SANDAG

CONCEPTUAL PLANNING FOR NEXT GEN *RAPID* ROUTES 41, 471, AND 625

STUDY REPORT

FINAL
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Prepared by

HNTB

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AHSC	Affordable Housing and Sustainable Communities
AT	active transportation
BRT	bus rapid transit
CBO	community-based organization
CEQA	California Environmental Quality Act
CIG	Capital Investment Grant
CMAQ	Congestion Mitigation and Air Quality
CMCP	Comprehensive Multimodal Corridor Plan
CRP	Carbon Reduction Program
ETC	Escondido Transit Center
FTA	Federal Transit Administration
FY	fiscal year
Gen	Generation
IIJA	Infrastructure and Investment and Jobs Act
IIP	Interregional Improvement Program
ML	Managed Lane
MTS	San Diego Metropolitan Transit System
NCTD	North County Transit District
NEPA	National Environmental Policy Act
O&M	Operations and Maintenance
PDT	project development team
RIP	Regional Improvement Program
SANDAG	San Diego Association of Governments
SDSU	San Diego State University
SSTAC	Social Services Transportation Advisory Council
STIP	State Transportation Improvement Program
Study	Next Gen Rapid Routes 41, 471, and 625 study
TC	Transit Center

TDA	Transportation Development Act
TOD	transit-oriented development
UCSD	University of California, San Diego
UTC	University Town Center

1.0 Introduction

1.1 SANDAG Regional Plan and Next Gen *Rapid*

With the adoption of the 2021 Regional Plan[1], San Diego Association of Governments (SANDAG) is set to implement Next Generation (Gen) *Rapid*: a system of faster, more reliable bus service that will reshape how travelers move throughout San Diego County. Though the 2021 Regional Plan identifies approximate route alignments and stop locations, additional analysis is needed to define service characteristics and identify transit-supportive improvements along Next Gen *Rapid* corridors. Doing so will position SANDAG, San Diego Metropolitan Transit System (MTS), and North County Transit District (NCTD) to secure the funding needed to provide quality, reliable transit; maximize ridership by ensuring travel times that are competitive with automobiles; eliminate first- and last-mile barriers; serve basic needs, opportunities, and major destinations; and improve transit service while maximizing corridor passenger throughput.

1.2 Project Description

The conceptual planning for Next Gen *Rapid* Routes 41, 471, and 625 study (Study) informs potential future concepts and additional actions necessary to implement bus rapid transit (BRT) service along *Rapid* Routes 41, 471, and 625, which will provide reliable, high-capacity transit service to diverse communities in San Diego, National City, Chula Vista, Escondido, and San Marcos.

Advanced planning of *Rapid* routes is a critical first step in providing the region's residents and visitors with more mobility options, better connectivity, and greater access to resources across the region. This Study is the first step in conducting advanced planning for *Rapid* Routes 41, 471, and 625.

1.3 Purpose of this Report

This report summarizes Study efforts, key findings, and next steps. The findings of this report will inform future implementation phases.

1.4 Study Area Overview

The project evaluates potential BRT strategies in three separate study areas within the cities of San Diego, Chula Vista, National City, and Escondido. Each study area is described below and shown in Figure 1-1, Figure 1-2, and Figure 1-3.

1.4.1 Rapid 41 Study Area

Rapid 41 is a planned overlay of *Rapid* service along the existing local Route 41 service. Local Route 41 currently runs from University City to Mission Valley, primarily via Genesee Avenue, connecting low-income communities in Clairemont Mesa and Linda Vista to the Veterans Administration Medical Center, University Town Center (UTC) mall, University of California, San Diego (UCSD), and Fashion Valley mall. The route is also adjacent to San Diego Mesa College. *Rapid* 41 will have higher

[1] SANDAG (San Diego Association of Governments). 2021. 2021 Regional Plan. December 2021. Available at: https://www.sandag.org/regional-plan/2021-regional-plan/-/media/8D0F181A086844E3A84C3D44576BED6B.ashx.

frequencies, longer service spans, faster travel times, and more amenities than local Route 41. It will connect to the Green Line trolley at Fashion Valley and the Blue Line trolley at UCSD and UTC.

One of the corridor concepts includes an extension of *Rapid* 41 service to Hillcrest via Bachman Place. This extension would serve the transit-supportive land use in Hillcrest and provide a high-quality direct transit service between UCSD's La Jolla Campus and Hillcrest Medical Center Campus.

1.4.2 Rapid 471 Study Area

Rapid 471 is a planned rapid service that will connect eastern Escondido, Escondido Transit Center (ETC), Palomar Medical Center Escondido, and in some options, Nordahl Marketplace in San Marcos, providing vulnerable communities along the route – seniors, low-income, and minorities – with an essential regional multimodal option to and from the SPRINTER light rail and other Rapid and local bus routes at ETC. It will connect the medical center, a major employment center, to high-frequency transit for the first time. The City of Escondido is planning significant transit-oriented development (TOD) in the corridor, which will include affordable housing options. Providing a connection to ETC will link current and future residents to more transportation options to access destinations around the region.

1.4.3 Rapid 625 Study Area

Rapid 625 is a planned rapid service that will serve the San Diego State University (SDSU) community, City Heights, National City, Chula Vista, and communities in between. It connects these communities to key destinations, including the Green Line trolley at SDSU TC, the Orange Line trolley in Southeast San Diego, and the Blue Line trolley in Chula Vista. The route will serve disadvantaged communities within the top 25 and top 50 percent CalEnviroScreen thresholds and connect these communities to quality-of-life spaces, such as higher education facilities, job centers, and medical campuses within the region.

