7,251
Lemon Grove	309	123	135	0.8693	-0.3310	-0.16550	-42	46.75%	-7.15%	-3.575%	-3	68.91%	0.64%	0.32%	0	90	11%	-738	828	1,410	-1,320
National City	1,663	738	807	1.2898	0.0895	0.04475	25	61.14%	-21.54%	-10.770%	-64	94.29%	26.02%	13.01%	160	928	5%	-17,272	18,200	19,167	-18,239
Oceanside	6,210	2,460	2,692	0.6960	-0.5043	-0.25215	-1,291	39.51%	0.09%	0.045%	2	42.00%	-26.27%	-13.14%	-263	1,140	24%	-3,611	4,751	4,751	-3,611
Poway	1,253	496	543	1.8793	0.6790	0.33950	125	21.14%	18.46%	9.230%	78	0.00%	-68.27%	-34.14%	-138	608	**172%**	**255**	353	353	**255**
San Diego	88,096	34,888	38,173	1.4529	0.2526	0.12630	3,270	41.26%	-1.66%	-0.830%	-234	71.40%	3.13%	1.57%	910	42,119	27%	-116,154	158,273	201,050	-158,931
San Marcos	4,183	1,656	1,812	1.3585	0.1582	0.07910	97	40.00%	-0.40%	-0.200%	-3	50.63%	-17.63%	-8.82%	-119	1,787	61%	-1,144	2,931	2,931	-1,144
Santee	3,660	1,450	1,587	0.7596	-0.4407	-0.22035	-666	31.54%	8.06%	4.030%	99	2.87%	-65.40%	-32.70%	-386	634	38%	-1,016	1,650	1,650	-1,016
Solana Beach	340	135	148	1.1771	-0.0232	-0.01160	-4	26.99%	12.61%	6.305%	14	32.08%	-36.19%	-18.10%	-20	138	53%	-124	262	408	-270
Vista	1,374	544	595	1.4142	0.2139	0.10695	44	42.49%	-2.89%	-1.445%	-6	73.83%	5.56%	2.78%	25	658	38%	-1,073	1,731	11,592	-10,934
Unincorporated	22,412	8,876														3,670	100%	0	3,670	3,670	0
Region	**161,980**	**64,150**	**60,480**	**1.2003**			**0**	39.60%			**0**				**0**	**64,150**					

*New starting shares based on VL + L Regionwide Shares with an adjustment made to cap the Unincorporated Area at 3,670 units, and 5,206 units distributed proportionally to the remaining jurisdictions

** For this analysis, the transit types included are: Bus Rapid Transit (BRT), rail, and local and express bus routes with 15 minute headways or better during peak periods

*** For this calculation, the incorporated area housing capacity average was used as opposed to the regional average. This is based on the fact that the Unincorporated Area has little transit service and very low density land which significantly reduces the regional average housing capacity within a quarter mile of transit.

Notes:

(a) 2050 Regional Growth Forecast pro-rated to 11-year RHNA Determination.
The Forecast is based on information from local jurisdictions regarding existing and future land use policies and inputs.
(b) Very Low + Low Income unit allocation based on regionwide shares
(c) New Starting Shares
(d) Projected jobs/housing balance in 2020
(e) Variance of each jurisdiction's jobs/housing ratio from the regional average = 1.2003 (regional average) - (c)
(f) Half of Variance = (e) * 1/2
(g) Adjustment for jobs/housing balance = (c) * (f) controlled to a net balance of 0 regionwide
(h) Percentage of Very Low + Low Income Households in each jurisdiction (2000 Census)
(i) Variance from regional average of VL+ L Income Households = 39.6% - (g)
(j) Half of Variance = (i) * 1/2
(k) Adjustment for income distribution = (c) * (j) controlled to a net balance of 0 regionwide
(l) Percent of each jurisdiction's capacity within 1/4 mile of a transit stop
(m) Variance of each jurisdiction's transit accessible housing capacity from incorporated average = (l) - 69%
(n) Half of variance = (m) * 1/2
(o) Adjustment for transit =(n) *(c) controlled to a net balance of 0 regionwide
(p) Very Low + Low Income unit allocation with controlled Jobs/Housing, Income, & Transit adjustment= (c) + (g) + (k) + (o)
(q) Very Low + Low unit allocation expressed as a percentage of existing 20+ du/acre capacity = (p)/(s)
(r) Difference between Very Low + Low Income unit allocation and existing 20+ du/acre capacity = (p) - (s)
(s) Estimated Existing Plan housing capacity at 20+ du/acre
(t) Estimated 2050 housing capacity at 20+ du/acre
(u) Difference between Very Low + Low Income unit allocation and estimated 2050 capacity at 20+ du/acre = (p) - (t)

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Table 4. Households by Income and Very Low & Low Income Allocation Percentages for RHNA Options

11-Year RHNA (1/1/2010 - 12/31/2020)

	Households by Income (2000 Census)	Regional Share Option (Table 1c)	Lower Income Capacity Option (Table 2b)	Lower Income Capacity Option with Jobs/Housing Balance Adjustment (Table 2c)	Regional Share Option with Jobs/Housing Balance and Income Adjustment (Table 3a)	Regional Share Option with Jobs/Housing Balance, Income, and Transit Adjustment (Table 3c)	Regional Share Option with Jobs/Housing Balance, Income, Transit and Unincorporated Area Capacity Adjustment (Table 3d)
	VL + Low	VL + Low	VL + Low	VL + Low	VL + Low	VL + Low	VL + Low
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Carlsbad	27%	40%	32%	36%	47%	43%	46%
Chula Vista	42%	40%	44%	36%	33%	33%	31%
Coronado	25%	40%	44%	32%	34%	44%	40%
Del Mar	25%	40%	20%	23%	51%	54%	56%
El Cajon	53%	40%	44%	40%	36%	42%	42%
Encinitas	27%	40%	44%	39%	40%	38%	41%
Escondido	44%	40%	44%	44%	41%	41%	44%
Imperial Beach	52%	40%	44%	31%	28%	44%	31%
La Mesa	44%	40%	44%	39%	36%	50%	45%
Lemon Grove	47%	40%	44%	34%	31%	32%	29%
National City	61%	40%	44%	44%	37%	54%	50%
Oceanside	40%	40%	44%	30%	29%	26%	18%
Poway	21%	40%	28%	37%	56%	48%	49%
San Diego	41%	40%	44%	47%	44%	46%	48%
San Marcos	40%	40%	44%	45%	42%	40%	43%
Santee	32%	40%	44%	32%	32%	24%	17%
Solana Beach	27%	40%	44%	41%	42%	38%	41%
Vista	42%	40%	44%	46%	43%	47%	48%
Unincorporated	34%	40%	16%	16%	29%	21%	16%
Region	**40%**	**40%**	**40%**	**40%**	**40%**	**40%**	**40%**

Notes:

(a) Proportion of households in Very Low and Low Income categories (Where "Very Low " is defined as less than 50% of regional median household income and "Low" is defined as 50-80% of regional median household Income defined by California Dept. of Housing and Community Development).

(b) Percent of Very Low + Low Income Units under the Regional Share Option (Table 1c)

(c) Percent of Very Low + Low Income Units under the Lower Income Capacity Option (Table 2b)

(d) Percent of Very Low + Low Income Units under the Lower Income Capacity Option with Jobs/Housing Balance Adjustment (Table 2c)

(e) Percent of Very Low + Low Income Units under the Regional Share Option with Jobs/Housing Balance and Income Adjustment (Table 3a)

(f) Percent of Very Low + Low Income Units under the Regional Share Option with Jobs/Housing Balance, Income, and Transit Adjustment (Table 3c)

(g) Percent of Very Low + Low Income Units under the Revised Regional Share Option with Jobs/Housing Balance, Income, Transit and Unincorporated Area Capacity Adjustment (Table 3d)

Table 5. Very Low & Low Income Allocation Numbers for RHNA Options

11-Year RHNA (1/1/2010 - 12/31/2020)

	Regional Share Option (Table 1c)	Lower Income Capacity Option (Table 2b)	Lower Income Capacity Option with Jobs/Housing Balance Adjustment (Table 2c)	Regional Share Option with Jobs/Housing Balance and Income Adjustment (Table 3a)	Regional Share Option with Jobs/Housing Balance, Income, and Transit Adjustment (Table 3c)	Regional Share Option with Jobs/Housing Balance, Income, Transit and Unincorporated Capacity Adjustment (Table 3d)	Estimated Existing Plan Capacity
	VL + Low	VL + Low	VL + Low	VL + Low	VL + Low	VL + Low	20+ du/ac capacity
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Carlsbad	1,980	1,605	1,796	2,357	2,170	2,319	1,605
Chula Vista	5,094	5,648	4,586	4,296	4,185	3,955	21,899
Coronado	20	22	16	17	22	20	270
Del Mar	24	12	14	31	33	34	12
El Cajon	2,299	2,549	2,342	2,077	2,415	2,410	13,225
Encinitas	932	1,033	925	940	901	958	1,293
Escondido	1,653	1,833	1,848	1,716	1,697	1,832	2,582
Imperial Beach	100	111	80	70	112	80	1,784
La Mesa	682	756	671	621	865	770	6,498
Lemon Grove	123	136	106	97	98	90	828
National City	738	818	812	695	1,009	928	18,200
Oceanside	2,460	2,727	1,877	1,784	1,593	1,140	4,751
Poway	496	353	463	701	601	608	353
San Diego	34,888	38,680	41,135	38,682	40,467	42,119	158,273
San Marcos	1,656	1,836	1,877	1,774	1,688	1,787	2,931
Santee	1,450	1,608	1,160	1,164	884	634	1,650
Solana Beach	135	150	141	143	129	138	262
Vista	544	603	631	590	640	658	1,731
Unincorporated	8,876	3,670	3,670	6,395	4,641	3,670	3,670
Region	**64,150**	**64,150**	**64,150**	**64,150**	**64,150**	**64,150**	**241,817**

Notes:

(a) Very Low + Low Income Units under the Regional Share Option (Table 1c)

(b) Very Low + Low Income Units under the Lower Income Capacity Option (Table 2b)

