Transit Optimization Plan

September 2017





Contents

Introduction	6
Goals and Focus	6
Study Process	7
Report Contents	8
Existing Conditions	9
Market Assessment	9
Population	9
Employment	9
Development Patterns	9
Regional Growth	10
Growth in Senior Population	10
Transit's Role in Mobility	10
Service Evaluation	11
Service Tiers	11
Service Design	12
Historical Ridership Trends	12
Current Ridership	16
Service Productivity	17
Operating Speeds	17
Agency Partnerships	17
Framework and Guiding Principles	19
Market Goals	19
Goal 1: Match Service to Current and Future Markets	19
Goal 2: Coordinate Land Use, Housing, and Infrastructure	19
Service Goals	20

Goal 1: Optimize Service	20
Goal 2: Increase Ridership	20
Goal 3: Strengthen the Network	21
Transit Network Development Tradeoffs	21
Ridership versus Coverage	22
Route Spacing: Access versus Frequency	22
Stop Spacing: Access versus Speed	23
Network Structure	23
All-Day, All-Week Service versus Peak Commuter Service	26
Route Evaluation Process	29
Density and Development Patterns	29
Stop Efficiency	29
Route Alignment	
Service Duplication	
Performance Indicators	
Public Outreach	32
Transit Optimization Plan	34
Introduction	34
Trolley Service	
Rapid Bus	35
Recommendations	35
UCSD and Mira Mesa	35
163 Corridor	
I-15 Corridor	43
Mid-City and Downtown	46
Beaches	52
National City	55
South County	

East County – El Cajon	64
East County – La Mesa and Spring Valley	69
Rural	73
Customer Impacts & Benefits	75
Frequency Investments	75
Travel Time Improvements	77
Financial and Operating Impacts	77
Phasing	78
Immediate-Term Changes (Summer 2017)	79
Near-Term Changes (Fall 2017)	79
Mid-Term Changes (Winter 2018)	79
Regional Coordination	79

List of Tables

Table 1: MTS Service Roles	12
Table 2: Industry Ridership Trends	13
Table 3: MTS Ridership Trends	14
Table 4: MTS Top 10 Routes Experiencing Ridership Declines by Route	15
Table 5: MTS Open House Events	32
Table 6: UCSD/Mira Mesa Route Recommendations	39
Table 7: 163 Corridor Route Recommendations	40
Table 8: I-15 Corridor Route Recommendations	44
Table 9: Mid-City and Downtown Route Recommendations	48
Table 10: Beaches Route Recommendations	53
Table 11: National City Route Recommendations	57
Table 12: South County Route Recommendations	61
Table 13: El Cajon Route Recommendations	66

Table 14: La Mesa and Spring Valley Route Recommendations	71
Table 15: Rural Route Recommendations	74
Table 16: Frequency Investments	76

List of Appendices

Δ nnendix Δ .	MTS TOP	Recommendations	and Service (^hange Disti	inctions	81
rppcnuix r.	10113101	necommentations		chunge Disti		

Introduction

The San Diego Metropolitan Transit System (MTS) *Transit Optimization Plan* is a project that sought to better utilize existing transit resources in the MTS service area. The study, conducted over a six-month period by Transportation Management and Design (TMD) Inc., follows the highly successful Comprehensive Operations Analysis conducted between 2004 and 2006 which increased ridership and implemented a core frequent network. The *Transit Optimization Plan* (TOP) aimed to address ridership stagnation and decline through more effective and efficient use of operating resources. Additionally, this project aims to position the transit system in advance of major regional projects, including the South Bay Rapid linking Otay Mesa to eastern Chula Vista and downtown San Diego, and Mid-Coast Trolley which extends the Blue Line north to connect to University City (UCSD/UTC).

This study reviewed the broader network structure and route-specific performance to provide MTS with a comprehensive understanding of its market conditions and service performance. The findings led to the development of recommendations designed to build upon the network's performance strengths, maximize ridership, improve the overall rider experience, respond to market opportunities, and ensure the system's financial sustainability. The recommendations are based on analysis of existing and future market conditions, service performance data, and feedback from MTS riders. The TOP is intended to help guide transit service development in the short term.

Goals and Focus

The primary goal of the TOP is to develop a plan that will grow MTS ridership while using vehicle and labor resources more efficiently. As population, employment, and demographics shift, it is important to reshape transit service to respond to new and changing public mobility demands. It is also critical that MTS implement system improvements in a financially sustainable manner. The overall strategy is to enhance service on key network corridors to increase ridership and generate more fare revenue, while maintaining mobility options in lower potential ridership areas. The recommendations also respond to key issues identified by the community to create a system that is more attractive to riders such as restoring Sunday services to more areas.

The TOP addresses regional mobility issues of both existing and potential riders. To that end, the project accomplishes the following:

- Improves transit network design to increase ridership and improve public mobility
- Uses operating resources more effectively and efficiently
- Builds advocacy and ownership within the community
- Defines transit's role in public mobility and economic development

Study Process

DATA COLLECTION AND PUBLIC INVOLVEMENT

The study began in October 2016 with an extensive data assembly effort. Service and operating data from automated passenger counting and vehicle location systems was analyzed regarding rider activity, travel time, and on-time performance information on all fixed-route trips operated by MTS.

Prior to the start of the study, MTS conducted an extensive public outreach effort to gain feedback from the public on improvements they would like to see in MTS transit services. MTS collected 4,000 responses from an online survey and engaged riders and the general public at 15 meetings throughout the service area held at community centers, college campuses, neighborhood gatherings, and major transfer hubs.

SYSTEM ANALYSIS

Using the collected regional market data and agency service data, a thorough analysis of the existing conditions was conducted to evaluate the forces impacting current MTS service. This process consisted of three main documents:

- Review of Relevant Transportation and Land Use Plans
- Market Analysis
- Service Evaluation

An overview of the *Market Analysis* and *Service Evaluation* documents is included in the "Existing <u>Conditions</u>" section of this report. This summary provides the key components that influence the market for transit within San Diego County, as well as an overview of key service characteristics. These documents provide a comprehensive look at how MTS operates within the region and how the agency's ridership and productivity have changed over time. The documents also examine how the region's development patterns and demand for transit are expected to change in the coming years.

SERVICE ALTERNATIVES

The process for recommending service changes consisted of several iterations of analysis, discussion, and route modeling. Several metrics were examined to determine the relative strengths and weaknesses of each subarea and its respective routes. A more thorough look at the

recommendation process is included in the "<u>Route Evaluation Process</u>" section of this report. This process provided the opportunity to optimize each route's operation individually as well as ensure routes worked seamlessly together to create a cohesive network. The recommendation process resulted in service change proposals for more than 60 routes within the system.

PUBLIC OUTREACH

Upon completion of the system analysis and initial stages of the recommendation process, MTS conducted more than two dozen open house events to receive public comments. The agency also hosted an online form for riders to provide their feedback on the proposed network. More than 2,500 comments were collected in-person and online, providing valuable information on the travel preferences of San Diego County residents. The TOP considered input from both this round of public engagement as well as that undertaken prior to the project start.

Report Contents

The Transit Optimization Plan Final Report includes the following sections:

- Existing Conditions
 - Provides key findings from the *Market Assessment* and *Service Evaluation*.
 - Summarizes trends in transit ridership within MTS as well as across the industry.
- Network Structure
 - Introduction to the ten subareas within the MTS network.
 - Overview of the proposed service tiers and their role in the MTS network.
 - Summary of critical agency partnerships.
- Framework and Guiding Principles
 - Outline of key service and market goals for MTS through the Transit Optimization Plan.
 - Discussion of guiding network development and design principles that provided a framework for the development of service recommendations.
 - o In-depth look at the service change recommendation and decision-making processes.
- Public Outreach Activities
 - Summarizes the public and stakeholder outreach activities and recurring themes that emerged from the community engagement process.

Transit Optimization Plan

- Summarizes the plan recommendations by geographic area.
- Outlines the implementation plan and estimated resource requirements based on operator and phase.

Customer Impacts and Benefits

- Provides an overview of the plan benefits as well as the ridership and ADA impacts of the plan.
- Implementation Plan
 - Highlights the implementation phasing of the plan.

Existing Conditions

The *Market Assessment* and *Service Evaluation* detail the existing conditions in the MTS service area. The findings from these documents helped inform and develop the guiding principles and framework for the final recommendations. Both of these documents provided the basis for the TOP's recommendation process, further discussed in the *Evaluation Process* section of this report.

Market Assessment

MTS provides bus and trolley services to residents within a 570-square mile area of San Diego County. This includes ten cities and parts of unincorporated areas of the county and includes the cities of Chula Vista, Coronado, El Cajon, Imperial Beach, La Mesa, Lemon Grove, National City, Poway, Santee, and San Diego. The City of San Diego itself has over fifty different communities and is approximately 372 square miles in size.