Figure 1-1. Study Area – Rapid 41 Corridor

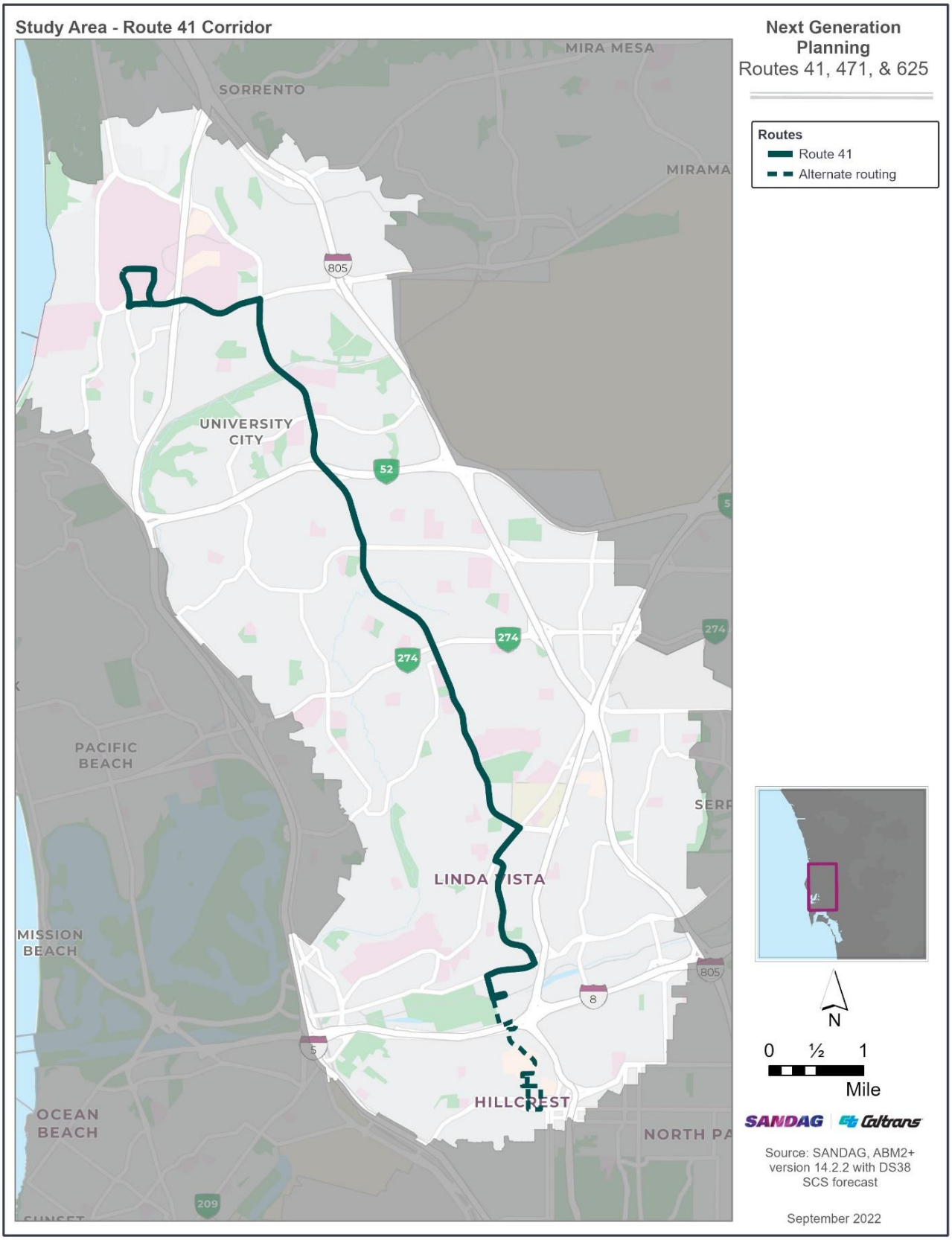


Figure 1-2. Study Area – Rapid 471 Corridor

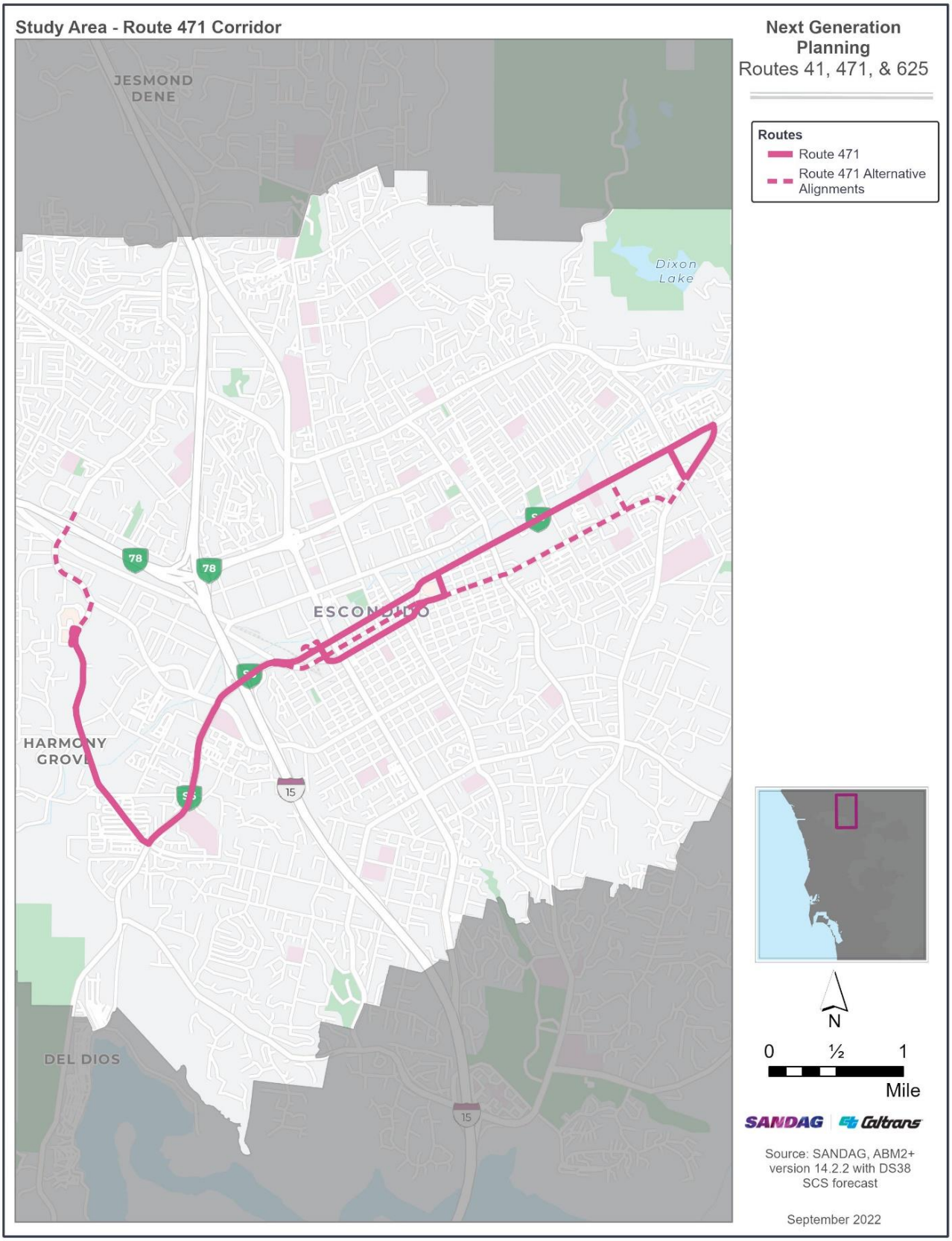
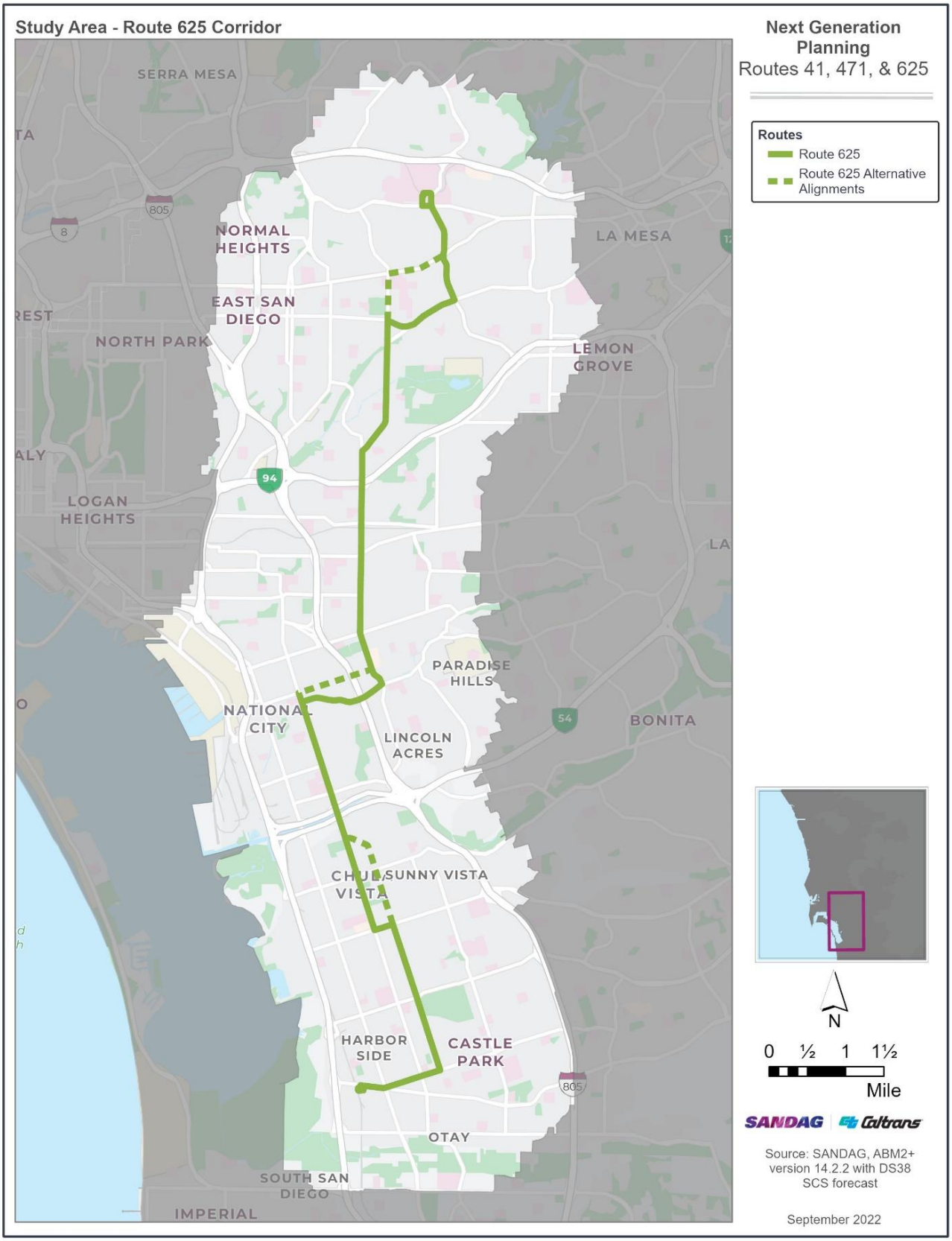


Figure 1-3. Study Area – *Rapid* 625 Corridor



2.0 Existing Conditions

This section summarizes existing and future conditions within the *Rapid* 41, 471, and 625 corridors. The information in this section and in **Attachment A** supported the development of study goals and objectives, which drove the development of enhancements along each corridor.

2.1 Relevant Planning Documents

Planning documents and data were provided by the project team in coordination with the project development team (PDT). Documents were reviewed to identify key planning considerations and previously recommended mobility improvements in each corridor. A summary of the reviewed regional and local planning documents follows.

Regional Planning Documents

The SANDAG 2021 Regional Transportation Plan, South Bay to Sorrento Comprehensive Multimodal Corridor Plan (CMCP) (2022), and North County CMCP (2022) were reviewed to understand regional planning needs and projects in each of the study corridors.

Local Planning Documents

Several local planning documents within the cities of San Diego, Escondido, Chula Vista, and National City were reviewed. Documents included community plans, specific plans, and active transportation (AT) plans, among others. A complete list of documents reviewed is included in Attachment A.