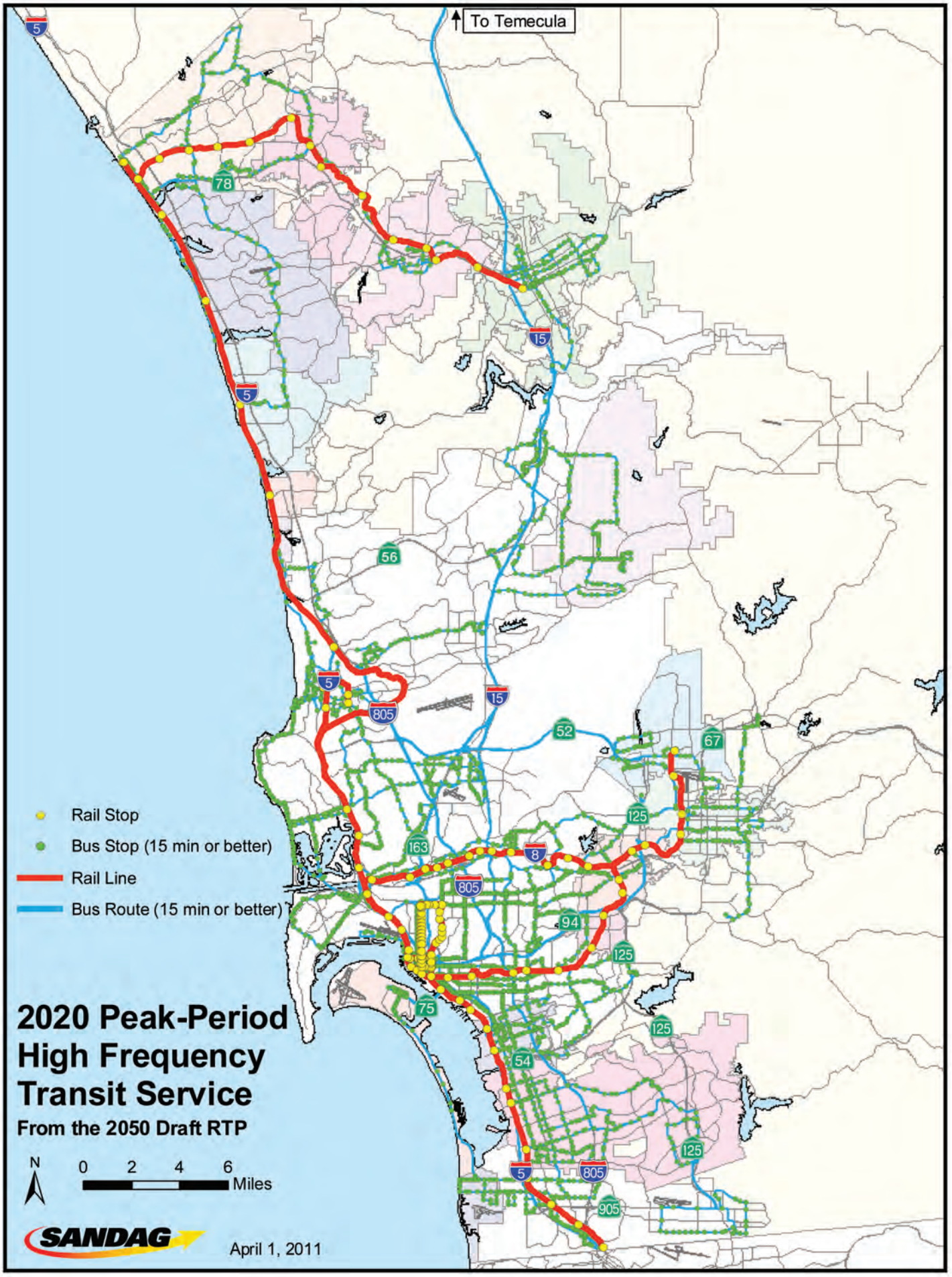
(c) Very Low + Low Income Units under the Lower Income Capacity Option with Jobs/Housing Balance Adjustment (Table 2c)

(d) Very Low + Low Incomd Units under the Regional Share Option with Jobs/Housing Balance and Income Adjustment (Table 3a)

(e) Very Low + Low Income Units under the Regional Share Option with Jobs/Housing Balance, Income, and Transit Adjustment (Table 3c)

(f) Very Low + Low Income Units under the Regional Share Option with Jobs/Housing Balance, Income, Transit and Unincorporated Capacity Adjustment (Table 3d)

(g) Estimated Existing Plan Housing Capacity at 20+ du/ac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SANDAG
April 1, 2011

RHNA Background Information
May 27, 2011

RHNA and Senate Bills 375 and 575

The Regional Housing Needs Assessment (RHNA) process is being conducted by SANDAG in conjunction with the development of the 2050 Regional Transportation Plan (2050 RTP) and its Sustainable Communities Strategy (SCS) in accordance with Senate Bill 375 (Steinberg, 2008) (SB 375) and SB 575 (Steinberg, 2009). SANDAG is assigned the RHNA responsibility by state housing element law, and undertakes this process prior to each housing element cycle as described in the statutory excerpts from state law (Attachment 4).

SB 375 calls for the coordination and integration of housing planning with the regional transportation plan. It requires that the RHNA be consistent with the development pattern of the SCS and that the SCS show that it accommodates the RHNA. The coordination of the 2050 RTP and its SCS with RHNA is intended to assist the region in meeting the greenhouse gas reduction targets that were set by the California Air Resources Board on September 23, 2010.

SB 575 modified the timing of the fifth housing element cycle in the San Diego region and eliminated the housing element, which SB 375 required to be due by July 1, 2010. SB 575 requires some jurisdictions to prepare a housing element update in four years; and specifies housing site identification requirements for the July 1, 2010, to December 31, 2013, timeframe for all jurisdictions. Prior to passage of SB 375, housing element cycles were five years in length. The housing element cycle for the San Diego region now covers an eight-year time period from January 1, 2013, to December 31, 2020.

RHNA Components and RHNA-Determination

The RHNA process has three main components, which are described below:

- RHNA Determination – California Department of Housing and Community Development (HCD) regionwide housing need determination in four income categories: very low, low, moderate, and above moderate for the 11-year RHNA Projection Period of January 1, 2010, to December 31, 2020;

- RHNA Plan – SANDAG plan to distribute the RHNA-Determination to the local jurisdictions by four income categories, which includes the RHNA methodology; and

- RHNA Allocation – Each jurisdiction's housing need allocation in four income categories for use in updating local housing elements.

SANDAG received its RHNA Determination from HCD in a letter dated November 23, 2010, following the required consultation process between the two agencies, which began in June 2010.

The HCD RHNA-Determination for the 11-Year RHNA Projection Period of January 1, 2010, through December 31, 2020, is 161,980 housing units. The regional distribution of the RHNA Determination by income category is shown in the table below. SANDAG is required to distribute the total number of units in the four income categories among the region's 19 jurisdictions in the RHNA Plan.

Regionwide Distribution of Total RHNA-Determination by Income Category

Income Categories	Percent	Units
Very Low	22.5%	36,450
Low	17.1%	27,700
Moderate	18.9%	30,610
Above Moderate	41.5%	67,220
Total	**100%**	**161,980**

State Housing Element Law RHNA Objectives and Factors

State housing element law (found, in part, at Government Code Section 65584 (d)) states that the RHNA shall be consistent with the following four objectives:

1. Increasing the housing supply and the mix of housing types, tenure, and affordability in all cities and counties within the region in an equitable manner, which shall result in all jurisdictions receiving an allocation of units for low- and very low-income households.

2. Promoting infill development and socioeconomic equity, the protection of environmental and agricultural resources, and the encouragement of efficient development patterns.

3. Promoting an improved intraregional relationship between jobs and housing.

4. Allocating a lower proportion of housing need to an income category when a jurisdiction already has a disproportionately high share of households in that income category, as compared to the countywide distribution of households in that category from the most recent decennial United States census.

All of the RHNA Methodology and Allocation options under consideration meet the four objectives listed above.

1. All options allocate RHNA numbers in all four income categories to each of the region's 19 jurisdictions, thus addressing the objective of promoting socioeconomic equity.

2. All of the RHNA options also utilize the forecasted pattern of development from the 2050 Regional Growth Forecast, which incorporates policies in local plans that call for higher density housing to be concentrated in urbanized areas adjacent to transit and that protect environmental and agricultural resources, and demonstrates that the region's local land use plans have significantly increased the region's multifamily housing capacity and ability to accommodate the housing needs of all income levels during the next housing element cycle and out to the horizon year of the 2050 RTP.

3. The RHNA options promote an intraregional relationship between jobs and housing because the 2050 Regional Growth Forecast distributes housing and employment growth at a jurisdiction level using a model that considers proximity to job centers, travel times, and commuting choices, as well as land use plans.

4. The RHNA options also move toward improving the current distribution of lower income households in the region to reduce overconcentration.

State housing element law also requires that SANDAG consider a number of factors as the RHNA allocation methodology is developed. These factors include: jobs/housing relationship; opportunities and constraints to developing housing; distribution of household growth in RTP, and maximizing transportation infrastructure; market demand for housing; agreements between county and cities to direct growth toward incorporated areas; units at risk of converting to market rate units; high housing cost burdens; housing needs of farmworkers; housing needs generated by California State University or University of California campuses; and other factors adopted by SANDAG.

Most of these factors are components of the 2050 Regional Growth Forecast model, and influence the distribution of the region's future housing and job growth. During the formulation of the RHNA Methodology and Allocation options, the Regional Planning Technical Working Group (TWG) and Regional Housing Working Group (RHWG) discussed these factors and incorporated some adjustments to increase the influence of some factors to a greater degree than reflected in the 2050 Regional Growth Forecast. The RHNA Plan will describe in detail how the factors were considered in the development of the Draft RHNA Methodology and Allocation.

Public Meetings Held by SANDAG in Developing the Draft RHNA Methodology and Allocation

Since June 2010, the TWG and RHWG have been meeting jointly to discuss and formulate recommendations to the Regional Planning Committee on the RHNA Determination and the Draft RHNA Methodology and Allocation. The two groups have met jointly 11 times in public meetings to date: June 8, July 8, September 9, October 21, November 10, and December 9, 2010; and on January 13, February 10, February 24, March 10, and April 14, 2011.

In addition to these working group meetings, the Regional Planning Committee discussed the RHNA on April 2, September 10, and December 3, 2010; and on March 4, April 1, and May 6, 2011. The SANDAG Board of Directors discussed the RHNA at a Policy Board meeting on July 9, 2010, and will do so again on May 13, 2011. In addition, the January 28, 2011, Board agenda included an information item regarding the RHNA Determination from HCD. All of the Regional Planning Committee and Board meetings were public meetings.

Excerpts from Housing Element Law (Government Code Sections 65584 and 65584.04)

Regional Housing Needs Assessment (RHNA) Objectives, Methodology, and Factors

65584. (a) (1) For the fourth and subsequent revisions of the housing element pursuant to Section 65588, the department shall determine the existing and projected need for housing for each region pursuant to this article. For purposes of subdivision (a) of Section 65583, the share of a city or county of the regional housing need shall include that share of the housing need of persons at all income levels within the area significantly affected by the general plan of the city or county.

(2) While it is the intent of the Legislature that cities, counties, and cities and counties should undertake all necessary actions to encourage, promote, and facilitate the development of housing to accommodate the entire regional housing need, it is recognized, however, that future housing production may not equal the regional housing need established for planning purposes.

"future housing production may not equal regional housing need ..."

(b) The department, in consultation with each council of governments, shall determine each region's existing and projected housing need pursuant to Section 65584.01 at least two years prior to the scheduled revision required pursuant to Section 65588. The appropriate council of governments, or for cities and counties without a council of governments, the department, shall adopt a final regional housing need plan that allocates a share of the regional housing need to each city, county, or city and county at least one year prior to the scheduled revision for the region required by Section 65588. The allocation plan prepared by a council of governments shall be prepared pursuant to Sections 65584.04 and 65584.05 with the advice of the department.

SANDAG/HCD RHNA consultation

(c) Notwithstanding any other provision of law, the due dates for the determinations of the department or for the councils of governments, respectively, regarding the regional housing need may be extended by the department by not more than 60 days if the extension will enable access to more recent critical population or housing data from a pending or recent release of the United States Census Bureau or the Department of Finance. If the due date for the determination of the department or the council of governments is extended for this reason, the department shall extend the corresponding housing element revision deadline pursuant to Section 65588 by not more than 60 days.

RHNA plan objectives

(d) The regional housing needs allocation plan shall be consistent with all of the following objectives:

(1) Increasing the housing supply and the mix of housing types, tenure, and affordability in all cities and counties within the region in an equitable manner, which shall result in each jurisdiction receiving an allocation of units for low and very low income households.

(2) Promoting infill development and socioeconomic equity, the protection of environmental and agricultural resources, and the encouragement of efficient development patterns.

(3) Promoting an improved intraregional relationship between jobs and housing.

(4) Allocating a lower proportion of housing need to an income category when a jurisdiction already has a disproportionately high share of households in that income category, as compared to the countywide distribution of households in that category from the most recent decennial United States census.

(e) For purposes of this section, "household income levels" are as determined by the department as of the most recent decennial census pursuant to the following code sections:

(1) Very low incomes as defined by Section 50105 of the Health and Safety Code.

(2) Lower incomes, as defined by Section 50079.5 of the Health and Safety Code.

(3) Moderate incomes, as defined by Section 50093 of the Health and Safety Code.

(4) Above moderate incomes are those exceeding the moderate income level of Section 50093 of the Health and Safety Code.