Population

The MTS service area includes over 2.3 million residents. The vast City of San Diego is home to 1.3 million residents, followed by Chula Vista with a population of nearly 250,000, and El Cajon with roughly 100,000 people.

Employment

There are about 1.1 million jobs within the service area. Major concentrations of employment outside of downtown San Diego span across University City, Sorrento Valley, Mira Mesa, and Kearny Mesa. The largest employer in San Diego County is the University of California, San Diego (UCSD) and its associated medical and research facilities. UCSD facilities are primarily located in areas with high population densities which make it an area that can support high levels of transit investment. Downtown and surrounding communities also form an area with both high employment and population concentrations.

Development Patterns

A significant part of the MTS service area is characterized by largely suburban development outside of the urban core with pockets of denser development in key areas. Employment and population are largely segregated, with overlap only in certain communities such as downtown San Diego, University City, and Chula Vista. As a result, employees tend to commute out of the community where they live to a neighboring community in which they work.

Regional Growth

San Diego County is expected to experience continued growth in the coming years, specifically in the MTS service area. This growth will impact the type of rider who uses transit, as well as how potential riders are able to access it. MTS service will need to reflect and react to changing development patterns.

More specifically, SANDAG's projections show that future growth in the region will trend towards denser, compact development and away from further suburban sprawl. The encouragement of smart growth concepts will allow for denser communities and more opportunities for transit-oriented development. Specific areas that are expected to grow significantly include areas of Downtown, Chula Vista, Mission Valley, and University City. Transit's role in mobility will continue to grow with concentrated, mixed-use development.

Growth in Senior Population

San Diego's population is expected to age significantly in the next few decades, with the senior population accounting for 20 percent of total population by 2050. This segment of the population will likely age in place, a popular trend among current seniors, leading to a dispersed senior population that is difficult to serve. The TOP refinement of the current transit network and service tiers should consider the senior customer experience in order to mainstream senior mobility where cost-effective.

Transit's Role in Mobility

For the region to absorb growth in population and jobs without deterioration in San Diego's quality of life and further congestion, transit will need to play an increasing role in mobility as outlined in SANDAG's San Diego Forward: The Regional Plan. MTS should consider starting to implement these strategies within its limited current funding as part of the TOP.

Service Evaluation

MTS provides trolley, fixed-route bus, and paratransit services to the greater San Diego area. The agency currently serves over 90 million riders annually. The *System and Service Evaluation* provided a comprehensive analysis of MTS services by examining the system at the network, service tier, and individual route level.

Service Tiers

The MTS service network embraces the following service tiers:

- **Trolley:** Light rail services including the Blue, Green, and Orange Trolley Lines. Fares are \$2.50 per trip.
- Freeway Rapid/Express: Express, Rapid Express, and Rapid Routes 235 and 237. These services are high-speed, limited stop services operating primarily on highways and major arterials. Fares for these services are \$2.50 for Express and Rapid routes and \$5.00 for Rapid Express routes.
- Arterial Rapid/Urban Frequent: Urban Frequent routes and Rapid Routes 201/202, 204, and 215. These services are high-frequency, high-turnover routes primarily operating along major arterials in the dense urban core. Fares are \$2.25 per trip.
- **Urban Standard:** all Urban Standard routes operating within the MTS service area. Fares are \$2.25 per trip.
- **Circulator:** Circulator routes operating within the MTS service area. Fares are \$2.25 per trip, excluding the SVCC Shuttles (Routes 972, 973, 978, 979), which are partially subsidized by NCTD and are free to the public.
- **Rural:** the four Rural routes operate primarily in the East and South regions of the MTS service area. Zone boundaries for Rural routes are defined at Alpine, Tecate, and Ramona. Fares are \$5.00 for trips within one zone and \$10 for trips within two zones.

Each service tier fills a unique role within the transit network. A discussion of each service tier's network role and key transit markets follow. These distinctions helped to guide service recommendations by highlighting core network spines and major corridors that support high levels of service while recognizing how other tiers help complete an integrated network of public mobility options that match market needs and opportunities.

Table 1: MTS Service Roles

MTS Service Tier Roles				
Service Tier	Network Role	Key Rider Markets		
Trolley	Structural network spine with fast regional service.	All-day, all-week and peak period regional travel		
Freeway Rapid/ Express	Structural network spine with fast regional service. Peak period regional trave			
Arterial Rapid/ Urban Frequent	Structural network spine with fast subregional service.	Peak period subregional travel		
Urban Standard	Completes core network with key corridors outside of network spines.	All-day, all-week community and subregional travel		
Circulator	Network connections through local circulation.	Neighborhood circulation		
Rural Network connections from remote county destinations. Lifeline service		Lifeline service		

Service Design

MTS follows industry best practice and defines "frequent" services as those which operate every 15 minutes or better during base periods. On weekdays, MTS currently operates 93 routes, 34 of which are frequent. Of the 34 frequent weekday routes, 18 of them serve downtown San Diego with 16 providing crosstown network connections. On Saturdays, MTS operates 66 routes with nine running frequently. On Sundays, MTS operates 53 routes, eight of which are frequent. The routes most likely to operate only on weekdays are commuter express and circulator services.

Almost 90 percent of population and 91 percent of jobs within the MTS service area have access to transit, while 72 percent of people and 81 percent of jobs have access to frequent network services – a key success story from the 2004 COA that helped drive ridership growth.

Historical Ridership Trends

Industry

In recent years, the transit industry as a whole has faced a decline in bus ridership coupled with an increase in light rail ridership. Between 2010 and 2016, bus ridership declined 5 percent and light rail ridership increased by 17 percent, for a total ridership increase of 2 percent. Total

ridership was down 2 percent between 2015 and 2016, with a 4 percent decrease in bus ridership and a 3 percent increase in light rail ridership.

Light rail ridership is generally increasing, but bus ridership continues to decline. The recent ridership decline is likely caused by low gas prices, increasing employment rates, an improved economy which encourages more people to drive, and possibly new competition from transportation network companies (TNCs).

Industry Ridership Trends					
Modo	2010	2015	2016	% Change	% Change
Mode	(000s)	(000s)	(000s)	2010-2016	2015-2016
Bus	5,231,478	5,157,146	4,945,927	-5%	-4%
Light Rail	464,978	528,031	546,126	+17%	+3%
All Modes	10,172,352	10,626,931	10,382,628	+2%	-2%

Source: American Public Transportation Association Ridership Report

Figure 1: National Public Transit Ridership Trends



Source: American Public Transportation Association Ridership Report

MTS

MTS bus and rail system ridership is up 12 percent from 2010, yet MTS has experienced a small decline in both bus and rail ridership in the past years. Between fiscal years 2015 and 2016, bus ridership declined 6 percent while combined Trolley and bus ridership declined 4 percent.

MTS Ridership Trends					
Mode	2010	2015	2016	% Change 2010-2016	% Change 2015-2016
Bus	51,880,035	56,043,882	52,497,138	1%	-6%
Trolley	30,468,981	40,049,516	39,578,290	30% ¹	-1%
Total	82,349,016	96,093,398	92,075,428	12%	-4%

Table 3: MTS Ridership Trends

Figure 2: MTS System Ridership Trends



¹ Ridership recording systems on trolleys were updated to an automated system in 2014. Thus, Trolley ridership may have been undercounted prior to 2014.

In a recent comparison of ridership numbers over a five-month period (July-November) of fiscal years 2016 and 2017, there was still a 4 percent decline in weekday ridership. The table below features 10 routes with the largest percentage decrease in weekday ridership.

Among the top ten routes with the most significant declines in ridership are nine Urban Frequent routes. These routes carry a significant number of riders along central corridors within the service area. A main concern within the TOP includes efforts to reverse ridership decline within this service tier and along these critical routes by reinvesting in frequency. Efforts to improve travel time and limit the time spent waiting for bus transfers will help ensure that transit is a competitive mobility option within San Diego.

MIS Top 10 Routes Experiencing Ridership Declines – 5 Month Comparison				
Route	Service Type	Total Ridership Decline FY16-FY17	% Ridership Decline FY16-FY17	
2 – Downtown San Diego – 30 th & Adams	Urban Frequent	-108,573	-21%	
30 – Downtown San Diego – UTC via Pacific Beach	Urban Frequent	-98,352	-13%	
905 – Iris Trolley to Otay Mesa Border	Urban Standard	-98,020	-28%	
13 – Kaiser Hospital – 24 th St. Trolley	Urban Frequent	-77,461	-9%	
7 – Downtown San Diego – La Mesa	Urban Frequent	-77,022	-6%	
11 – SDSU – Skyline Hills	Urban Frequent	-76,024	-8%	
8 – Old Town - Mission Beach/Pacific Beach	Urban Frequent	-69,970	-24%	
3 – UCSD Hospital – Euclid Trolley	Urban Frequent	-66,409	-9%	
929 – Iris Trolley – Downtown San Diego	Urban Frequent	-59,920	-6%	
955 – National City - SDSU	Urban Frequent	-52,966	-8%	

Table 4: MTS Top 10 Routes Experiencing Ridership Declines by Route

Source: FY16 vs FY17 July – November Ridership by Route

Current Ridership

Ridership by Time of Day

Ridership peaks during the morning between 6 AM and 7 AM with 23,200 boardings, while the afternoon rush hour has its highest ridership of 27,100 boardings between 3 PM and 4 PM. Midday ridership is robust, averaging between 17,000 and 21,000 boardings per hour. The strong midday ridership is the result of the frequent all-day all-week network that allows for a live-work-play mobility lifestyle.