2.2 Corridor Conditions

Existing and future conditions were assessed within each study corridor. The information in this section supported the refinement and validation of study issues, opportunities, goals, and objectives. Mobility elements, demographic information, land use, key activity centers and community resources, and safety were evaluated. A more in-depth description of the elements evaluated, maps and tables summarizing existing and future conditions information, and key findings are included in Attachment A.

3.0 Stakeholder Outreach and Engagement

Public outreach and engagement for the Study was conducted in two phases. Phase One took place in October and November 2022. Outreach during this phase was conducted to inform stakeholders and the public in each corridor about the planning effort and future service, discuss and confirm existing conditions, and seek input about mobility challenges and transit use in the corridor.

Phase Two took place in April and May 2023. Concepts for each corridor were shared with the public and they were asked for feedback on routing options, station locations, and potential trade-offs that would be necessary to implement bus-only lanes to enhance service.

Ensuring social equity in outreach efforts was a key priority. As such, SANDAG contracted with three community-based organizations (CBOs) to conduct grassroots outreach with key stakeholders and the public in each corridor, including disadvantaged communities, low- and moderate-income residents, and residents with limited English proficiency. Bayside Community Center conducted events in the *Rapid* 41 corridor, Escondido Education COMPACT conducted events in the *Rapid* 471 corridor, and City Heights Community Development Corporation conducted events in the *Rapid* 625 corridor.

3.1 Outreach Methods

Outreach was conducted via community roundtable meetings, pop-up outreach events, virtual public meetings, and an online survey.

Community roundtable meetings convened key stakeholders and community leaders in each corridor, including representatives from community planning groups, partner agencies, CBOs, transportation advocacy groups, educational institutions, and faith-based organizations.

Pop-up outreach events allowed the study team to collect input from community members and key stakeholders in person.

Virtual public meetings held in Phase One provided participants with a more in-depth understanding of the corridors and the proposed service and allowed them to interact with and ask questions of the project team.

Online surveys were disseminated in Phase Two after determining that an online survey would be more effective at increasing participation than a second round of virtual public meetings.

Pop-up outreach events, public meetings, and surveys were promoted to the public via e-blast, SANDAG's social media channels, and flyers at the pop-up outreach events. Surveys were made available for additional time to allow for a larger number of interested parties to contribute to the corridor concept development process.

3.2 Public Input Received

A significant amount of public input was received through the outreach and engagement activities described previously. Input received during Phase One was used to confirm and augment the information presented in the Existing Conditions Report and inform the development of draft alternative scenarios for each route. Input received during Phase Two was used to refine alternative concepts, route alignments, and station locations, and to provide guidance to SANDAG about community preferences for roadway modifications needed to implement dedicated bus lanes on existing streets. Key themes are included below. A detailed summary of information received is in **Attachment B.**

4.0 Conceptual-level Alignment Alternatives

This section includes Study goals and objectives, evaluation criteria, performance measures, development of corridor concepts, and evaluation of each against Study performance measures.

4.1 Goals and Objectives

A series of goals and objectives, performance measures, and evaluation criteria were identified by the project team in coordination with the PDT. Table 4-1 summarizes the Study goals and objectives. More information on goals, objectives, evaluation criteria, and performance measures is included in **Attachment C**.

Table 4-1. Study Goals and Objectives, Evaluation Criteria, and Performance Measures

Goal	Objectives
Provide reliable, high-quality transit service that is competitive with automobile travel	Implement strategies that minimize delays to buses caused by congestion along roadways and at intersections Provide station amenities that expedite the boarding and alighting process
Maximize ridership potential	Serve key activity centers and areas with high concentrations of population and employment
	Enhance non-motorized access to transit beyond a 5- or 10-minute travelshed
	Identify AT improvements that have the potential to improve safety
Improve access for social equity focus and transit -dependent populations	Implement service that directly connects social equity focus populations with employment centers, higher education institutions, and basic needs (e.g., healthcare and grocery stores)
	Ensure stations are accessible
Gain support from the public and key stakeholders	Implement context sensitive strategies, e.g. those that consider how a project fits within a community and supports community vision
	Implement services that serve multiple travel markets in each corridor
Implement cost-effective and financially feasible Next Gen service	Design cost-effective routes; design a project with high funding feasibility
	Identify TOD opportunities that could be used to fund a portion of capital and/or Operations and Maintenance (O&M) costs

4.2 Conceptual-level Alignments

This section provides an overview of the characteristics for each corridor concept. More information on the types of strategies that were considered, a detailed summary of each option (including routing characteristics), and full-size maps of each concept are included in Attachment C.

4.2.1 Rapid 41

The *Rapid* 41 corridor concepts are shown in Figure 4-1 (Option 1), Figure 4-2 (Option 2), and Figure 4-3 (Option 3). Option 1 provides the lowest capital cost option, but with slightly slower service than Option 2. Option 1 includes mostly bus-only lanes, with some mixed flow operations near the Fashion Valley TC, Mesa College, and UCSD. Option 2 provides faster, more reliable service than Option 1, but with a higher capital cost. Option 2 utilizes center running bus-only lanes in Clairemont and University City, some mixed flow operations near UCSD, and bus-only lanes elsewhere. Option 3 has similar characteristics to Option 2, except it extends south into Hillcrest. Buses operate in mixed flow conditions for most of the extension and in bus-only lanes along First Avenue and Fourth Avenue.

Figure 4-1. Rapid 41, Option 1

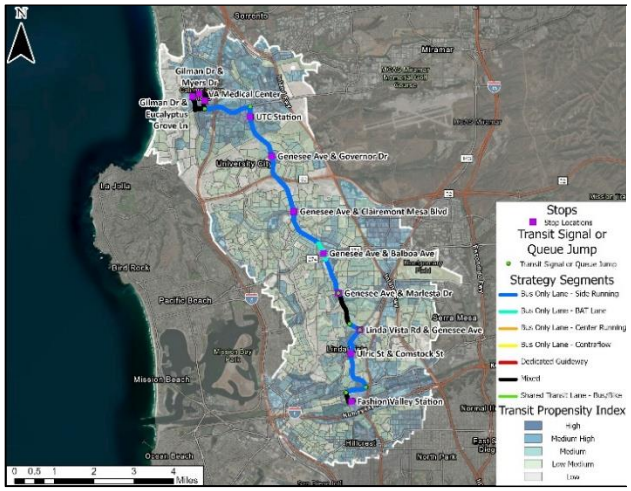


Figure 4-2. Rapid 41, Option 2

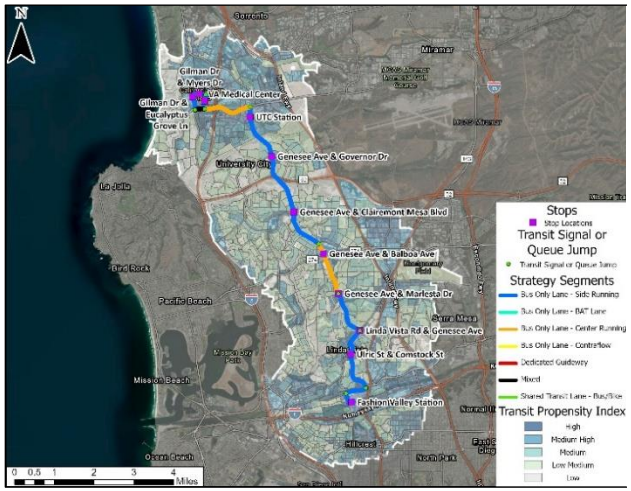
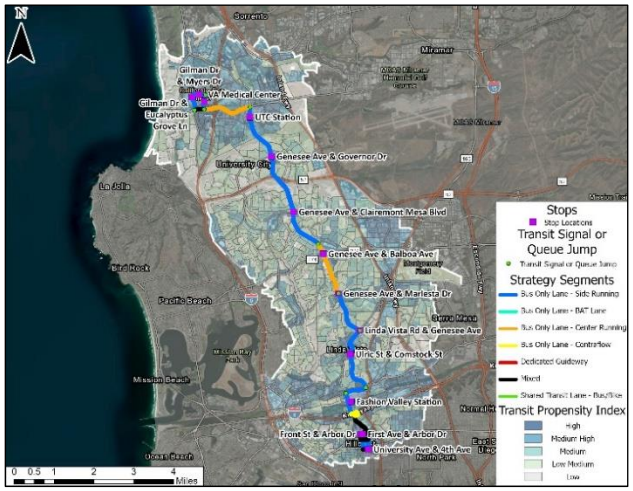


Figure 4-3. Rapid 41, Option 3



4.2.2 Rapid 471

The *Rapid 471* corridor concepts are shown in Figure 4-4 (Option 1), Figure 4-5 (Option 2), and Figure 4-6 (Option 3). Option 1 provides the lowest capital cost option, but with slightly slower service. Option 1 includes mostly bus only lanes, with some mixed flow operations near Downtown and eastern Escondido. In Options 2 and 3, the western terminus would be extended to Nordahl Marketplace, just north of State Route 78. Option 2 provides faster, more reliable service, but with a higher capital cost. Option 2 includes a dedicated guideway along Grand Avenue in Downtown Escondido and shared bus/bike lanes along Grand Avenue east of 2nd Avenue. Option 3 provides the fastest service with the highest capital cost. Option 3 also includes a dedicated guideway along Grand Avenue in Downtown Escondido, as well as center running bus-only lanes near Interstate 15 and east of Downtown, along Valley Parkway.

