August 7, 2020

The Vision for the 2021 Regional Plan: A Deep Dive into the Details

Action: **Discussion**

An overview of the data-driven approach used to develop the vision for the 2021 Regional Plan and in-depth details that form the foundation of the vision will be presented.

Fiscal Impact:

Funding for development of the 2021 Regional Plan is included in Overall Work Program Element No. 3102000 in the FY 2021 Program Budget.

Schedule/Scope Impact:

The vision for the 2021 Regional Plan will be presented to the Board of Directors on August 14, 2020. The environmental impact report (EIR) will be initiated this fall. The draft EIR and draft 2021 Regional Plan are expected to be released for public comment in spring 2021.

Overview

The data-driven approach used to develop the vision for the 2021 Regional Plan in 5 Big Moves has been led by teams of experts using rigorous and innovative methods not seen before at SANDAG. The outcome of years of outreach, research, data analysis, and coordination with experts has resulted in a vision that when incorporated into the 2021 Regional Plan will serve the transportation needs for generations of regional residents.

This bold new transportation vision for the San Diego region directly addresses traffic congestion, social equity, and state and federal mandates.

Key Considerations

The 2021 Regional Plan must comply with specific state and federal mandates including a Sustainable Communities Strategy (per Senate Bill 375) that achieves greenhouse gas emission reduction targets set by the California Air Resources Board, compliance with federal civil rights requirements (Title VI), and environmental justice considerations, air quality conformity, and public participation. More information about the requirements for the Regional Plan are provided as Attachment 3.

Capital investments alone are not likely to achieve desired congestion relief or meet mandated greenhouse gas emission reductions. As such, a package of innovative policies, programs, and technologies will be a necessary component of the 2021 Regional Plan. A discussion of these components will be brought forward this fall.

In addition to new technologies, new transportation options are needed to meet the mobility needs of the San Diego region and serve generations to come. For this reason, staff has used a data-driven approach to understanding the critical connections needed to access jobs, services, education, healthcare, and places of recreation. Because work commutes are generally the most consistent and predictable trips and because they are a primary cause of peak-period congestion and delay, staff started with analyzing empirical data that revealed how people are traveling to major employment centers each day.

To augment this analysis, location-based (cell phone) data provided insights on travel to other key destinations across the region. Operational data revealed how major corridors are used and provided insight into where most daily travel is occurring so the appropriate transportation solutions could be identified to address the demand. For example, data taken from the Caltrans Performance Measurement System shows that our region's most significant delays and largest number of vehicle miles traveled (VMT) occurs on Interstate 5, Interstate 805, and Interstate 15 during peak periods. These three corridors support both regional and interregional trips and account for approximately two-thirds of the freeway delay and VMT during peak periods. Corridor investments — like managed lanes and high-speed transit — are needed to efficiently move more people and create capacity that will reduce VMT and delay. Attachment 1 provides a comprehensive overview of the data-driven approach to developing the vision.

In addition to observed data, feedback from residents, employers, and stakeholders across the region has been collected through focus groups, surveys, interviews, and workshops to understand the transportation challenges that our residents and businesses face. Based upon previous Board direction, the data analysis combined with stakeholder input has guided the development of a comprehensive vision for transportation that leverages technology to create a safe, adaptable, and equitable transportation network with faster, fairer, and cleaner choices to move around the region seamlessly. Staff will present a transportation network that integrates the 5 Big Moves to provide a regional system of Complete Corridors that are managed in real time by the Next Operating System (Next OS) to create capacity and keep the transportation system operating smoothly and safely for all modes. Transit Leap and Flexible Fleet services connect a network of Mobility Hubs that cover the region's population centers, major employment centers, and other key activity centers across the region.

Next Steps

The vision will be presented by the Director of Regional Planning and the Chief Economist to the Board on August 14, 2020, complemented by a panel discussion with SANDAG staff experts to answer specific questions. Future meetings will focus on the key policies and programs that are being considered as part of the vision, as well as modeling results, revenue assumptions, and other critical aspects.

The Board will be asked to adopt the 2021 Regional Plan in fall 2021.

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Attachments:
1. Draft Vision for the 2021 Regional Plan Network Development Summary Report
2. Timeline of Key Activities Related to the Development of the Vision for the 2021 Regional Plan
3. Regional Plan: Federal and State Requirements

San Diego FORWARD

Vision for the 2021 Regional Plan Network Development Summary Report

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Introduction

This report describes how the San Diego Association of Governments (SANDAG) developed the Vision for the 2021 Regional Plan transportation network. This Vision will be a fundamental part of the forthcoming San Diego Forward: The 2021 Regional Plan, which will provide a blueprint for increased mobility in the San Diego region through 2050. By mid-century, our region is projected to be home to 3.75 million people, and the health of our regional economy, our state mandated goals for reducing greenhouse gases and protecting the environment, and maintaining and improving the overall quality of life for everyone will depend heavily on enhancing personal mobility.

The Vision for the 2021 Regional Plan was developed through application of key strategies known as the 5 Big Moves, which together reimagine how our region will grow and how people and goods will get around. New investments in the regional transportation network will enhance connectivity, increase safety and sustainability, and improve the everyday lives of millions of people. The Vision, if fully realized, would add tremendous capacity to the transportation system and offer people compelling alternatives to driving alone.

SANDAG developed the Vision based on a data-driven process—analyzing where people live and work, how they get around, what transportation infrastructure exists, what is needed to serve future growth, and more. But SANDAG did not build it on data alone: the Vision reflects the views of real residents from around the region, the professional judgments of a number of planning professionals at the agency, and extensive knowledge of diverse communities across our region.

SANDAG conducted its work in distinct *sprints*,[1] each lasting about three weeks. These sprints were organized into three overall phases shown in Figure 1.

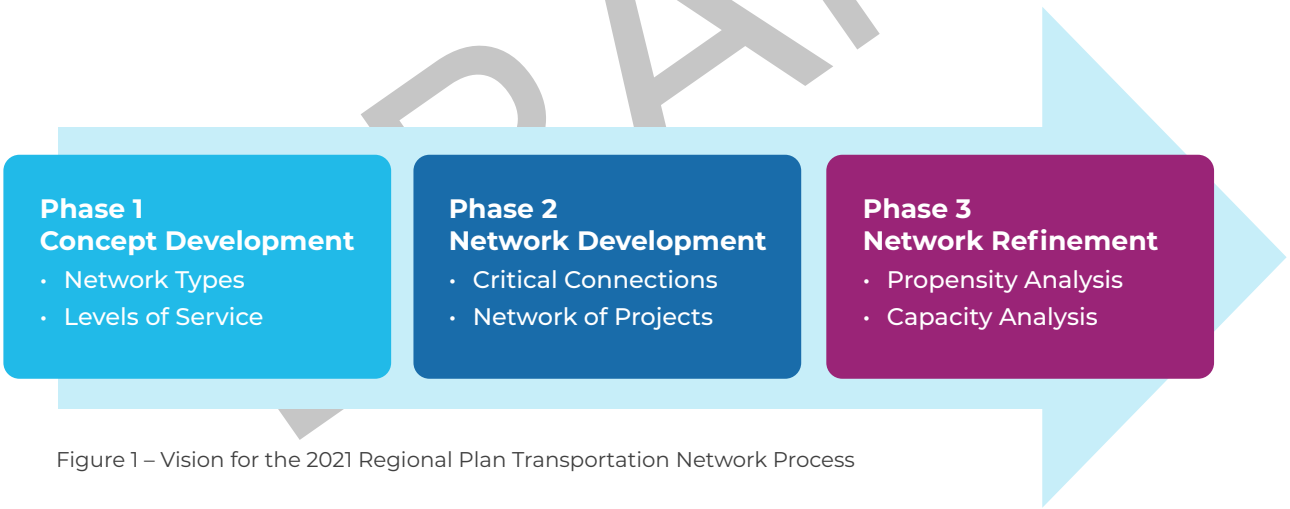

Figure 1 – Vision for the 2021 Regional Plan Transportation Network Process

1 The word "sprint," commonly used in project management, refers to a set period of time during which specific work has to be completed.

5 Big Moves Overview

The Vision for transportation in San Diego County completely reimagines mobility in the 21st century—how we get around every day for work, school, shopping, recreation, and more, as well as how goods are transported in the region. This Vision is fundamentally shaped by five key strategies for mobility that we call the "5 Big Moves." Below we describe each of the 5 Big Moves, but in short, they would result in vastly more efficient and accessible major corridors of travel; a completely new high-speed and high-capacity public transit network; a new network of Mobility Hubs where people and multiple mobility options come together; Flexible Fleets of vehicles that offer people quick mobility options when and where they need them; and a regionwide digital platform that unifies the 5 Big Moves to offer people the most efficient, safe, and time-saving travel options possible.

As SANDAG began developing this Vision, it divided planning professionals into teams that studied how to best implement each of the 5 Big Moves. They worked individually within their own teams, and together with other 5 Big Moves teams. The result was an overall vision that unifies and integrates all the 5 Big Moves. In this Vision, each strategy becomes fully realized only to the extent that the other four become fully realized. As you read further about the 5 Big Moves and how SANDAG developed the Vision, this integrated approach should become evident.

Here is a brief summary of each of the 5 Big Moves that have shaped the Vision:

COMPLETE CORRIDORS

Complete Corridors provide a variety of travel choices and use technology to manage how highways and local streets and roadways are used in real time. They provide a balance of dedicated, safe space for everyone, including freight vehicles and people who walk, bike, drive, ride transit, and use Flexible Fleets. Key features and benefits of Complete Corridors include Managed Lanes that offer priority access to transit, carpool, and vanpool users, and access to single-occupant drivers for a fee; Active Transportation and Demand Management (ATDM) technology that enables transportation operators to modify how infrastructure and services are used, based on changing traffic conditions; high-speed communication networks that allow connected vehicles, smartphones, and smart roads to share data to reduce collisions, increase network capacity, and improve travel times; priority access to roadways for public transit, active transportation, and shared mobility services; managed curb space that accommodates different uses based on levels of traffic at varying times of the day; and electric vehicle (EV) infrastructure, including public charging and hydrogen fueling stations.

TRANSIT LEAP

The Transit Leap will create a complete network of high-speed, high-capacity, and high-frequency transit services that connect major residential areas with employment centers and attractions throughout the San Diego region. Transit Leap services will connect to supporting Flexible Fleets in Mobility Hubs. New high-speed transit services—covering longer distances with limited stops—may be separated from vehicle traffic with bridges, tunnels, or dedicated lanes. Improvements to existing transit services—such as the Trolley, COASTER, SPRINTER, and *Rapid*—may include additional rail tracks, more frequent service, dedicated transit lanes, and traffic signal priority to keep transit moving quickly.

MOBILITY HUBS

Mobility Hubs are communities with a high concentration of people, destinations, and travel choices. They offer on-demand travel options and supporting infrastructure that enhance connections to high-quality Transit Leap services while helping people make short trips around the community on Flexible Fleets. Mobility Hubs can span one, two, or a few miles based on community characteristics and are uniquely designed to fulfill a variety of travel needs while strengthening sense of place.

FLEXIBLE FLEETS

Flexible Fleets are shared, on-demand transportation services that provide convenient and personalized travel options. While they build on the popularity of services such as rideshare, bikeshare, and scootershare, fleets can also include neighborhood shuttles and delivery services. These fleets provide services for all types of trips, 24/7, which can reduce the need to own a car. They also provide important connections between high-speed Transit Leap services and key destinations such as work or home, making it easier for commuters to choose transit. Flexible Fleets are primarily accessible through mobile apps and can be operated by public and private agencies or through partnerships.

NEXT OPERATING SYSTEM (NEXT OS)

Next OS is the "brain" of the entire transportation system. It is a digital platform that compiles information from sources such as passenger vehicles, buses, ridesharing vehicles, delivery trucks, bikes, and scooters into a centralized data hub. Analysis of this data will improve how transportation is planned, operated, and experienced. Transportation operators will be able to better manage supply and demand by modifying how infrastructure and services are used throughout the day. The result will be a modernized transportation system with roads and transit services that operate smoothly and serve people better. This report discusses how SANDAG has planned for *physical* transportation networks—envisioning fully realized corridors of travel, next-generation public transit, Mobility Hubs where people and mobility options come together, and Flexible Fleets that serve people with innovative and tailor-made mobility options when and where they need them. But Next OS is the *digital* network that will analyze data in real time from these physical networks and make them all work better—more integrated, more efficient, and most of all more responsive to people's immediate needs.

Concept Development (Phase 1)

The general concept for the Vision was informed significantly by early work on the 2019 Regional Plan, which led to the 2019 Federal Regional Transportation Plan (RTP). This work included reviewing case studies and best practices, consulting with transportation operators in the region, interviewing private sector providers, and gathering other perspectives, including significant community input gained through two outreach programs in 2018. Insights gained from these previous efforts, as well as more recent work, have served as the foundation for the 2021 Regional Plan.

SANDAG also conducted a series of focus groups, each with a diverse cross-section of the region's residents, to gather feedback on how each of the 5 Big Moves could improve their own lives (Figure 2). In this sense, the Vision reflects the views and opinions of real people from communities throughout the region. SANDAG *designed* the Vision based on both data analysis and what people told the agency in these focus groups. This process is known as "Human Centered Design." For example, individuals in focus groups were asked what they thought about SANDAG's ideas for "Flexible Fleets," and then what *they* thought would make Flexible Fleets a viable alternative to driving alone. As we discuss later in this report, many residents said they would view a Flexible Fleet service as a real alternative to driving if it could get them from their home to a public transit station within ten minutes. SANDAG professionals relied on this feedback as they built the Vision.

Figure 2 – Focus Group

Meanwhile, a Vision Advisory Panel convened to gain insights from private industry leaders about how emerging technology might enhance personal mobility, and how public-private partnerships might accelerate their adoption in the region. The Panel consisted of executives and thought leaders in the fields of wireless communications, intelligent transportation systems, original equipment manufacturing (auto, bus, truck), data analytics, artificial intelligence and automation, fleet management systems, and venture funding, based in Southern California.

All this information served to develop an initial set of services and transportation infrastructure types considered for each of the 5 Big Moves—and operating assumptions to guide SANDAG's development of the Vision. These services and infrastructure types evolved throughout the development of the Vision for a new transportation network as additional information was gathered and analyses were conducted.

Type descriptions for the 5 Big Moves are shown in Appendix A.

Network Development (Phase 2)

Once SANDAG developed a conceptual idea for what a future regional transportation network might look like, it was time to actually build the network. This required a series of iterative analyses, in which data related to population, employment, and demographics were repeatedly analyzed in order to reach the best answer to a given question—where a new commuter rail line might be needed most, or where to situate a Mobility Hub, for example. As we've mentioned, decisions about how to build each network were based on data analysis as well as feedback from residents, professional judgments, and SANDAG's deep knowledge of the region's diverse communities.

SANDAG gathered data from numerous sources, including: surveys by the federal government on the location of employees and employers; the U.S. Census Bureau; land use information from local jurisdictions; individual traveler data from cellular devices; goods movement data from trucking and other commercial transport operations; and citizen feedback. Data was primarily analyzed using the geographic information system (GIS) tool, ArcGIS, and geospatial statistical methods. GIS in transportation planning can take numerous sources of data and visualize them on maps to model traffic patterns, plan new routes and services, and assess the environmental impacts of new transportation infrastructure. ArcGIS is a GIS tool maintained by the Environmental Systems Research Institute (ESRI), and all SANDAG'S geospatial analyses use the ArcGIS platform.

IDENTIFYING THE CRITICAL CONNECTIONS

A key part of SANDAG's early analyses as it built the network for the Vision was to identify how and where people travel every day. At the most basic level, they had to figure out where people live, where they work, and how they get from one place to the other. The routes that most people take every day are known as "critical connections." SANDAG's early goal was to identify these connections first, so it could eventually decide how to build a transportation network—embodying the 5 Big Moves—that would best serve the daily travel patterns of people in the region.

People travel every day to work, school, shopping, recreation, and other destinations. But it's clear that commutes to and from jobs place the greatest daily demands on the regional transportation system. This reality drove the development of critical connections.

SANDAG began its work by focusing on 15 of the top employment centers in San Diego County (there are more than 70 employment centers[2] in the region). The agency focused on the 15 employment centers (Figure 3) because collectively they account for a large portion of civilian jobs in the region—40%—and as a result a significant proportion of daily congestion on roads and highways.