Ridership by Geography

Ridership throughout the MTS service area is highest along Trolley lines, with heavy south to north movement in the South County along the Blue Line and significant east to west movement between downtown and El Cajon along the Orange and Green Lines. Bus ridership is also notably high in North Park, Mid-City, South Bay urban west, and El Cajon; and around UC San Diego and the U.S./Mexico Border Ports of Entry.

Areas such as the U.S. Border, downtown, and UC San Diego have high ridership because they are key destination points which generate demand, parking is expensive and/or scarce, and trip lengths, origins, and destinations are conducive to transit.

Ridership by Service Type

Daily ridership on the Blue, Orange, and Green trolley lines accounts for 39 percent of total MTS weekday ridership with approximately 121,000 riders.

Urban Frequent routes account for 42 percent of total weekday ridership with 130,594 riders, nearly 8 percent more than carried by the Trolley. Ridership on the top four Urban Frequent routes, Routes 7, 11, SuperLoop *Rapid* 201/202, and 929 make up over one-quarter of the total service tier weekday ridership.

Ridership on freeway-oriented Express, *Rapid*, and *Rapid Express* routes accounts for 5.5 percent of total weekday ridership.

Ridership on Urban Standard routes accounts for 12 percent of weekday ridership.

None of the 13 Circulator routes have more than 1,000 weekday riders and over half of them serve fewer than 200 riders per day.

Ridership on Rural routes makes up less than one percent of all weekday ridership. The four rural routes have just 338 total weekday boardings, with ridership on Route 894 accounting for 80 percent of all rural riders.

Service Productivity

MTS bus services average 31 passenger boardings per revenue hour, an excellent system average. Factoring in Trolley services, productivity jumps to 47 boardings per revenue hour. There are only four routes in the entire system that average above 50 boardings per revenue hour, including the three Trolley lines. As a system, MTS performs well, but there is still room for improvement and opportunities to adjust and reallocate services to improve effectiveness and efficiency.

Operating Speeds

The majority of bus routes do not meet current MTS on-time performance standards set forth in Policy 42.² A number of major bus lines have operating speeds that are below 11 mph, making critical corridor service less attractive to customers and adding operating cost. The TOP will analyze operating speeds, layover percentage, and on-time performance to establish revised service standards and pinpoint services where speeds and performance can be improved.

Agency Partnerships

Within the MTS network, there are certain partnerships that benefit both the agency and regional stakeholders. These partnerships require distinct administrative processes that allow regional services to operate efficiently and effectively. These coordinated efforts add to MTS's menu of mobility options and serve a unique function within the existing network structure. These partnerships are critical in creating and maintaining community mobility hubs.

One solution to changing demand patterns is the integration of community services at mobility hubs. This concept recognizes that fixed-route transit cannot satisfy all trip needs, and by integrating multiple forms of transportation at a single location, people have the opportunity to choose the mode that best meets their travel needs for a particular trip. The following agencies and institutions are community stakeholders who play a role in developing mobility hubs.

North County Transit District

The North County Transit District (NCTD) operates the Coaster commuter train, and reimburses MTS half the actual subsidy cost to operate plus one dollar for every boarding to cover the MTS Coaster Connection Shuttle operating costs (Routes 972, 973, 978, 979). This partnership between

² Policy 42 is a Board-approved transit service evaluation and adjustment agency policy. Policy 42 establishes a process for evaluating existing transit services and outlines procedures for implementing minor and major service adjustments. The policy includes service standards for on-time performance, base weekday headways, and vehicle load factor standards by service tier.

MTS and NCTD is critical in keeping these shuttles in operation as fare-free last mile connectors for the Coaster.

Regional Universities

MTS currently has partnerships with the University of California, San Diego (UCSD), the University of San Diego (USD), San Diego State University (SDSU), and 15 area educational sites to provide discounted passes to student riders. UCSD's U-Pass provides students with unlimited riding on most transit routes provided by both MTS and NCTD. USD, SDSU, four community colleges, and other institutions provide discounted semester and monthly passes.

Employer Shuttles

The Coaster Connection routes are prime candidates for future mobility hub partnerships. Private vans/shuttles can provide more efficient first/last-mile access for residents or employees. For example, if a business locates two miles from the nearest transit service, instead of dedicating a fixed-route MTS vehicle to serve the location, the employer can provide a few vans/shuttles at a nearby mobility hub to help employees complete their journey to work. For the existing Coaster Connection shuttles, this key mobility hub is the Sorrento Valley Coaster Station. This will require greater coordination with area businesses and institutions, or expansion into alternative services such as vanpooling and ridesharing. MTS should take further consideration of more cost-effective solutions for the Coaster connections service. Route 84, which largely acts as a Coaster Connection Shuttle out of Old Town Station, could also be replaced through a similar partnership with the Navy Base on Point Loma.

Framework and Guiding Principles

Based on the findings of the *Market Analysis* and *Service Evaluation*, coupled with input from the public and stakeholder groups, the TOP goals were developed to guide the optimization of MTS's existing network through a phased plan. The framework focuses on strengthening the network and increasing ridership through service optimization within established financial constraints. These goals are achieved through the TOP's Service Design Principles.

Market Goals

Goal 1: Match Service to Current and Future Markets

Mobility needs vary throughout the MTS service area, and it is important that service levels and types are matched to markets in order to ensure the efficient and effective use of resources. MTS serves a variety of rider markets including commuters, students, lifestyle transit users, seniors, and visitors. Each market has its own unique set of consumer mobility needs that should be addressed in MTS's service delivery. Overall, service investment should be focused where transit is most competitive – the transit-oriented, high-density area with a mix of land uses and walkable street network –to ensure overall network success. In these transit "lifestyle" areas, residents may choose to take transit because it is convenient, opting to make it part of their daily lifestyle. For areas which can only sustain commuter-type services, Express routes must offer fast travel speeds and focus service on park and rides to be competitive. New "mobility-on-demand" choices like TNCs (Uber, Lyft, etc.) as well as carsharing and bikesharing present new competition for certain mobility trips as well as bringing new customers to the public mobility group of modes. This emerging mobility-on-demand brings both opportunities and challenges for MTS – in both cases making the transit network more competitive and better integrated from a mobility need and consumer experience standpoint will serve MTS well.

MTS should also work to ensure that the network continues to meet regional mobility needs as these needs evolve into the future. Monitoring industry best practices, new technologies, and projections in population growth and travel demand will allow MTS to incorporate changes into its service delivery each year so the network keeps pace with future changes.

Goal 2: Coordinate Land Use, Housing, and Infrastructure

Transit is most cost-effective in areas with a strong mix of population and employment densities as well as a street and sidewalk network that promotes walkability and access. By advocating for transit-friendly land use development patterns, MTS can ensure that transit is a competitive transportation option in San Diego County. This will become increasingly important as the region looks to mitigate the traffic impacts of the continuing rapid population expansion.

MTS should be proactive in meeting with communities to ensure it has a place at the table when master plans for future developments are being discussed. This way, transit can be integrated into plans instead of being considered as an afterthought. MTS can work to encourage sustainable development and incentivize businesses and housing developments to locate near the frequent transit network instead of locating away from the network and requesting new service.³ Being proactive will allow MTS to mitigate cost increases and encourage development along proposed transit investment corridors.

A comprehensive update to the 1994 *Designing for Transit Manual* is included as part of the TOP. This manual incorporates changes in city street policies and best practices as well as smart growth, urban bikeway, and transit street design guides. This manual will provide the city, partnering developers, and public agencies with an updated street and sidewalk network guide.

Service Goals

Goal 1: Optimize Service

To maintain a successful transit system, all resources must be used efficiently and effectively. With an eye towards cost savings and reinvestment, the critical goal of service optimization enables continued transit success under current financial constraints. Specific strategies include streamlining route alignments, balancing bus stop and route spacing, and maintaining efficient schedule cycle times.

The optimization process establishes which routes are low performers and provides cost-effective solutions for future service changes. These strategies ensure services levels and frequencies match the local demand for transit. A more detailed discussion of the basis of these optimization strategies is included in the Service Design Principles section.