Figure 4-4. Rapid 471, Option 1

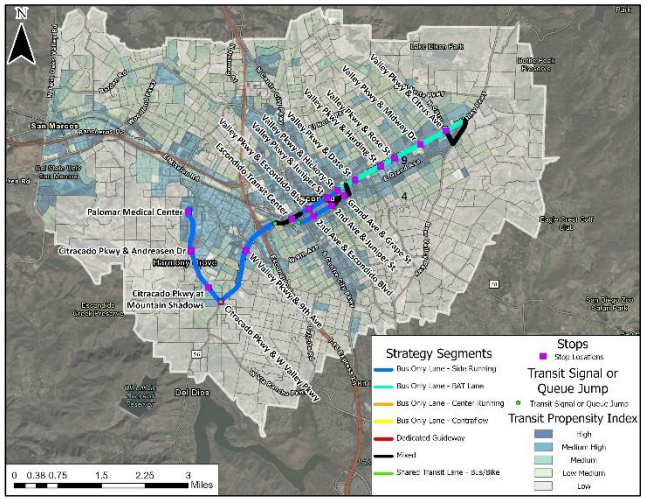


Figure 4-5. Rapid 471, Option 2

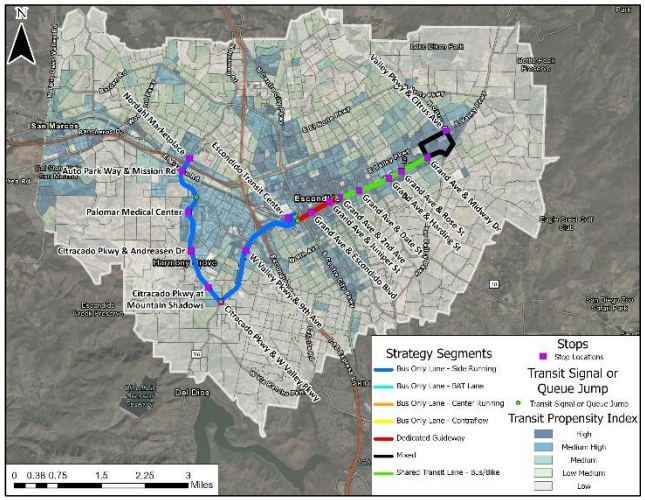
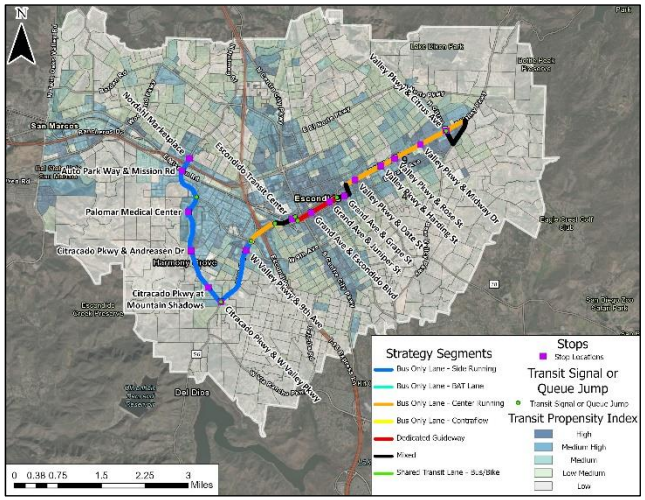


Figure 4-6. Rapid 471, Option 3



4.2.3 Rapid 625

The *Rapid 625* corridor concepts are shown in Figure 4-7 (Option 1), Figure 4-8 (Option 2), and Figure 4-9 (Option 3). Option 1 provides the lowest capital cost option, but with slightly slower service. Option 1 includes mostly bus-only lanes, with some mixed flow operations along 3rd Avenue in Chula Vista, along Euclid Avenue in National City, and near SDSU. Option 2 provides faster, more reliable service than Option 1, but with a higher capital cost. Travel times for Option 2 are longer because the route itself is longer; however, it is more efficient as it only takes one minute longer than Option 1 to travel 0.3 additional miles. Option 2 utilizes center-running bus-only lanes along Plaza Boulevard in National City, mixed flow operations near SDSU, and bus-only lanes elsewhere. Option 3 provides somewhat faster service and a medium-high capital cost. Option 3 utilizes bus-only lanes along most of the route, shared bus/bike lanes along 3rd Avenue in Chula Vista, a dedicated guideway north of Euclid Avenue and Federal Boulevard, a Business Access and Transit Lane along University Avenue, and mixed flow operations near SDSU.

Figure 4-7. Rapid 625, Option 1

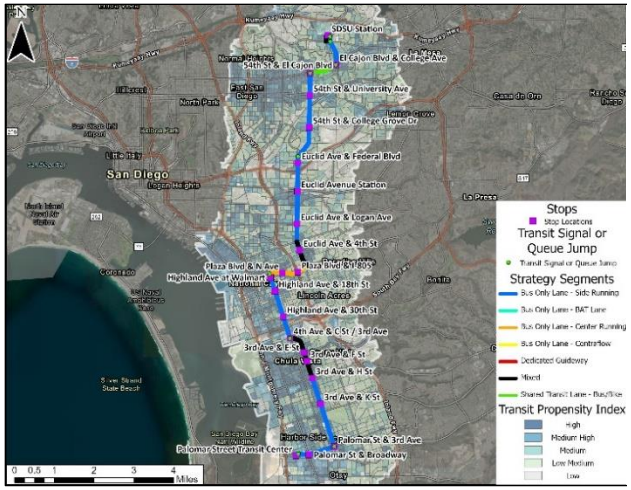


Figure 4-8. Rapid 625, Option 2

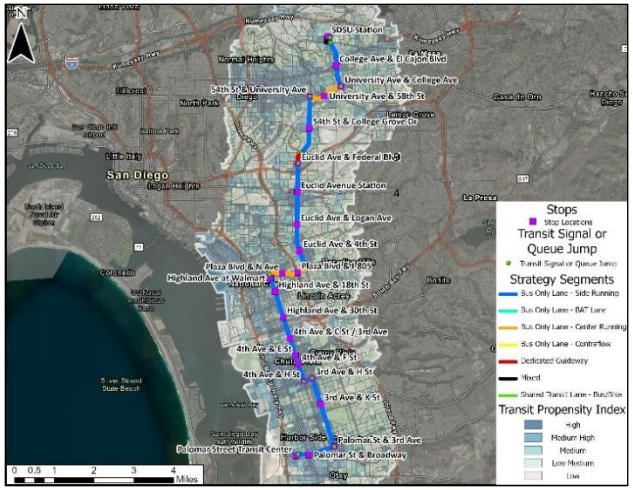
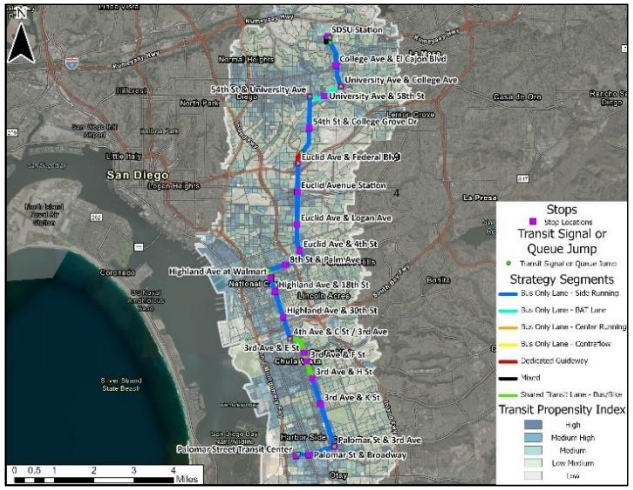