(f) Notwithstanding any other provision of law, determinations made by the department, a council of governments, or a city or county pursuant to this section or Section 65584.01, 65584.02, 65584.03, 65584.04, 65584.05, 65584.06, or 65584.07 are exempt from the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code).

RHNA allocation methodology development

65584.04. (a) At least two years prior to a scheduled revision required by Section 65588, each council of governments, or delegate subregion as applicable, shall develop a proposed methodology for distributing the existing and projected regional housing need to cities, counties, and cities and counties within the region or within the subregion, where applicable pursuant to this section. The

methodology shall be consistent with the objectives listed in subdivision (d) of Section 65584.

RHNA allocation methodology data collection

(b) (1) No more than six months prior to the development of a proposed methodology for distributing the existing and projected housing need, each council of governments shall survey each of its member jurisdictions to request, at a minimum, information regarding the factors listed in subdivision (d) that will allow the development of a methodology based upon the factors established in subdivision (d).

(2) The council of governments shall seek to obtain the information in a manner and format that is comparable throughout the region and utilize readily available data to the extent possible.

(3) The information provided by a local government pursuant to this section shall be used, to the extent possible, by the council of governments, or delegate subregion as applicable, as source information for the methodology developed pursuant to this section. The survey shall state that none of the information received may be used as a basis for reducing the total housing need established for the region pursuant to Section 65584.01.

(4) If the council of governments fails to conduct a survey pursuant to this subdivision, a city, county, or city and county may submit information related to the items listed in subdivision (d) prior to the public comment period provided for in subdivision (c).

Public participation in RHNA methodology and allocation

(c) Public participation and access shall be required in the development of the methodology and in the process of drafting and adoption of the allocation of the regional housing needs. Participation by organizations other than local jurisdictions and councils of governments shall be solicited in a diligent effort to achieve public participation of all economic segments of the community. The proposed methodology, along with any relevant underlying data and assumptions, and an explanation of how information about local government conditions gathered pursuant to subdivision (b) has been used to develop the proposed methodology, and how each of the factors listed in subdivision (d) is incorporated into the methodology, shall be distributed to all cities, counties, any subregions, and members of the public who have made a written request for the proposed methodology. The council of governments, or delegate subregion, as applicable, shall conduct at least one public hearing to receive oral and written comments on the proposed methodology.

Public hearing on proposed RHNA methodology

Factors for use in RHNA methodology

(d) To the extent that sufficient data is available from local governments pursuant to subdivision (b) or other sources, each council of governments, or delegate subregion as applicable, shall include the following factors to develop the methodology that allocates regional housing needs:

Jobs-housing balance

(1) Each member jurisdiction's existing and projected jobs and housing relationship.

(2) The opportunities and constraints to development of additional housing in each member jurisdiction, including all of the following:

Opportunities and constraints to development

(A) Lack of capacity for sewer or water service due to federal or state laws, regulations or regulatory actions, or supply and distribution decisions made by a sewer or water service provider other than the local jurisdiction that preclude the jurisdiction from providing necessary infrastructure for additional development during the planning period.

Sewer and water service capacity

(B) The availability of land suitable for urban development or for conversion to residential use, the availability of underutilized land, and opportunities for infill development and increased residential densities. The council of governments may not limit its consideration of suitable housing sites or land suitable for urban development to existing zoning ordinances and land use restrictions of a locality, but shall consider the potential for increased residential development under alternative zoning ordinances and land use restrictions. The determination of available land suitable for urban development may exclude lands where the Federal Emergency Management Agency (FEMA) or the Department of Water Resources has determined that the flood management infrastructure designed to protect that land is not adequate to avoid the risk of flooding.

Vacant, underutilized, infill, and redevelopment land available for residential development

(C) Lands preserved or protected from urban development under existing federal or state programs, or both, designed to protect open space, farmland, environmental habitats, and natural resources on a long-term basis.

Land protected from urban development

(D) County policies to preserve prime agricultural land, as defined pursuant to Section 56064, within an unincorporated area.

Prime agricultural land in unincorporated area

(3) The distribution of household growth assumed for purposes of a comparable period of regional transportation plans and opportunities to maximize the use of public transportation and existing transportation infrastructure.

Distribution of household growth in RTP

(4) The market demand for housing.

(5) Agreements between a county and cities in a county to direct growth toward incorporated areas of the county.

(6) The loss of units contained in assisted housing developments, as defined in paragraph (9) of subdivision (a) of Section 65583, that changed to non-low-income use through mortgage prepayment, subsidy contract expirations, or termination of use restrictions.

(7) High-housing cost burdens.

(8) The housing needs of farmworkers.

(9) The housing needs generated by the presence of a private university or a campus of the California State University or the University of California within any member jurisdiction.

(10) Any other factors adopted by the council of governments.

(e) The council of governments, or delegate subregion, as applicable, shall explain in writing how each of the factors described in subdivision (d) was incorporated into the methodology and how the methodology is consistent with subdivision (d) of Section 65584. The methodology may include numerical weighting.

SANDAG shall explain how factors were used in RHNA

(f) Any ordinance, policy, voter-approved measure, or standard of a city or county that directly or indirectly limits the number of residential building permits issued by a city or county shall not be a justification for a determination or a reduction in the share of a city or county of the regional housing need.

Building permit limits shall not be justification for RHNA allocations

(g) In addition to the factors identified pursuant to subdivision (d), the council of governments, or delegate subregion, as applicable, shall identify any existing local, regional, or state incentives, such as a priority for funding or other incentives available to those local governments that are willing to accept a higher share than proposed in the draft allocation to those local governments by the council of governments or delegate subregion pursuant to Section 65584.05.

SANDAG shall identify incentives for acceptance of higher RHNA share

(h) Following the conclusion of the 60-day public comment period described in subdivision (c) on the proposed allocation methodology, and after making any revisions deemed appropriate by the council of governments, or delegate subregion, as applicable, as a result of comments received during the public comment period, each council of governments, or delegate subregion, as applicable, shall adopt a final regional, or subregional, housing need allocation methodology and provide notice of the adoption of the methodology to the jurisdictions within the region, or delegate subregion as applicable, and to the department.

60-day public comment period

(i) (1) It is the intent of the Legislature that housing planning be coordinated and integrated with the regional transportation plan. To achieve this goal, the allocation plan shall allocate housing units within the region consistent with the development pattern included in the sustainable communities strategy.

Coordination with RTP, consistency with SCS development pattern

(2) The final allocation plan shall ensure that the total regional housing need, by income category, as determined under Section 65584, is maintained, and that each jurisdiction in the region receive an allocation of units for low- and very low income households.

Each jurisdiction shall receive an allocation of units for lower-income households

(3) The resolution approving the final housing need allocation plan shall demonstrate that the plan is consistent with the sustainable communities strategy in the regional transportation plan.

REGIONAL HOUSING NEEDS ASSESSMENT (RHNA)
FACT SHEET



2010 Household Income Limits for a Family of Four

Very Low Income =
0 – 50 percent AMI ($39,250)

Low Income =
50 – 80 percent AMI ($62,800)

Moderate Income =
80 – 120 percent AMI ($90,600)

Above Moderate Income =
120+ percent AMI

AMI = Area Median Income

AMI for a family of four in 2010 is $75,500

The San Diego Association of Governments (SANDAG), in consultation with the California Department of Housing and Community Development (HCD), is required by California state law to undertake a Regional Housing Needs Assessment (RHNA) prior to each housing element cycle for the 19 local jurisdictions in the San Diego region -- the 18 cities and County of San Diego. The RHNA process has three main components:

- RHNA Determination – HCD regionwide housing need determination in four income categories: very low, low, moderate, and above moderate for the housing element cycle;
- RHNA Plan - SANDAG plan to distribute the RHNA Determination to the local jurisdictions in four income categories; and
- RHNA Allocation - each jurisdiction's housing need assessment in four income categories for use in updating local housing elements.

The RHNA process for the eight-year, fifth housing element cycle (January 1, 2013 – December 31, 2020) is being conducted in conjunction with the development of the 2050 Regional Transportation Plan (RTP) and its Sustainable Communities Strategy (SCS) in accordance with Senate Bill (SB) 375 (Steinberg).

RHNA/SCS Consistency

SB 375 requires consistency between the RHNA and the development pattern of the SCS. It also requires that the SCS land use pattern, and therefore the RHNA, assist the region in meeting the greenhouse gas (GHG) reduction targets set by the California Air Resources Board (CARB)

RHNA Determination

The overall regionwide housing need for the housing element cycle is based on projections from the California Department of Finance and the SANDAG 2050 Regional Growth Forecast, and on assumptions about the formation rates for new households, vacancy rates, household size, and demolitions, and data from the U.S. Census.

RHNA Methodology and Allocation

The Draft RHNA Methodology and Allocation accepted for distribution and comment by the SANDAG Board of Directors on May 27, 2011, for a 60-day public review, is based on the land use pattern in the 2050 RTP and SCS and the 2050 Regional Growth Forecast, which reflects the region's local general and community plans. These plans indicate that approximately 80 percent of our projected new housing will be multifamily, and 83 percent of our housing in 2050 will be located within a half-mile of high frequency (15 minute headways) transit service. The Draft RHNA Methodology and Allocation distributes housing in accordance with the four RHNA objectives in state law: by reflecting the region's commitment to planning for housing for all income levels in all jurisdictions, balancing jobs and housing, focusing development in our urban areas, and protecting our rural areas, open space, and habitat lands.

RHNA Process and Public Involvement

SANDAG worked with the region's planning directors (Regional Planning Technical Working Group) and Regional Housing Working Group to develop the Draft RHNA Methodology and Allocation to distribute

(Continued on reverse)

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Regionwide Distribution of RHNA Determination by Income Category
January 1, 2010 – December 31, 2020
(RHNA Projection Period)

Income Categories	%	units
Very Low	22.5%	36,450
Low	17.1%	27,700
Moderate	18.9%	30,610
Above-Moderate	41.5%	67,220
Total		**161,980**

the regionwide housing need to the 18 cities and County of San Diego in the four income categories. The development of the Draft RHNA Methodology and Allocation took place over a 12-month period during numerous public meetings conducted by the working groups, Regional Planning Committee, and SANDAG Board of Directors.

To read more about the RHNA and to comment on the Draft RHNA Methodology and Allocation, visit **www.sandag.org/rhna. Public comments will be accepted through July 28, 2011.**

Draft RHNA Methodology and Allocation*

	RHNA Allocation by Income Category						Estim. Existing Plan Capacity
	11-Year RHNA	Very Low	Low	Moderate	Above Moderate	VL + Low**	20+ du/ac
Carlsbad	4,999	912	693	1,062	2,332	1,605	1,605
Chula Vista	12,861	3,209	2,439	2,257	4,956	5,648	21,899
Coronado	50	13	9	9	19	22	270
Del Mar	61	7	5	15	34	12	12
El Cajon	5,805	1,448	1,101	1,019	2,237	2,549	13,225
Encinitas	2,353	587	446	413	907	1,033	1,293
Escondido	4,175	1,042	791	733	1,609	1,833	2,582
Imperial Beach	254	63	48	45	98	111	1,784
La Mesa	1,722	430	326	302	664	756	6,498
Lemon Grove	309	77	59	54	119	136	828
National City	1,863	465	353	327	718	818	18,200
Oceanside	6,210	1,549	1,178	1,090	2,393	2,727	4,751
Poway	1,253	201	152	282	618	353	353
San Diego	88,096	21,977	16,703	15,462	33,954	38,680	158,273
San Marcos	4,183	1,043	793	734	1,613	1,836	2,931
Santee	3,660	914	694	642	1,410	1,608	1,650
Solana Beach	340	85	65	59	131	150	262
Vista	1,374	343	260	241	530	603	1,731
Unincorporated	22,412	2,085	1,585	5,864	12,878	3,670	3,670
11-Year RHNA Totals		**36,450**	**27,700**	**30,610**	**67,220**	**64,150**	**241,817**
		22.5%	**17.1%**	**18.9%**	**41.5%**	**39.6%**	

*Table 2b. Lower Income Capacity Option. This table excerpted from the May 27, 2011 RHNA Board Report.