Goal 2: Increase Ridership

MTS's financial success relies on a stable ridership base that generates sufficient fare revenue to continue providing a service that consumers want to use. To increase transit's market share, MTS must offer service that is competitive with other modes of travel, especially the automobile as

³ One critical issue is locating affordable housing with access to the frequent transit network. Efficient and effective access to public mobility is a key ingredient in escaping from poverty. Also, providing transit to remote locations will usually cost more over time than properly locating the facility in the first place.

well as with emerging mobility-on-demand options. In a region largely characterized by suburban development, MTS will need to offer streamlined, customer-friendly service to maintain and grow ridership.

Enhancing the customer experience will attract new discretionary riders and encourage existing riders to use transit more frequently and for more trip purposes. Enhancing the customer experience can be achieved by increasing frequencies and travel speeds, maintaining on-time performance, and making the network easy to understand and use. These strategies reduce passenger wait time, shorten travel times, and improve reliability.

Goal 3: Strengthen the Network

In order to strengthen the network, MTS must invest in the strongest performing routes at the core. By building up the core network and defining clear network roles for each route and service type, MTS can maintain an efficient and effective system. MTS's current system features a polycentric network, with several core routes interspersed throughout the system. Strengthening connections to the core network through the Urban Standard/Circulator routes will increase regional connectivity and provide valuable mobility options for MTS constituents.

Creating an all-day, all-week comprehensive transit network with higher service frequencies will attract riders to use transit for more of their variable trips throughout the week. Budget constraints in 2011 led to a reduction in Sunday service that limited rider ability to use the network. Through optimizing the use of existing resources, MTS is now able to reinvest resources back into an all-day all-week network.

Transit Network Development Tradeoffs

MTS faces challenging tradeoffs when determining how to allocate its limited resources throughout its service area. These tradeoffs affect network design, levels and types of service, and service coverage. The following section aligns with industry best practice.

Ridership versus Coverage

When choosing where to invest in the system, the TOP emphasizes maximizing ridership over coverage.

- Maximize Ridership: Maximizing ridership requires investing more resources in routes with high ridership and productivity at the expense of service in areas that are less productive. Focused investment in specific corridors maximizes resource effectiveness in the system core with a tradeoff of slightly less network reach. This strategy results in more overall system ridership and farebox revenue resulting in more operating resources for reinvestment in more service.
- **Maximize Coverage:** Maximizing service area coverage gives more market areas access to the transit network; however, resources are spread across more routes, resulting in a lower service frequencies and a less attractive transit network that generates fewer riders and less farebox revenue.

MTS can achieve its goals to increase ridership and strengthen the network by choosing to maximize ridership over coverage. With concentrated investments in the system's core corridors, the TOP favors investing in the system's most productive market areas while adjusting low performing routes in the greater service area.

Route Spacing: Access versus Frequency

Through its optimization, MTS must balance service frequency and walk access when determining network route spacing.

- Frequent service and greater route spacing: MTS can focus its resources on providing more frequent service on fewer corridors. Industry experience has found that people walk farther to access more frequent service, mitigating the longer walk created by greater route spacing.⁴
- Less frequent service on closer spaced routes: MTS can provide service on more routes, but with less frequency. This would decrease the walking distance to transit but would limit transit attractiveness by reducing frequencies to basic or lifeline levels.

The TOP has established efforts to reduce route duplication while investing in greater frequency. By maximizing resource efficiency to invest in high frequency routes, MTS will attract a larger transit ridership and higher farebox revenue.

⁴ Typical transit walk access is between ¼ mile (5-minute walk) and ½ mile (10-minute walk). Frequent transit draws from ½ mile (80% of the riders come from a ½ mile catchment area) while the 80% catchment area for infrequent transit area is smaller at ¼ mile. Federal regulations assume a ¾ mile walk access distance for ADA purposes.

Stop Spacing: Access versus Speed

MTS must balance stop placement and spacing in order to provide adequate levels of service while still maintaining appropriate vehicle speeds.

- Access: Closely-spaced bus stops improve transit access by minimizing walk distances, and in some cases the spacing is so close that the usual ¼ walk access target for less frequent local transit has significant overlap and redundancy that is ineffective and inefficient. Routes with optimized distances between stops can reduce overlaps in coverage without decreasing overall access.
- **Speed:** Fewer stops along a corridor can improve route speeds. By limiting the number of times a bus must decelerate and stop, runtimes and delays are decreased. Routes with frequent stops typically experience much lower speeds and higher variance in service running times, which can affect on-time performance.

Balancing both speed and access is a key tradeoff for MTS. The agency will need to assess appropriate opportunities for stop consolidation as an optimization method. The TOP's service recommendations aim to achieve an optimal balance between service speed and access.

Network Structure

MTS has several options for structuring its network. Each of these options comes with different tradeoffs.

- Grid Network: A grid network consists of routes serving individual corridors oriented along dominant patterns (i.e. parallel north/south and east/west or radial/crosstown depending upon the roadway network). By operating a series of frequent corridors, passengers will have reliable, frequent access to the entire network by transferring just once between routes in the grid. These networks are most beneficial where travel is dispersed among many potential destinations (i.e. lifestyle mobility covering all daily tripmaking) instead of single-purpose mobility such as commute travel to a central location like a downtown. Because grid networks expect that many riders will have to transfer at least once, they require frequent transit service (minimum of 15 minutes with 10-minute service levels desirable) to minimize street corner transfer wait times. Grid networks are productive in areas like the core market area where densities and development patterns support sustainable lifestyle mobility.
- Hub-and-Spoke Network: A hub-and-spoke network consists of routes that travel to and from one or more central locations. For MTS, these would include downtown, UCSD, and employment centers (e.g., Sorrento Valley, Kearny Mesa) where transit centers or mobility hubs have been developed. Passengers have access to the entire network by transferring at the hub. A hub-and-spoke network is most beneficial if the hub is the destination for most trips or when the road network is less linear. Hub-and-spoke

networks often provide enhanced facilities for transferring, but at a cost of significant outof-direction travel and lower frequencies (less resource efficient).

- All-to-All: An all-to-all network focuses on providing one-seat rides for all trip purposes with a decreased emphasis on transferring. An all-to-all network requires a large number of resources to serve all potential origins and destinations within a service area, so frequency is very limited. Since an all-to all-network focuses on one-seat rides, riders whose origin and destination are not on the same route have difficulty using the network. Examples of this strategy are vanpools and mobility-on-demand services.⁵
- **Hybrid:** Most transit system networks are hybrids, combining a grid configuration in the core market area transitioning to hub-and-spoke as transit market densities drop with all-to-all structure in the less dense suburban and rural areas. The previous COA resulted in an efficient and effective hybrid MTS network subject to TOP "tuning" based on changes in markets and transit service competitiveness.

⁵ Short distance zone-based "mobility-on-demand" service can provide cost-effective mobility while wide area, longer distance on-demand service is much less cost-effective.



Routes travel to and from one or more central locations.

HUB & SPOKE

Passengers have access to the entire network by transferring at a central hub.

A hub-and-spoke network is most beneficial when all trips meet at a specific time and hub to maximize access to the entire network. This is used in smaller, monocentric development patterns



Hub-and-spoke networks often provide enhanced facilities for transferring, but at a significant cost of out-of-direction travel and lower frequencies, and is often more resource intensive.



ALL-TO-ALL

Routes provide one-seat rides for all trip purposes with limited transferring





An all-to-all network requires a large number of resources to serve all potential origins and destinations within a service area, so frequency is very limited.

All-to all-networks focus on one-seat rides, meaning riders whose origin and destination are not on the same route have difficulty using the network.

Short distance zone-based "on-demand" service can provide costeffective mobility while wide area, longer distance on-demand service is much less cost-effective.

All-Day, All-Week Service versus Peak Commuter Service

Transit can be used for a variety of trip purposes, and MTS seeks to provide balanced mobility solutions that cater to both all-day, all-week lifestyle transit use and peak commute travel.

- All-Day, All-Week Service: Providing an all-day, all-week network is critical to generating
 lifestyle transit use that supports sustainable community mobility initiatives. Lifestyle
 transit works in concert with active modes (i.e. walking and biking) to reduce dependency
 on personal vehicle use. In addition, using the transit resources (e.g., buses/trains,
 facilities, and rights-of-way) over an extended all-day, all-week period increases the value
 of capital and operating investments while maintaining community quality of life and
 arterial congestion levels despite significant planned growth in population.
- Peak Commuter Service: A major public issue for employment travel is traffic congestion. Focusing on commute travel increases transit's value in offsetting new congestion as the region grows, possibly deferring new roadway development. Concentrating service in peak period trips would serve a broad range of the service area population that have traditional work or school hours, but would limit MTS's ability to serve a more diverse range of mobility needs. Peak commuter service is typically more expensive to operate than an all-day, all-week service, resulting in less efficient use of MTS operator and fleet resources. With passengers traveling longer distances with little or no seat turnover, achieving cost-effectiveness targets for commuter services can be more challenging. Additionally, focusing on traditional peak commuter trips does not benefit the growing segment of the population with non-traditional work schedules.