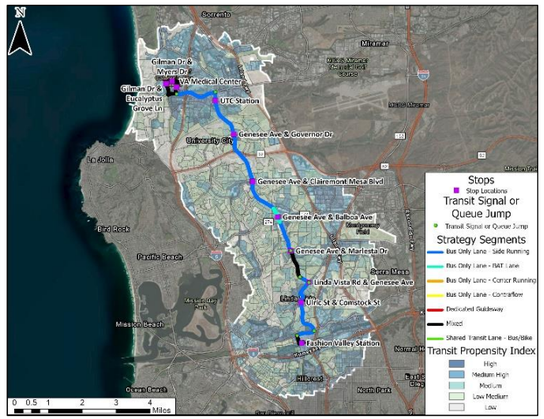
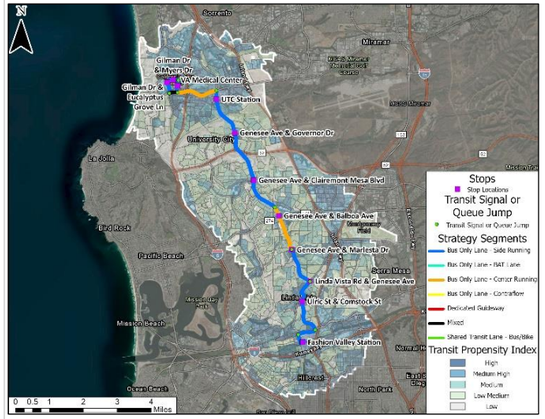
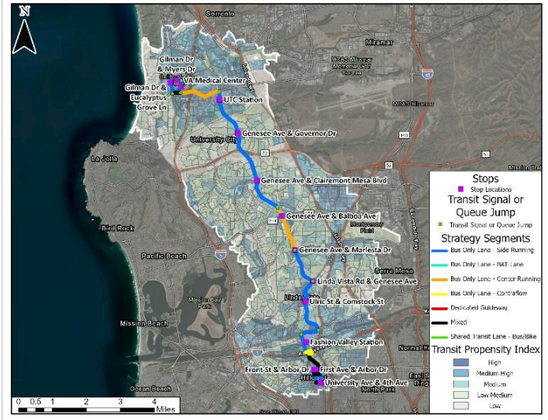
Figure 4-9. Rapid 625, Option 3



4.3 Analysis of Corridor Concepts

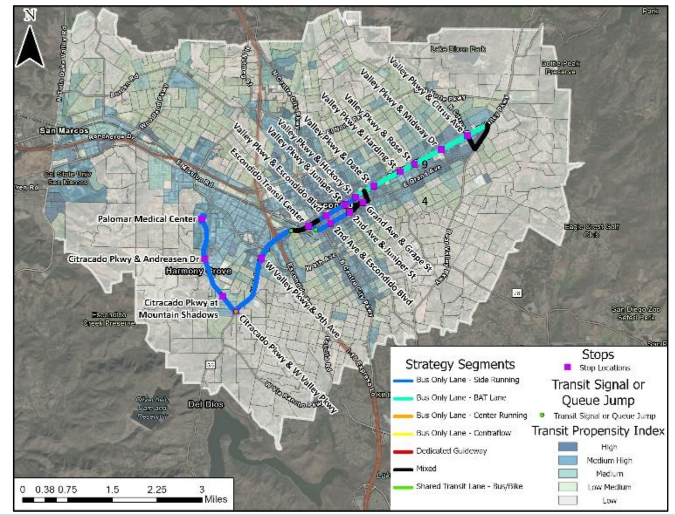
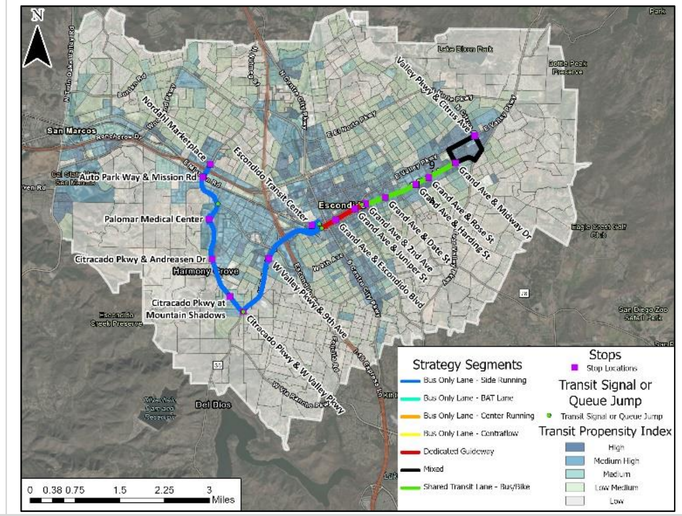
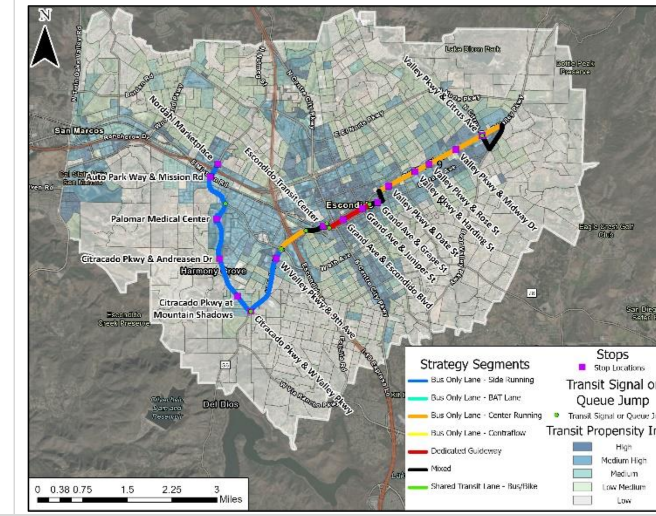
This section summarizes the assessment of corridor concepts against the study performance measures summarized in Attachment C. An overview of concept performance measures and an assessment comparing concepts is included in Table 4-2. for *Rapid* 41, Table 4-3. for *Rapid* 471, and Table 4-4. for *Rapid* 625. A detailed summary of performance measures and rankings is included in Attachment C.

Table 4-2. Rapid 41 – Summary of Concept Performance

Summary	Option 1	Option 2	Option 3
Option 3 performed the best overall in the *Rapid* 41 corridor. Regarding transit service reliability, it includes the greatest investment in dedicated bus facilities and shows the greatest potential to reduce travel time compared to local bus service. It also has the greatest ridership potential as it serves more activity centers and provides access to more people and jobs than Options 1 and 2. From a social equity standpoint, Option 3 serves a slightly higher percentage of senior residents, whereas Options 1 and 2 serve slightly higher percentages of minority and low-income residents. Option 3 also received the highest level of support from the community and has a slightly higher land use score than Options 1 and 2. Option 3 also has the lowest annual O&M cost per rider and a slightly higher redevelopment potential index.			
Concept Information			
General Characteristics	Low level of investment, slower speeds	Higher level of investment, faster service	Higher level of investment, faster service
System Length (miles)	12.0	12.0	14.4
Number of Stations/Stops (per direction)	11	11	14
End-to-End Travel Time (minutes)	42	39	51
Capital Cost	$90 - $132 Million	$107 - $158 Million	$116 - $173 Million
Annual O&M Cost (gross)	$8,304,472	$7,474,025	$9,965,366
Transit Service Reliability (PDT Rank: #1)			
Weighted dedicated bus facilities score (index, see Attachment C)	1.4	1.9	2.1
% Change in trip time (*Rapid* vs. autos)	-10% to 11%	-18% to 6%	-1% to 62%
% Change in trip time (*Rapid* vs. local bus)	-24%	-30% to -28%	-47% to -33%
Change in potential person throughput along each corridor	80%	80%	80%
Ridership Potential (PDT Rank: #2)			
People + Jobs within 0.5 mile of stations	82,917	82,917	121,332
Known activity centers within 0.5 mile of stations	6	6	10
People + Jobs within 10-20 minutes (bicycle/flex fleet access)	126,492	126,492	149,167
Existing/proposed AT facilities score (index, see Attachment C)	2.1	2.3	2.8
Socially Equity Focus and Transit-Dependent Population Benefits (PDT Rank: #4)			
% of social equity focus populations within 0.5 mile of stations	Senior 10.52% / Minority 61.36% / Low Income 30.15%	Senior 10.52% / Minority 61.36% / Low Income 30.15%	Senior 10.97% / Minority 57.86% / Low Income 27.55%
Feedback from Social Services Transportation Advisory Council (SSTAC) meeting on station access strategies (ranking)	3	2	1
Stakeholder Support (PDT Rank: #5)			
Feedback from stakeholders on conceptual design elements	11%	34%	55%
Weighted land use score per parcel accessible within 0.5 mile of stops (index, see Attachment C)	2.70	2.70	2.80
Cost Effectiveness and Financial Feasibility (PDT Rank: #3)			
Annual O&M cost per potential rider	$100.15	$90.14	$82.13
Redevelopment Potential Index	38.42	38.42	39.24
Overall Ranking (weighted index)	3	2	1