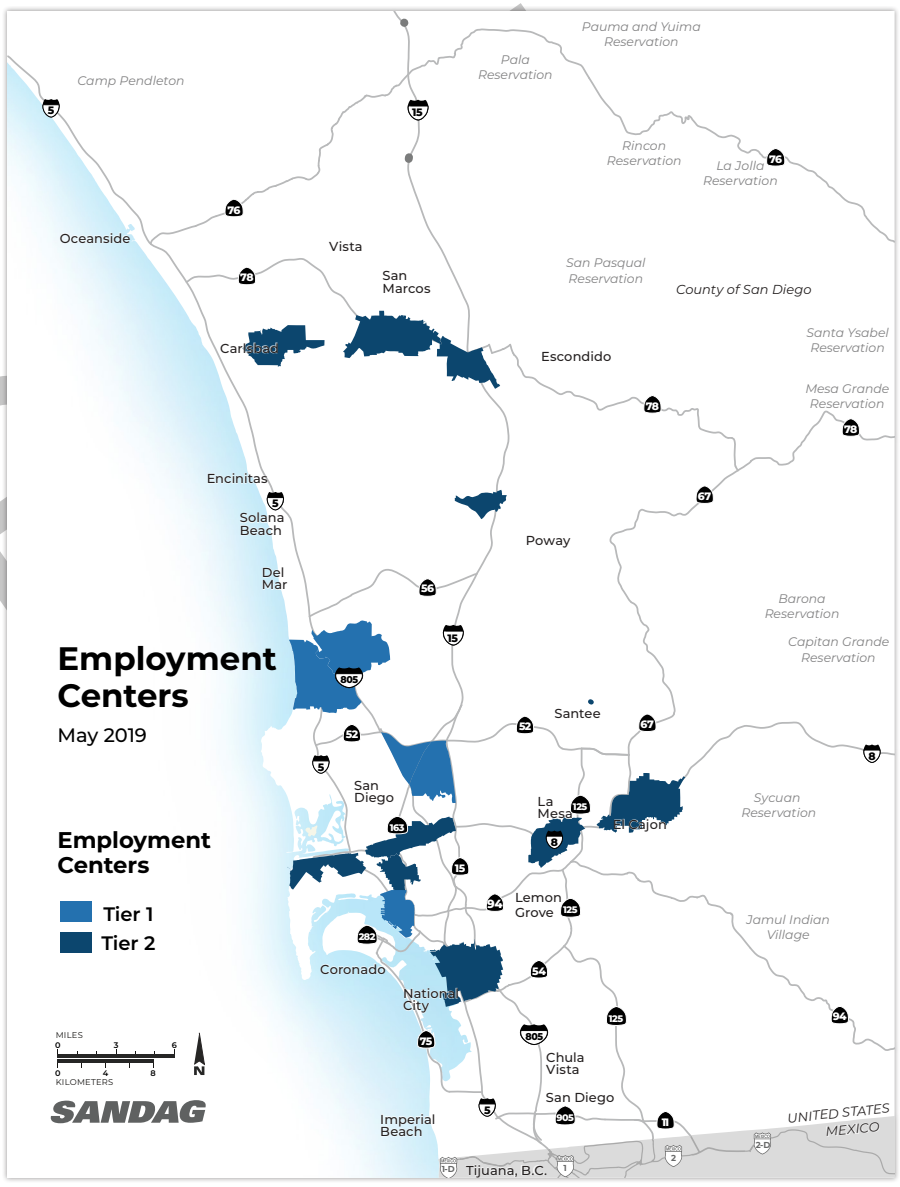

Figure 3 – Employment Centers

2 Thirteen Tier 1 and Tier 2 Employment Centers were identified by SANDAG. For the purpose of developing the Vision for the 2021 Regional Plan, the Sorrento Valley and Kearny Mesa Employment Centers were each split into two centers, resulting in 15 centers. For an in depth look at research and data development efforts on employment centers refer to SANDAG's employment centers webpage at: sandag.org/employmentcenters

Developing critical connections based on where people live and work also makes sense when you consider a few more powerful statistics: about 33% of all trips in the entire region are for work or work related, and people throughout the region consider 64% of their daily trips as mandatory—whether for work, school, or for other purposes—and not discretionary.

Identifying critical connections required several steps. First, SANDAG created 100-acre hexbins[3] (so named because they're in the shape of hexagons) that defined the concentration of jobs throughout the region. Demographic and employment data were then aggregated for each hexbin (Figure 4) in order to study where people live (origins) and where they work (destinations).

SANDAG then conducted a density analysis (kernel analysis)[4] of commute data in order to find concentrations of employees who commute to each of the 15 individual employment centers. These represented the "origins" where employees for each employment center live, as opposed to the employment centers which represent "destinations." These points on a map—origins and destinations—became the initial nodes of critical connections representing significant commute patterns in the region.

Using ArcGIS as an analytic tool, SANDAG then generated a series of maps, each one showing one of the 15 employment centers, as well as all the places where employees who work there live—and therefore where they begin their daily commutes. For each of these 15 employment center maps, origin-destination desire lines were generated from hexbins where people live to hexbins where people work (Figure 5).

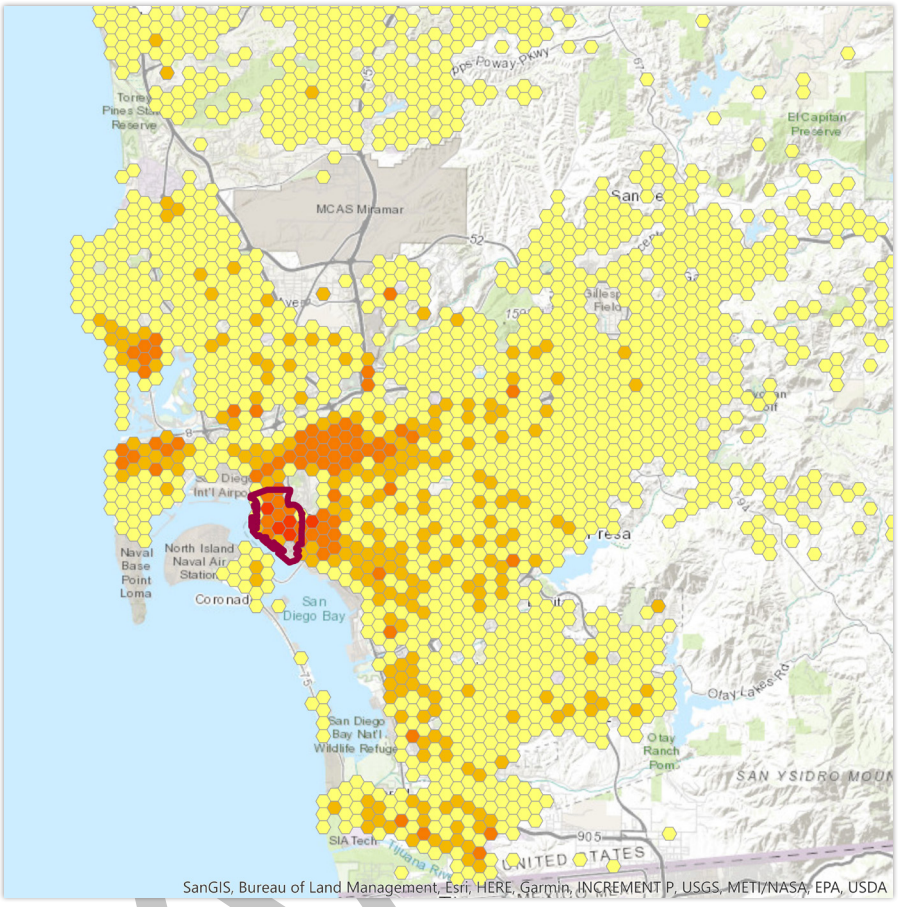

Figure 4 – Downtown San Diego Employment Center with Hexbins

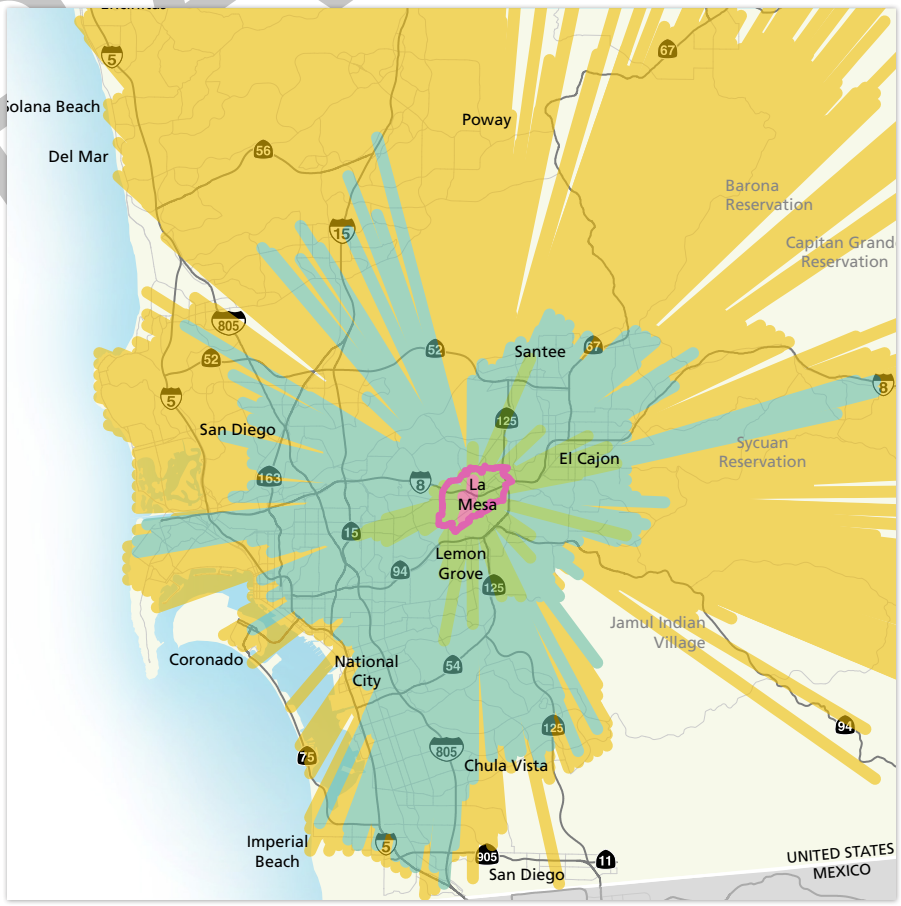

Figure 5 – Origin–Destination Lines to and from the La Mesa Employment Center

3 Hexbins are geographic areas in the shape of hexagons, used for geospatial analysis. For the Vision for the 2021 Regional Plan, 100-acre hexbins were created and overlaid over San Diego County, and demographic and other data were assigned to each hexbin.

4 pro.arcgis.com/en/pro-app/tool-reference/spatial-analyst/how-kernel-density-works.htm

The next step in the analysis was to use ArcGIS to "overlay" the origin-destination maps for these 15 employment centers, so the most heavily used commute routes could be visualized. Figure 6 shows a map of initial critical nodes and potential connections generated by the density analyses just described. Each employment center and commute origin is indicated on the map as a circle, and these are referred to as nodes. These nodes, and the initial critical connections that join them, reveal core travel patterns that the Vision for a transportation network is designed to support.

With initial nodes and potential critical connections identified, SANDAG then began to build its overall transportation network, which evolved iteratively—each analysis considering new information and moving the network closer to its final version. Successive analyses conducted over several sprints considered land use, communities of concern (seniors, minorities, and low-income residents), current traffic patterns, and highway and transit performance data. One critical dataset that SANDAG has introduced into the development of the Vision for the 2021 Regional Plan is anonymous cellular tower based origin-destination data from *Teralytics,*[5] an information technology firm that provides insights related to transportation. This data helped guide network development beyond the traditional commute trip because it also allowed SANDAG to consider longer interregional and intraregional trips and trips to special activity centers. The early goals of network development focused on fast connections between nodes via transit and a network of Managed Lanes that leverages technology to maximize use of existing roadway infrastructure.

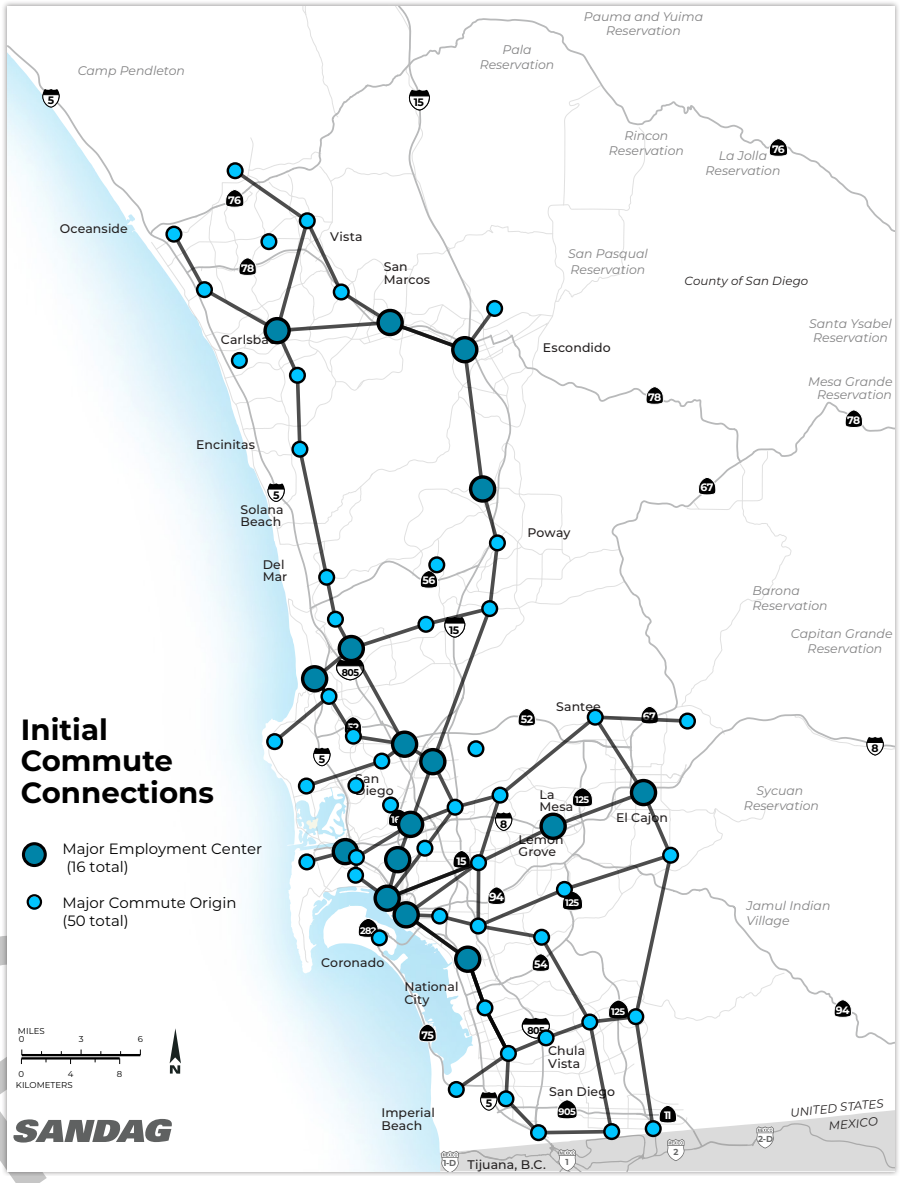

Figure 6 – Initial Commute Connections

The next section of this report provides a detailed account of network development as it pertains to the 5 Big Moves. Each of the 5 Big Moves was not considered in isolation; because the success of one relies so heavily on the success of another, development of the 5 Big Moves was closely coordinated. Information generated for Transit Leap, for example, informed the development of Mobility Hubs. This interrelationship is shown in Figure 7.

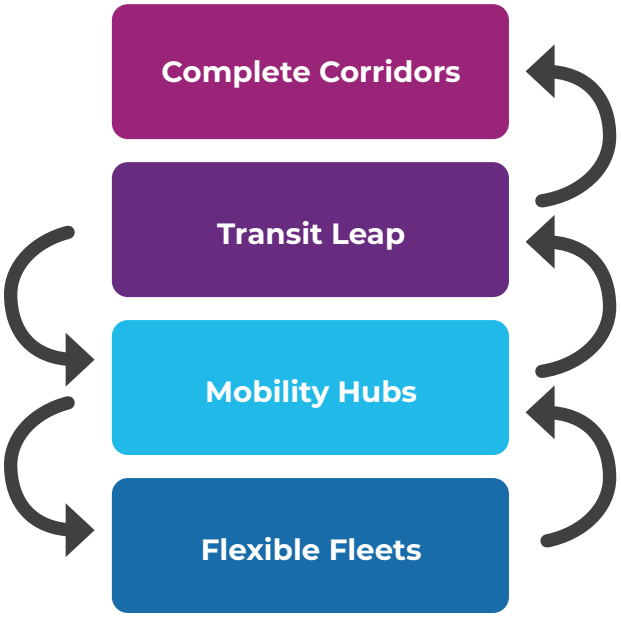

Figure 7 – Relationship of 5 Big Moves during Phase 2

5 SANDAG procured Teralytics data for Calendar Year 2018 for use on the Regional Plan. Teralytics uses cell tower data from one of the top three cell carriers in the region to determine trip-making patterns. This cellular data represents a sample of "no less than 10%" for the region. Trips are defined as movements occurring between 30-minute dwell periods in cellular activity. This trip data is aggregated into census tracts.

TRANSIT LEAP NETWORK DEVELOPMENT

Of all the 5 Big Moves, Transit Leap is the most fundamental to the region's goals for reducing traffic congestion, achieving state-mandated cuts in greenhouse gas emissions, protecting the environment, and improving everyone's overall quality of life. The success of Transit Leap is also intimately tied to the success of the other 5 Big Moves. We will not reach our goals for Complete Corridors, Mobility Hubs, and Flexible Fleets unless we build a network of high-speed, high-capacity, and frequent transit services that connect major residential areas with employment centers and local attractions. The importance of achieving our Transit Leap goals cannot be overstated. They are the foundation for improving personal mobility in our region.

In order to develop the first iteration of a Transit Leap network, SANDAG used ArcGIS tools to develop logical transit route segments through the highest traveled critical connections. Because the goal of Transit Leap is to provide high-speed and frequent transit services (such as commuter rail and light rail) that are comparable to the automobile, travel times between employment centers and commute origin nodes were analyzed in ArcGIS. SANDAG computed these travel times based on a transit vehicle operating speed of 80 mph, with stop delays at each node, and compared them with the time it takes to drive.