Many of MTS's Rapid and Express routes currently serve the peak commuter market by offering limited-stop service between major residential and employment centers within the service area. The TOP emphasizes these major regional connectors in an effort to improve network connectivity, while still focusing on developing a more robust all-day, all-week network. Reinvestment of resources gained through optimization are focused on increasing this all-day, all-week network.

TOP Design Principles

The following transit service design principles informed the development of service recommendations as part of the TOP to ensure system-wide consistency across community, sub-regional, and regional levels.

- **Direct Route Alignments:** Where possible, routes should be direct with limited deviations. Minimizing nonlinear alignments and unproductive deviations improves the passenger experience and has the added benefit of reducing operating costs and increasing speed, often allowing for cost-neutral frequency improvements.
- Half-Mile Route Spacing: The recommended distance between routes is a half mile to balance access and coverage. Having routes spaced ½ mile apart means no one will be more than ¼ mile walk from a route, the average walkshed to standard transit service. Routes spaced too closely together will compete for ridership, spreading out benefits for little return in ridership gain. Appropriate route spacing ensures that each route serves a unique role in the network. By minimizing service duplication, MTS can reinvest in higher frequency service.
- Far-Side Stop Placement: Stops should be placed on the far-side of intersections where feasible. Far-side stops are located immediately after an intersection, allowing the vehicle to pass through the intersection before stopping for passenger loading and unloading, preventing the bus from having to sit through multiple light cycles. When the bus needs to reenter traffic, the intersection and traffic signal generate gaps in traffic flow. Far-side stops require shorter deceleration distances and minimize bus blockage within the curb lane on the approach to the intersection. Additionally, far-side stops have the benefit of having pedestrians use the intersection behind the bus rather than walk in front of the bus improving safety and reducing delay.
- Quarter-Mile Stop Spacing: Promoting adequate stop spacing can retain riders while improving vehicle speeds. Limiting the number of times a bus must decelerate and stop can significantly improve service speeds if stop spacing is particularly dense. However, spacing stops too far apart has the negative effect of impeding pedestrian access to transit. Quarter-mile stop spacing achieves the desired balance between speed and access, and appropriate stop consolidation along a corridor can reduce delay and runtimes.

Transit Design Principles Components of a successful transit system





Direct Alignments

Provide direct routing where possible, making sure to avoid unnecessary deviations.

Balanced Route Spacing

Avoid duplicative service with half mile route spacing

Far-Side Stop



Far-Side Stop Placement

Stops located after an intersection allow the vehicle to pass through before stopping. This prevents sitting through multiple light cycles and generates gaps in the traffic flow.

Efficient Stop Spacing

Adequate stop spacing retains riders and improves vehicle speeds. Typically, quarter mile stop spacing provides access while maintaining speeds.



Route Evaluation Process

The existing market and service conditions, chosen transit network development characteristics, and designated TOP design principles helped guide the system optimization process by providing a basis for route and network evaluation. Each MTS route was evaluated through a combination of field work, spatial analysis, and survey of existing conditions through the *Service Evaluation* and *Market Analysis*. Routes were analyzed based on a number of characteristics and their role in the subarea and MTS system. This section discusses these characteristics as they relate to the evaluation process, and how the TOP design principles guided this effort.

Density and Development Patterns

Existing and near-term future development significantly influenced individual route analysis. Land use and development patterns surrounding transit stops is an important indicator of future transit success. Preliminary field work informed the recommendation process by helping identify key destinations, major transfer hubs, and areas undergoing development. Relevant key destinations noted for each route included Trolley Stations, transit centers, colleges, shopping centers, dense residential complexes, and major employment centers. Population and employment density from the TOP's Market Analysis supplemented with online mapping tools assisted in identifying major trip generators warranting service changes or additional service. By identifying areas of significant density and potential underserved corridors, the TOP was able to match service levels to market demands.

Stop Efficiency

Each route was analyzed for stop spacing and stop placement efficiency. As established by the TOP design principles, quarter-mile stop spacing and far-side stop placement is preferable. The recommendation process evaluated these efficiencies by analyzing stop-level route ridership. Comparing ridership levels along a route and the distance between stops provides insight whether stops are placed too close or too far apart. This analysis is largely complemented by the survey of existing development and key trip generators as major ridership sources.

Given San Diego's particularly varied terrain, the TOP paid special attention to topographic constraints and differences in elevation when evaluating stop spacing and placement recommendations. Additionally, a subarea's street network largely dictates stop efficiency and placement, requiring this stop-level analysis for each route and subarea. For example, areas with low-density development may not warrant a stop every quarter mile if there is a half-mile stretch along the route with no destinations or pedestrian access. By evaluating the system on a subregional basis, the TOP was able to accommodate these variances.

Route Alignment

A central component of the TOP recommendation process is maintaining direct route alignments to improve travel speeds and minimize operating costs. Each route with a significant out-of-direction deviation was evaluated using the MTS out-of-direction model.⁶ The model measures the extra travel time that through-riding passengers face for every passenger gained along the deviation. Deviations that incurred more than five minutes of delay per on-board passenger were recommended for discontinuation. Each deviation was also evaluated based on whether or not it required that an additional vehicle be used to operate the route. If a route could be operated with fewer vehicles without the deviation, the deviation was recommended for discontinuation.

Service Duplication

The recommendation process also evaluated instances where multiple routes served the same corridor. While particularly dense, high-traveled corridors will have overlapping routes with varying roles, each subarea was evaluated for areas in which duplicative service did not yield substantial benefits. Having a single route operate every 10 minutes on a corridor is preferable to having three routes operate every 30 minutes on the same corridor. Even though both scenarios could effectively provide 10-minute frequency, many riders only know their route number and will not know that they can take any of three different routes to reach their destination making the service less useful. Through the optimization process, routes that did not provide a unique service were discontinued or consolidated in order to reinvest those resources into more productive services that was easier to use and would attract more ridership.

Performance Indicators

Throughout the recommendation process, key performance metrics were utilized as the basis for route realignments, frequency improvements or reductions, and discontinuations. This includes measures such as passengers per revenue hour, farebox recovery, subsidy per passenger boarding, service speeds, average layover percentage, and on-time performance. Many of these metrics were used throughout the *Service Evaluation*, and provided indicators for optimization opportunities.

⁶ TMD worked with MTS in the early 1990's to develop the Out-of-Direction Model, which was used to effectively streamline many of the deviations that existed at the time. TRB awarded the MTS/TMD team for innovative service design for developing and using the model. The model has since evolved into a Travel Delay Index tool for assessing both service deviation and the value of individual stops (e.g., LA Metro Rapid stations and SFMTA system-wide stop spacing).

Productivity measures such as passengers per revenue hour (PPRH) played a major role in the justification for route recommendations. Routes with high PPRH are highly effective and may warrant increased frequency. Routes with very low PPRH were recommended for remedial action (i.e. service restructuring, reduction, replacement, and discontinuation). These routes are typically cost-inefficient and feature high subsidies per passenger boarding. On longer routes, segment productivity provided insight into sub-route performance and allowed for a more nuanced approach to optimizing individual routes geographically.

On-time performance and average speeds by time of day were analyzed on a route-by-route basis to determine service reliability and efficiency. Outside influences that impact MTS service such as congested corridors and inefficient street design were noted for optimization. The *Designing for Transit Manual* update as part of Task 5 of the TOP takes a deeper look at how cities within the MTS service area can encourage transit-friendly street design.

Routes were also evaluated for their layover percentage⁷ to identify any instance of excess recovery. MTS's use of interlining limited a significant number of inefficiencies, and new proposed routes aimed to maintain this practice.

Each of these performance indicators were used to justify major and minor service changes throughout the system. By analyzing the average metrics within service types and throughout subareas, a baseline was established for any new route proposals or changes to existing service.

⁷ Service layover or recovery is the time allocated at the end of individual trips for operator rest and schedule recovery to ensure on-time departures. The relation of route in-service running time and frequency has a significant impact of overall schedule efficiency. Where possible, the TOP sought to ameliorate schedule cycle time inefficiency.

Public Outreach

Upon completion of the system analysis and route recommendation process, MTS conducted its public outreach to gain rider feedback on the proposed network. Throughout March and April 2017, MTS collected rider feedback online and conducted over two dozen open house outreach events throughout the region.