**Allocation proposal is based on estimated existing plan capacity, or regional allocation, whichever is lower in jurisdictions where estimated existing plan capacity is exceeded.

Appendix E

List of Related Studies and Reports

Appendix Contents

Studies/Reports Completed Since the 2030 Regional Transportation Plan (RTP) E-2

Current Studies E-9

Future Studies E-11

Studies/Reports Completed Since the 2030 Regional Transportation Plan (RTP)

Completed Studies

2050 Regional Growth Forecast (April 2011)

Since 1972, the San Diego Association of Governments (SANDAG) has produced long range forecasts of population, housing, and employment that are used as a basic resource by elected officials, planners, academics, and the general public. Among other applications, the 2050 Regional Growth Forecast is the basis for the 2050 Regional Transportation Plan (RTP).

These forecasts represent the best assessment of the changes we can anticipate for the region and its communities based on the best available information and well-proven and verified computer models. The SANDAG forecasts are meant to help policy- and decision-makers prepare for the future and are not an expression for or against growth. The forecasts are developed through a collaborative effort with experts in demography, housing, the economy, and other disciplines, and the close cooperation of the local planning directors and their staffs. The 2050 Regional Growth Forecast is included as Technical Appendix 2.

Central Interstate 5 Conceptual Improvement Program (July 2010)

In 2009, the Centre City Development Corporation (CCDC) initiated the Central Interstate 5 (I-5) Conceptual Improvement Program. This study was intended to identify ideas for improving the Central I-5 Corridor. These ideas would be subsequently refined as required by the Regional Transportation Plan (RTP) process. Staff members at the CCDC, the San Diego Association of Governments (SANDAG), the California Department of Transportation (Caltrans), the City of San Diego, the Port of San Diego, the San Diego County Regional Airport Authority, and the Metropolitan Transit System collaborated on the study.

The concept plan was initially based on the Central I-5 Corridor Study (SANDAG; June 2003), and refinements and modifications to the plan were based on more recent studies, as well as input from the involved agencies. This effort identified enhancements to the Sea World Drive and Old Town interchanges; Pacific Highway high occupancy vehicle (HOV) Lanes from Sea World Drive to downtown San Diego; Harbor Drive HOV lanes from Tidelands Avenue to downtown San Diego; I-5 Freeway HOV lanes south of I-15 connectors; and I-5 freeway ramp improvements and auxiliary lanes.

Comprehensive Freight Gateway Study (March 2010)

In March 2010, SANDAG published the Comprehensive Freight Gateway Study (Gateway Study), which forecasts regional freight traffic in San Diego and Imperial Counties through 2050. The primary objective of the Gateway Study is to give SANDAG, the Imperial County Transportation Commission, and other regional stakeholders access to timely and comprehensive information on the flow of freight. This information is used as a tool to better plan and manage a network for freight that is sustainable, particularly for the flow of freight across the border with Mexico.

The Gateway Study informed the update of the Goods Movement Strategy, a component of the 2050 RTP, by identifying

current and future freight flows and by providing insights into how freight investments impact the flow of freight, industrial development, and related economic activity. The Gateway Study is included as Technical Appendix 11.

Congestion Management Program (CMP) (November 2008)

The purpose of the state-mandated CMP is to monitor roadway congestion and assess the overall performance of the region's transportation system. Based on this assessment, the CMP contains specific strategies and improvements to reduce traffic congestion and improve the performance of a multimodal transportation system. Examples of strategies include increasing the emphasis on public transportation and rideshare programs, mitigating the impacts of new development, and better coordinating decisions for how land is used and how transportation is planned. The region opted to be exempt from the state CMP requirements in 2009.

Coordinated Public Transit – Human Services Transportation Plan (October 2010)

The Regional Short Range Transit Plan (RSRTP) provides a five-year blueprint for how public transit improvements described in the RTP are to be implemented. The federal government, through the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) now requires each region to prepare a Coordinated Public Transit and Human Services Transportation Plan (Coordinated Plan). The intent of this plan is to improve coordination in transportation planning and operations between public transit and human service transportation. Because several requirements for the RSRTP and the Coordinated Plan overlap, it was determined that the two documents should be combined. In addition to including new federal requirements, the Coordinated Plan also includes goals, objectives, and indicators that will be used to evaluate performance, as required by the Transportation Development Act of the State of California.

A key highlight of this Coordinated Plan update is the addition of information on rural transportation services and needs, based on surveys and outreach efforts specifically in rural areas. Therefore, rural area transportation information and needs are woven throughout the document.

Designing for Smart Growth, Creating Great Places in the San Diego Region (June 2009)

The quality of a community's design can make the difference between a sense of overcrowding and a feeling of vibrancy. This is particularly true where smart growth principles result in more compact development and promote a wider mix of uses.

Smart growth guidelines reflect the importance of design in maintaining and enhancing a community's character, and in creating great public places. They collectively serve as both a primer and a technical reference. Among the subjects covered are site design, street design, parking, and other topics that define a mixed-use community that offers a variety of options for transportation.

Destination Lindbergh (March 2009)

In March 2009, SANDAG, the City of San Diego, and the San Diego County Regional Airport Authority finalized the Destination Lindbergh Project. This report identified the ultimate configuration and capacity for the San Diego International Airport. Also, it

described proposed improvements for connecting the airport with the greater San Diego region with multiple modes of transportation. Destination Lindbergh is included as Technical Appendix 16.

Encinitas Grade Separated Pedestrian Crossings Combined Project Study Report/Project Report (June 2009)

SANDAG collaborated with the City of Encinitas on the development and analysis of alternatives for grade separated pedestrian crossings along the Coastal Rail corridor. Major products of this study included: an analysis of alternatives; final plans, specifications, and estimates; and an environmental document that provided the needed approvals for the construction phase under a separate project.

Escondido BREEZE Rapid (June 2011)

In June 2005, in cooperation with the City of Escondido and the North County Transit District (NCTD), SANDAG initiated the Escondido Rapid Bus project. The purpose of this project was to identify and implement improvements for a "rapid bus" connection between the Escondido Transit Center, downtown and south Escondido, and Westfield North County (North County Fair). This service also would connect to the future SPRINTER passenger rail line and I-15 Bus Rapid Transit (BRT) services.

This project corridor was identified in the MOBILITY 2030 RTP to improve local and rapid bus services. A number of transit priority measures were reviewed to improve the travel time and reliability of Route 350, without adversely impacting the local transportation system. Specific improvements include a "queue jump" lane at one of the most congested intersections along the route, transit signal priority at each intersection, and improved bus stops and shelters with real-time bus schedule information signs.

The NCTD Board of Directors, Escondido City Council, and SANDAG Transportation Committee approved the recommendations from the initial study. Preliminary engineering and design was completed in 2007, final design was completed in 2010, and the service was launched in June 2011.

Feasibility Study for the San Diego Portion of the California Coastal Trail

The California Coastal Trail (CCT) is currently made up of a series of trails stretching 1,300 miles up and down the California coastline. The Preliminary Scoping Study for the San Diego Portion of the California Coastal Trail provides a summary of planning, mapping, engineering, environmental, and funding data relevant to the California Coastal Trail. This data can provide background information for the preparation of future feasibility studies. The San Diego portion of the CCT will be made up of a series of trails running from Camp Pendleton and Oceanside to the southern border of the United States. The Feasibility Study for the San Diego Portion of the California Coastal Trail Technical Memoranda No. 1 through 5 are included as Technical Appendix 14.

Hillcrest Corridor Bus Rapid Transit Planning and Conceptual Design (Spring 2008)

This was a planning and conceptual design study of pedestrian and transit improvements in the 4th and 5th Avenue corridors in Hillcrest. Work included a conceptual design of street improvements, including transit lanes, stations, and pedestrian improvements, as well as an initial operating plan that assumes the current level of operating resources.

Intelligent Transportation Systems (ITS) Strategic Plan (August 2011)

ITS is an approach to managing Transportation networks using technology to maximize efficiency. ITS includes the application of advanced technologies like communications, sensor technologies, and other techniques to enhance the current transportation system and provide safer, efficient, and economic travel in the San Diego Region.

Whereas the 2050 RTP has a 40-year horizon, the ITS Strategic Plan looks at the next 10 years at what is possible to implement and institute in the coming decade.

The ITS Strategic Plan was developed with inputs from SANDAG's regional partners including the 18 cities within the region, the County of San Diego, Caltrans District 11, the Metropolitan Transit System, and North County Transit District. The ITS Strategic Plan documents the region's priorities for investments into TSM without regard to which agency will implement individual strategies. Instead, this plan looks at the region as a whole and how each partner can participate as a member of the whole to improve the overall transportation system network. The ITS Strategic Plan is included as a Technical Appendix 21.

Interstate 15 Interregional Partnership Phase III (February 2010)

The primary goal of this partnership is for the San Diego and Riverside regions to collaborate on planning for housing, transportation, and economic development to improve the quality of life for residents in both regions. Phase III was funded by two Caltrans grants. The first grant allowed SANDAG and the Western Riverside Council of Governments to continue with activities in all three of the areas of focus: economic development, transportation and housing. The second grant allowed SANDAG and the Riverside County Transportation Commission to improve vanpool programs that the two agencies administer, and to look at how people who use vanpools and carpools can be persuaded to instead choose transit options such as the express bus or BRT. Phase III received additional funding to develop a Strategic Implementation Plan (SIP), using a multimodal approach to reduce congestion in the I-15 corridor at the county line.

Interstate 15 Managed Lanes Implementation Study (2009)

This study described plans for a new Electronic Toll Collection System (ETCS) for the expanding I-15 Managed Lanes facility between State Route (SR) 163 and SR 78. This project is expected to build upon the recommendations from the I-15 Managed Lanes Value Pricing Study, completed in 2003, which evaluated the feasibility of allowing single occupant vehicles to use the excess capacity of the Managed Lanes. Final design and systems engineering of the ETCS and deploying the toll system has been completed. Training for I-15 Managed Lanes incident management and implementation of a Violation Enforcement systems field operational test also has been completed. The I-15 Managed Lanes Implementation Study is included as Technical Appendix 17.

Interstate 5 South Multimodal Corridor Study (December 2010)

SANDAG, in collaboration with the City of Chula Vista and Caltrans, conducted the I-5 South Multimodal Corridor Study to examine potential transportation improvements to I-5 between SR 54 and Main Street in the City of Chula Vista. Initiated in February 2009, this study will complement a larger effort by Caltrans to

prepare a highway project study report for a longer segment of I-5, from SR 15 to the international border with Mexico. In May 2010, the SANDAG Board approved Alternative 2, which includes the addition of two high occupancy vehicle (HOV) lanes, a braided freeway on\off ramp system, bus rapid transit service (BRT) on I-5, and three Trolley rail grade separations, for consideration in the development of the 2050 RTP. The I-5 South Multimodal Corridor Study is included as Technical Appendix 18.

Los Angeles-San Diego-San Luis Obispo Rail Corridor (LOSSAN) Preliminary Environmental Impact Report/Statement (PEIR/EIS) (Spring 2008)

In July 2004, Caltrans and the Federal Railroad Administration released the draft PEIR/EIS for the Los Angeles to San Diego coastal rail corridor. This document complies with federal and state environmental laws, in terms of reviewing rail improvement alternatives, demonstrating the purpose and the need for these improvements, and identifying project impacts. In some locations along the corridor, the document selects a preferred alternative. In other locations, options are identified that will require further environmental review. Caltrans finalized the document in FY 2008, following an extensive public comment period.