This analysis provided a set of all potential new transit routes, approximately 5,000 combinations of routes regionwide. SANDAG initially ranked these transit routes based on population and employment densities around transit nodes serving each route. SANDAG then evaluated each transit route in a series of successive analyses in order to pare down the total number of routes. Each evaluation considered a route's potential to draw riders, its alignment with Mobility Hubs, its access to key activity centers and points of interest (beyond employment centers), and how well the overall combination of routes would result in a Transit Leap network that serves communities of concern. SANDAG's Transit Leap analysis, which also relied on *Teralytics* data, allowed it to pare down the 5,000 combinations of transit routes to an initial Transit Leap network of potentially viable high capacity routes for Transit Leap services (See Figure 8).

This initial Transit Leap network, however, only included higher-speed, higher-capacity routes such as commuter rail and light rail. To complete the overall Transit Leap network, SANDAG then added Next Generation (Next Gen) *Rapid* bus service routes detailed in previous Regional Plans, as well as local bus routes which reflect existing local bus service in the region.

In later sprints, SANDAG adjusted the location of Transit Leap stations for all types of service, as well as routes for Next Gen *Rapid* bus service. The entire Transit Leap network was developed in continuous coordination with the development of the regional networks for Mobility Hubs and Flexible Fleets.

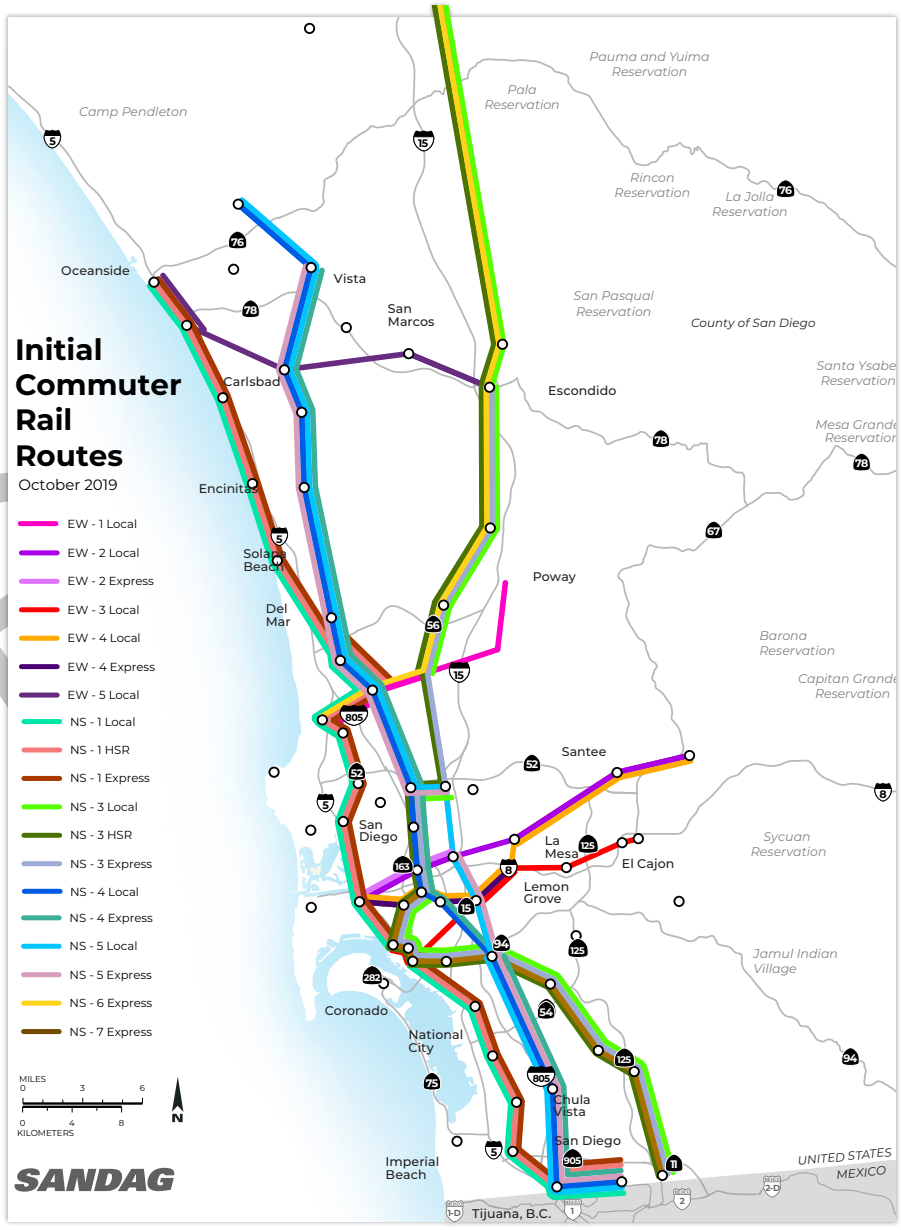

Figure 8 – Initial Commuter Rail Routes

MOBILITY HUB NETWORK DEVELOPMENT

SANDAG developed the regional Mobility Hub network based on the initial critical connection nodes. Each employment center node and commute origin node was evaluated as a potential site for a mobility hub by considering land use, population density (including communities of concern), employment density, activity centers of regional significance, and unique local characteristics. SANDAG then used ArcGIS to evaluate a selection of initial Mobility Hub coverage areas—1, 2, or 4 miles from each node. The location and size for each Mobility Hub was determined as a direct result of a propensity analysis (discussed later in this report). The network map for Mobility Hubs will show the location of each Mobility Hub and the size that meets the needs for that location.

Mobility Hubs offer people convenient and efficient access to Transit Leap services—making these two Big Moves closely paired. In fact, the analysis that informed the development of the Transit Leap network also informed the placement of transit stations and surrounding Mobility Hubs. Meanwhile, analyses conducted during the development of Flexible Fleets (such as the market potential analysis described below) and bike routes information were also used to assess the best locations for Mobility Hubs. Additionally, data from Teralytics was used to evaluate non-commute trips. SANDAG considered the top destinations people traveled to in 2018 as it developed the initial Mobility Hub network (Figure 9).

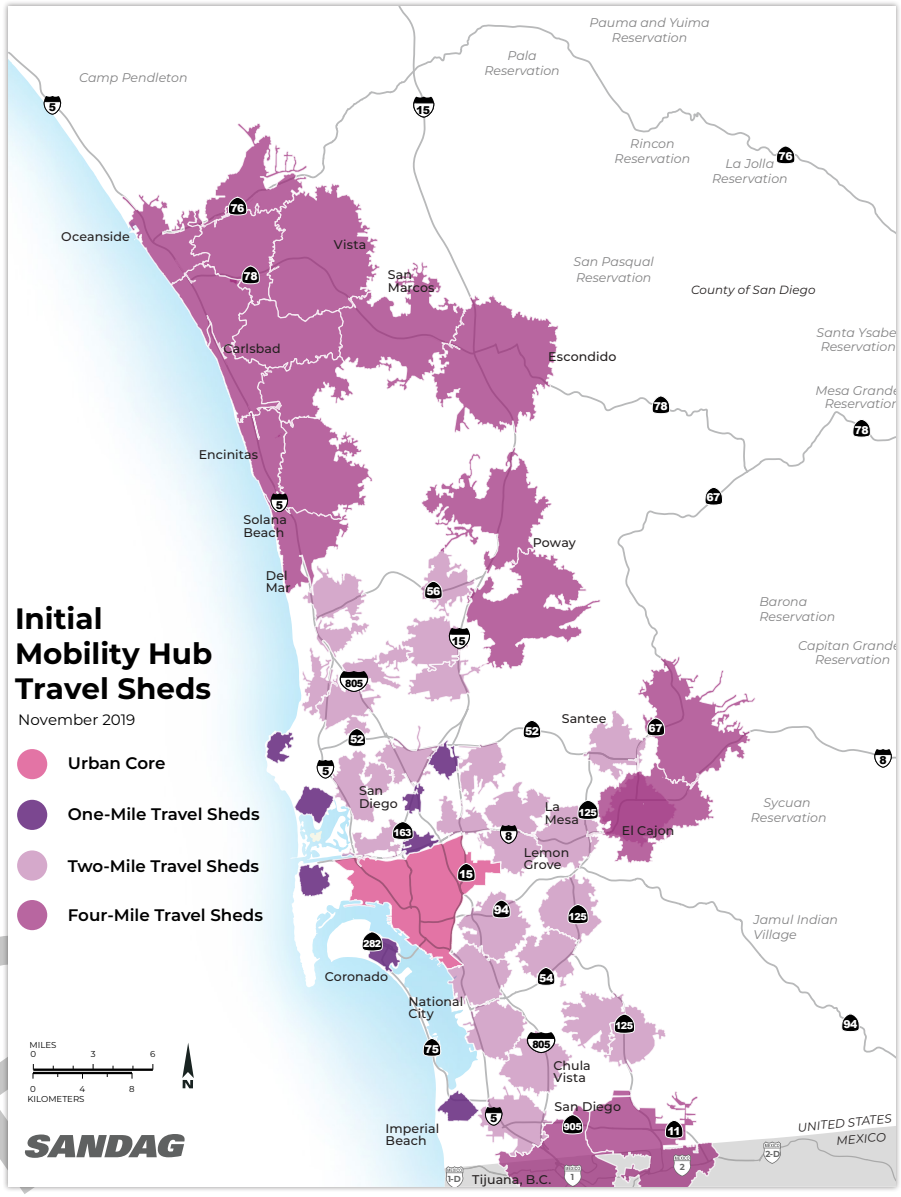

Figure 9 – Initial Mobility Hub Travel Sheds

FLEXIBLE FLEETS NETWORK DEVELOPMENT

Along with identifying the region's critical connections, building a regional network of Mobility Hubs, and determining the best Transit Leap routes, SANDAG has planned for how Flexible Fleets can best offer people mobility options for short individual trips, and importantly, for connecting easily to and from transit. The Vision for the 2021 Regional Plan envisions five Flexible Fleet services that will serve people throughout the region:

1. Micromobility
2. Carsharing/Ridehailing
3. Ridesharing
4. Microtransit
5. Last Mile Delivery

Table A-4 in the Appendix provides a detailed description of these five Flexible Fleet services. Together, they will provide people with connections to regional transit services, alternatives for short trips around neighborhoods, and mobility options in areas that may not have access to high-speed transit. Flexible Fleets will travel within and between Mobility Hubs and provide people with connections to Transit Leap services using "priority treatments" on Complete Corridors. These priority treatments include designated or shared lanes with transit for more rapid travel by Flexible Fleet vehicles and offering them priority at traffic signals.

Offering Flexible Fleet vehicles priority treatments will require dedicated infrastructure to ensure that walking, biking, scooting, and riding transit are safe and convenient. SANDAG has developed the Flexible Fleet network concurrently with the Mobility Hub, Complete Corridor, and Transit Leap networks, and its success is closely tied to the success of the other three.

SANDAG considered two primary characteristics of an effective Flexible Fleet network:

1. How well it connects with the region's network of Mobility Hubs and Transit Leap routes
2. The operating characteristics of each Flexible Fleet service

Flexible Fleets could be operated by both public and private agencies, as well as through public-private partnerships. It is anticipated that Flexible Fleet services will be deployed in coordination with transit agencies, local jurisdictions, non-profits, employers, tribal nations, and other stakeholders. This would ensure that Flexible Fleet options are more closely tailored to the specific needs of a given community.

Determining the optimal operating environment for each type of Flexible Fleet service is based on case study research and a synthesis of interviews with Flexible Fleet operators. SANDAG also conducted interviews with public agencies in order to understand their experience operating these services, and to gain insights on lessons learned from partnering with the private sector. This case study research and synthesis of interviews served as baseline data to determine which services operate best in a given condition, and where each service should be deployed.

Flexible Fleets can operate throughout the region. Service areas for Flexible Fleet will vary based on the service type, community needs, community context, and service objectives. Flexible Fleets are also concentrated at mobility hubs, and therefore provide people with fast and convenient connections to Transit Leap services. The service areas for Flexible Fleet services are shown in the Appendix Table A-5.

SANDAG determined where particular Flexible Fleet services would be needed based on how they operate and what specific service they provide. SANDAG also considered how a given Flexible Fleet service could best interact with and support the Transit Leap, Mobility Hub, and Complete Corridor networks. Based on this work, SANDAG developed ideal operating scenarios for Flexible Fleets. These are described in Table A-6 in the Appendix.

COMPLETE CORRIDORS NETWORK DEVELOPMENT

The goal of Complete Corridors is to provide travelers with a comprehensive roadway network that uses technology to support the diverse mobility needs of people throughout the region, while also supporting the other 5 Big Moves. To define a Complete Corridors network, SANDAG first studied the region's existing freeway system as a baseline for analysis.

SANDAG first analyzed the performance of key corridors in the region. It did this by using the Caltrans Performance Measurement System (PeMS) tool, which

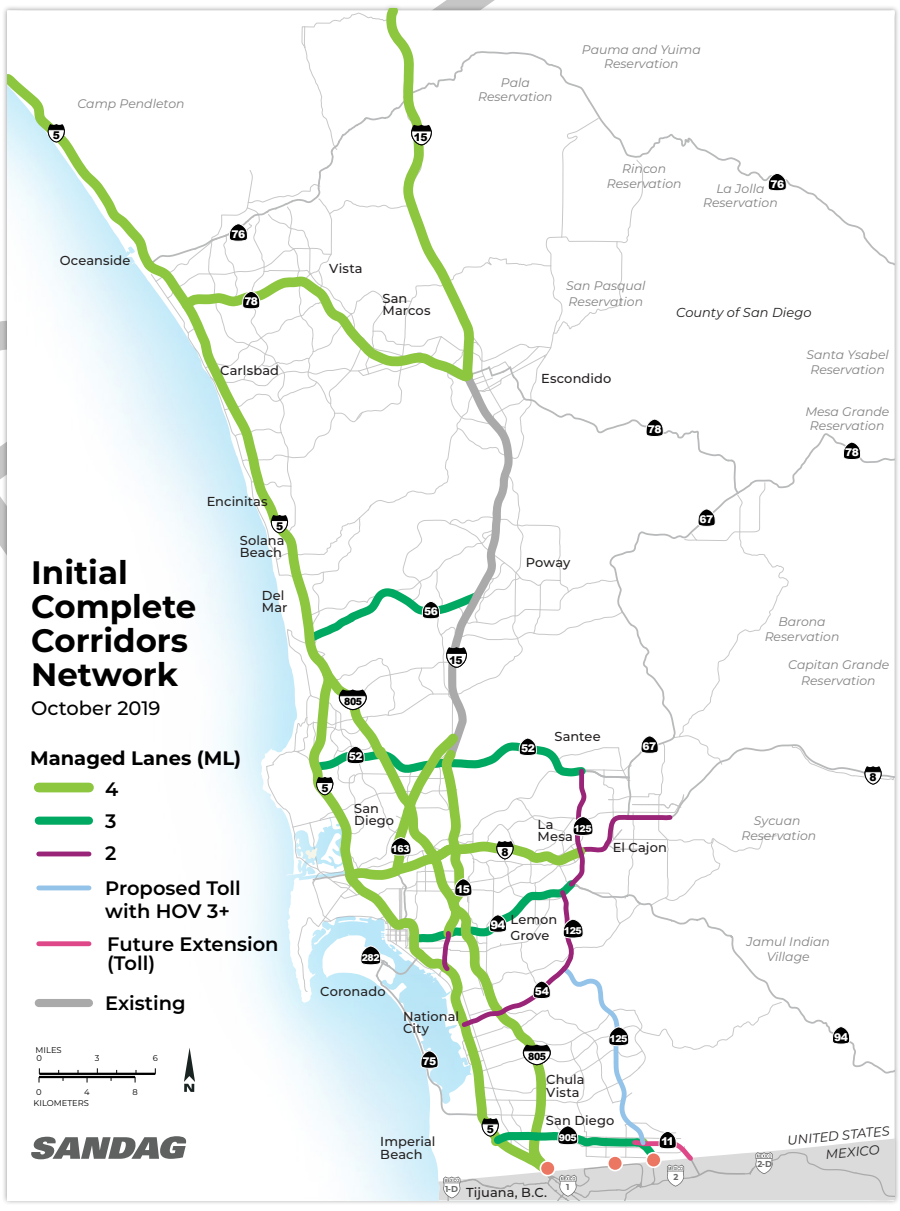

Figure 10 – Initial Complete Corridors Network

identifies vehicle miles traveled, freeway delays, average trip distances, and other characteristics along specific corridors; considering the functional characteristics of each corridor (for example, commuting, the movement of freight, and the prevalence of active transportation); and considering the geographical coverage of each corridor (for example, the extent to which the corridor provides people with access to rural or urban areas, the typical length of commutes, etc.).

SANDAG then estimated needed improvements in capacity along the region's key corridors. It did this by comparing corridor capacity with traffic volumes—using a measure known as the volume to capacity (V/C) ratio. SANDAG then estimated peak traffic volumes along the key corridors in 2050, using forecasted[6] 2050 traffic volumes and the number of lanes that exist today on the region's freeways. These analyses, along with detailed discussions between SANDAG and staff from Caltrans, District 11, helped define future capacity constraints. SANDAG then addressed these constraints by developing a system of Managed Lanes throughout the region that would increase corridor capacity. This initial Complete Corridors network is shown in Figure 10.