Table 5: MTS Open House Events

MTS Open House Events			
Date	Time	Location	
Northern			
March 27, 2017	4:00 PM – 6:00 PM	Kearny Mesa Transit Center	
March 31, 2017	6:00 AM – 8:00 AM	Sabre Springs/Penasquitos Transit Station	
April 5, 2017	4:00 PM – 6:00 PM	UTC Transit Center	
April 6, 2017	6:00 AM – 8:00 PM	Miramar College Transit Station	
Central			
March 25, 2017	11:00 AM – 1:00 PM	Old Town Transit Center	
March 25, 2017	11:00 AM – 1:00 PM	City College Transit Center	
March 29, 2017	6:00 AM – 8:00 AM	12th & Imperial Transit Center	
March 30, 2017	6:00 AM – 8:00 AM	Euclid Avenue Transit Center	
April 1, 2017	11:00 AM – 1:00 PM	12th & Imperial Transit Center	
April 3, 2017	6:00 AM – 8:00 AM	Old Town Transit Center	
April 3, 2017	11:00 AM – 1:00 PM	City College Transit Center	
April 4, 2017	4:00 PM – 6:00 PM	City Heights Transit Plaza (University & I-15)	
April 6, 2017	11:00 AM – 1:00 PM	SDSU Transit Center	
April 6, 2017	4:00 PM – 6:00 PM	Fashion Valley Transit Center	
April 8, 2017	11:00 AM – 1:00 PM	City Heights Transit Plaza (University & Fairmount)	

Eastern		
March 29, 2017	4:00 PM – 6:00 PM	El Cajon Transit Center
March 31, 2017	6:00 AM – 8:00 AM	La Mesa (Allison & Date)
April 1, 2017	11:00 AM – 1:00 PM	El Cajon Transit Center
April 5, 2017	6:00 AM – 8:00 AM	Santee Trolley Station
Southern		
March 27, 2017	4:00 PM – 6:00 PM	8th Street Transit Center
March 28, 2017	4:00 PM – 6:00 PM	24th Street Transit Center
April 4, 2017	6:00 AM – 8:00 AM	Iris Avenue Transit Center
April 5, 2017	11:00 AM – 1:00 PM	Southwestern College Transit Center
April 7, 2017	6:00 AM – 8:00 AM	H Street Transit Center
April 8, 2017	11:00 AM – 1:00 PM	Iris Avenue Transit Center

Transit Optimization Plan

Introduction

The following section details the recommendations for the *Transit Optimization Plan*. Given the sheer size and varied road network of the MTS service area, the TOP utilizes a subregional approach to ensure each subarea is adequately served based on existing market and service characteristics. Each subarea features unique development patterns, market conditions, and its own small-scale transit network, and thus demands individual optimization in addition to system-wide analysis. The subareas include the following:

- Northern
 - o UCSD/Mira Mesa
 - o 163 Corridor
 - o I-15 Corridor
- Central
 - o Downtown and Mid-City San Diego
 - Beaches
- Southern
 - National City
 - o South County
- Eastern
 - East County El Cajon
 - East County La Mesa and Spring Valley
 - o Rural

A brief discussion of existing conditions within each main area will be followed by the recommendation for each individual route. Route recommendations were largely guided by the goals and design standards within the *Framework and Guiding Principles* section of this report, as follows:

- Optimize Service
- Increase Ridership
- Strengthen the Network

Trolley Service

No major changes to the Trolley network are proposed based on the existing network (which was significantly restructured during the previous COA), as existing frequencies are appropriate for

the network at large. The anticipated opening of the Mid-Coast Trolley in 2021 will significantly impact the system in the future. At that time, further implementation plans should look to balance service between Old Town and Santa Fe Depot where both the Green Line and UC San Diego Blue Line will operate.

One long-term recommendation requires additional capital investment to implement a Trolley shuttle service between El Cajon Transit Center and Santee Town Center. This proposal allows MTS to isolate the single-track section from the rest of Green Line operations. The presence of this single-track section dictates the schedule timing and frequency options of the entire Trolley system. Isolating this section allows for a more reliable system and better matches travel markets in Eastern San Diego County.

Rapid Bus

MTS Rapid services are routes that are subsidized through the regional half cent TransNet sales tax. This includes Routes 201, 202, 204, 215, 235, 280, and 290. Recommendations made to routes with Rapid branding require coordination with SANDAG, the regional metropolitan planning organization. These recommendations serve as suggestions to SANDAG on how to reallocate TransNet funding to MTS Rapid routes, and thus do not impact MTS's budget. This required agency coordination may impact potential phasing options for Rapid routes.

Recommendations

UCSD and Mira Mesa

UCSD is a major employer and educational institution for the San Diego region. The surrounding area includes the communities of University City, La Jolla, Mira Mesa, and Sorrento Valley. This is a major employment area on par with downtown San Diego with significant employment density, making it a major regional destination. The commute-focused demographic is complemented by the growing population of students living in University City and La Jolla. This student population largely relies on public transportation for daily mobility, making the SuperLoop one of the top routes in the system.

The area is expected to densify in the coming years, especially with the completion of the Mid-Coast Trolley in 2022. The TOP's recommendations seek to streamline and improve service in the interim to steadily grow transit as the area's preferred mode choice in anticipation of Mid-Coast opening.

The UCSD/Mira Mesa subarea consists of twelve main routes. On an average weekday, this subarea will move nearly 16,000 riders, half of which travel on the SuperLoop (201/202) alone. Four of the twelve routes offer weekend service, a strong indicator of the mostly commute and

school-based service provided in the area. The recommendations within this area aim to streamline alignments, reallocate resources to core MTS routes, and create a more effective allday, all-week network.




Table 6: UCSD/Mira Mesa Route Recommendations

	UCSD/Mira Mesa Route Reco	ommenc	lations					
Route	Recommendation	Exist Frequ	ting ency	Propo Frequ	osed ency	Proposed Servic		
		Peak	Base	Peak	Base	Wkdy	Sat	Sun
31	Straighten alignment along La Jolla Village Dr (September 2017).	30	-	30	-			
150	No recommended changes.	7.5-15	30	7.5-15	30			
201/202	No proposed changes.	5-10	10	5-10	10			
204	Weekday service would be reduced to a 30-minute frequency, and weekend service would be discontinued.	15	15	30	30			
237	All trips would terminate on the east end at the Miramar College Transit Station. Continuing service to/from Sabre Springs/Peñasquitos and Rancho Bernardo Transit Stations would remain available on Route 235.	15	-	15	-			
921	No proposed changes.	30	30	30	30			
964	No proposed changes.	30	30	30	30			
972	No proposed changes. Draft recommendation on future vanpool/microtransit options.	10 trips	-	10 trips	-			
973	No proposed changes. Draft recommendation on future vanpool/microtransit options.	10 trips	-	10 trips	-			
978	No proposed changes. Draft recommendation on future vanpool/microtransit options.	9 trips	-	9 trips	-			
979	No proposed changes. Draft recommendation on future vanpool/microtransit options.	9 trips	-	9 trips	-			

Figure 4: UCSD and Mira Mesa Subarea Map



163 Corridor

The 163 Corridor bisects the Clairemont Mesa and Kearny Mesa communities, a significant regional employment center. This subarea contains eight routes, many of which connect Kearny Mesa to the rest of the system through key transit hubs at Kearney Mesa, UTC, and Fashion Valley. On average, over 17,000 passengers ride these routes per weekday. More than 9,000 passengers ride Routes 41 and 44 alone, which help connect UTC to Fashion Valley (Route 41) and Kearny Mesa Transit Center to Old Town Transit Center (Route 44). Route recommendations within the 163 Corridor subarea seek to improve route efficiency and travel time and reduce service duplication so each route serves a unique role in the network.