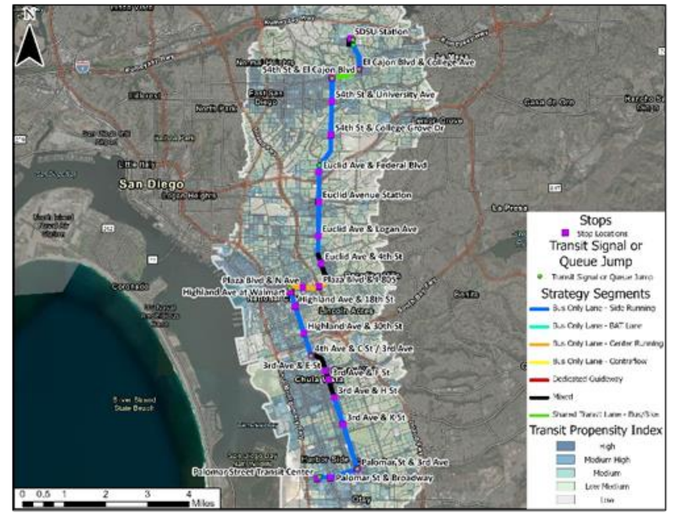
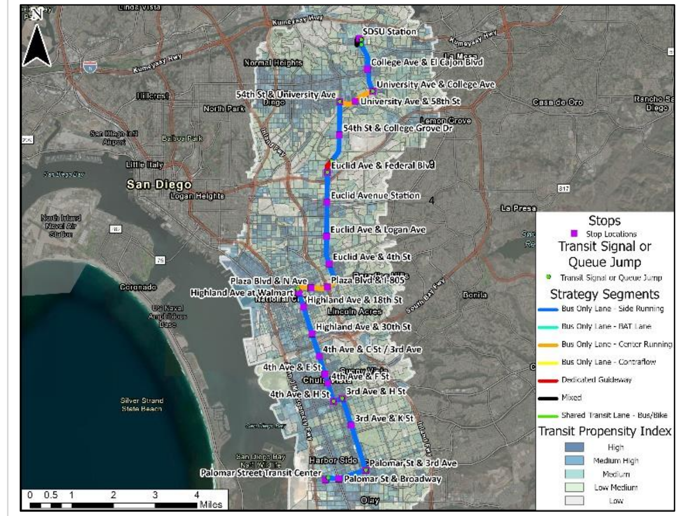
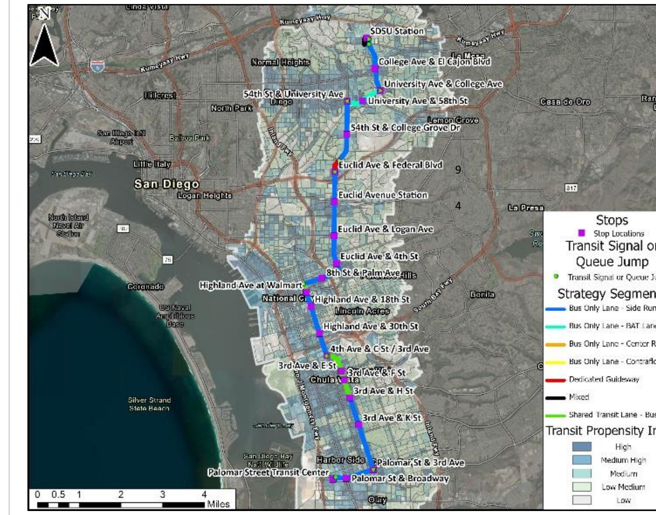
Note: The highest scoring performance measures are shaded purple

Table 4-3. Rapid 471 – Summary of Concept Performance

Summary	Option 1	Option 2	Option 3
Option 1 performed the best overall in the *Rapid* 471 corridor. Regarding transit service reliability, Option 3 includes the greatest investment in dedicated bus facilities, but Option 1 shows the greatest potential to reduce travel time compared to local bus service and has travel times that are most competitive with automobile travel. Regarding ridership potential, Option 1 serves slightly fewer people and jobs than Option 3; however, it serves the same number of activity centers and has a higher AT facilities index than the other two options. Option 2 serves a slightly higher percentage of senior residents, whereas Option 1 serves slightly higher percentages of minority and low-income residents. Option 1 also received the highest level of support from the SANDAG SSTAC, tied Option 3 for the highest level of support from the community, and has a higher land use score than Options 2 and 3.			
Concept Information			
General Characteristics	Lowest level of investment, slower service	Higher level of investment, faster service	Highest level of investment, faster service
System Length (miles)	9.9	10.1	9.9
Number of Stations/Stops (per direction)	14	16	16
End-to-End Travel Time (minutes)	38	40	38
Capital Cost	$65 - $97 Million	$58 - $86 Million	$58 - $87 Million
Annual O&M Cost (gross)	$9,502,848	$10,558,720	$9,502,848
Transit Service Reliability (PDT Rank: #1)			
Weighted dedicated bus facilities score (index, see Attachment C)	1.1	1.3	1.4
% Change in trip time (*Rapid* vs. autos)	2% to 18%	9% to 94%	11% to 76%
% Change in trip time (*Rapid* vs. local bus)	-58% to -21%	-47% to -27%	-52% to -26%
Change in potential person throughput along each corridor	35%	24%	36%
Ridership Potential (PDT Rank: #2)			
People + Jobs within 0.5 mile of stations	97,824	95,612	98,856
Known activity centers within 0.5 mile of stations	8	8	8
People + Jobs within 10-20 minutes (bicycle/flex fleet access)	62,259	73,832	72,549
Existing/proposed AT facilities score (index, see Attachment C)	1.6	1.2	1.5
Socially Equity Focus and Transit-Dependent Population Benefits (PDT Rank: #4)			
% of social equity focus populations within 0.5 mile of stations	Senior 8.41% Minority 71.53% Low Income 40.97%	Senior 8.53% Minority 70.56% Low Income 40.37%	Senior 8.51% Minority 70.73% Low Income 40.26%
Feedback from SSTAC meeting on station access strategies	1	2	3
Stakeholder Support (PDT Rank: #5)			
Feedback from stakeholders on conceptual design elements	34%	32%	34%
Weighted land use score per parcel accessible within 0.5 mile of stops (index, see Attachment C)	2.62	2.50	2.53
Cost Effectiveness and Financial Feasibility (PDT Rank: #3)			
Annual O&M cost per potential rider	$97.14	$110.43	$96.13
Redevelopment Potential Index	40.30	40.59	41.05
Overall Ranking (weighted index)	1	3	2

Note: The highest scoring performance measures are shaded purple

Table 4-4. Rapid 625 – Summary of Concept Performance

Summary	Option 1	Option 2	Option 3
Option 2 performed the best overall in the *Rapid* 625 corridor. Regarding transit service reliability, Option 2 had slightly lower performance than Option 3. Option 2 stands out primarily due to its ridership potential and stakeholder support. Option 2 serves the highest number of people and jobs, the same number of activity centers as Option 1, and has the highest AT facilities score. Regarding social equity focus populations, Option 2 serves the same percentage of minority and low-income residents as Option 1. Option 3 received the most endorsement from the SSTAC. Regarding stakeholder support, Option 2 received the highest level of support from the community and has the highest land use score. Option 3 has the lowest annual O&M cost per rider because it is shorter than Option 2 and has more transit priority treatments than Option 1, resulting in a slightly faster end-to-end travel time. Option 2 has a slightly lower redevelopment potential index than Options 1 and 3.			
Concept Information			
General Characteristics	Lowest capital cost, slower speeds	Highest capital cost, faster service	Highest capital cost, faster service
System Length (miles)	15.3	15.6	15.3
Number of Stations/Stops (per direction)	22	24	22
End-to-End Travel Time (min)	70	71	67
Capital Cost	\$105 - \$156 Million	\$127 - \$190 Million	\$112 - \$167 Million
Annual O&M Cost (gross)	\$14,117,602	\$14,117,602	\$13,287,155
Transit Service Reliability (PDT Rank: #1)			
Weighted dedicated bus facilities score (index, see Attachment C)	2.0	2.4	2.5
% Change in trip time (*Rapid* vs. autos)	85% to 156%	89% to 163%	75% to 148%
% Change in trip time (*Rapid* vs. local bus)	-46% to -33%	-45% to -32%	-49% to -35%
Change in potential person throughput along each corridor	90%	153%	169%
Ridership Potential (PDT Rank: #2)			
People + Jobs within 0.5 mile of stations	206,178	210,124	199,471
Known activity centers within 0.5 mile of stations	15	15	14
People + Jobs within 10-20 minutes (bicycle/flex fleet access)	182,366	180,463	184,887
Existing/proposed AT facilities score (index, see Attachment C)	2.3	2.7	2.4
Socially Equity Focus and Transit-Dependent Population Benefits (PDT Rank: #4)			
% of social equity focus populations within 0.5 mile of stations	Senior 7.86% / Minority 82.17% / Low Income 44.99%	Senior 7.83% / Minority 82.17% / Low Income 44.99%	Senior 7.85% / Minority 82.13% / Low Income 44.74%
Feedback from SSTAC meeting on station access strategies	3	2	1
Stakeholder Support (PDT Rank: #5)			
Feedback from the community on conceptual design elements	34%	41%	25%
Weighted land use score per parcel accessible within 0.5 mile of stops (index, see Attachment C)	2.60	2.60	2.60
Cost Effectiveness and Financial Feasibility (PDT Rank: #3)			
Annual O&M cost per potential rider	\$68.47	\$67.19	\$66.61
Redevelopment Potential Index	39.93	39.82	39.37
Overall Ranking	2	1	3

Note: The highest scoring performance measures are shaded purple

5.0 Implementation

This section summarizes capital and operating costs for study alternatives, as well as potential funding sources that could be used to construct and/or operate each route. A potential implementation timeline for study routes is also included.