SANDAG's development of a regional system of Managed Lanes was guided by the following principles:

- One or two Managed Lanes would operate in each direction in the middle of existing freeway corridors. A single, additional reversible Managed Lane may operate in the desired peak direction during peak periods, as needed.
- For vehicles to use Managed Lanes, high-occupancy vehicle (HOV) requirements would apply—in other words, three occupants per vehicle (HOV3+). This HOV policy is assumed to be in place on all Managed Lane roadways by 2025.
- New Managed Lanes are situated either along freeway shoulders that have adequate widths, or along converted general-purpose lanes that already exist.
- The expansion of freeways was limited to locations only where there were no freeway shoulders available, or where converting general-purpose lanes was not feasible.
- The reconfiguration of freeway infrastructure to accommodate Managed Lanes will require technology enhancements and operational improvements, so that travelers on general-purpose lanes do not experience delays because of the new Managed Lane system.

The principles described below guided the development of additional elements of the Complete Corridors network.

1. *Freeway Managed Lanes Connectors*

   Managed Lanes connectors are critical to the Complete Corridor network because they provide seamless connectivity between Managed Lanes corridors, helping travelers fully realize the potential of Managed Lanes to minimize delays on the freeway network. SANDAG situated Managed Lanes connectors using the following guiding principles and considerations:

   - They should support logical trip patterns.
   - They should meet the recommended minimum volume operating guidelines for Managed Lanes.
   - There should be direct connections between the Managed Lanes to maintain optimal operations.
   - The feasibility of Managed Lanes should be based on a high-level visual engineering assessment requiring more detailed analysis during the project development phase.
   - The placement of Managed Lanes should support Transit Leap services proposed for freeways.

Also considered were the total number of Managed Lanes needed for the region; the availability of freeway medians; physical constraints on freeways that might hinder the addition of Managed Lanes; traffic volumes on the region's freeways; planned Transit Leap services; a preliminary engineering visual assessment; and logical traffic movement.

2. *Freeway Managed Lanes Direct Access Ramps (DARs)*

   Like Managed Lanes connectors, direct access ramps support the Managed Lanes network. They do this by providing travelers with direct access off the freeway network and into surrounding communities—without impacting the parallel freeway facility. SANDAG based its decisions on where to situate direct access ramps in the region according to the following guiding principles and considerations:

   - Direct access ramps should support proposed Transit Leap services on the region's freeways.
   - Direct access ramps should provide travelers with direct connections to the Central Mobility Hub.
   - Direct access ramps should provide critical connections to regionally significant activity centers.
   - The placement of new direct access ramps should consider those that already exist and received environmental approval.

6 Traffic forecasts were based on annual growth rates of 1.3% and 0.9% for north-south and east-west freeways, respectively.

3. Rural Highways

State highways outside the urbanized portion of San Diego County provide local and regional access to major freeway corridors and activity centers, and they support interregional travel to surrounding counties and to Mexico. All rural highways on the State Highway System were identified in the Complete Corridors network.

4. Arterial Network

The main goal of the arterial network is to establish a local roadway network that connects communities to one another and to the greater region. The network aligns with federal and national networks to facilitate future funding. SANDAG's development of an arterial network was based on the following guiding principles and considerations:

- The arterial network should provide travelers with mobility throughout the region.
- The arterial network should provide connections to the highway network.
- The arterial network should provide travelers with connections to major destinations.
- The arterial network should provide travelers with access to and from Mobility Hubs.
- The arterial network should provide travelers with continuity and access to Transit Leap, Mobility Hubs, active transportation, and freight transportation facilities.
- The arterial network should provide connectivity to the National Highway System (NHS).
- The arterial network should provide connectivity to the National Freight Network (NFN).

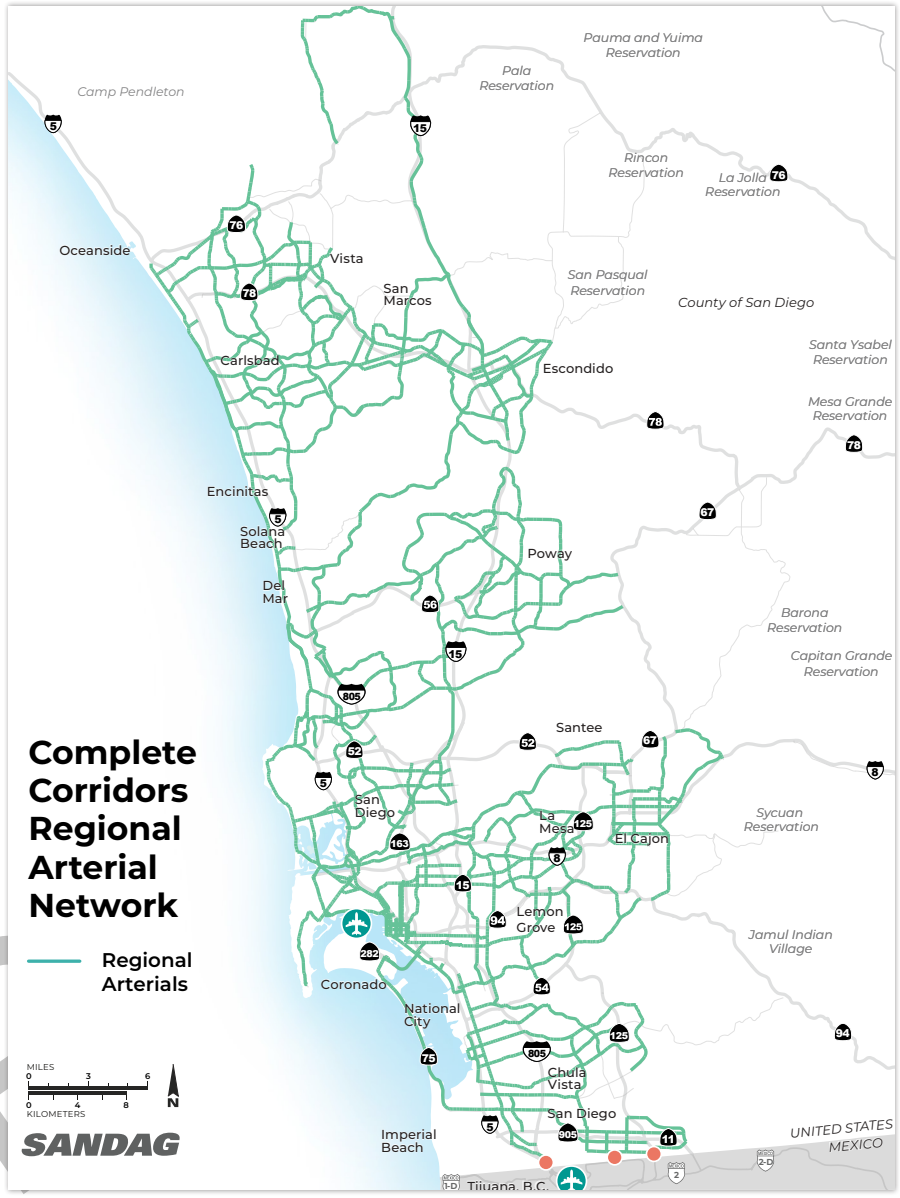

Figure 11 – Complete Corridors Regional Arterial Network

SANDAG considered numerous factors during its development of an arterial network. These included the number of lanes; location; limits; importance; corridor type; the location of Mobility Hubs and their surrounding areas; Transit Leap routes; bikeway network; accident information; national highway and freeway references; and average daily travel (ADT). The Regional Arterial Network is shown in Figure 11.

Network Refinement (Phase 3)

The final steps in the development of the Vision for the 2021 Regional Plan were to refine critical elements of the network and to verify that the Vision network would meet future mobility needs. With the Transit Leap and Mobility Hubs networks developed, a process known as a *propensity analysis* was conducted to ensure that each service would be located where it would be needed most—based on the area's demographics and how people in that particular area travel. Transit Leap and Complete Corridors networks were evaluated to ensure that enough freeway and transit capacity would be available to meet future travel demands on every major corridor in the region.

PROPENSITY ANALYSIS

A propensity analysis uses demographic data, travel data, and other information to evaluate the suitability of services throughout a network. The data used in a propensity analysis is based on research and best practices, reflecting the suitability of a *service*, such as public transit, to a *characteristic*, such as population density. As SANDAG developed its Transit Leap and Mobility Hub networks, propensity analyses conducted for each network helped reveal where in the region certain mobility services—and what combination of services—were most needed to most effectively enhance personal mobility, while also promoting regional goals for economic development and social equity, reducing greenhouse gases, and protecting the environment.

Transit Leap Propensity Analysis

SANDAG conducted this analysis to identify which transit routes, and which segments within each route, were most likely to meet the needs of transit riders now and in the future (Figure 12). Propensity factors are well-developed in the transit industry, based on decades of market studies, customer surveys, and industry research. Certain demographic and travel characteristics, as well as the proximity of Transit Leap routes and nodes to certain activity centers, increase transit use. As SANDAG developed its Transit Leap network, it considered the following propensity factors:

- Total Employment for 2018, 2035, and 2050.
- Weighted Population Density – This measure helped exclude undeveloped and/or vacant land from SANDAG's calculation of population densities throughout the region. Population densities were analyzed for 2018, 2035, and 2050.

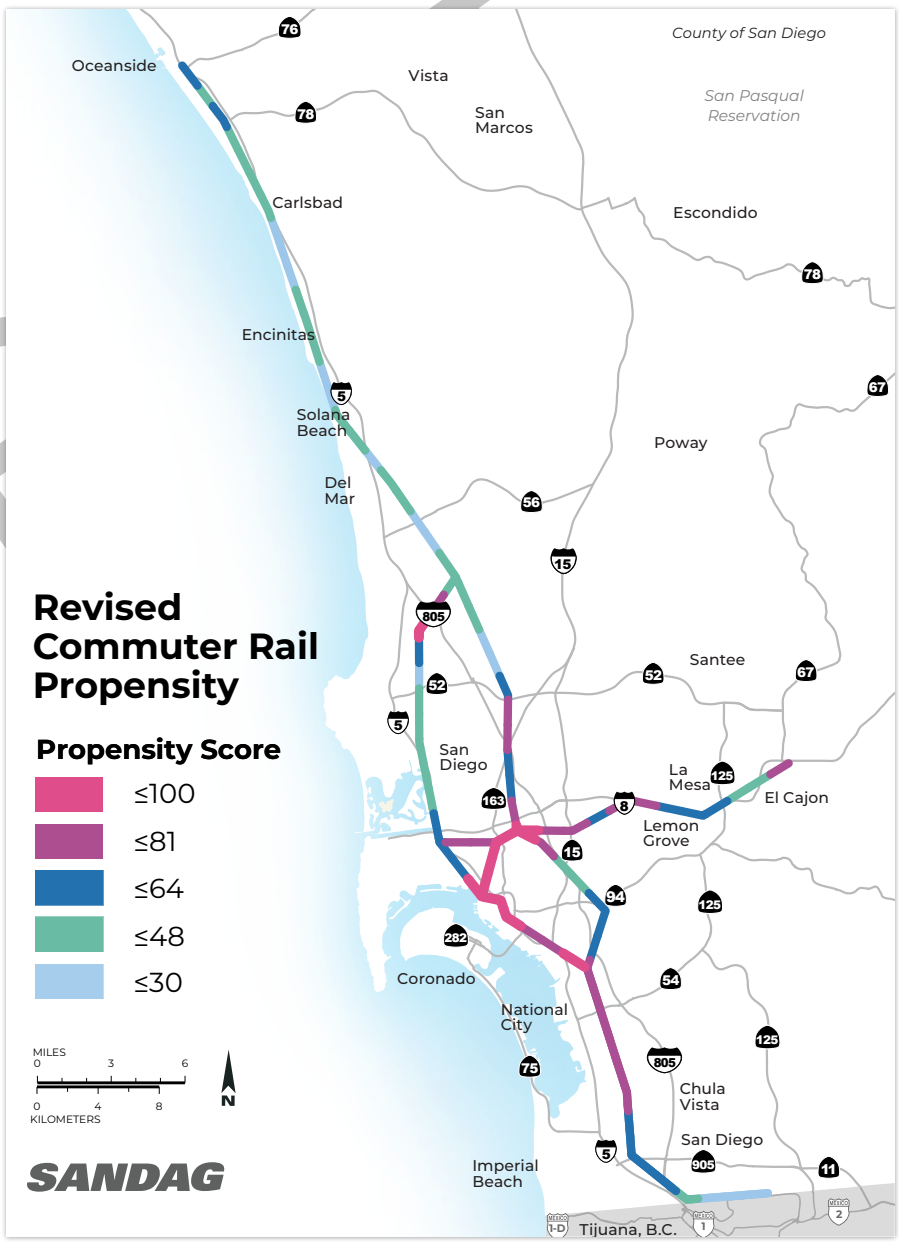

Figure 12 – Revised Commuter Rail Propensity

- The proximity of transit routes to “Activity Centers” – Defined as the total number of airports, government centers, hospitals, hotels, major attractors (such as amusement parks, sports arenas, and music venues), military installations, shopping centers, and universities/colleges.
- Connectivity – Commutes of 30 minutes or longer.
- The location of communities of concern, including senior, minority, and low-income populations.
- Population Counts by Age Group, including under 18, 18–24, 25–39, 40–74, and 75 plus.
- VMT per Capita – Year 2016 vehicle miles traveled, normalized by population.

Each factor was weighted to reflect the likelihood of transit use, with higher weights going to areas with higher densities, younger and older populations, minority and low-income populations, etc. The analysis used GIS and other tools to calculate a composite propensity score for each transit route, as well as each one-mile transit segment across the region. The propensity score reflects the weighted factors within a given distance (e.g., one mile) from each transit segment. The results of the propensity analysis helped inform the Phase 3 Transit Leap network that SANDAG developed. This network is represented in Figure 13.

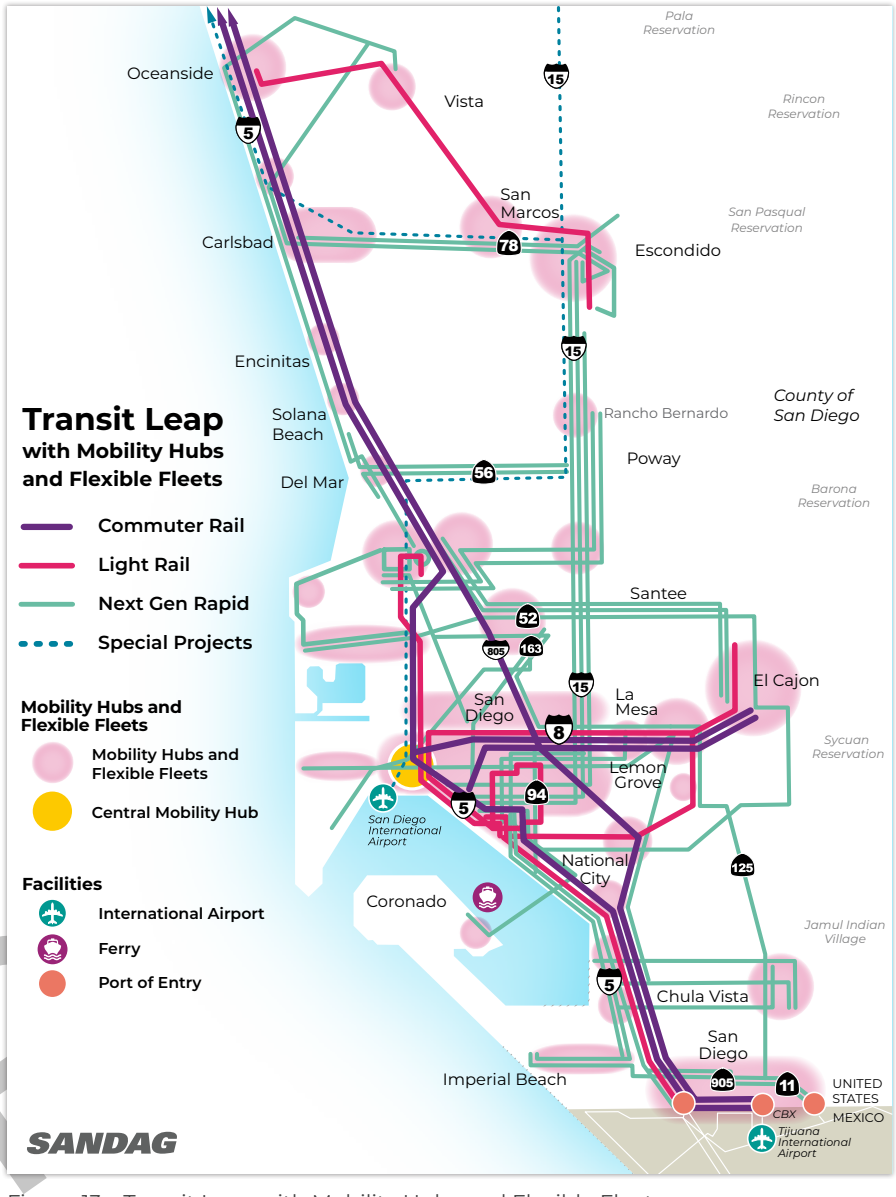

Figure 13 – Transit Leap with Mobility Hubs and Flexible Fleets

Mobility Hubs Propensity Analysis

As noted earlier, SANDAG also conducted a propensity analysis to identify which communities were most suitable for Mobility Hubs. A combination of demographic, travel data, and land use factors were examined to evaluate the communities served by Transit Leap services. Many factors used for the Transit Leap propensity analysis were also used for the Mobility Hubs propensity analysis. However, the propensity analysis for Mobility Hubs also examined the demand in individual communities for short trips within those communities—a demand that Mobility Hubs could meet. To identify the places where Mobility Hubs would be most needed, SANDAG collected and weighted the following data to determine a composite score for every Census Block Group in the region.