Figure 5: 163 Corridor Recommendation Overview



Table 7: 163 Corridor Route Recommendations

	163 Corridor Route Recommendations										
Route	Recommendation	Existing Frequency		Proposed Frequency		Proposed Serv		rvice			
		Peak	Base	Peak	Base	Wkdy	Sat	Sun			
25	Route would be streamlined to use Highway 163 and Friars Rd. between Mesa College Drive and Fashion Valley. Local service between Mesa College Drive and Fashion Valley would remain on other routes as follows: Health Center Dr. on Route 120, Genesee Ave. on Routes 41 & 120, and Ulric St. on Route 120. Service on Comstock St. (west of Linda Vista Rd.) and Osler St. would be discontinued.	60	60	60	60						
27	Route would be streamlined to operate along Kearny Villa Rd. instead of Convoy St. between Balboa Ave. and Clairemont Mesa Blvd.	30	30	30	30						
41	No proposed changes.	7.5/15	15	7.5/15	15						
44	The northern end of Rt. 44 would be realigned on Clairemont Mesa Blvd. to serve east of Convoy St. to the Kearny Mesa T.C. (instead of west to Clairemont Square). Service on Clairemont Mesa Blvd. between Convoy St. and Clairemont Square would be replaced by a revised Rt. 105.	15	15	15	15						
50	Route would be adjusted in Clairemont and University City to use Regents Rd. and Governor Drive. Midday service would be discontinued between approx. 10 a.m. and 2 p.m. (but remain available on Rt. 41 on Genesee Ave. and Route 105 on Clairemont Dr.).	15	60	15	-						

	163 Corridor Route Recommendations											
Route	Recommendation	Existing Frequency		Proposed Frequency		Propos	rvice					
		Peak	Base	Peak	Base	Wkdy	Sat	Sun				
105	The northern end would be realigned to operate east from Clairemont Square to the Kearny Mesa Transit Center, replacing Route 44 along Clairemont Mesa Blvd. Frequency along Clairemont Mesa Blvd. between Kearny Mesa Transit Center and Clairemont Square would be 15 minutes on weekdays and 30 minutes on weekends. The Route 105 segment between Clairemont Square and UTC would be replaced during weekday peak hours by a realigned Route 50. Service along Milton St. and Burgener Blvd. would be discontinued and operated via Ingulf St. and Denver St. (current Route 105A routing).	30	30	15/30	15/30							
120	Routing would be adjusted in Kearny Mesa to remain on Kearny Villa Rd. instead of Convoy St. and Kearny Mesa Rd.	15	15	15	15							
928	No proposed changes.	30	30	30	30							





I-15 Corridor

The I-15 Corridor is largely dominated by express commute service. The subarea features eight existing routes that carry over 11,000 passengers per average weekday. Routes within the subarea connect north central communities of the county to major employment centers in Mira Mesa, Kearny Mesa, and downtown San Diego. The only routes within the subarea that do not fill a Rapid/Express role are Routes 944 and 945, which operate locally in Poway. Recommendations within this subarea were largely guided by the goal of matching transit service to appropriate markets.





Table 8: I-15 Corridor Route Recommendations

	I-15 Corridor Route Recommendations											
Route	Recommendation	Existing Frequency		Proposed Frequency		Proposed Ser		rvice				
		Peak	Base	Peak	Base	Wkdy	Sat	Sun				
20	Routing would be streamlined between Kearny Mesa and Mira Mesa to use Freeways 15 and 163 instead of Ruffin Rd., Kearny Villa Rd. and Black Mountain Rd. Service along Black Mountain Rd. would remain available during weekday peak periods on Route 31.	15	30	15	30							
60	No proposed changes.	-	15	-	15							
110	No proposed changes.	4 trips	-	4 trips	-							
235	Weekday midday service would be increased to a 15-minute frequency.	15	30	15	15							
280	No proposed changes.	15	-	15	-							
290	No proposed changes.	10	-	10	-							
944	Route would be adjusted to serve Community Rd. and Hilleary Place. Service would be discontinued east of Midland Rd. (and along the Garden Rd. loop).	30	30	30	30							
945	No proposed changes.	30	30	30	30							





Mid-City and Downtown

Mid-City San Diego surrounds the downtown urban core with several high-density corridors optimal for transit use. The street network is walkable and bikeable, but destinations are more spread out with population and employment primarily built into dense mixed-use development and multi-unit apartment and office buildings. Development is focused along major corridors like El Cajon Blvd and University Ave where transit is heavily utilized throughout the week. Mid-City is ideal for frequency investments on the strongest corridors and on routes with the highest productivity.

This central subarea of the MTS system includes 20 existing routes, several of which are core network spines. On an average weekday, nearly 70,000 riders utilize these routes. Recommendations for this subarea were largely guided by efforts to improve frequency and travel speed and reliability. With continued attention toward congested corridors throughout this sub-region, these route adjustments seek to mitigate the impact of slow traffic speeds on MTS service.

There are several recommendations within this subarea given its size and density of MTS service. Many recommendations center around increasing frequency along highly-traveled corridors. Others focus on realigning the network to better serve key trip generators and transit centers while avoiding congested corridors or duplicative service.

Figure 9: Mid-City and Downtown Recommendations

	IMPROVED FREQUENCY OR SPAN Route 1, Route 3, Route 5, Route 7, Route 11, Route 13, Route 955, Route 992
	REALIGNED SERVICE Route 1, Route 2, Route 7, Route 11, Route 14, Route 955, Route 965
	REDUCED FREQUENCY None
$\overline{\otimes}$	DISCONTINUATION None

Table 9: Mid-City and Downtown Route Recommendations

Mid-City and Downtown Route Recommendations										
Route	Recommendation	Existing Frequency		Proposed Frequency		Proposed Serv		rvice		
		Peak	Base	Peak	Base	Wkdy	Sat	Sun		
1	Route would be extended from Hillcrest to Fashion Valley, via Sixth Ave., Hwy. 163, and Hotel Circle. Rt. 1 service along 4th/5th Avenues in Hillcrest would be discontinued, but the stops would remain served by Route 3. Route 1A service to 70th St. T.S. would be discontinued, with all trips ending at the La Mesa Blvd. Trolley Station instead. Continuing service between Downtown La Mesa and Grossmont T.C. via La Mesa Blvd. would be served by new Route 52.	15	15	15	15					
2	Discontinue Sunday segment along Adams Avenue due to low ridership (June 2017). Adams Avenue service is covered by Route 11 alignment.	10	15	10	15					
3	Weekday frequency would be increased from 15 to 12 minutes, and Sunday frequency would be increased from 60 to 30 minutes.	15	15	10	10					
4	No proposed changes.	30	30	30	30					
5	Weekday frequency would be increased from 15 to 12 minutes.	15	15	15	15					
6	No proposed changes.	15	15	15	15					
7	All Rt. 7 trips would operate between Downtown and University Ave./College Ave. only. Continuing service east of College Ave. into Downtown La Mesa via University Ave. would be served by new Rt. 52. Also, peak hour service would be adjusted to operate every 10 minutes in both directions (instead of every 6 or 12 minutes, depending on direction).	6	12	10	10					

Mid-City and Downtown Route Recommendations									
Route	Recommendation	Existing Frequency		Proposed Frequency		Propo	rvice		
		Peak	Base	Peak	Base	Wkdy	Sat	Sun	
10	Provide better stop spacing in Hillcrest to reduce delay and improve trip times for riders (June 2017).	12	15	12	15				
11	Route 11 would be split into two routes: The northern segment would remain Route 11, operating between Downtown and SDSU via the current alignment. The routing in Downtown would be: southbound on Front St., left on Market St., and left on First Ave. to a terminal at First Ave./G St. Extend Sunday route alignment to accommodate for Sunday service discontinuation of Route 2 along Adams.	15	15	15	15				
12	New route number for the southern half of the current Route 11, operating between Skyline Hills and the City College T.C. in Downtown San Diego along the current alignment to Imperial Ave. In Downtown, Route 12 would use 10th/11th Avenues between Imperial Ave. and the City College T.C. Hours and frequency would be similar to current service.	-	-	15	15				
13	Weekday afternoon frequency would be increased from 15 to 12 minutes.	15	15	12	12				
14	No proposed changes.	60	60	60	60				
18	Minor reduction in service span.	30	30	30	30				
52	New Route 52 would replace eastern segments of Routes 1 and 7, operating between University Ave./54th St. and the Grossmont Transit Center via University Ave., Allison Ave., La Mesa Blvd. and Grossmont Blvd. 30-minute frequency, 7 days/week.	-	-	30	30				

Mid-City and Downtown Route Recommendations											
Route	Recommendation	Existing Frequency		Proposed Frequency		Proposed Serv		rvice			
		Peak	Base	Peak	Base	Wkdy	Sat	Sun			
83	Service would operate weekday middays only, approx. 8 a.m 3 p.m. The segment along Washington St. and into Hillcrest would be discontinued from Route 83, but remain served by Route 10. A new northern terminal would be established at Old Town T.C., and the north Mission Hills alignment would change from Fort Stockton Dr. to Sunset Blvd./Juan St.	60	60	60	60						
88	No proposed changes.	30	30	30	30						
115	No proposed changes.	30	30	30	30						
215	No proposed changes.	10	15	10	15						
854	Saturday service would be discontinued. Some weekday night service would be reallocated from regular Route 854 (via Baltimore Dr. & Lake Murray Blvd.) to Route 854x (via SR-125).	60	60	60	60						
955	Reroute to Market and 47th instead of Euclid and Imperial. Weekday service would be increased to a 12-minute frequency.	15	15	12	12						
965	Change alignment to operate on University between Fairmount and Euclid (June 2017). All existing service on Landis within 1/4 mile of Route 965 or Route 13.	30	35	30	35						
992	Increase weekend frequency to 15 minutes.	15	15	15	15						

Figure 10: Mid-City and Downtown Subarea Map



Beaches

The Beaches subarea includes the western coast of central San Diego, encompassing parts of La Jolla, Pacific Beach, Mission Beach, Ocean Beach, and Point Loma. The peninsula is largely dominated by major destinations such as the San Diego International Airport, Point Loma Naval Base, and Sea World.