5.1 Capital and Operating Costs

Planning-level capital and O&M cost estimates are included in Table 5-1. The level of detail of the capital cost estimates for this study corresponds with the current level of concept definition and conceptual engineering (less than 5% design). The level of estimating detail typically increases as the project progresses through the various phases of development during Environmental Review/ Preliminary Engineering and, eventually, into Final Design.

Annual O&M costs for all concept options were calculated assuming each would operate daily at 10-minute headways from 4:00 a.m. to 12:00 a.m., with no service reduction for Saturdays, Sundays, or holidays.

Assumptions used to develop capital and O&M costs, as well as a detailed breakdown of cost elements, are included in Attachment C.

Table 5-1. Capital and O&M Cost Estimates

Route	Cost ($2023, millions)		
	Option 1	Option 2	Option 3
Rapid 41 – Capital	$90 - $132	$107 - $158	$116 - $173
Rapid 41 – O&M	$8.3	$7.5	$10.0
Rapid 471 – Capital	$65 - $97	$58 - $86	$58 - $87
Rapid 471 – O&M	$9.5	$10.6	$9.5
Rapid 625 – Capital	$105 - $156	$127 - $190	$112 - $167
Rapid 625 – O&M	$14.1	$14.1	$13.3

5.2 Funding Opportunities

Table 5-2 shows local, state, and federal revenue sources that could be used to fund transit capital and/or operations. A detailed overview of each funding program is included in Appendix A.

Table 5-2. Potential Funding Programs

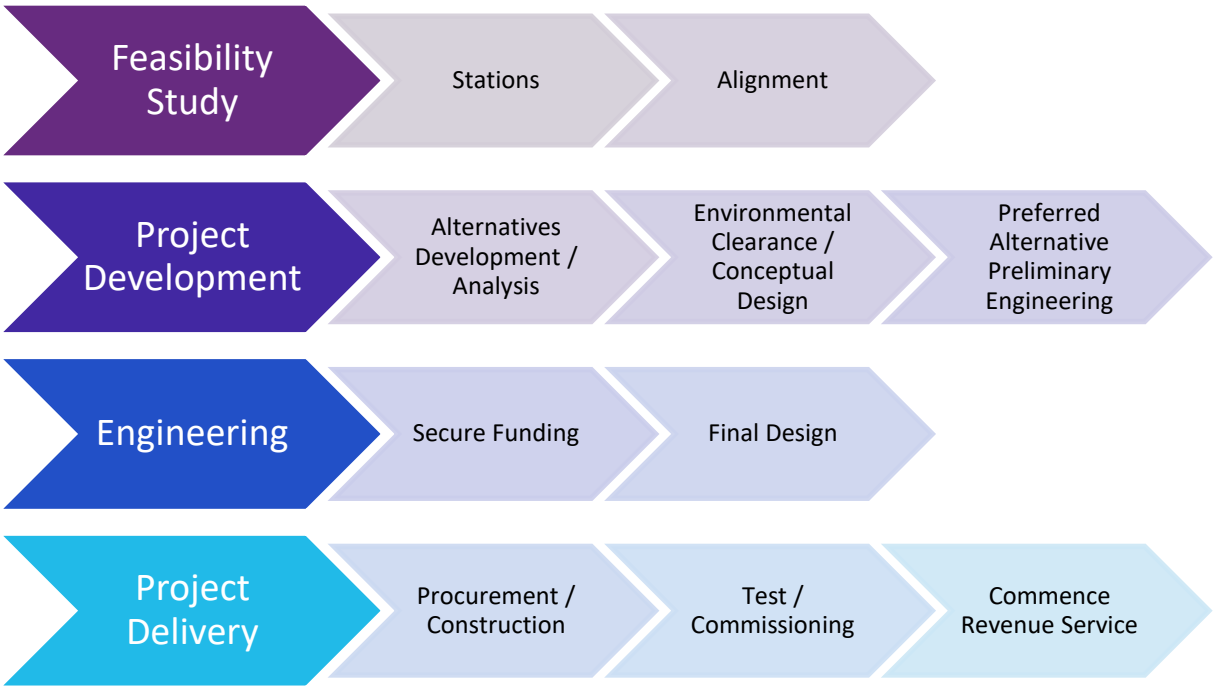
Revenue Source	Transit Capital	Transit Operations
Local Revenues		
TransNet		X
TransNet Bond Proceeds	X	
Transportation Development Act (TDA)	X	X

Revenue Source	Transit Capital	Transit Operations
General Fund/Miscellaneous Local Road Funds	X	
FasTrak®	X	X
Passenger Fares		X
State Revenues		
State Transportation Improvement Program	X	
State Transit Assistance Program	X	X
- Transit and Intercity Rail Capital Program	X	
- Low Carbon Transit Operations Program		X
- Affordable Housing and Sustainable Communities	X	
Federal Revenues		
Federal Transit Administration (FTA) Formula	X	X
Capital Investment Grants	X	
Bus/Low-No	X	
Congestion Mitigation and Air Quality (CMAQ)/ Regional Surface Transportation Program/ Carbon Reduction Program (CRP)	X	X
United States Department of Transportation (USDOT) Discretionary	X	
New Revenues		
Future SANDAG Revenues	X	
Future MTS Revenues	X	X

5.3 Implementation

This section summarizes the phases and next steps required to implement Next Gen *Rapid* service in the Study corridors. The project delivery process is shown in Figure 5-1 and described in the following sections.

Figure 5-1. Project Implementation Process



5.3.1 Feasibility Study

This study assesses the initial feasibility of routes along each corridor, with approximate station locations and alignment configurations identified and analyzed against Study performance measures.

5.3.2 Project Development

5.3.2.1 Alternatives Development / Analysis

In the next phase of development for Study routes, a more in-depth alternatives analysis will be conducted. It is anticipated that the composition of study routes (e.g., transit improvements, stop locations) may change during this step based on stakeholder and community needs.

5.3.2.2 Environmental Clearance / Conceptual Design

Conducting an alternatives analysis is not anticipated to be required as part of the National Environmental Quality Act (NEPA), and study concepts may qualify as an FTA Categorical Exclusion as defined in 23 CFR 771.118(c)(9):

> *Assembly or Construction of Facilities (9) Assembly or construction of facilities that is consistent with existing land use and zoning requirements (including floodplain regulations), and uses primarily land disturbed for transportation use, such as: buildings and associated structures; bus transfer stations or intermodal centers; busways and streetcar lines or other transit investments within areas of the right-of-way occupied by the physical footprint of the existing facility or otherwise maintained or used for transportation operations; and parking facilities.*

The effects of implementing bus and BRT projects like Next Gen *Rapid* routes are exempt from a mobility impacts analysis under the California Environmental Quality Act (CEQA). At the same time, the effects of proposed improvements on bus and vehicular traffic operations along corridor roadways

and intersections should be evaluated based on local mobility analysis guidelines. Other items like potential right-of-way (ROW), environmental, and community impacts could be assessed.

5.3.2.3 Preferred Alternative Preliminary Engineering

The environmental assessment and findings will be used to identify a preferred alternative for each corridor. Once a preferred alternative is identified, preliminary engineering (30%) design should be conducted to more thoroughly determine how the preferred alternative might affect the natural and built environment. Preliminary engineering and environmental clearance must occur concurrently as engineering findings could influence the need for, or findings of, an environmental impact assessment.

5.3.3 Engineering

At the time this study was conducted, funding had not been secured to fully implement any of the Study routes. Once funding for construction is secured and preliminary engineering is complete, each project will move into the final design phase. In this phase, the elements (e.g., bus improvements, stations, etc.) of the preferred alternative in each corridor will be designed to 100%. If it is determined that an environmental impact assessment is needed, at this point the full scope of potential environmental impacts will be identified.

5.3.4 Project Delivery

Once final design is complete, the elements needed to support Next Gen implementation along Study routes will be constructed. Depending on construction complexity, it may take between one to two years to construct along individual routes. Once construction is sufficiently complete, testing of the systems (e.g., Transit Signal Priority and station next bus arrival signs) needed to facilitate Next Gen *Rapid* service will be conducted. Once testing is complete, revenue service would begin.

6.0 Key Findings and Next Steps

This document summarizes the process used to develop and analyze corridor concepts in each of the *Rapid* Route 41, 471, and 625 corridors. It also summarizes subsequent activities needed to implement Next Gen service in each corridor. Findings of this effort, items for consideration, and next steps are described in the following section.

6.1 All Routes

Next Gen *Rapid* service, as defined in this study, has the potential to provide fast, reliable, high-quality transit in each of the study corridors. Next Gen service would connect people to jobs, key community resources, and regional transit services in each corridor.