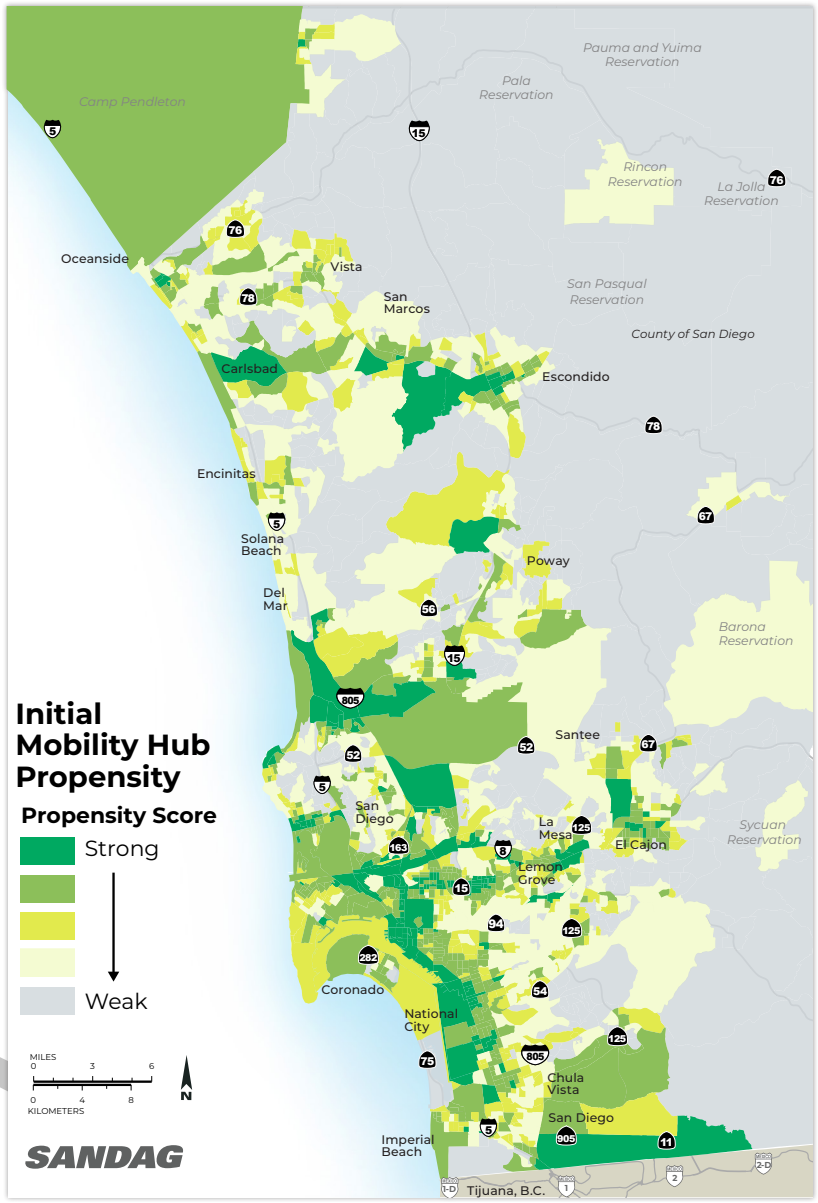

Figure 14 – Initial Mobility Hub Propensity

- Total Employment for 2018, 2035, and 2050.
- Weighted Population Density – This measure helped exclude undeveloped and/or vacant land from the density calculation. SANDAG calculated population densities for 2018, 2035, and 2050—aggregated up to each Census Block Group level and normalized by Census Block Group population.
- Population-Employment Composite Score – This was based on the Total Employment and Weighted Population scores for 2018, 2035, and 2050.
- Proximity of Mobility Hubs to "Activity Centers" – Defined as the total number of airports, government centers, hospitals, hotels, major attractors (such as amusement parks, sports arenas, and music venues), military installations, shopping centers, and universities/ colleges.
- Intersection Density – The number of local street intersections per square mile, as of 2019.
- Communities of Concern (as of 2018) – Senior, minority, and low-income populations.
- Population Counts by Age Group (as of 2018) – Under 18, 18–39, and 40–74.
- Short Tours (i.e., short trips) – Year 2016 person tours of three miles or less.
- VMT per Capita – Vehicle miles traveled in 2016, normalized by population.

The analysis used GIS and other tools to calculate a composite score for each Census Block Group in the San Diego region. Census Block Groups with composite scores greater than 29 (Figure 14) were selected and examined for their proximity to the Transit Leap network of commuter rail, light rail, and Next Generation *Rapid* services. Mobility Hub boundaries were drawn around the portion of Census Block Groups that exhibited higher Mobility Hub propensity and contained Transit Leap stops.

The resulting Mobility Hub network that SANDAG developed is comprised of the region's urban core and 30 more Mobility Hubs situated across the region that will span one, two, or more miles to enable people to connect to Transit Leap services and access an array of Flexible Fleet services. SANDAG has customized the size of each Mobility Hub so that it will meet the specific travel needs of each individual community where it is situated. The urban core includes higher density residential and commercial areas; various employment centers, including downtown and Naval Base San Diego; and popular activity centers such as Balboa Park and other tourist attractions. Also included in the urban core is the Central Mobility Hub where several

Transit Leap services will converge to provide people with rapid and convenient access to and from the airport.

By 2050 is it anticipated that the regional Mobility Hub network will serve approximately half of the region's population and more than two-thirds of the region's jobs. Additionally, approximately 60% of low-income households, half of all seniors, and more than half of all minority residents will have access to Mobility Hub services and amenities. The regional Mobility Hub network is designed to serve communities as they grow in density, offering people convenient, safe, and seamless mobility options to get to and from work, school, shopping, and more. Nearly half of all trips in the region are three miles or less, making this network a prime opportunity to reduce the number of miles that people travel driving alone while helping the region meet state mandated goals for cutting greenhouse gas emissions.

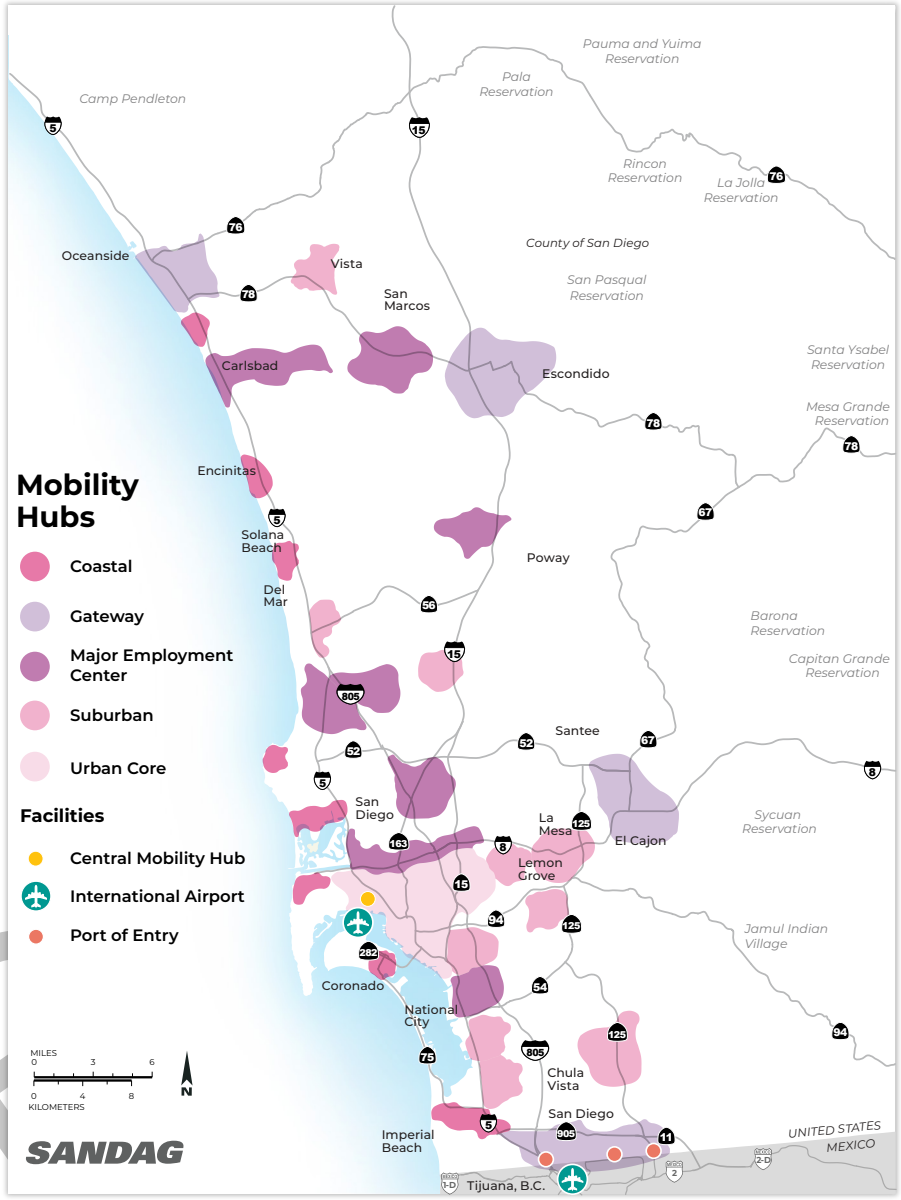

Figure 15 – Mobility Hubs

CORRIDOR CAPACITY ANALYSIS

The final validation step in the development of the Vision for the 2021 Regional Plan was an analysis of demand on the region's major corridors of travel. The methodology for this analysis was to forecast future travel demand (in 2035) on the freeway network, and to assess the capacity of freeway managed lanes as well as Transit Leap services to meet future corridor demand. SANDAG conducted this analysis for selected locations on every major freeway corridor where travel demand was highest in 2016. Traffic data for 2016 was collected at each freeway location, in order to understand the capacity of a given freeway corridor to move people and goods reliably.

Using travel forecasts from the 2019 Federal RTP, SANDAG estimated travel demands in the Year 2035 at each freeway location. These demands were then compared with future freeway capacity for that particular segment, in order to assess the segment's performance.

For example, a segment of I-805 may have an estimated demand in 2035 of 8,000 vehicles during the peak hour. However, that segment may only have a capacity for 5,000 vehicles on its general-purpose freeway lanes in 2035. Each freeway, and each managed lane on that freeway, have different capacities to move people based on different operational characteristics.

Finally, the freeway analysis assessed unmet demand (in terms of the number of individuals) at each freeway segment (if any), along with the number of hours in which demand exceeded capacity. In the previous example, the unmet demand would be 3,000 vehicles or 3,300 individuals at 7 a.m., and demand exceeds capacity from 6 a.m. to 9 a.m. in 2035.

For those freeway segments with future unmet demand, parallel transit services were identified from future Transit Leap concepts in each freeway corridor.[7] Based on available Transit Leap services and their respective vehicle configuration and design and comfort capacities, an aggregate transit capacity was calculated for the selected peak period.

7 Future unmet demand was further reduced, as any future managed lanes were assumed to meet 20% of overall freeway demand.

Table 1 – Passenger loading assumptions for Transit Leap vehicles

Mode	Vehicles/ Consists	Design Capacity	Comfort Load	Max Capacity	Vehicle
Commuter Rail	5	355	355	1775	Bombardier Bi-Level Coach
LRT	3	225	150	450	Siemens S70
Tram	1	226	150	450	Siemens Desiro VT642
Next Gen *Rapid*	1	125	125	125	New Flyer Articulated
Local Bus	1	82	82	82	New Flyer Excelsior

The available transit capacity[8] in the corridor in Year 2035 was then compared with unmet freeway demand. Based on the analysis conducted, SANDAG found that all freeway segments identified with unmet person demand also had a sufficient amount of Transit Leap capacity available in order to meet the excess corridor demand.

Next Steps

As we approach mid-century, our region will see many changes related to where we live and work, how we get around, how our economy grows, how we protect our environment, and how we preserve our high quality of life. One of the biggest challenges we will face is a projected growth in population to 3.75 million—more than 400,000 people than today. In 2050, personal mobility will be critical to everyone's quality of life.

The Vision for the transportation ecosystem in the 2021 Regional Plan, shaped by the transformative 5 Big Moves, has come together through a careful and deliberate analysis of real data related to where people live, where they work, how they get around, and what combination of mobility options would make their lives easier. Not every answer came from the analysis of data, however. SANDAG also built the Vision based on conversations with real people in cities and neighborhoods throughout the region, the judgments of SANDAG professionals, and a deep knowledge of local communities and their unique needs.

The work described in this report led SANDAG to its Vision—a vision of possibilities. Now, as the agency continues its work developing *San Diego Forward: The 2021 Regional Plan*, it will have to make the hard decisions about what it can build with the resources it is projected to have over the next 30 years, leading up to 2050. The ultimate transportation network chosen for our region will also have to show that it can perform—that is, achieve our mobility and environmental goals. The Vision will guide this upcoming work, pointing us in the right direction—like a guide star leading us toward a better future.

8 Maximum transit capacity in Year 2025 was reduced to account for preexisting transit demands in the corridor that exist today that will continue into future years

APPENDIX A – 5 BIG MOVES DESCRIPTIONS

Table A–1 – Complete Corridor Types

Type	Travel Shed/ Trip Purpose/ Characteristics	Functionality/ Multimodal Elements	Key Performance Characteristics
Regional and Interregional	Regional and Interregional commuting Serves long distance commute trips (>20 miles), regional employment and industrial centers and primary regional freight backbone	High-speed transit, regional freight, active transportation	About 65–70% of freeway VMT (total for all type A) 60% of trips >20 miles 66% of total regional freeway Delay
Urban Connectivity	Regional urban commuting Serves long and medium distance commute trips (>5 miles), part of primary regional freight backbone	Transit, regional freight, and active transportation	25–30 % of total freeway VMT 80–90% of trips > 5 miles 35% of regional freeway delay
Rural Access and Connectivity	Provide rural access and connectivity: non commuting long stretches of rural roadway connecting nearby rural towns and lands to the interstate system Serves long and medium distance trips (>5 miles) with mountainous terrain and limited transit option	Transit: Rural bus, commuter bus, local bus International/Cross Border/subregional freight Active Transportation	About 5% of regional freeway VMT 80% of trips lengths 5–20 miles About 1% of regional freeway delay
CC Regional Arterial Network	Local commuting: primary arterial network connecting employment and industrial centers to residential neighborhoods Trip distance 5–20 miles with bus and light rail providing transit backbone	Transit: LRT/BRT/*Rapid* bus/Express bus Short haul trips (local delivery) Active transportation: urban network, first and last mile to Mobility Hubs	Generally represents 65% of trips <5 miles

Table A–2 – Transit Leap Service Types

Type of Service	Purpose	Speed	Distance and Station Spacing	Infrastructure
Commuter Rail	Commuter rail lends itself to longer trips and interregional travel.	Operates with speeds up to 110 mph.	Routes can exceed distances of over 100 miles, with spacing of 10 miles or more between stations.	Transit Leap Commuter Rail operates exclusively on fully grade separated guideways, similar to high-speed rail.
Light Rail	Facilitate shorter, more regional trips than Commuter Rail.	These services operate at average speeds of up to 30 mph, with a maximum speed of 55 mph.	LRT routes generally have station spacing of 1 mile at minimum.	Light Rail Transit (LRT) services are partially grade separated guideways, such as the current light rail service in the region (MTS Trolley and the Sprinter).
Next Generation *Rapid*	Next Generation *Rapid* services seek to improve existing premium or express bus services by leveraging technology and dedicated bus infrastructure to improve operating speeds.	Next Generation *Rapid* services operate at average speeds of up to 35 mph, with a maximum of 65 mph.	Route range from 10 to 40 miles in length with station spacing from 0.5 to 5 miles.	These services run in a fixed guideway or a dedicated lane during peak periods on major arterial corridors and freeway managed lanes, requiring vehicle priority to reduce or minimize conflicts.
Local Bus Routes and Flexible Fleets	These services better facilitate local, short distance trips. Future services may be supplied using on-demand Flexible Fleet vehicles (for more detail see Flexible Fleets section)	Local Bus and Flexible Fleet services operate at average speeds up to 25 mph, with a maximum speed of 65 mph.	These local routes can have route distances of various lengths, with stations spaced from 0.25 to over 1 mile in length.	Buses receive vehicle priority at critical spots along the route, as well as at major signalized intersections. Flexible Fleets services are similar to existing local bus services in that they run on major roadways and local streets