Mid-City Interstate 15 Transit Station Study (June 2009)

Due to operational safety issues surrounding centerline stations that were previously proposed on I-15 in Mid-City, SANDAG, Caltrans, and the City Heights community developed a design for bus rapid transit stations. This effort was conducted in conjunction with community planning for transit-oriented development. The goal was to have the stations built by the time that I-15 BRT service begins in 2012. The Mid-City I-15 Transit Station Study was completed in June 2009. Four alternatives were selected for a future environmental analysis, and a draft of the analysis was released on December 30, 2010. A final environmental document was released on June 30, 2011.

Mid-City Rapid Bus Project Development (Summer 2008)

Service and phasing plans for the introduction of rapid bus service for Mid-City will be developed through this project. Preliminary engineering (PE), final design, environmental work for the implementation of rapid bus service in the Mid-City communities, and an outline PE/environmental work for the Park Boulevard segment were completed. Staff has coordinated with the Federal Transit Administration and will be receiving a Very Small Starts grant. Phase I of the project is scheduled start service in 2012.

Regional Aviation Strategic Plan and Airport Multimodal Accessibility Plan (RASP – March 2011; AMAP – June 2011)

SANDAG and the San Diego County Regional Airport Authority are engaged in a two-pronged process to plan for improved infrastructure that will be needed to accommodate air traffic in the region, as well as surface transportation that will serve airport facilities.

Senate Bill 10 of 2007 (SB 10) requires airport multimodal planning to be conducted and coordinated by SANDAG and the Authority. The main planning provisions of SB 10 include the development of a Regional Aviation Strategic Plan (RASP) and an Airport Multimodal Accessibility Plan (AMAP).

The Authority is the lead for the RASP, which identified workable strategies to

improve the performance of the regional airport system. SANDAG is the lead for the AMAP, which is developing a multimodal strategy to improve surface transportation to airports.

The development of the RASP and AMAP is a coordinated process between the Authority and SANDAG. While the Authority is the lead for the aviation demand, capacity, and airport infrastructure components to be completed for the RASP, these studies were incorporated into the AMAP – particularly the first phase of the AMAP, the Regional Air Rail Network Study. The RASP identified the airport infrastructure needed to meet future aviation demands. The AMAP identified surface transportation infrastructure needs associated with future airport expansion. The RASP and the AMAP are included as Technical Appendix 12.

Regional Comprehensive Plan 2009 Performance Monitoring Report (September 2010)

The Regional Comprehensive Plan (RCP) describes using performance indicators as tools to track progress in implementing the plan. Many of the strategies and actions recommended in the RCP will take years to develop and fund. Therefore, it is important to have a consistent and valid set of indicators that can reflect sometimes subtle changes that occur over the long run. Future performance monitoring reports on these indicators will be used to assess how the RCP is influencing the quality of life in the region.

The RCP Baseline Report for Performance Monitoring was completed in November 2006, and it established a benchmark for future monitoring. The 2009 RCP Monitoring Report is the third to be published since the 2006 Baseline Report.

Riding to 2050, the San Diego Regional Bicycle Plan (May 2010)

The San Diego Regional Bicycle Plan was adopted to provide a regional strategy for making the bicycle a useful form of transportation for everyday travel. It was developed to support implementing the RCP and RTP. The San Diego Regional Bicycle Plan includes a bicycle network, as well as the programs that are necessary to support it.

The Bicycle Plan also would lead to benefits to public health by encouraging more people to exercise by riding a bicycle on at least some of their trips. The San Diego Regional Bicycle Plan provides detailed information on the structure of the Regional Bicycle Network, the policies and programs that support it, and the benefits of implementing the Regional Bicycle Plan. The San Diego Regional Bicycle Plan is included as Technical Appendix 13.

San Diego Region Aggregate Supply Study (January 2011)

The San Diego Region Aggregate Supply Study is an analysis of aggregate supply in the region. SANDAG, in cooperation with Caltrans District 11, examined issues related to the supply of aggregate in order to begin developing a framework for managing projected shortfalls.

The objectives of the study are to provide a comprehensive review of aggregate sources in the region; clarify regional needs for aggregate; understand what affects the supply of aggregate; develop a regional geographic information system (GIS) database for visualizing aggregate sources; and develop tools that local governments can use to identify potential aggregate sites and estimate how air quality would be impacted by mining.

San Diego-Imperial County I-8 Corridor Strategic Plan (February 2009)

The San Diego-Imperial County I-8 Corridor Strategic Plan was developed by the Imperial Valley Association of Governments in collaboration with SANDAG and Caltrans District 11. The plan comprises the first phase of a planning effort to improve mobility for people and goods along the I-8 freeway corridor between San Diego and Imperial counties. The Strategic Plan recognizes that economic conditions, population growth, environmental conditions and other dynamics all interact to influence traffic. The plan looks holistically at these traffic-related issues, and it provides direction for planning. The San Diego-Imperial County I-8 Corridor Strategic Plan is included as Technical Appendix 19.

San Diego Station Car Pilot Program Study (Summer 2008)

SANDAG conducted a Station Car Pilot Program Study that consisted of two parts. The first was a marketing study and operations plan, and the second was implementation of the car sharing demonstration program. The San Diego Station Car Pilot Program Study served as a two-year demonstration to measure the market demand for car sharing, specifically station car services, and to outline the implementation plan necessary for sharing cars in San Diego.

Smart Growth Concept Map Update (July 2008)

In 2006, SANDAG accepted the initial Smart Growth Concept Map for the San Diego region. In July 2008, the SANDAG Board accepted an updated Concept Map. The Concept Map contains nearly 200 locations in seven smart growth categories identified in the RCP. The seven smart growth "place types" include: the Metropolitan Center, Urban Centers, Town Centers, Community Centers, Rural Villages, Mixed Use Transit Corridors, and Special Use Centers. This reflects the notion that smart growth is not a "one-size-fits-all" endeavor.

Smart Growth Trip Generation and Parking Study (June 2010)

Smart growth developments are generally perceived to generate fewer auto trips and less demand for parking, compared with conventional developments, because these developments promote the use of public transit, walking, and bicycling. Current guidelines for trip generation and parking supply are based on conventional suburban development, which can impose a burden on developers and jurisdictions to provide more roadway and parking capacity than is necessary. Applying trip generation and parking demand rates appropriate for smart growth development could result in cost savings for jurisdictions, developers, homebuyers, and renters.

SANDAG prepared the studies "Trip Generation for Smart Growth: Planning Tools for the San Diego Region" and "Parking Strategies for Smart Growth: Planning Tools for the San Diego Region" to identify trip generation rates and parking demands associated with smart growth developments. The trip generation and parking demand guidelines update the "SANDAG San Diego Traffic Generators Manual," a guide to trip generation rates in the San Diego region, and "Designing for Smart Growth: Planning Tools for the San Diego Region," smart growth design guidelines published by SANDAG in 2009. The guidelines are available for jurisdictions to use in local planning efforts.

Smart Parking Research Pilot Project (June 2010)

SANDAG, Caltrans, NCTD, and the Federal Highway Administration (FHWA) worked jointly to implement QuickPark, a Smart Parking Research Pilot Project at select COASTER stations. Smart parking uses modern technologies to deliver an effective parking management system.

A study funded by the federal and state governments evaluated how cost-effective smart parking technologies can be used to improve parking management; provide customers with information on available parking; evaluate pricing strategies; and develop parking management business models. Providing convenient and reliable access to parking is essential for making transit more competitive to driving alone.

State of the Commute – Performance Monitoring Report (June 2011)

The State of the Commute report is prepared for the *TransNet* Independent Taxpayer Oversight Committee. The 2010 Report documented how the freeway, transit, and some local arterial network systems are performing; identified transportation performance bottlenecks; and documented the effects and benefits associated with completed *TransNet* or other capital project investments.

State Route 67 Project Study Report (PSR) (November 2008)

Caltrans developed this PSR to convert the existing State Route from a two-lane conventional roadway to a four-lane conventional highway. The PSR included an examination of possible alternatives for median barriers, and some operational improvements as they may pertain to future traffic analyses.

Transit Impediments Study (September 2009)

The Transit Impediments Study summarizes both financial and ridership impediments to maintaining long-term transit service levels throughout San Diego County. The report also details potential alternatives for overcoming these impediments, increasing and maintaining service levels, and increasing and maintaining funding for transit operational expenses.

Tribal Transportation Demand Management Outreach Project (February 2009)

The objective of this project was to partner with the Reservation Transportation Authority (RTA) to strengthen participation by tribal nations in the San Diego region in the regional Transportation Demand Management (TDM) program. SANDAG, the RTA, and the Southern California Tribal Chairmen's Association (SCTCA) collaborated on an assessment of the needs of tribal employers; developed a strategy to meet their needs; and assisted the RTA in setting up a tribal Transportation Management Association (TMA) that collaborated with the SANDAG iCommute program. The tribal TMA, a private, non-profit, member-controlled organization, provided the institutional framework for the recommended TDM programs and services developed as a result of the study.

Current Studies

Coordinated Public Transit-Human Services Transportation Plan (2011)

The Coordinated Public Transit-Human Services Transportation Plan (Coordinated Plan) provides a framework for transit and social service transportation development over the next five years. SANDAG was designated by the State of California as the agency responsible for the preparation of

the federally mandated Coordinated Plan. The Plan also incorporates the Regional Short Range Transit Plan required by the SANDAG Board of Directors, as well as service monitoring required by the state Transportation Development Act. The Coordinated Plan is updated annually. The Coordinated Plan (2010) is included as Technical Appendix 10.

High-Speed Rail Plan (2013/2014)

The California High-Speed Rail Authority (Authority) is the state agency responsible for planning, constructing, and operating a high-speed train system that serves California's major metropolitan areas, including San Diego.

The proposed system would stretch more than 800 miles, connecting San Diego, Los Angeles, the Central Valley, San Francisco, and Sacramento. San Diego would be connected from Los Angeles via the Inland Empire. High-speed train (HST) service along the Inland Corridor would parallel I-215 and I-15 and extend south to downtown San Diego. HST service on the coastal corridor would extend no farther south than Irvine, because of environmental constraints along the coast and in coastal communities between South Orange County and San Diego. Between Los Angeles and Irvine, HST service would share the corridor with existing Amtrak intercity service, Metrolink commuter rail service, and freight.

iCommute Strategic Plan (Summer 2012)

The iCommute Strategic Plan (Strategic Plan) is a five-year implementation plan for all of the SANDAG TDM programs. These include vanpool, carpool, SchoolPool, Buspool, and the Regional Bike Program. The purpose of the Strategic Plan is to outline measurable objectives, describe actions to achieve those objectives, and define performance measures to evaluate progress. These objectives support the goals of other SANDAG plans and initiatives, including the RTP, RCP, the Regional Bicycle Plan, and the Climate Action Strategy.

Performance Measurement System (PeMS) (2011)

PeMS is a joint effort by Caltrans, U.C. Berkeley, Partners for Advanced Transit and Highways, and Berkeley Transportation Systems. SANDAG has partnered with these agencies in the past to expand the capabilities of PeMS to provide transportation performance data tailored to the San Diego region including the development of a multimodal performance measurement and evaluation tool. Specifically, this includes completing the arterial (A-PeMS) and transit (T-PeMS) module. PeMS will allow the region to track "door-to-door" travel times. The A-PeMS module was completed in 2010. Work will continue to develop the T-PeMS module, and integrate it with the PeMS statewide system.

Regional Transit Passenger Counting Program (PCP) (Ongoing)

The PCP fulfills a Federal Transit Administration (FTA) requirement for transit operators, and it provides data required for local transit planning and performance monitoring. This project also manages estimation counts for riders of the Trolley and SPRINTER, which are required by the FTA and are used to manage local revenue-sharing requirements between MTS and NCTD.

State Route 11 and Otay Mesa East Port of Entry (POE) Environmental Reports (November 2011)

In collaboration with SANDAG, Caltrans is conducting the initial phases of environmental studies for the development

of SR 11. This road will connect SR 125 and SR 905 in the United States. In Mexico, the corridor will connect the new POE to the Tijuana-Tecate and Tijuana-Ensenada free and toll roads. SR 11 will include two travel lanes in each direction, and a new Commercial Vehicle Enforcement Facility.