6.1.1 Rapid 41

Of the three options evaluated for *Rapid* 41, Option 3 performed the best against Study performance measures. Option 3 has the highest transit service reliability, highest ridership potential, and greatest potential to reduce travel times compared to local bus service.

Option 3 garnered the most support from the SANDAG SSTAC and the community, and its higher diversity of land use means it has the potential to serve a greater breadth of travel markets.

None of the *Rapid* 41 options provides direct service to Mesa College; however, this may be warranted with future travel demand. As such, the concept(s) that are carried forward should be developed in a manner that does not preclude service to Mesa College.

The effects of potential flooding near Fashion Valley TC were not evaluated as part of this study. However, flooding periodically causes service disruptions for buses serving this area and the potential effects of flooding on *Rapid* 41 operations should be evaluated in subsequent phases of study.

6.1.2 Rapid 471

Of the three options evaluated for *Rapid* 471, Option 1 performed the best against Study performance measures. Option 1 shows the greatest potential to reduce travel time compared to local bus service and has travel times that are most competitive with automobile travel. Option 1 has the highest AT facilities index, which could generate additional ridership through enhanced first- and last-mile connectivity.

Option 3 garnered the most support from the SANDAG SSTAC, tied Option 1 with the most support from the community, and its higher diversity of land use means it has the potential to serve a greater breadth of travel markets.

6.1.3 Rapid 625

Of the three options evaluated for *Rapid* 625, Option 2 performed the best against Study performance measures. Option 2 stands out primarily due to its ridership potential and stakeholder support. Option 2 has the highest AT facilities score and garnered the highest level of support during community outreach activities.

6.2 Additional Items for Consideration

While one option performed the best in each corridor, at times it outperformed other options by a small margin. As such, stakeholders within each corridor should consider trade-offs of implementing one option compared to another, specifically if the difference in performance is marginal.

As noted in Section 5.3.1, the composition of improvements along each corridor is subject to change. Possible route deviations, supporting modifications to other routes, and infrastructure investment (e.g., transit center expansions) that can benefit Study routes, but are not necessarily part of them, could be identified in subsequent phases. A detailed summary of route-specific items for consideration is included in Attachment C.

Concept resilience – or ability to minimize or avoid impacts of severe climate events – was not evaluated as part of this effort. In subsequent phases, study routes should be examined to determine whether Next Gen *Rapid* service would be disrupted by severe weather, such as wildfires or flooding. Steps to minimize or eliminate disruptions should be identified.

6.3 Next Steps

As noted, funding to advance Study routes has not been secured. As such, SANDAG should work with local and regional stakeholders to prioritize implementation of next steps, including the order in which to advance Study routes once funding becomes available.

Securing funding is a critical step in advancing and ultimately implementing Study routes. To do this, SANDAG should consider applying for grant funding through the programs identified in Section 5.2. SANDAG may also elect to reappropriate funding from other regional mobility projects.

The next step is to initiate the preliminary engineering/environmental phase for each Study route. In this phase, a more robust assessment of potential effects on other modes (e.g., vehicular operations and parking), ROW needs, environmental effects, and other factors should be evaluated.

Appendix A. Revenue Source Information

Local Revenues

The TransNet Program

The *TransNet* Program is a voter-approved half-cent sales tax for transportation purposes in the San Diego region. It was approved by voters in 2004 and is estimated to generate nearly $12 billion ($2024) for regional transportation improvements for the remaining years of the measure (2025 to 2048). It is also assumed that the measure will be extended by voters beyond 2048, to cover 2049 to 2050, for a grand total of $13.1 billion.

The Transportation Development Act

The TDA is a statewide one-quarter-percent sales tax to be used for transportation purposes. In the San Diego region, the TDA program is used exclusively for transit, non-motorized, and regional planning purposes. Historically, TDA funds have been assumed to grow at the same rate as TransNet funds because TDA funds are also based on the growth of sales taxes. However, the tax base for TransNet and TDA is slightly different; whereas TransNet is a sales and use tax, TDA is a more traditional sales tax. Over time, small differences in their growth rates have been observed. As such, these variances continue to be monitored.

General Fund/Miscellaneous Local Road Funds

General Fund/Miscellaneous Local Road Funds are general fund revenues dedicated for transportation purposes. These revenues are based on information provided in the State Controller's annual reports for local street and road expenditures and revenues.

The average amount of general fund contributions and other revenues (including fines and forfeitures, interest earnings, and other miscellaneous revenue sources) used for local street and road expenditures in recent years is assumed to continue.

FasTrak® Revenues

FasTrak® revenue is and will continue to be collected along the region's Managed Lane (ML) network. Revenues from managed lane users can be used to pay for transit capital and O&M costs.

Passenger Fares

Passenger fares collected from MTS and NCTD can be used to pay for transit operational costs.

State Transportation Improvement Program

The State Transportation Improvement Program (STIP) includes the county share of the Regional Improvement Program (RIP) and funding from the Interregional Program.

These revenues are consistent with the amounts available for new and existing programming through fiscal year (FY) 2029, as included in the 2024 STIP Fund Estimate. The San Diego region anticipates receiving at least a minimum formula "County Share" (estimated at approximately 7.2% of available RIP shares) and a proportionate share of the STIP Interregional Improvement Program (IIP) funds (estimated at 25% of the 7.2% share rate) over time as well. The STIP funds are flexible and are available for capital projects to increase the capacity of highways, public transit, and local roads. The STIP IIP funding must be used on projects that are consistent with the Interregional Transportation Strategic Plan. STIP funds also are available for efforts to manage demands on the transportation system and for planning, programming, and monitoring activities.

State Transit Assistance Program

State Transit Assistance Program funds support transit agencies and can be used for both operating and capital projects. The program provides a share of revenues from diesel sales taxes, and the State Controller distributes these funds based on a statutory allocation formula.

The annual state budget includes revenue generated from the state's portion of the proceeds from the Cap-and-Trade Auction Revenues to facilitate greenhouse gas emission reductions. The intercity rail is a competitive program, while the transit program is on a formula basis. The Affordable Housing and Sustainable Communities (AHSC) program supports projects that implement land-use, housing, transportation, and agricultural land preservation practices. Two of the three subprograms (the Transit and Intercity Rail Capital Program and AHSC) are competitive in nature, whereas the Low Carbon Transit Operations Program is formula based.

Federal Revenues

Federal Transit Administration Formula Programs

The Federal Transit Administration (FTA) formula programs are appropriated annually, based on urbanized area population, population density, and transit revenue miles of service, among other factors. Sections 5307 (Urbanized Area), 5337 (State of Good Repair), and 5339 (Bus and Bus Facilities) formula funds are mainly used for capital projects and to purchase transit vehicles. Section 5310 (Enhanced Mobility) funds are specifically designated to assist nonprofit groups in meeting the transportation needs of the elderly and individuals with disabilities when transportation service is unavailable, insufficient, or inappropriate to meet their needs.

FTA's discretionary Capital Investment Grant (CIG) program funds rail transit and BRT corridor projects across the nation. Projects costing $400 million or more are known as New Starts; projects of less than that cost (or require less than $150 million in CIG funding) are called Small Starts. MTS *Rapid* 215 route (Small Starts) was funded, in part, with CIG funding. IIJA authorizes the program at a minimum of $1.6 billion annually, with another $3 billion available subject to Congressional appropriations.

Low-No Emission Bus and Bus and Bus Facilities Programs

Since 2016, the FTA has jointly solicited its Low or No Emission Bus and Bus Facilities discretionary grant programs under a single annual solicitation. IIJA significantly increased the size of the former while slightly reducing the latter, resulting in an annual combined funding level of approximately $1.6 billion between FY 2022 and FY 2026. It is assumed that these two programs will continue to be authorized at IIJA and enacted funding levels and administered together by FTA.

Congestion Mitigation and Air Quality Improvement Program (CMAQ)/Surface Transportation Block Grants/Carbon Reduction Program (CRP)

Surface Transportation Block Grants funds are flexible, and they may be used for a wide range of capital projects. The CMAQ and the CRP funds are for projects that help reduce congestion and improve air quality. Eligible projects include the construction of high occupancy vehicle lanes, the purchase of transit vehicles, rail improvements, and Transportation Demand Management, among others. CMAQ also can be used for transit operations for the first 5 years of new service.

US Department of Transportation Discretionary Programs

The Secretary's Office at USDOT also administers a number of competitive programs authorized by IIJA. These include the Rebuilding American Infrastructure with Sustainability and Equity discretionary

grant, which funds all federally eligible surface transportation projects; Mega, which funds particularly large (at least $100 million) projects; Safe Streets for All, for community safety investments ($5 million); and a number of smaller programs. It is assumed that these programs will continue in the future.

New Revenues

Future Local Revenues

A citizens initiative called Let's Go San Diego would generate revenue through a one-half cent sales tax increase. Of all revenue generated by this tax increase, 50% would be expended on transit capital projects, including Next Gen *Rapid* routes. A portion of this revenue could be used to advance Study concepts.

Future MTS Revenues

MTS may elect to propose a sales tax initiative that could generate revenue for transit capital improvements and operational costs.