Table A–3 – Mobility Hub Types

Mobility Hub	Type	Transit Leap Services	Flexible Fleet Services
Carlsbad Village	Coastal	Commuter Rail, Next Gen *Rapid*	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Carmel Valley	Suburban	Commuter Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
College Area	Suburban	Commuter Rail, Light Rail, Next Gen *Rapid*	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Coronado	Coastal	Next Gen *Rapid*	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Encinitas	Coastal	Commuter Rail	Micromobility, Rideshare, Microtransit, NEV Microtransit
Imperial Beach	Coastal	Commuter Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
La Jolla	Coastal	Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
La Mesa	Suburban	Commuter Rail, Light Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Lemon Grove	Suburban	Light Rail	Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Mira Mesa	Suburban	Next Gen *Rapid*	Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Ocean Beach	Coastal	Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Oceanside	Gateway	Commuter Rail, Light Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Pacific Beach	Coastal	Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Solana Beach	Coastal	Commuter Rail, Next Gen *Rapid*	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Southeast San Diego	Suburban	Commuter Rail, Light Rail, Next Gen *Rapid*	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Southwest Chula Vista	Suburban	Commuter Rail, Light Rail, Next Gen *Rapid*	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Vista	Suburban	Light Rail, Next Gen *Rapid*	Micromobility, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Carlsbad Palomar	Major Employment Center	Commuter Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Downtown Chula Vista	Suburban	Commuter Rail, Light Rail, Next Gen *Rapid*	Micromobility, Rideshare, NEV Microtransit, Last-Mile Delivery
El Cajon	Gateway	Commuter Rail, Light Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Escondido	Gateway	Light Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery

Mobility Hub	Type	Transit Leap Services	Flexible Fleet Services
Kearny Mesa	Major Employment Center	Commuter Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Mission Valley	Major Employment Center	Commuter Rail, Light Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
National City	Major Employment Center	Commuter Rail, Light Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Otay Ranch	Suburban	Next Gen *Rapid*	Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
San Marcos	Major Employment Center	Light Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Sorrento Valley	Major Employment Center	Commuter Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
University Community	Major Employment Center	Commuter Rail, Light Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
Urban Core	Urban	Commuter Rail, Light Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
U.S.–Mexico Border	Gateway	Commuter Rail, Light Rail, Next Gen *Rapid*	Micromobility, Carshare, Rideshare, Microtransit, NEV Microtransit, Last-Mile Delivery
West Bernardo	Major Employment Center	Next Gen *Rapid*	Carshare, Rideshare, Microtransit, Last-Mile Delivery

Table A–4 – Flexible Fleet Services Descriptions

Flexible Fleets Services	
	**Micromobility** Small, low-speed vehicles such as e-scooters, bikes, and other rideables support short trips around a community.
	**Ridehailing/Carsharing** On-demand ridehailing services allow someone to request a ride or vehicle in real time using a mobile app. Ridehailing services link the passenger with available drivers based on their trip length, number of passengers, origin, and destination. Carsharing service provides members with access to a shared vehicle. Ridehailing services will be automated in the future and operate as subscription-based services, allowing users to reserve a ride any type of vehicle for their trip.
	**Ridesharing** Drivers and passengers headed in a similar direction can share the ride in a vehicle. This includes carpool, vanpool, and pooled ride hailing services such as uberPOOL and Lyft Shared. Eventually these services will operate as automated and shared taxis that will be designed to meet passenger needs.
	**Microtransit** Multi-passenger shuttles can carry up to 15 passengers and provide rides within a defined service area. This technology-enabled transit service allows users to reserve a ride ahead of time or on demand, and it may be a more efficient option for suburban areas of the region. Smaller, all-electric shuttles, also known as neighborhood electric vehicles (NEV), also are a form of microtransit that provide a sustainable and convenient solution for short trips around communities.
	**Last-Mile Delivery** Driverless vehicles, e-bikes, drones, and bots will deliver a range of goods from a distribution hub to individual consumers, businesses, or smart lockers at Mobility Hubs. Some last mile delivery services can consolidate trips by carrying passengers and goods at the same time.

Table A–5 –Service Areas Descriptions

Flexible Fleets Service Areas

Micromobility
Mobility Hubs with high population and/or employment densities; other hubs that support micromobility include those designated as a "Gateway" or "Coastal," presence of major universities and commuter rail service.

Ridehailing/Carsharing
Mobility Hubs with high population and/or or employment densities; other hubs that support micromobility include those designated as a "Gateway" or "Major Employment Center".

Ridesharing
All ridesharing deemed suitable to operate throughout Mobility Hub network as carpool, vanpool, dynamic ridesharing and pooled ridehailing is already prevalent throughout the region.

Microtransit
There are two types of Microtransit services:

1. *Microtransit*
   This category pertains to higher occupancy, on-demand shuttle services in the region that operate similar to demand-responsive local bus. This includes hubs with high population and employment densities; other hubs that support microtransit include those designated as a "Gateway", those without commuter or light rail Transit Leap services, and hubs within the North County Transit District (NCTD) area which plans to transition local bus to on-demand microtransit as early as 2021.
2. *NEV Microtransit*
   This category pertains to small, low-speed, all-electric shuttles that operate in the region. Mobility hubs deemed suitable for micromobility are also suitable for NEVs due to the low-speed nature of the service; other hubs that support NEV microtransit include those with a high walkability index and communities with planned/existing NEV infrastructure.

Last-Mile Delivery
This includes hubs with high population and employment densities, high commercial and industrial land uses, and hubs that include major activity centers (e.g., universities, major shopping centers, major attractors, airport, hospitals, hotels).

Table A–6 – Flexible Fleets Operating Environments

Flexible Fleet	Transit Leap Interaction	Mobility Hub Interaction	Complete Corridor Interaction
Micromobility	Connections to/from: -Commuter Rail -Light Rail -Next Generation Rapid -Local Bus	Intra-hub trips; inter-hub (or neighborhood-to-neighborhood) trips Shared micromobility fleets sited and centered around commuter and light rail Transit Leap service and/or downtown, village centers	Complete Corridor Type D & E
Ridehailing and Carshare	Connections to/from: -Commuter Rail -Light Rail -Next Generation Rapid	Intra-hub trips; point-to-point Site ridehailing pick-up/drop-off locations at Transit Leap stations, curb, and where Park & Pool opportunities exist. Site carsharing vehicles where Park & Pool exists.	Complete Corridor Type A- E
Rideshare	Connections to/from: -Commuter Rail -Light Rail -Next Generation Rapid	Intra-hub trips; inter-hub trips; point-to-point Site rideshare pick-up & drop-off at commuter and light rail Transit Leap stations, curbs within hubs, and where Park & Pool opportunities exist	Complete Corridor Type A- E
Microtransit	Connections to/from: -Commuter Rail -Light Rail -Next Generation Rapid Opportunity to augment: -Local Bus	Point-to-point trips; inter-hub trips; intra-hub trips Site microtransit fleets where Park & Pool opportunities exist. NEV shuttles sited and centered around commuter and light rail Transit Leap service and/or downtown, village centers	Complete Corridor Type A- E. NEV shuttles use Complete Corridor Type D & E only
Last Mile Delivery	No connections to/from Transit Leap but opportunities to leverage transit to deliver goods or to pick up packages at transit stations exist	Package lockers and drone landing zones/pads sited around commuter and light rail Transit Leap service and/or downtown, village centers, and Park & Pool lots.	Ground services use Complete Corridor Type D- E only. Aerial services do not apply

APPENDIX B – DATA SOURCES USED IN VISION DEVELOPMENT

Table B–1 – Data Sources

Data	Data Source	Geography	Time Period	Comments
Land Use				
Activity Centers	SANDAG	San Diego Region, Point layer	Year 2019	Draft dataset
Dwelling Units	SANDAG	San Diego Region, Polygon layer	Year 2018	SANDAG Land Inventory System (SPACECORE)
Housing Unit Forecast	SANDAG	San Diego Region, by Jurisdiction, Employment Centers	Years 2016 and 2050	SANDAG Draft Regional Growth Forecast Data Source ID-28, used for Surplus Capacity analysis
Land Use, Existing	SANDAG	San Diego Region, by Polygon and Employment Center	Year 2018	
Port of Entry (POE) Boundaries	SANDAG	Polygon layer	Year 2019	Polygon feature class depicting generalized boundaries for international ports of entry along the San Diego and Imperial County border with Baja California
Smart Growth Opportunity Areas	SANDAG	San Diego Region, Polygon layer	Year 2016	
Unincorporated Communities	SanGIS	San Diego Region, Polygon layer	Year 2016	Community Planning Group areas within the County of San Diego
Transportation				
Bike Network, Proposed	SANDAG	San Diego Region, Line layer	Year 2019	Proposed network developed on September 24th, 2019 and finalized on September 25th, 2019

Data	Data Source	Geography	Time Period	Comments
Bike Routes, Existing	SANDAG	San Diego Region, Line layer	Year 2019	Existing bike routes merged by bike class and road name
Journey-to-Work Travel Time data	American Community Survey (ACS), Five-year averages.	San Diego Region, Block group	Year 2017	U.S. Census
Jurisdiction Boundaries	SanGIS	San Diego Region, Polygon layer	Year 2019	
Major Roads	SANDAG	San Diego Region, Line layer	Year 2019	
Park and Ride Lots	SANDAG	San Diego Region, Point layer	Year 2018	
Peak Period Traffic Volumes	SANDAG	San Diego Region, Line layer	Year 2016	2016 AM and PM peak period traffic flows based on ABM v14.0.1
Person Origin and Destination by Time-of Day, Trip Purpose, Day Type	Teralytics	San Diego Region, Trips from origin census tract to destination tract	Year 2018	Trip Purpose include “To Work”, “To Home”, and “To Other”; Day Types include “Weekday” and “Weekend”
Regional Arterial System	SANDAG	San Diego Region, Line layer	Year 2016	Network of regional arterials
Regional Bikeways	SANDAG	San Diego Region, Line layer	Year 2050	Riding to 2050 Regional Bikeway corridor alignments, names, and classifications
Roadway Traffic Volumes	SANDAG	San Diego Region, Line layer	Base Year (2016)	Traffic volumes from SANDAG ABM Scenario 358 (Federal RTP Update)
Short Tours (under 3 Miles), Destination MGRA	SANDAG	San Diego Region, Polygon by MGRA	Year 2016	Count of tours by destination MGRA
Short Tours (under 3 Miles), Origin MGRA	SANDAG	San Diego Region, Polygon by MGRA	Year 2016	Count of tours by origin MGRA
Street Intersections	SANDAG	San Diego Region, Point layer	Year 2016	
Transit (Rail and Bus), Existing	SANDAG	San Diego Region, Line layer	Years 2018 and 2019	From SANDAG ABM v.14.0.1

Data	Data Source	Geography	Time Period	Comments
Transit Ridership by Stop. Weekdays	SANDAG, MTS, NCTD, GTFS	San Diego County, Point Layer	FY 2018	
Transit Routes (Bus and Rail), Future	SANDAG	San Diego County, Line layer	Years 2025 and 2050	2015 Regional Plan and 2019 Federal RTP
TransNet Projects	SANDAG	San Diego County	Year 2019	
Commercial Vehicle Origin-Destination	StreetLight	San Diego County	Year 2017	Trip data from 66 zones to/from various destinations in San Diego County and northern Baja CA
Vanpool Trips	SANDAG	Vanpools destined within San Diego County, Census Block Group	Year 2017	Origin-destination data based on SANDAG's 2017 Vanpool Passenger Survey
Vehicle Miles Traveled	SANDAG	San Diego County	Base Year 2016	From SANDAG ABM v.14.1.1, Scenario 376
Socioeconomic Data				
Employment Estimates	SANDAG	San Diego Region, Polygon layers by MGRA, Census Block	Year 2018	SANDAG Annual Estimates
Employment Estimates	SANDAG	San Diego Region, Polygon layer by Employment Centers and Hexbins	Year 2016	SANDAG Employment Inventory
Employment Estimates	Longitudinal Employer-Household Dynamics Dataset, (LEHD)	San Diego Region, Hexbins	Year 2016	Center for Economic Studies, U.S. Census
Employment Forecasts	SANDAG	San Diego Region, Polygon layers by MGRA, Census Block	Years 2035 and 2050	SANDAG Draft Regional Growth Forecast Data Source ID-28
Population by Age	SANDAG	San Diego Region, Polygon layers by MGRA	Year 2018	SANDAG Annual Estimates
Population by Income	SANDAG	San Diego County, Polygon layers by MGRA	Year 2016	From SANDAG ABM v.14.1.0 Scenario 330

Data	Data Source	Geography	Time Period	Comments
Population Estimates	SANDAG	San Diego Region, polygon layers by MGRA, Census Block Group, Employment Center	Year 2018	SANDAG Annual Estimates
Population Forecasts	SANDAG	San Diego Region, polygon layers by MGRA, Census Block	Years 2035 and 2050	SANDAG Draft Regional Growth Forecast Data Source ID-28

APPENDIX C – GLOSSARY

A

active transportation
Active Transportation includes any method of travel that is human-powered, but most commonly refers to walking and biking. With technological advances, the definition has expanded to include things like e-scooters and e-bikes.

activity centers
Places that attract a significant number of people or vehicles daily, including employment centers, shopping centers, business parks, hospitals, major tourist attractions, colleges/universities, and other destinations.

ADT
see **average daily traffic**

arterial
Streets with traffic lights that serve primarily to carry traffic through an area as quickly and efficiently as possible.

Active Transportation and Demand Management
Active Transportation and Demand Management (ATDM) is the dynamic management, control, and influence of travel demand, traffic demand, and traffic flow of transportation facilities.

ATDM
see **Active Transportation and Demand Management**

autonomous vehicles
Vehicles that operate independently from other vehicles and use internal sensors to survey and respond to surroundings.

average daily traffic
The average number of vehicles that travel through a specific point of a road over a short duration of time (often seven days or less).

B

bikeshare
Bikeshare services provide low-cost, on-demand, and convenient access to a fleet of shared bikes for short-term use. Services can be accessed by using a smartphone app.

C

capacity
In transportation, the maximum number of vehicles, people, or freight than can travel a given route in a given amount of time, usually an hour. For roadways, it's the maximum sustainable hourly flow rate at which vehicles reasonably can be expected to traverse a point or a lane on a roadway during a given time period, typically 15-minute intervals under prevailing roadway, traffic, and control conditions. Roadway capacity is usually expressed in vehicles per hour per lane. For transit, capacity is determined by the product of transit vehicle capacity and the maximum frequency with which transit vehicles can pass a given location.

carsharing/ridehailing
Carshare services offer access to vehicles 24 hours a day, seven days a week. These cars can be found within a specified service area, at transit stations, or other locations, and people can find them through a smartphone app or provider's website.

Census Block Group
A geographical unit used by the United States Census Bureau. Typically, Block Groups have a population of 600 to 3,000 people. This is the smallest geographical unit for which the Census Bureau publishes sample data (i.e., data that are only collected from a fraction of all households).

connectivity
The general ability for people to reach destinations. In the transportation context, enhanced connectivity is achieved by increasing the options and opportunities for travel to various destinations.

communities of concern
see **disadvantaged communities**

commuter rail
Conventional rail passenger service within a metropolitan area. Service is primarily in the morning (home-to-work) and afternoon (work-to-home) travel periods.

congestion
Travel time or delay in excess of what is 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 several streets and highways as well as bike routes and transit route alignments.

D

DARs
see **direct access ramps**

data hub
In transportation systems, a data hub is the central location of data storage, analysis, and transport. It includes data-input channels; high-speed, high-volume computing platforms; and data storage technologies. Data hubs are used to receive field data from local and regional data providers; process, analyze, and verify quality of received data; message and communicate data within the system; store data; and provide security measures for stored data.

delay
see **congestion**

density analysis
Density analysis is a GIS mapping process that takes known quantities of some phenomenon (e.g., population) and spreads them across an area (e.g., San Diego County) based on the quantity that is measured at each location and the spatial relationship of the locations of the measured quantities.

direct access ramps
Freeway ramps that provide direct access between HOV lanes or Managed Lanes and local communities. Direct access ramps (DARs) provide the benefits of local connectivity, shorter freeway access times, and minimal conflicts with general-purpose freeway lanes.

disadvantaged communities
Disadvantaged communities are identified as minority, low-income, and senior populations. The term "minority" is described by the Federal Highway Administration as: Black (having origins in any of the black racial groups of Africa); Hispanic (of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race); Asian American (having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or American Indian and Alaskan Native (having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition). Low-income populations are those with income levels below 200% of the Federal Poverty Rate, and senior populations include anyone 75 years old and older.

E

e-scooters
see **electric scooters**

electric scooters
Kick scooters are equipped with an electric motor, making it easier for people to travel to work or other destinations when topography is challenging. E-scooters typically have two small wheels and can travel at a maximum speed of 15 to 20 mph.

emerging technology
A technological advance that can be applied to the transportation system and personal vehicles to reduce congestion, increase efficiency, and improve safety. Emerging transportation technologies include, but are not limited to, zero-emission vehicles, transit vehicle technologies, smart parking, mobility hubs, and universal transportation account.

F

Flexible Fleets
On-demand, shared services that provide different mobility options and vehicles for all types of trips, reducing the need own a car. Vehicle types can range from small, low-speed scooters to a 12-passenger shuttles. These services can make it easier to connect to high-speed transit and other important destinations by providing a last-mile connection or fulfilling a complete trip.

G

gateway mobility hub
A mobility hub that provides an entry point into the 5 Big Moves network. These mobility hubs are situated near the starting point of many Transit Leap routes while featuring a robust set of Flexible Fleet services to help the outlying community connect to/from transit. Gateway mobility hubs include Oceanside, Escondido, El Cajon, and the US-Mexico Border.

general purpose lanes
Term used to refer to traditional mixed-flow freeway lanes. Used to distinguish between high-occupancy vehicle (HOV) lanes, Express Lanes, or toll lanes.

geographic information system
A framework for gathering, managing, and analyzing data. Rooted in the science of geography, a geographic information system (GIS) integrates many types of data. It analyzes spatial location and organizes layers of information into visualizations using maps and three-dimensional scenes. With this unique capability, GIS reveals deeper insights into data, such as patterns, relationships, and situations, helping users make smarter decisions.