In June 2008, the U.S. General Services Administration (GSA) and U.S. Customs and Border Protection completed a feasibility study of the proposed Otay Mesa East POE. GSA, in partnership with Caltrans, began a program development study for the Otay Mesa East POE in fall 2008.

The Final Phase I PEIR/PEIS for SR 11 and the Otay Mesa East POE was completed in August 2008, and the Federal Highway Administration approved it in October 2008. The Tier II EIS/EIR is underway and it will be completed in 2012.

State Route 78 Corridor Study (Spring 2012)

The SR 78 Corridor Study is evaluating the feasibility of toll and non-toll alternatives to address future regional and local travel demand within this regionally significant corridor. The study area includes SR 78 from I-5 to I-15, and includes participation from SANDAG, Caltrans, local jurisdictions, and other key stakeholders.

TransNet Environmental Mitigation Program (EMP) (ongoing)

The *TransNet* Extension Ordinance and Expenditure Plan, approved by voters in November 2004, includes an EMP. The EMP is a funding allocation category for the costs associated with mitigating habitat impacts from regional transportation projects. The EMP is a unique component of the *TransNet* Extension, because it goes beyond traditional mitigation for transportation projects by including a funding allocation for acquiring habitat, and managing and monitoring those habitats as needed to help implement the Multiple Species Conservation Program and the Multiple Habitat Conservation Program. This funding allocation is tied to mitigation requirements and the environmental clearance approval process for projects outlined in the RTP.

Urban Area Transit Strategy (October 2011)

SANDAG crafted a new vision for public transit as part of its 2050 RTP with the development of the Urban Area Transit Strategy, an innovative transit network within the San Diego region.

The goals of the transit strategy are two-fold: first, to maximize transit ridership in the greater urbanized area of the region; and second, to test the role of the transit network to reduce vehicle miles traveled and greenhouse gas emissions. This study will be finalized as part of the 2050 RTP. The Urban Area Transit Strategy is included as Technical Appendix 7.

Future Studies

Connected Vehicle Development Program (2013)

This project will conduct planning and deployment of the local Phase I pilot test bed environment to complement the I-15 Integrated Corridor Management project. It will prepare the San Diego region for an expected 2013 federal rule that will mandate vehicles to be connected to an intelligent communications infrastructure.

Regional Comprehensive Plan Update (Fall 2013)

The RCP serves as the long-term planning framework for the San Diego region. It provides a broad context in which local and regional decisions can be made that move the region toward a sustainable future – a

future with more choices and opportunities for all residents of the region. The RCP will be updated after the 2050 RTP is adopted.

Regional Safe Routes to School Strategic Plan (March 2012)

The Regional Safe Routes to School Strategic Plan will provide a framework to support the region's local communities and schools as they implement programs that enable students to walk and bike to school safely and routinely. The plan will detail actions, implementing agencies, and the estimated costs of effectively implementing the Safe Routes to School Strategy, which is delineated in the 2050 RTP. The draft plan is anticipated in November 2011, and the final plan is expected to be completed in March 2012.

Trucks on Managed Lanes Study (2013)

This study will assess opportunities and feasibility for improved operations, safety, and efficiency on freeways in the San Diego region by exploring options for Truck Managed Lanes (TML). Based on the evaluation of TML strategies, the study will identify two test corridors to determine the most effective and feasible set of alternatives for TML on regional freeways.

Appendix F:

Glossary

Appendix Contents

Glossary of Transportation Terms,
Abbreviations, and Acronyms F-2

Glossary of Transportation Terms, Abbreviations, and Acronyms

2050 Regional Growth Forecast
The 2050 Regional Growth Forecast was accepted for use in planning studies by the SANDAG Board of Directors in 2010. The forecast is based on the General and Community Plans of each of the region's 19 jurisdictions.

ADA
Americans with Disabilities Act: The federal civil rights legislation for disabled people that was passed in 1990; it requires public transportation systems to be more fully accessible; includes the provision of paratransit service.

Active Transportation
Active Transportation includes any method of travel that is human-powered, but most commonly refers to walking and bicycling.

ADT
Average Daily Traffic: The average number of vehicles that travel on a given roadway in a 24-hour period on a weekday.

Air Cargo
Revenue-producing items in domestic or international air commerce, composed of freight, express, and mail, but excluding passenger baggage.

Air Carrier
An aviation operator that provides regular round-trips per week between two or more points, and publishes flight schedules that specify the times, days of the week, and places between which such flights are performed; or that transports mail by air pursuant to a contract with the U.S. Postal Service.

Alternative Transportation Fuels
Low polluting fuels that are used to propel a vehicle, in place of petroleum-based gasoline or diesel fuels. Examples include biodiesel, electricity, ethanol, propane, compressed natural gas, and liquid natural gas.

Amtrak
The National Railroad Passenger Corporation, or Amtrak, is the nation's intercity passenger rail provider. Amtrak operates trains in partnership with 15 states and four commuter rail agencies.

Annual Service Miles
The number of miles that all transit vehicles travel each year in scheduled transit service operations, or when carrying passengers in door-to-door transit service.

APCD
Air Pollution Control District: The APCD is a government agency that regulates sources of air pollution within San Diego County. The County Board of Supervisors sits as the Air Pollution Control Board.

Apportionment
A federal budgetary term that refers to a statutorily prescribed division of assigned funds. It is based on formulas prescribed by law.

APS
Alternative Planning Strategy: Senate Bill 375 (SB 375) provides that if the sustainable communities strategy falls short of meeting the regional greenhouse gas reduction targets from passenger vehicles, the region must prepare an "alternative planning strategy" that, if implemented, would meet the targets.

ArcInfo
A geographic information system (GIS) that can be used to maintain, manipulate, and display transportation, land use, and demographic data.

Arterial
Streets with traffic lights that serve primarily to carry traffic through an area as quickly and efficiently as possible.

Arterial Rapid Transit (also known as Rapid Bus)
Provides rapid and frequent transit service along arterials that use signal priority and queue jumper lanes at major intersections.

Arterial Management System
A hardware and software system that enables local agencies to coordinate the timing of traffic signals across jurisdictional boundaries; optimize the flow of traffic on regionally significant arterials; manage traffic caused by special events and major accidents; and coordinate arterial signals with freeway ramps, transit service, and rail grade-crossings.

Auxiliary Lane
An additional freeway lane between adjacent interchanges that improves the weaving conflicts between exiting and entering vehicles.

AVL
Automated Vehicle Location: A transportation device that uses the coordinates from earth-orbit satellites to determine the precise location of a vehicle on the earth's surface. AVL is used to manage taxi, bus, and commercial vehicle fleet operations.

Bikeway Classifications
As defined by the Manual on Uniform Traffic Control Devices:

- Class I Bike Path: A paved shared-use path within an exclusive right of way
- Class II Bike Lane: Signed and striped lanes within a street right of way
- Class III Bike Route: Preferred routes on existing streets identified by signs only
- Shared Lane Marking or "Sharrow:" Provides positional guidance to bicyclists on roadways that are too narrow to be striped with bicycle lanes and to alert motorists of the location a cyclist may occupy in the roadway

BRT
Bus Rapit Transit: Corridor-level services providing fast and frequent transit services that are designed to take advantage of freeway improvements such as High Occupancy Vehicle (HOV) and Managed Lanes in order to serve longer distance regional trip-making.

CAA
Clean Air Act: Federal legislation that sets national air quality standards and requires each state with areas that have not met federal air quality standards to prepare a State Implementation Plan, or SIP. The 1990 amendments to the CAA, often referred to as the CAAA, established new air quality requirements for the development of metropolitan transportation plans and programs. The California Clean Air Act (CCAA) sets more stringent standards for state air quality.

CAAA
Clean Air Act Amendments of 1990: Federal legislation that established criteria for attaining and maintaining federal air quality standards for allowable concentrations and exposure limits for various air pollutants. The legislation also provides emissions standards for specific vehicles and fuels.

Caltrans
California Department of Transportation: The state agency responsible for the design, construction, operation, and maintenance of the state highway system. The State system includes interstate freeways and state highways.

CARB
California Air Resources Board: The state agency responsible for adopting state air quality standards, establishing emission standards for new cars sold in the state, overseeing activities of regional and local air pollution control agencies, and setting regional targets for reducing greenhouse gas emissions from passenger vehicles.

Carpool
An arrangement in which two or more people share the use of a privately-owned automobile to travel together to and from pre-arranged destinations — typically between home and work or home and school.

Carsharing
Organized short-term auto rental, often located in downtown areas near public transit stops as well as near residential communities and employment centers. Carsharing organizations operate fleets of rental vehicles that are available for short trips by members who pay a subscription fee, plus a per trip charge.

CCAA
California Clean Air Act: A California law passed in 1988 that provides the basis for air quality planning and regulation, independent of federal regulations.

CCI
Construction Cost Index: A measurement of the inflation rate in the cost of major construction projects.

CHP
California Highway Patrol: The state law enforcement agency responsible for highway safety.

CHSRA
California High Speed Rail Authority: It was created by the California Legislature in 1996 to develop a plan for the construction, operation, and financing of a statewide, intercity high speed passenger rail system.

CMIA
Corridor Mobility Improvement Account: A $4.5 billion congestion relief component of Proposition 1B, a measure approved by voters in 2006 that provides nearly $19.9 billion in infrastructure bonds.

CMAQ
Congestion Mitigation and Air Quality Improvement Program: A category of funds contained in SAFETEA-LU for projects and activities that reduce congestion and improve air quality in regions not yet attaining federal air quality standards.

CMP
Congestion Management Program: Required of every county in California with a population of 50,000 or more to qualify for certain state and federal funds. CMPs set performance standards for roads and public transit, and show how local agencies will attempt to meet those standards. The CMP is required to be adopted by the Congestion Management Agency, and it must be consistent with the adopted Regional Transportation Plan (RTP). The San Diego region elected to be exempt from the California State CMP in October 2009.

CNG
Compressed Natural Gas: A clean-burning alternative fuel for vehicles.

COG
Council of Governments: A voluntary organization of local governments that strives for comprehensive regional planning. SANDAG is the COG in the San Diego region.

Community Plan
More specific versions of General Plans, generally dealing with smaller geographical areas, but having the same force of law. See General Plan.

Commuter
A person who travels regularly between home and work or school.

Commuter Rail
Conventional rail passenger service within a metropolitan area. Service primarily is in the morning (home-to-work) and afternoon (work-to-home) travel periods.

Compass Card
A payment system that utilizes smart card technology to enable transit customers to board vehicles more quickly. The Compass Card stores monthly, 30-day, and 14-day transit passes.

Conformity
A demonstration of whether a federally-supported activity is consistent with the SIP — per Section 176 (c) of the Clean Air Act. Transportation conformity applies to plans, programs, and projects approved or funded by the Federal Highway Administration or the Federal Transit Administration.

Congestion
Congestion is usually defined as travel time or delay in excess of what is normally experienced under free-flow traffic conditions. Congestion is typically accompanied by lower speeds, stop-and-go travel conditions, or queuing, such as behind ramp meters or heavily-used intersections.

Corridor
A broad geographical band that follows a general directional flow connecting major trip origins and destinations. A corridor may contain a number of streets, highways, and transit route alignments.

CPI
Consumer Price Index: Developed by the Bureau of Labor Statistics of the U.S. Department of Labor to provide a measurement of the inflation rate in the general economy of a given metropolitan area.

CTC
California Transportation Commission: A state agency that sets state spending priorities for many state and federally funded highway and transit projects and allocates funds to those projects. CTC members are appointed by the governor.