GIS
see **geographic information system**

H

hexbin
Hexagon-shaped geographic areas used for geospatial analysis.

high-occupancy vehicle
A vehicle that carries more than one person, such as a carpool, vanpool, shuttle, or bus.

HOV
see **high-occupancy vehicle**

HOV 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 can use HOV lanes include carpools, vanpools, buses, other multi-passenger vehicles, motorcycles, and emergency vehicles, as well as decaled low-emission vehicles.

human-centered design
A customer-focused approach to solving problems. A human perspective is taken into consideration in every step of the problem-solving process, from determining the true needs of the people who are served to verifying that the solution designed for them is actually meeting their needs.

I

J

K

kernel analysis
see **density analysis**

L

last-mile delivery
The delivery of goods (e.g., small packages or food) by a person or by using semi- or fully automated vehicles, e-bikes, drones, and bots to make deliveries from the distribution center to a user's home or smart lockers at Mobility Hubs. Shared vehicles can make efficient trips by carrying passengers and goods at the same time.

level of service
A performance measure used to determine how well a transportation facility is operating from a traveler's perspective. Typically, six levels of service are defined, each assigned a letter designation from A to F, with LOS A representing the best operating conditions and LOS F

the worst. Various statistics or metrics are associated with each level of service depending on the transportation system or mode.

light rail
Dedicated rail service that serves longer commute trips and shorter local trips (e.g., the MTS San Diego Trolley and NCTD SPRINTER rail service). Light rail is generally integrated into the street network much more than commuter rail.

LOS
see **level of service**

M

Managed Lanes
Highway facilities or a set of lanes where operational strategies are proactively implemented and actively managed to optimize traffic flow and person throughput. Managed Lanes include high-occupancy vehicle lanes, value priced lanes, high-occupancy toll lanes, and exclusive or special use lanes. Managed Lanes are designed to give priority access to alternative modes. The Interstate 15 Express Lanes that run 20 miles between State Route 78 in Escondido and State Route 163 in San Diego are Managed Lanes that offer free use for transit, carpools, vanpools, and motorcycles while single-occupant vehicles pay a toll to use the lanes.

managed lane connectors
Freeway connectors that provide direct access between one high-occupancy vehicle lanes or Managed Lanes facility with another. Managed Lane connectors provide the benefits of shorter freeway travel times and minimal conflicts with the general-purpose freeway lanes.

master geographic reference area
The basic geographic unit in SANDAG's Master Geographic Reference File system for storing demographic, economic, and other information. MGRAs are small—comparable to census blocks in size. Currently, there are more than 23,000 MGRAs used to represent the San Diego region.

MGRA
see **master geographic reference area**

micromobility
Small, low-speed, low-occupancy vehicles that fulfill short trips (e.g., bikeshare, scootershare, and neighborhood electric vehicles).

microtransit
Microtransit services use smaller vehicles that carry 5–12 passengers. Riders can typically

request service through a mobile app that directs them to common locations along the service route for pick-up.

ML
see **Managed Lanes**

Mobility Hubs
Mobility Hubs are communities with a high concentration of people, destinations, and travel choices. They provide an integrated suite of mobility services, safe roads, and supporting amenities and technology to help people reach high-frequency transit or make short trips around a community. Mobility Hubs can span one, two, or few miles, and each hub is uniquely designed to fulfill a variety of travel needs while strengthening sense of place.

Mobility Hub network
Comprising "right-sized" Mobility Hubs that are situated close to major residential, job, and activity centers across the region. Each mobility hub enhances connections to and from Transit Leap services by offering an array of on-demand Flexible Fleet choices throughout a community. Mobility Hubs also integrate with Complete Corridors to ensure walking and biking are safe experiences while prioritizing the movement of shared mobility options over single-occupant vehicles.

N

National Highway Freight Network
A network of highways, including:

- the Primary Highway Freight System (PHFS), a network of highways identified as the most critical highway portions of the U.S. freight transportation system
- non-PHFS Interstate highway routes that provide important continuity and access to freight transportation facilities
- Critical Rural Freight Corridors (CRFCs), public rural roads that provide access and connection to the PHFS and the Interstate with other important ports, public transportation facilities, or other intermodal freight facilities
- Critical Urban Freight Corridors (CUFCs), urbanized public roads that provide access and connection to the PHFS and the Interstate with other ports, public transportation facilities, or other intermodal transportation facilities

National Highway System
An interconnected system of principal arterial routes that serve major population centers, international border crossings, ports, airports, public transportation facilities, and other intermodal transportation facilities and major travel destinations; meet national defense requirements; and serve interstate and interregional travel.

Next Generation *Rapid*
Next Generation (Next Gen) *Rapid* uses sleek and comfortable transit vehicles that can be

configured to different sizes or coupled, can be automated in the future, and get priority on roads so they can travel at posted street speed limits. Service is provided every ten minutes all day.

Next Operating System
The proposed digital platform of the regional transportation system that compiles information from sources like passenger vehicles, buses, ridesharing vehicles, delivery trucks, bikes, and scooters into a centralized data hub. Analysis of these data will improve how transportation is planned, operated, and experienced. Transportation operators will be able to better manage supply and demand by modifying how infrastructure and services are used throughout the day.

Next OS
see **Next Operating System**

NHFN
see **National Highway Freight Network**

NHS
see **National Highway System**

O

on-demand transportation
A form of transportation where services are requested in real time by the traveler and fulfilled by services providers based on location and availability. On-demand rideshare services, for example, allow someone to request a ride in real time using a mobile app. Services match drivers and passengers traveling in the same direction based on their origin and destination while identifying the quickest route.

P

Performance Measurement 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.

PeMS
see **Performance Measurement System**

priority treatments
Improvements, modifications, or design features of either the operations or the environment in which selected transportation systems or modes operate that improve performance. The

most prevalent priority treatment is for transit priority, which attempts to increase speeds, reduce delays, or otherwise benefit bus operations by improving reliability or attractiveness to patrons.

propensity analysis
A process in which observed data is used to predict the likelihood of a certain outcome. For example, transit propensity may assume that there are certain physical, locational, and socioeconomic factors that can potentially serve as predictors of where transit service may be successful. By assessing those factors in relationship to existing or future transit services, propensity models may be used to plan future transit routes.

public–private partnership
Any formal collaboration between a public agency and a private company to deliver a public service or facility.

Q

R

Rapid
Provides rapid and frequent transit service along arterials and express lanes. Arterial *Rapid* bus services use signal priority and queue-jumper lanes at major intersections, while freeway *Rapid* services use express lanes to maintain reliable, high-speed service (e.g., Mid-City *Rapid* transit service). All day, all-stop trunk *Rapid* services can be complemented with peak-period commuter express services designed to provide very limited stop connections to major employment centers (e.g., Interstate 15 *Rapid* transit).

rideshare/ridesharing
Shared trips for people with a common origin and destination. Technology enabled pooled ridehailing services to thrive in addition to traditional carpools and vanpools.

S

scootershare
Scootershare provides low-cost, on-demand, convenient access to a fleet of shared electric scooters for short-term use. Services may include kick scooters or mopeds and are typically dockless and can be accessed by using a smartphone app.

shared mobility
Transportation services that are shared among users, either concurrently or one after another. Services may include shared vehicle fleets (e.g., dockless bikes and scooters) or shared ride options (e.g., Lyft and Uber).

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.

SPRINTER
The SPRINTER light rail train system, operated by NCTD, provides service between Oceanside and Escondido.

sustainability
Meeting current economic, environmental, and community needs without jeopardizing the ability of future generations to meet their needs.

T

traffic volumes
see **average daily traffic**

transit capacity
see **capacity**

transit signal priority
Technology that uses GPS along with bus route schedules and real-time performance data to request priority treatment at particular intersections as necessary.

Transit Leap
A complete network of high-speed, high-capacity, high-frequency transit services that connects major residential areas with employment centers and attractions. High-speed services, covering longer distances with limited stops, are separated from vehicle traffic with bridges, tunnels, or dedicated lanes. Improvements to existing transit services, such as the Trolley, COASTER, SPRINTER, and *Rapid*, may include additional rail tracks, more frequent service, dedicated transit lanes, and traffic signal priority.

travel demand
The general phenomenon of the movement of people and goods within a given area. Demand is typically measured in trips, characterized by a trip origin and either single or multiple trip destinations. For the purposes of travel forecasting and analysis, trip purpose, trip mode, time of day, and other travel factors are considered.

Trolley
The San Diego Trolley is the urban light rail transit service currently provided in the San Diego region. MTS operates three primary lines.

U

V

V/C ratio
see **volume to capacity ratio**

vehicle miles traveled
The total number of miles traveled on all roadways by all vehicles. Reducing vehicle miles traveled (VMT) can help ease traffic congestion and improve air quality.

VMT
see **vehicle miles traveled**

volume to capacity ratio
One of many measures used to assess roadway performance. It is the ratio of a roadway's volume to its capacity for a given time period (usually a peak hour). A V/C ratio of less than one is acceptable, while a V/C ratio of greater than one is unacceptable.

W

weighted population density
The average of the population densities of subareas (e.g., block groups) of a larger area (e.g., census tract) weighted by the populations of those subareas. Weighted population density is an alternative to the conventional population density measure—total population divided by total area.

X

Y

Z

Timeline of Key Activities Related to the Development of the Vision for the 2021 Regional Plan

On **February 22, 2019**, the Board of Directors unanimously approved an action plan to develop a bold new vision for San Diego Forward: The 2021 Regional Plan.

On **April 26, 2019**, staff introduced the 5 Big Moves as key strategies for developing a transportation system that provides safe, convenient, equitable, and attractive travel choices that will meet state and federal requirements, including a Sustainable Communities Strategy (per Senate Bill 375) that achieves the greenhouse gas emission reduction targets set by the California Air Resources Board.

On **July 12, 2019**, staff presented more detail on the 5 Big Moves to the Board for discussion. The presentation showed how key employment and commute data was being used to develop new solutions to long-standing commute challenges. The Board directed staff to continue development of the 2021 Regional Plan, focusing on the 5 Big Moves and conforming to all state and federal requirements, while also prioritizing specific corridors using the Complete Corridors model.

On **September 27, 2019**, the Board allocated $593.4 million over the next five fiscal years to advance planning for 12 Complete Corridors and a Central Mobility Hub with transit connectivity to the airport. The Board action also included funding for regional programs related to the 5 Big Moves (Regional Electric Vehicle Charger Incentive Program, Flexible Fleets Pilot, and Smart Center Concept of Operations).

On **October 8, 2019,** Governor Gavin Newsom signed Assembly Bill 1730 (Gonzalez) into law which, in effect, keeps the region in compliance with state laws to ensure important state funds continue to flow to the region while the 2021 Regional Plan is being developed. Also, in October the Board approved the 2019 Federal Regional Transportation Plan (RTP) to keep important transportation funding coming to the region while the vision is being developed. In November, the U.S. Department of Transportation issued the 2019 Federal RTP air quality conformity finding.

From **January through July 2020**, staff delivered a series of presentations to the Policy Advisory Committees and Board on topics related to the Regional Plan in preparation for the presentation of the vision. Presentation topics included our regional economy, data-driven planning, big data, regulatory requirements, environmental impact reports, transportation modeling, and lessons learned from COVID-19.

Regional Plan: Federal and State Requirements

Introduction

The development of our Regional Plan is governed by several federal and state laws and regulations, as described below. In the San Diego region, the Regional Plan combines the Regional Transportation Plan (RTP). its Sustainable Communities Strategy (SCS), and the Regional Comprehensive Plan (RCP).

State Requirements

- **Senate Bill 375 (SB 375):** (Chapter 728, Statutes of 2008) directed the California Air Resources Board (CARB) to set regional targets for cars and light trucks for the reduction of greenhouse gas emissions. SB 375 amended state RTP requirements (Government Code Section 65080 et seq.) by requiring that RTPs include a SCS that demonstrates how the regional greenhouse gas reduction targets will be achieved. CARB has adopted guidelines for the evaluation of the SCS.
- **Assembly Bill 805:** (Chapter 658, Statutes of 2017) requires that SANDAG's Regional Plan include strategies that provide for mode shift to public transportation, identify disadvantaged communities, and include transportation strategies to reduce pollution exposure in disadvantaged communities.
- **Assembly Bill 1730:** (Chapter 634, Statutes of 2019) extended the deadline for SANDAG's next Regional Plan until December 31, 2021. It also requires that SANDAG submit an implementation report to CARB when it submits a SCS to CARB for review. This report will track the implementation of its most recently adopted 2015 SCS.
- **California Environmental Quality Act (CEQA):** SANDAG, as the Lead Agency under the CEQA, will prepare a Program Environmental Impact Report (EIR) for the 2021 Regional Plan.
- **Other State Requirements:** The Regional Plan also includes the elements required for the RCP (Public Utilities Code Section 132360, et seq.) and the Regional Housing Needs Assessment described in the state's housing element law (Government Code Section 65580, et seq.).

Federal Requirements

- **Moving Ahead for Progress in the 21st Century Act (MAP-21)/Fixing America's Surface Transportation (FAST) Act and Metropolitan Planning Regulations:** The Regional Plan must implement a performance-based approach in its metropolitan transportation planning process and meet other requirements of the U.S. Department of Transportation Metropolitan Planning Regulations (Title 23 CFR Parts 450 and 771 and Title 49 CFR Part 613).
- **Section 176 of the federal Clean Air Act and Transportation Conformity Rule:** Under the Clean Air Act (42 USC Section 7506), as amended, and the Environmental Protection Agency's (EPA's) Transportation Conformity Rule (Title 40 CFR Part 93), SANDAG must demonstrate that the Regional Plan conforms to requirements of the State Implementation Plan for attainment of air quality standards, and uses the most recent planning assumptions.

- **Title VI of the federal Civil Rights Act of 1964 and other non-discrimination requirements:** The Regional Plan must comply with Title VI of the federal Civil Rights Act of 1964 (42 U.S.C. 2000d), the Americans with Disabilities Act (as defined in Title 49, Part 37, of the United States Code), Executive Order 12898 on Environmental Justice, and Executive Order 13166 on Limited English Proficiency to ensure consideration of social equity, environmental justice, and accessibility.

Regional Plan Content Requirements

The California Transportation Commission (CTC) periodically adopts guidelines for the preparation of RTPs that include checklists that must be submitted with the draft and final Regional Plan to the CTC, Caltrans, and federal agencies. Attachments 3A and 3B include the RTP Checklist and the Air Quality Conformity Checklist, respectively. Key requirements are summarized below.

RTP Checklist

- **General:** The Regional Plan must cover a period of at least 20 years from the adoption date; include policy, action, financial elements, and SCS addressing 10 specified issues; long- and short-range strategies and actions; and travel demand model methodology.
- **Consultation/Cooperation:** A Public Involvement Program must be developed and implemented. Consultation must be conducted with Tribal Governments; local elected officials; representatives from environmental and economic communities, airport, transit, and freight; with agencies responsible for land use, natural resources, environmental protection, conservation, and historic preservation. The Regional Plan must discuss involvement of private sector, federal land management agencies, and coordination efforts with regional air quality planning authorities (San Diego County Air Pollution Control District).
- **Title VI and Environmental Justice:** The Public Participation Plan must describe strategies to seek out and consider the needs of low-income and minority communities. A Title VI analysis and an Environmental Justice analysis must be prepared.
- **Multimodal Discussion, Programming/Operations:** The Regional Plan must discuss intermodal and connectivity issues, highways, transit, regional airport system, regional pedestrian needs, regional bicycle needs, California Coastal Trail, rail transportation, maritime transportation, and goods movement. It must be consistent with regional ITS architecture. It also must identify objective criteria used for measuring the performance of the transportation system.
- **Financial:** The Regional Plan must include a financial plan that demonstrates how it can be implemented, revenues must reflect fiscal constraint and the Regional Plan must include a list of financially constrained projects.
- **Environmental:** The Regional Plan is subject to CEQA and an EIR must be prepared. Clean Air Act State Implementation Plan conformity must be demonstrated (see below).

Air Quality Conformity Checklist

- Under the U.S. Department of Transportation Metropolitan Planning Regulations and EPA's Transportation Conformity Rule requirements, the Regional Plan needs to meet four requirements: (1) Regional emissions analysis; (2) Timely implementation of Transportation Control Measures; (3) Financial Constraint Analysis; and (4) Interagency consultation and public involvement. In the San Diego region, the air quality conformity analysis is conducted for ozone or smog (2008 and 2015 federal ozone standards).

Regional Transportation Plan Checklist

(Revised December 2016)

(To be completed electronically in Microsoft Word format by the MPO and submitted along with the draft and final RTP to Caltrans)

Name of MPO: _____

Date Draft RTP Completed: _____

RTP Adoption Date: _____

What is the Certification Date of the Environmental Document (ED)? _____

Is the ED located in the RTP or is it a separate document? _____

By completing this checklist, the MPO verifies the RTP addresses all of the following required information within the RTP.

Regional Transportation Plan Contents

General

		Yes/No	Page #
1.	Does the RTP address no less than a 20-year planning horizon? (23 CFR 450.324(a))		
2.	Does the RTP include both long-range and short-range strategies/actions? (23 CFR 450.324(b))		
3.	Does the RTP address issues specified in the policy, action and financial elements identified in California Government Code Section 65080?		
4.	Does the RTP address the 10 issues specified in the Sustainable Communities Strategy (SCS) component as identified in Government Code Sections 65080(b)(2)(B) and 65584.04(i)(1)?		
	a. Identify the general location of uses, residential densities, and building intensities within the region?		
	b. 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?		
	c. Identify areas within the region sufficient to house an eight-year projection of the regional housing need for the region pursuant to Government Code Section 65584?		

	Yes/No	Page #
d. Identify a transportation network to service the transportation needs of the region?		
e. 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 Government Code Section 65080.01?		
f. Consider the state housing goals specified in Sections 65580 and 65581?		
g. Utilize the most recent planning assumptions, considering local general plans and other factors?		
h. 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 ARB?		
i. Provide consistency between the development pattern and allocation of housing units within the region (Government Code 65584.04(i)(1)?		
j. Allow the regional transportation plan to comply with Section 176 of the federal Clean Air Act (42 U.S.C. Section 7506)?		
4. Does the RTP include Project Intent i.e. Plan Level Purpose and Need Statements?		
5. Does the RTP specify how travel demand modeling methodology, results and key assumptions were developed as part of the RTP process? (Government Code 14522.2)		

Consultation/Cooperation

1. Does the RTP contain a public involvement program that meets the requirements of Title 23, CFR 450.316(a)?		
(i) Providing adequate public notice of public participation activities and time for public review and comment at key decision points, including a reasonable opportunity to comment on the proposed metropolitan transportation plan and the TIP;		
(ii) Providing timely notice and reasonable access to information about transportation issues and processes;		
(iii) Employing visualization techniques to describe metropolitan transportation plans and TIPs;		
(iv) Making public information (technical information and meeting notices) available in electronically accessible formats and means, such as the World Wide Web;		
(v) Holding any public meetings at convenient and accessible locations and times;		
(vi) Demonstrating explicit consideration and response to public input received during the development of the metropolitan transportation plan and the TIP;		

	Yes/No	Page #
(vii) Seeking out and considering the needs of those traditionally underserved by existing transportation systems, such as low-income and minority households, who may face challenges accessing employment and other services;		
(viii) Providing an additional opportunity for public comment, if the final metropolitan transportation plan or TIP differs significantly from the version that was made available for public comment by the MPO and raises new material issues that interested parties could not reasonably have foreseen from the public involvement efforts;		
(ix) Coordinating with the statewide transportation planning public involvement and consultation processes under subpart B of this part; and		
(x) Periodically reviewing the effectiveness of the procedures and strategies contained in the participation plan to ensure a full and open participation process.		
2. Does the RTP contain a summary, analysis, and report on the disposition of significant written and oral comments received on the draft metropolitan transportation plan as part of the final metropolitan transportation plan and TIP that meets the requirements of 23 CFR 450.316(a)(2), as applicable?		
3. Did the MPO/RTPA consult with the appropriate State and local representatives including representatives from environmental and economic communities; airport; transit; freight during the preparation of the RTP? (23 CFR 450.316(b))		
4. Did the MPO/RTPA who has federal lands within its jurisdictional boundary involve the federal land management agencies during the preparation of the RTP? (23 CFR 450.316(d))		
5. Where does the RTP specify that the appropriate State and local agencies responsible for land use, natural resources, environmental protection, conservation and historic preservation consulted? (23 CFR 450.324(g))		
6. Did the RTP include a comparison with the California State Wildlife Action Plan and (if available) inventories of natural and historic resources? (23 CFR 450.324(g)(1&2))		
7. Did the MPO/RTPA who has a federally recognized Native American Tribal Government(s) and/or historical and sacred sites or subsistence resources of these Tribal Governments within its jurisdictional boundary address tribal concerns in the RTP and develop the RTP in consultation with the Tribal Government(s)? (23 CFR 450.316(c))		
8. Does the RTP address how the public and various specified groups were given a reasonable opportunity to comment on the plan using the participation plan developed under 23 CFR part 450.316(a)? (23 CFR 450.316(a)(i))		
9. Does the RTP contain a discussion describing the private sector involvement efforts that were used during the development of the plan? (23 CFR 450.316(a))		

	Yes/No	Page #
10. Does the RTP contain a discussion describing the coordination efforts with regional air quality planning authorities? (23 CFR 450.316(a)(2)) **(MPO nonattainment and maintenance areas only)**		
11. Is the RTP coordinated and consistent with the Public Transit-Human Services Transportation Plan? (23 CFR 450.306(h))		
12. Were the draft and adopted RTP posted on the Internet? (23 CFR 450.324(k))		
13. Did the RTP explain how consultation occurred with locally elected officials? (Government Code 65080(D))		
14. Did the RTP outline the public participation process for the sustainable communities strategy? (Government Code 65080(E))		
15. Was the RTP adopted on the estimated date provided in writing to State Department of Housing and Community Development to determine the Regional Housing Need Allocation and planning period (start and end date) and align the local government housing element planning period (start and end date) and housing element adoption due date 18 months from RTP adoption date? (Government Code 65588(e)(5))		

Title VI and Environmental Justice

1. Does the public participation plan describe how the MPO will seek out and consider the needs of those traditionally underserved by existing transportation system, such as low-income and minority households, who may face challenges accessing employment and other services? (23 CFR 450.316 (a)(1)(vii))		
2. Has the MPO conducted a Title VI analysis that meets the legal requirements described in Section 4.2?		
3. Has the MPO conducted an Environmental Justice analysis that meets the legal requirements described in Section 4.2?		

Modal Discussion

1. Does the RTP discuss intermodal and connectivity issues?		
2. Does the RTP include a discussion of highways?		
3. Does the RTP include a discussion of mass transportation?		
4. Does the RTP include a discussion of the regional airport system?		
5. Does the RTP include a discussion of regional pedestrian needs?		

		Yes/No	Page #
6.	Does the RTP include a discussion of regional bicycle needs?		
7.	Does the RTP address the California Coastal Trail? (Government Code 65080.1) (For MPOs and RTPAs located along the coast only)		
8.	Does the RTP include a discussion of rail transportation?		
9.	Does the RTP include a discussion of maritime transportation (if appropriate)?		
10.	Does the RTP include a discussion of goods movement?		

Programming/Operations

1.	Is the RTP consistent (to the maximum extent practicable) with the development of the regional ITS architecture? (23 CFR 450.306(g))		
2.	Does the RTP identify the objective criteria used for measuring the performance of the transportation system?		
3.	Does the RTP contain a list of un-constrained projects?		

Financial

1.	Does the RTP include a financial plan that meets the requirements identified in 23 CFR part 450.324(f)(11)?		
2.	Does the RTP contain a consistency statement between the first 4 years of the fund estimate and the 4-year STIP fund estimate? (65080(b)(4)(A))		
3.	Do the projected revenues in the RTP reflect Fiscal Constraint? (23 CFR part 450.324(f)(11)(ii))		
4.	Does the RTP contain a list of financially constrained projects? Any regionally significant projects should be identified. (Government Code 65080(4)(A))		
5.	Do the cost estimates for implementing the projects identified in the RTP reflect "year of expenditure dollars" to reflect inflation rates? (23 CFR part 450.324(f)(11)(iv))		
6.	After 12/11/07, does the RTP contain estimates of costs and revenue sources that are reasonably expected to be available to operate and maintain the freeways, highway and transit within the region? (23 CFR 450.324(f)(11)(i))		
7.	Does the RTP contain a statement regarding consistency between the projects in the RTP and the ITIP? (2016 STIP Guidelines Section 33)		
8.	Does the RTP contain a statement regarding consistency between the projects in the RTP and the RTIP? (2016 STIP Guidelines Section 19)		

	Yes/No	Page #
9. Does the RTP address the specific financial strategies required to ensure the identified TCMs from the SIP can be implemented? (23 CFR part 450.324(f)(11)(vi) (**nonattainment and maintenance MPOs only**)		

Environmental

1. Did the MPO/RTPA prepare an EIR or a program EIR for the RTP in accordance with CEQA guidelines?		
2. Does the RTP contain a list of projects specifically identified as TCMs, if applicable?		
3. Does the RTP contain a discussion of SIP conformity, if applicable?		
4. Does the RTP specify mitigation activities? (23 CFR part 450.324(f)(10))		
5. Where does the EIR address mitigation activities?		
6. Did the MPO/RTPA prepare a Negative Declaration or a Mitigated Negative Declaration for the RTP in accordance with CEQA guidelines?		
7. Does the RTP specify the TCMs to be implemented in the region? **(federal nonattainment and maintenance areas only)**		

I have reviewed the above information and certify that it is correct and complete.

(Must be signed by MPO Executive Director or designated representative)

Date

Print Name

Title

Conformity Analysis Documentation
Checklist for MPO TIPs/RTPs

40 CFR	Criteria	Page	Comments
§93.102	Document the applicable pollutants and precursors for which EPA designates the area as nonattainment or maintenance. Describe the nonattainment or maintenance area and its boundaries.		
§93.104 (b, c)	Document the date that the MPO officially adopted, accepted or approved the TIP/RTP and made a conformity determination. Include a copy of the MPO resolution. Include the date of the last prior conformity finding.		
§93.104 (e)	If the conformity determination is being made to meet the timelines included in this section, document when the new motor vehicle emissions budget was approved or found adequate.		
§93.106	If the metropolitan planning area is in a serious, severe, or extreme ozone nonattainment area and/or serious carbon monoxide nonattainment area and contains an urbanized population over 200,000, then RTP must specifically describe the transportation system envisioned for future years called "horizon years."		
§93.106 (a)(2)ii	Describe the regionally significant additions or modifications to the existing transportation network that are expected to be open to traffic in each analysis year. Document that the design concept and scope of projects allows adequate model representation to determine intersections with regionally significant facilities, route options, travel times, transit ridership and land use.		
§93.108	Document the TIP/RTP is fiscally constrained consistent with DOT's metropolitan planning regulations at (23 CFR 450) in order to be found in conformity.		
§93.109 (a, b)	Document that the TIP/RTP complies with any applicable conformity requirements of air quality implementation plans (SIPs) and court orders.		
§93.109 (c-k)	Provide either a table or text description that details, for each pollutant and precursor, whether the interim emissions tests and/or the budget test apply for conformity. Indicate which emissions budgets have been found adequate by EPA, and which budgets are currently applicable for what analysis years.		
§93.110 (a, b)	Document the use of latest planning assumptions (source and year) at the “time the conformity analysis begins,” including current and future population, employment, travel and congestion. Document the use of the most recent available vehicle registration data. Document the date upon which the conformity analysis was begun.		
USDOT/EPA guidance	Documents planning assumptions are less than 5 years old at the time the conformity analysis begins. If assumptions are older than 5 years documents justification for not reviewing and updating assumptions at least every 5 years.		
§93.110 (c,d,e,f)	Document any changes in transit operating policies and assumed ridership levels since the previous conformity determination. Document the use of the latest transit fares and road and bridge tolls. Document the use of the latest information on the effectiveness of TCMs and other SIP measures that have been implemented. Document the key assumptions and show that they were agreed to through Interagency and public consultation.		
§93.111	Document the use of the latest emissions model approved by EPA.		

40 CFR	Criteria	Page	Comments
§93.112	Document fulfillment of the interagency and public consultation requirements outlined in a specific implementation plan according to §51.390 or, if a SIP revision has not been completed, according to §93.105 and 23 CFR 450. Include documentation of consultation on conformity tests and methodologies as well as responses to written comments.		
§93.113	Document timely implementation of all TCMs in approved SIPs. Document that implementation is consistent with schedules in the applicable SIP and document whether anything interferes with timely implementation. Document any delayed TCMs in the applicable SIP and describe the measures being taken to overcome obstacles to implementation.		
§93.114	Document that the conformity analyses performed for the TIP is consistent with the analysis performed for the Plan, in accordance with 23 CFR 450.324(f)(2).		
§93.115	Describe how the projects come from a conforming RTP and TIP. If this criterion is not satisfied, the project must satisfy all criteria in Table 1 of §93.109(b) for a project not from a RTP and TIP.		
§93.118 (a, c, e)	For areas with SIP budgets: Document that emissions from the transportation network for each applicable pollutant and precursor, including projects in any associated donut area that are in the Statewide TIP and regionally significant non-Federal projects, are consistent with any adequate or approved motor vehicle emissions budget for all pollutants and precursors in applicable SIPs.		
§93.118 (b)	Document for which years consistency with motor vehicle emissions budgets must be shown.		
§93.118 (d)	Document the use of the appropriate analysis years in the regional emissions analysis for areas with SIP budgets, and the analysis results for these years. Document any interpolation performed to meet tests for years in which specific analysis is not required.		
§93.119 [1]	For areas without applicable SIP budgets: Document that emissions from the transportation network for each applicable pollutant and precursor, including projects in any associated donut area that are in the Statewide TIP and regionally significant non-Federal projects, are consistent with the requirements of the "Action/Baseline", "Action/1990" and/or "Action/2002" interim emissions tests as applicable.		
§93.119 (g)	Document the use of the appropriate analysis years in the regional emissions analysis for areas without applicable SIP budgets. The regional emissions analysis must be performed for analysis years that are no more than ten years apart. The first analysis year must be no more than five years beyond the year in which the conformity determination is being made. The last year of the timeframe of the conformity determination (as described under §93.106(d)) must also be an analysis year.		
§93.119 (h,i)	Document how the baseline and action scenarios are defined for each analysis year.		
§93.122 (a)(1)	Document that all regionally significant federal and non-Federal projects in the nonattainment/maintenance area are explicitly modeled in the regional emissions analysis. For each project, identify by which analysis it will be open to traffic. Document that VMT for non-regionally significant Federal projects is accounted for in the regional emissions analysis		

40 CFR	Criteria	Page	Comments
§93.122 (a)(2, 3)	Document that only emission reduction credits from TCMs on schedule have been included or that partial credit has been taken for partially implemented TCMs. Document that the regional emissions analysis only includes emissions credit for projects, programs, or activities that require regulatory action if: the regulatory action has been adopted; the project, program, activity or a written commitment is included in the SIP; EPA has approved an opt-in to the program, EPA has promulgated the program, or the Clean Air Act requires the program (indicate applicable date). Discuss the implementation status of these programs and the associated emissions credit for each analysis year.		
§93.122 (a)(4,5,6)	For nonregulatory measures that are not included in the STIP, include written commitments from appropriate agencies. Document that assumptions for measures outside the transportation system (e.g. fuels measures) are the same for baseline and action scenarios. Document that factors such as ambient temperature are consistent with those used in the SIP unless modified through interagency consultation.		
§93.122 (b)(1)(i) [2]	Document that a network-based travel model is in use that is validated against observed counts for a base year no more than 10 years before the date of the conformity determination. Document that the model results have been analyzed for reasonableness and compared to historical trends and explain any significant differences between past trends and forecasts (for per capita vehicle-trips, VMT, trip lengths mode shares, time of day, etc.).		
§93.122 (b)(1)(ii) [2]	Document the land use, population, employment, and other network-based travel model assumptions.		
§93.122 (b)(1)(iii) [2]	Document how land use development scenarios are consistent with future transportation system alternatives, and the reasonable distribution of employment and residences for each alternative.		
§93.122 (b)(1)(iv) [2]	Document use of capacity sensitive assignment methodology and emissions estimates based on a methodology that differentiates between peak and off-peak volumes and speeds, and bases speeds on final assigned volumes.		
§93.122 (b)(1)(v) [2]	Document the use of zone-to-zone travel impedances to distribute trips in reasonable agreement with the travel times estimated from final assigned traffic volumes. Where transit is a significant factor, document that zone-to-zone travel impedances used to distribute trips are used to model mode split.		
§93.122 (b)(1)(vi) [2]	Document how travel models are reasonably sensitive to changes in time, cost, and other factors affecting travel choices.		
§93.122 (b)(2) [2]	Document that reasonable methods were used to estimate traffic speeds and delays in a manner sensitive to the estimated volume of travel on each roadway segment represented in the travel model.		
§93.122 (b)(3) [2]	Document the use of HPMS, or a locally developed count-based program or procedures that have been chosen through the consultation process, to reconcile and calibrate the network-based travel model estimates of VMT.		
§93.122 (d)	In areas not subject to §93.122(b), document the continued use of modeling techniques or the use of appropriate alternative techniques to estimate vehicle miles traveled		
§93.122 (e, f)	Document, in areas where a SIP identifies construction-related PM10 or PM 2.5 as significant pollutants, the inclusion of PM10 and/or PM 2.5 construction emissions in the conformity analysis.		
§93.122 (g)	If appropriate, document that the conformity determination relies on a previous regional emissions analysis and is consistent with that analysis.		

40 CFR	Criteria	Page	Comments
§93.126, §93.127, §93.128	Document all projects in the TIP/RTP that are exempt from conformity requirements or exempt from the regional emissions analysis. Indicate the reason for the exemption (Table 2, Table 3, traffic signal synchronization) and that the interagency consultation process found these projects to have no potentially adverse emissions impacts.		

[1] Note that some areas are required to complete both interim emissions tests.

[2] 40 CFR 93.122(b) refers only to serious, severe and extreme ozone areas and serious CO areas above 200,000 population

Disclaimers

This checklist is intended solely as an informational guideline to be used in reviewing Transportation Plans and Transportation Improvement Programs for adequacy of their conformity documentation. It is in no way intended to replace or supercede the Transportation Conformity regulations of 40 CFR Parts 51 and 93, the Statewide and Metropolitan Planning Regulations of 23 CFR Part 450 or any other EPA, FHWA or FTA guidance pertaining to transportation conformity or statewide and metropolitan planning. This checklist is not intended for use in documenting transportation conformity for individual transportation projects in nonattainment or maintenance areas. 40 CFR Parts 51 and 93 contain additional criteria for project-level conformity determinations.