CVO
Commercial Vehicle Operations: The segment of the surface transportation system involved in the movement of commercial goods or freight. Commercial vehicles are generally trucks and rail cars. The management of these fleets and the movement of freight, including its movement through ports of entry, intermodal transfer facilities, and other services is referred to as commercial vehicle operations.

DEFM
Demographic and Economic Forecasting Model: DEFM is an econometric forecasting model with a demographic module. It produces annual forecasts of the size and structure of the region's economy and a demographic forecast consistent with that future economy. Outputs include data such as the size and composition of the region's population, employment by industrial sector, household and personal income, and housing units by structure type, vacancy status and persons per household, labor force, and school enrollment.

Demand Responsive Service
Transit service that is provided in response to a pre-ordered or telephone reservation.

Development Impact Fee
A fee charged to private developers, usually on a per-dwelling-unit or per-square-foot basis, to help pay for infrastructure improvements necessitated as a result of the development.

Diamond Awards
A program sponsored by SANDAG that honors employers who have developed, maintained, and marketed superior transportation benefit programs for their employees.

DOT
Department of Transportation: At the federal level, the cabinet agency headed by the Secretary of Transportation that is responsible for highways, transit, aviation, and ports. The DOT includes the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Federal Aviation Administration (FAA), and other agencies. The state DOT is Caltrans.

Drive Alone
See SOV.

EAP
Early Action Program: A variety of high-priority *TransNet* transportation projects that have been accelerated into construction. Projects include highway, transit, and goods movement.

EIR
Environmental Impact Report: A detailed statement prepared under the California Environmental Quality Act (CEQA) that describes and analyzes the significant environmental effects of a project and discusses ways to mitigate or avoid the effects.

EMP
Environmental Mitigation Program: Provides *TransNet* funding for the mitigation of local and regional transportation projects and additional funding for activities that help implement the region's habitat preservation plans.

Environmental Justice
The fair treatment of people of all races, cultures, and incomes during the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies.

EPA
See U.S. EPA.

E-work
See Telework.

Expressway
Similar to a freeway, but with some signal-controlled intersections.

FAA
Federal Aviation Administration: The federal agency that regulates the use of airspace and is responsible for evaluating and disseminating information about hazards and obstructions to aviation. FAA is a component of the federal DOT.

Farebox Recovery Ratio
The proportion of operating expenses covered by passenger fares. The ratio divides the farebox revenue by the total operating expenses.

Farebox Revenue
The value of cash, tickets, and pass receipts given by passengers for payment for rides on public transit.

Fare Structure
The varying fees charged to use transit, normally differing by the age of the transit rider, single versus multiple transit trips, the

type of service (Trolley, express bus, etc.), and, for some types of services, the length of the trip.

FHWA
Federal Highway Administration: The federal agency responsible for the administration of federal highway funds, and issuing policy and procedures for implementing federal legislative directives. FHWA is a component of the federal DOT.

Fiscal Year
The 12-month period established for budgeting purposes. In California, the commonly accepted fiscal year for governmental purposes begins on July 1 and ends on June 30.

Fixed Route Service
Service provided on a regular, fixed-schedule basis along a specific route, with vehicles stopping to pick up and deliver passengers to specific locations.

Freeway
A divided highway with limited access and grade-separated junctions, and without traffic lights or stop signs.

FSP
Freeway Service Patrol: An ongoing program to provide a roving tow and motorist aid service, with technicians who assist or remove stranded and disabled vehicles on designated urban freeways and state roadways during peak period commuting hours. It is operated by SANDAG in cooperation with Caltrans and the California Highway Patrol.

FTA
Federal Transit Administration: The federal agency responsible for administering federal transit funds. FTA is part of the federal DOT.

Gas Tax
The tax applied to each gallon of fuel sold. Currently, the federal government has imposed a per-gallon tax of 18.4 cents, and the state has imposed a per-gallon excise tax of 35.3 cents per gallon.

General Plan
A policy document required of California cities and counties by state law that describes a jurisdiction's future development in general terms. All land use decisions must be derived from the document, which includes text, maps, and other information. The General Plan contains a set of broad policy statements about the goals for the jurisdiction, and it also must contain seven mandatory elements: Land Use, Circulation, Housing, Conservation, Open Space, Noise, and Safety.

GHG Emissions
Greenhouse Gas Emissions: Gases that influence global climate change. They include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

GIS
Geographic Information System

Grade Separation
A physical and/or structural separation between intersecting roads and/or railway tracks. One road or railway track typically travels over or under the other via an overpass, tunnel, or other structure.

GRH
Guaranteed Ride Home: A program that provides a free taxicab ride or 24-hour car rental up to three times per year to those who carpool, vanpool, use premium bus service or the COASTER train, or bike to work, in the event of an unscheduled incident, overtime, or illness.

HCM
Highway Capacity Manual: A resource for generating technical information that is used by transportation planners, designers, and operators. The materials contained in the HCM represent a collection of state of the art techniques for estimating level of service for many transportation facilities and modes.

Heavy Rail
Railroad services that operate in a mixed-user environment on conventional railroad tracks. Heavy rail services include freight trains, Amtrak, Commuter Rail, and most conventional rail transit systems.

Highway
A general term usually referring to a state or federally-designated urban or rural route, designed to accommodate longer trips in the region.

Household
All people living in a housing unit, regardless of whether they are related to one another. Housing units include houses, condominiums, apartments, and mobile homes.

HOT Lane
High Occupancy Toll Lane: HOT lanes are limited access lanes in which carpools, vanpools, and buses travel for free, while other vehicles gain access by paying a fee.

HOV
High Occupancy Vehicle: A vehicle that carries more than one occupant. Examples include carpools, vanpools, shuttles, and buses.

HOV Lane
High Occupancy Vehicle Lane: An exclusive road or traffic lane that typically has a higher operating speed and lower traffic volumes than a general purpose or mixed-flow lane. In California, vehicles that typically can use HOV lanes include carpools, vanpools, buses, other multi-passenger vehicles, and motorcycles and emergency vehicles.

HSR
High Speed Rail: Railroad passenger service that, as defined by California state law, operates at maximum speeds of more than 200 miles per hour. Because of the speed, high speed rail normally operates on intercity (longer) routes.

ICM
Integrated Corridor Management: A collaborative, cooperative, and coordinated system in which corridor partners work together to improve mobility and safety across modes and networks for people and goods.

iCommute
The San Diego regional rideshare program that provides information to commuters and employers on commute choices, such as carpooling, vanpooling, public transportation, bicycling, and telecommuting. iCommute operates a carpool ridematching service, the San Diego Regional Vanpool Program, the San Diego Regional Bike Locker Program, and the Guaranteed Ride Home Program.

I-15 FasTrak®
The I-15 FasTrak® Program uses electronic toll collection technology to employ dynamic pricing that allows solo drivers to use the lanes for a fee. The net revenues generated by the program are used to improve transit and carpool services along the I-15 corridor.

I-15 IRP
I-15 Interregional Partnership: The I-15 IRP is a voluntary partnership of local officials representing SANDAG and the Western Riverside Council of Governments. The I-15 IRP is working to identify and prioritize issues as well as implement recommended short- and long-term solutions related to the jobs/housing imbalance and traffic congestion along the north I-15 corridor.

Incident
An incident may be a traffic collision, stalled vehicle, load spillage, or other event that affects one or more lanes of traffic.

Integrated Performance Management Systems Network
This network will connect the region's local transportation management centers, and will enable agencies to cooperatively manage the overall performance of the local and regional transportation systems.

Intercity Rail
Railroad passenger service that primarily serves longer trips, such as those between major cities or regions.

Intermodal
Passenger or freight transportation services which involve or use more than one type of transportation facility (or mode). Aviation, automobile, rail, and transit are travel modes.

ITS
Intelligent Transportation Systems: A general classification of transportation technologies, management tools, and services made possible through advances in computer and communication technologies. ITS is used to make transportation systems safer and more efficient.

JARC
Jobs Access Reverse Commute: The SAFETEA-LU formula fund program that provides support for capital or operating costs for transportation services and facilities designed to facilitate reverse commute employment-related travel for people with limited means.

LEP
Limited English Proficiency

Light Rail
A passenger transportation system of self-propelled vehicles that operate over steel rails located in the street, on an aerial structure, or on a separated right of way.

LIM
Low Income and Minority communities

LNG
Liquefied Natural Gas: An alternative liquid fuel derived from a natural gas that is cooled to below its boiling point so it becomes a liquid.

LOS
Level of Service: A qualitative measure describing operational conditions within a traffic stream and motorists' perceptions of those conditions. LOS ratings typically range from LOS A, which represents free-flow conditions, to LOS F, which is characterized by heavy congestion, stop-and-go traffic, and long queues forming behind breakdown points.

LOSSAN
Los Angeles-San Diego-San Luis Obispo (LOSSAN): The LOSSAN Rail Corridor Agency coordinates planning and programming on the coastal rail line. SANDAG, Metropolitan Transit System, and North County Transit District are voting members of LOSSAN, along with regional transportation planning agencies in Orange, Los Angeles, Ventura, Santa Barbara, and San Luis Obispo counties. LOSSAN sets priorities for improvements in the corridor that will increase the capacity of the rail line and the reliability of service.

Low Community Engagement Community of Concern
A Low Community Engagement Community of Concern is any community in which 20 percent or more of households do not speak English as a primary language and do not speak English well, and/or 20 percent or

more of the population aged 25 and older have less than a high school education.

Low Income Community of Concern
A Low Income Community of Concern is any community in which 33 percent or more of households are low income, and/or 10 percent or more of the households are severely overcrowded, and/or 25 percent or more of the population is in poverty.

Low Mobility Community of Concern
A Low Mobility Community of Concern is any community in which 25 percent or more of households have no auto available, and/or 25 percent or more of the population is disabled, and/or 20 percent or more of the population is aged 75 or older.

LRT
Light Rail Transit: A type of transit vehicle and service that uses steel wheels and operates over railroad tracks. LRT systems generally serve stations averaging one-mile apart, are not remotely controlled, and can operate in a separated right of way or on public streets. The San Diego Trolley and the SPRINTER are LRT systems.

Managed Lanes (or Express Lanes)
These lanes provide access for carpools, vanpools, bus, and solo drivers who pay a fee to use the lanes. The lanes can be barrier-separated and some lanes can be reversed to go with the flow of traffic.

Minority Community of Concern
A Minority Community of Concern is any community in which 65 percent or more of the population is non-White.

Mixed-Use
The combining of commercial, office, and residential land uses to provide easy pedestrian access and reduce the public's dependence on driving. It can be implemented in multi-story buildings containing businesses and retail stores on the lower floors, and homes on the upper floors.

Mode
One of the various forms of transportation, including automobile, transit, bicycle, and walking. Intermodal refers to the connection between modes; multimodal refers to the availability and/or use of multiple transportation modes.

Mode Split or Mode Share
The percentage of trips that use each of the various travel modes.

MPO
Metropolitan Planning Organization: A federally-designated agency that is responsible for regional transportation planning in each metropolitan area. SANDAG is the MPO for the San Diego region.

MTS
San Diego Metropolitan Transit System: The agency created by the California legislature to operate in 570 square miles of the urbanized areas of San Diego County, as well as in the rural parts of East County. The system covers 3,240 total square miles, providing service to more than 2 million San Diego residents.

NAFTA
North American Free Trade Agreement: A formal agreement between Canada, Mexico, and the United States to promote ways to improve and increase free trade among the three countries.

NCTD
North County Transit District: The agency created by the California legislature to operate transit facilities in the North San Diego County. Its geographical boundary encompasses 1,020 square miles of North San Diego County extending from Del Mar in the south, northeasterly to Escondido, north to the Riverside County line and west to the

Orange County line. The 2010 total population of NCTD's service area is estimated at over 900,000 residents.

Non-Attainment Area
A geographic area identified by the U.S. EPA and/or the CARB as not meeting either the national or California Ambient Air Quality Standards for a given pollutant.

Off-Peak Period
The time of day when the lowest concentration of vehicles or transit riders are on the road or on another transit facility. These times are generally before 6 a.m., between 9 a.m. and 3 p.m., and after 6 p.m.

Paratransit
A specialized, door-to-door transport service for people with disabilities who are unable to use standard bus or commuter rail services.

Park-and-Ride
A travel option in which commuters park their personal vehicles in a public lot or other location, and continue their trip via carpool, vanpool, or transit.

Park-and-Ride Lot
A facility where individuals can meet to utilize carpools, vanpools, and public transit to continue traveling to their destinations.

Passenger Miles
The total number of passengers carried by a transit system, multiplied by the number of miles each passenger travels. Passenger miles are normally measured on a daily or annual basis.

Peak Period
The time of day when the highest concentrations of vehicles or transit riders are on the road or on another transit facility. The morning peak period is generally considered to be from 6 to 9 a.m.; the afternoon peak period is from 3 to 6 p.m.

PeMS
Performance Monitoring System: The PeMS program uses urban freeway data collected through freeway loop detectors to provide current, ongoing data on freeway volumes and speeds that can be displayed graphically and exported to other monitoring applications.

Performance Measures
Objective, quantifiable measures used to evaluate the performance of the transportation system, and to determine how well planned improvements to the system are achieving established objectives.

Person Trip
Any person's one-way travel to any destination for any purpose. More specifically, a trip is the one-way movement from an origin to a destination, whereby each trip has two trip ends.

PTC
Positive Train Control: It is a state-of-the-art train signaling and communication system that improves the efficiency of operations and enhances safety.

POE
Port of Entry: Trans-border facilities that process conveyances, passengers, and goods entering and exiting the United States.

PSR
Project Study Report: A preliminary engineering report that documents agreements on the scope, a set of reasonable and feasible alternatives, the schedule, and the estimated cost of a project so that the project can be included in a future State Transportation Improvement Program (STIP).

Public Transit
See Public Transportation

Public Transportation
Travel by bus, rail, or other vehicle, either publicly or privately owned, that provides general or specialized service on a regular or continuing basis.

Ramp Metering
Electronic traffic control devices located at freeway access points to meter the entry of vehicles onto the freeway. The goal is to help optimize the movement of persons and vehicles.

Rapid Bus (also known as Arterial Rapid Transit)
Provides rapid and frequent transit service along arterials that use signal priority and queue jumper lanes at major intersections.

RAQS
Regional Air Quality Strategy: The San Diego County Air Pollution Control District developed the Regional Air Quality Strategy (RAQS) pursuant to California Clean Air Act requirements. It identifies emission control measures to provide expeditious progress toward attaining the state ozone standard.

RCP
Regional Comprehensive Plan: A plan that serves as the foundation for integrating land uses, transportation systems, infrastructure needs, and public investment strategies within a regional smart growth framework. The RCP was adopted by SANDAG in July 2004.

Reverse Commute
Travel in the direction opposite to the main flow of peak period commute traffic.

Ridership
The number of transit users, usually reported as a yearly total or as the average for a normal workday.

Ridesharing
A mode of travel in which at least two individuals share the same vehicle to get to their destination. Rideshare vehicles include private automobiles, privately owned and operated vans and buses, as well as public transportation.

Route Miles
The length of a transit route or service, multiplied by the number of trips made by transit vehicles or trains each day.

ROW
Right of Way: The land required for the construction and/or operation of transportation infrastructure.

RTIP
Regional Transportation Improvement Program (RTIP): A five-year listing of major highway, transit, and active transportation projects including project costs, funding sources, and development schedules. Compiled from priority lists submitted by local jurisdictions and transportation agencies.

RTMS
Regional Transit Management System: A sophisticated management tool used to monitor and report on the performance of the transit system in real time, used for more than 50 percent of the region’s fixed route services.

RTP
Regional Transportation Plan: A minimum 20-year plan that is required by state and federal law to guide the development of the region's transportation system.

RTPA
Regional Transportation Planning Agency: A state-designated agency responsible for preparing the RTP and the RTIP, and for administering state transportation funds. SANDAG is the San Diego region's RTPA.

State Highway
A state-designated roadway. May be urban or rural.

Safe Routes to School
A state and federal program that funds education, encouragement campaigns, and infrastructure improvements to help decrease traffic congestion around schools, and to make the the journey to school on foot or bike more feasible for children.

Safe Routes to Transit
A program that funds strategies to address the challenges of getting to and from a transit stop or station. These strategies include first-mile/last-mile solutions such as enhanced pedestrian crosswalks near transit stations, bicycle lanes that connect to transit and bike parking at transit stations, feeder-distributor bus/shuttle routes, car sharing/station cars, and ridesharing.

SAFETEA-LU
Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users: Federal legislation signed into law on August 10, 2005 authorizing $244.1 billion for Federal surface transportation programs for highways, highway safety, and transit for the five-year period between 2005 and 2009. At the time of this writing, Congress had not yet passed a re-authorization of a multi-year transportation bill. In its place, Congress has approved a series of extensions, known as Continuing Resolutions, to keep federal funds flowing at the last approved annual funding level to SAFETEA-LU formula programs.

SANDAG
San Diego Association of Governments: SANDAG is responsible for long-range transportation planning and programming under both federal and state law.

SCS
Sustainable Communities Strategy: A new element of the RTP, as required by SB 375, that demonstrates how development patterns and the transportation network, policies, and programs can work together to achieve the state's targets for reducing regional greenhouse gas (GHG) emissions from cars and light trucks in a region.

SD&AE
San Diego and Arizona Eastern Railway: The SD&AE Railway is the only rail link to the east for the international and interstate movement of goods into, out of, and through the Southern California/Baja California region.

SIP
State Implementation Plan: A document that shows the steps planned to meet federal air quality standards (outlined in the Clean Air Act). Each non-attainment area prepares an air quality improvement plan; those are combined to make up the statewide SIP.

SHOPP
State Highway Operation and Protection Program: Caltrans' three-year program to address traffic safety, roadway rehabilitation, roadside rehabilitation, or operations needs on the state highway system.

SIDUE
Secretaría de Infraestructura y Desarrollo Urbano: State of Baja California Secretariat of Infrastructure and Urban Development.

Smart Growth
A compact, efficient, and environmentally-sensitive pattern of development that provides people with additional travel, housing, and employment choices by focusing future growth away from rural areas and closer to existing and planned job centers and public facilities, while preserving open space and natural resources.

Social Equity
Social Equity means ensuring that all people are treated fairly and are given equal opportunity to participate in the planning and decision-making process, with an emphasis on ensuring that traditionally disadvantaged groups are not left behind.

SOV
Single Occupant Vehicle: A vehicle with one occupant – the driver. Also referred to as a "drive alone."

SPRINTER
In 2008, NCTD launched the east-west SPRINTER light rail train system between Oceanside and Escondido.

STIP
State Transportation Improvement Program: A multi-year program of major transportation projects to be funded by the state. The CTC adopts the STIP every two years, based on projects proposed in RTIPs and from Caltrans.

STP
Surface Transportation Program: A federal program, originally established in the federal ISTEA legislation, that provides flexible funding allocated by regional agencies such as SANDAG for a wide range of projects including highways, transit, local streets and roads, and bicycles.

TAZ
Traffic Analysis Zone: a geographic unit used for transportation modeling. A TAZ is smaller than a census tract and a Trip Distribution Zone (TDZ).

TCM
Transportation Control Measure: A transportation strategy intended to reduce vehicle miles traveled (VMT) and to make VMT more efficient. TCMs include transportation system management (TSM) and transportation demand management (TDM) elements. Examples include carpooling, transit, and computer-optimized traffic signals.

TDA
Transportation Development Act: TDA funds are generated from a tax of one-quarter of one percent on all retail sales in each county, and they are used for transit, specialized transit for disabled people, and bicycle and pedestrian purposes.

TCRP
Transportation Congestion Relief Program

TDM
Transportation Demand Management: Programs to reduce demand by automobiles on the transportation system, by promoting telecommuting, flex-time, bicycling, walking, transit use, staggered work hours, and ridesharing.

TDZ
Trip Distribution Zone: The San Diego region is covered by 2,000 TDZs.

TEA-21
Transportation Efficiency Act for the 21st Century: Federal legislation enacted in 1998, authorizing the preparation and funding of a surface transportation program. Like previous ISTEA legislation, TEA-21 emphasizes diversity and a balance of modes, as well as the preservation of existing systems before the construction of new facilities.

Telework
Teleworkers or e-workers are employees who conduct some or all of their daily work activities from their home or from a remote site other than the normal work site, in order to avoid commuting during peak periods.

Title VI of the Civil Rights Act
Title VI of the Civil Rights Act states that "no person in the United States, shall, on the grounds of race, color or national origin be

excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance."

TPP
Transit Priority Project: Under SB 375, a project is exempt from CEQA if it (1) qualifies as a "transit priority project" and (2) meets the "sustainable communities project" requirements as declared by the legislative body of the local jurisdiction.

TransCAD
A computer model that simulates travel demand and its distribution to facilities within a geographic area.

Transit
See Public Transportation.

Transit Management System
A field operations management system that enables improved transit route planning, scheduling, and performance monitoring.

Transit-Oriented Development
Residential and employment growth that occurs near existing and planned public transit facilities.

TransNet
A half-cent local sales tax that San Diego region voters approved in 1987. Administered by SANDAG, this 20-year program generated nearly $3 billion in funding, which was divided equally among three major transportation categories: highways, pubic transit, and local streets.

***TransNet* Extension**
The *TransNet* sales tax, approved in 1987, expired in 2008. In November 2004, more than 67 percent of voters countywide approved an extension of the *TransNet* program to 2048. This 40-year extension will generate more than $14 billion for transportation improvements, and it includes an innovative $850 million environmental mitigation program (EMP).

Trip
See Person Trip and/or Vehicle Trip.

Trolley
The San Diego Trolley is the urban light rail transit service currently provided in the San Diego region. It operates three primary lines named the Blue Line, the Orange Line, and the Green Line.

TSM
Transportation Systems Management: Strategies that allow transportation systems to operate in a way that maximizes the number of people traveling in a corridor or facility. These strategies include traffic flow improvements, ramp metering, tracking public transit vehicles; and keeping travelers informed.

U.S. DOT
United States Department of Transportation: The federal cabinet-level agency with responsibility for highways, mass transit, aviation, and ports and headed by the Secretary of Transportation. The DOT includes the Federal Highway Administration and the Federal Transit Administration, among other agencies.

Urban Area Transit Strategy
A strategy to create a robust transit network that maximizes transit ridership in the greater urbanized areas of the San Diego region.

U.S. EPA
U.S. Environmental Protection Agency: The federal agency charged with setting policy and guidelines, and carrying out legal mandates, for the protection of national interests in environmental resources.

Vanpool
A vehicle operating as a ridesharing arrangement, providing transportation to a group of individuals typically traveling directly between their homes and employment locations within the same geographic area.

V/C Ratio
Volume to Capacity Ratio: The volume of traffic divided by the capacity of a transportation facility. Traffic volume is defined as the number of vehicles passing (or projected to pass) a point or section of roadway in a given time interval. Capacity is defined as the maximum number of vehicles that reasonably can be expected to traverse that point or section of roadway during the same time period under prevailing roadway, traffic, and control conditions.

Vehicle Trip
A single vehicle movement from the beginning of travel to its destination, in a vehicle that is motor-driven (e.g., automobiles, motorcycles, trucks, buses, and vans).

VMT
Vehicle Miles Traveled: The total number of miles traveled on all roadways by all vehicles. Reducing VMT can help ease traffic congestion and improve air quality.

Walking School Bus
A Walking School Bus consists of two adults walking to pick up children at pre-designated stops on the route to school. This program has been adopted by elementary, middle, and high schools alike, both public and private.

Work Trip
Any "person" or "vehicle" trip whose purpose (on at least one trip end) involves work or work-related business.



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SANDAG

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