The subarea consists of seven existing routes, which carry approximately 12,000 riders per average weekday. Nearly half of this ridership occurs on Route 30, which operates between Downtown San Diego and UTC via Pacific Beach and downtown La Jolla.

Figure 11: Beaches Recommendations Overview



Table 10: Beaches Route Recommendations

	Beaches Route Recommendations									
Route	Recommendation	Existing Frequency		Proposed Frequency		Proposed Ser		rvice		
		Peak	Base	Peak	Base	Wkdy	Sat	Sun		
8	During summer, frequency would remain every 15 min. on all days. In non-summer months, MonSat. frequency would be reduced from 20 to 30 min.	20	20	30	30					
9	During summer, frequency would remain every 15 minutes on all days (30 minutes north of SeaWorld). In non-summer months, Monday-Saturday frequency would be reduced from 20 to 30 minutes.	20	20	30	30					
28	No proposed changes.	15	30	15	30					
30	No proposed changes.	15	15	15	15					
35	Weekday service would be increased to a 15-minute frequency. Service south of Newport Ave. would be replaced on weekdays by an extended Route 923 to Point Loma Ave., and discontinued in the later evening and on Saturdays.	15	30	15	15					
84	Service would operate weekday peak hours only, operating two round trips in the morning and two round trips in the afternoon, between Old Town T.C., SPAWAR Main Gate (via Cañon St), and the Sub Base Main Gate. Midday service and all service to Cabrillo Monument would be discontinued.	60	60	2 trips	-					
923	Extend service to Sunset Cliffs along the existing Route 35 alignment. Discontinue unproductive Saturday service to the airport. By flipping the tails of both Route 35 and 923, this improves route efficiency.	30	30	30	30					

Figure 12: Beaches Sub Area Map



National City

National City lies between Downtown San Diego and Chula Vista, serving as a gateway into South County. National City has high population and employment density with urban development extending south from downtown. Suburban development within the region is primarily composed of single family homes and a few key commercial centers, especially in the Paradise Hills community.

The National City subarea includes 7 main routes. On a given weekday, the subarea will carry about 6,500 riders. Transit in the National City subarea depends on key North-South corridors such as National City Blvd, Highland Ave, and Euclid Ave. The subarea's focus for optimization includes its strong North-South movement along existing Urban routes and close proximity to Blue Line Trolley service.

The proposed changes within National City seek to separate or eliminate unproductive service deviations and focus on increased key corridor frequencies with more efficient service providing a subarea hybrid grid/hub-and-spoke focused on the Blue Line Trolley. Overall, these service adjustments reprioritize investments in the National City subarea by improving frequency on core routes, removing duplicative service, and realigning inefficient routes.

Figure 13: National City Recommendation Overview



Table 11: National City Route Recommendations

	National City Route Recommendations								
Route	Recommendation	Existing Frequency		Proposed y Frequency		Proposed Se		rvice	
		Peak	Base	Peak	Base	Wkdy	Sat	Sun	
705	No proposed changes.	30	30	30	30				
961	Increase Saturday frequency to 30 min to supplement lost service on Route 963 (September 2017).	30	30	30	30				
962	Frequency would be increased to 15 min. on weekdays and 30 min. on weekends. Also, route would be streamlined to Plaza Blvd. and Paradise Valley Rd., instead of Harbison Ave., Reo Dr., Cumberland St. and Potomac St. Local Paradise Hills service would be mostly replaced by Route 963.	30	30	15	15				
963	Route would be changed on the east end to continue east on Plaza Blvd. to Harbison Ave., and replace the Paradise Hills portion of Route 962, via a loop of Reo Dr., Cumberland St., Saipan Dr., and Alleghany St. Service would operate every 30 minutes on weekdays and hourly on Saturday/Sunday. Service south along Euclid Ave. to Plaza Bonita would be replaced by a realigned Route 968.	30	30	30	30				
967	Routing would be adjusted to eastbound 4th St. between Euclid Ave. and Harbison Ave, continuing east to Alta Vista (Mariposa Pl./Ava St) via the current routing. Also, Saturday service would be discontinued.	60	60	60	60				
968	Route would be adjusted to operate weekdays only, between 24th St. T.C. and Plaza Bonita. From 4th St., Route 968 would turn south on Euclid Ave. to Sweetwater Rd. and into Plaza Bonita. Route 968 service east of Euclid Ave. and to the Munda Rd. loop would be discontinued.	60	60	60	60				

Figure 14: National City Subarea Map



South County

The South County region includes the U.S.-Mexico border points of entry, Imperial Beach, Chula Vista, and Eastlake. Each of these subareas is well-suited for transit use due to dense concentrations of populations likely to use transit. The South County subarea consists of 16 routes that are heavily utilized throughout the week. On an average weekday, the South County subarea carries approximately 47,000 riders.

This region is characterized by heavy North-South movement, which is largely facilitated by the Blue Line Trolley. Key East-West connections within Chula Vista and Imperial Beach connect riders to the Blue Line Trolley creating a strong interconnected network. Major growth is expected in this region with new developments in eastern Chula Vista. South County draws ridership from both the Otay Mesa and San Ysidro border ports of entry. Increasing fast and reliable service in this region will increase ridership and productivity among transit-dependent populations. The upcoming South Bay BRT connecting the Otay Mesa Port of Entry with Downtown San Diego via Chula Vista promises to add a new transit spine to complement the Blue Line Trolley. Proposed changes to the TOP service network lay the groundwork for this new BRT rapid line.

The proposed changes aim to provide more frequent and efficient service to a subarea with a relatively high demand for transit. By removing deviations and duplicative service, these South County recommendations ensure that the region is fully optimized to provide efficient, frequent service.

Figure 15: South County Recommendation Overview



Table 12: South County Route Recommendations

South County Route Recommendations									
Route	Recommendation	Existing Frequency		Proposed Frequency		Proposed Serv		rvice	
		Peak	Base	Peak	Base	Wkdy	Sat	Sun	
85	New route would operate hourly on all days between the Otay Mesa border and SWC (Otay), replacing portions of Routes 905A (Airway Rd. between La Media Rd. and Britannia Blvd.) and 905B (Otay Mesa Rd. east of La Media Rd., Sanyo Rd., and H. Hertz Dr.).	-	-	60	60				
701	Sunday service would be added with a 60-minute frequency.	15	15	15	15				
703	Route 703 would be entirely replaced with restored Sunday service on Routes 701, 704, and 709.	60	60	-	-				
704	Shift alignment to operate along 3rd Avenue instead of 4th Avenue, and F Street instead of E Street. Restore Sunday service Palomar TC – Sharp Hospital.	30	30	30	30				
707	Upon implementation of the South Bay Rapid in 2019, frequency would be increased to every 30 minutes, replacing the extended Route 709 trips along Eastlake Parkway. The span-of-service would also be increased to match the current earliest and latest Route 709 Eastlake Parkway service.	60	60	30	30				
709	Add Sunday service to Otay Ranch at 60 min frequency. Proposed addition of Sunday service at 60-minute frequency. Also, Upon implementation of the South Bay Rapid in 2019, Route 709 service north of Olympic Parkway along Eastlake Pkwy., Boswell Rd., and Lane Ave. would be replaced with added Route 707 service. Service around Lakeshore Dr. would be discontinued.	7.5/15	15	7.5/15	15				

	South County Route Recommen	dation	S					
Route	Recommendation	Exist Frequ	ing ency	Proposed Frequency		Proposed Se		rvice
		Peak	Base	Peak	Base	Wkdy	Sat	Sun
712	No proposed changes.	15	15	15	15			
901	Minor schedule adjustments and trip changes.	15	30	15	30			
904	No proposed changes.	60	60	60	60			
905	Route 905 would be realigned to a single variant (instead of 905A/905B) via the current Route 905 alignment between the Otay Mesa border and Airway Rd./La Media Rd., then via La Media Rd. and Otay Mesa Rd. to/from the Iris T.C. Also, weekday frequency would be changed to 30 minutes all day. Service to Britannia Blvd. and the western segment of Airway Rd. (including Southwestern College), and to eastern Otay Mesa Rd. and Sanyo Rd., would be replaced by new Route 85.	20	35	30	35			
906/907	Saturday and Sunday service would be increased to a 15-minute frequency.	15	15	15	15			
929	Route 929 would terminate at the 12th & Imperial T.C. instead of City College. Through-service would be available on the Trolley or Routes 12 and 901. Some late trips could be extended to/from Broadway in Downtown.	12	15	12	15			
932	No proposed changes.	15	15	15	15			
933/934	No proposed changes.	10/12	15	10/12	12			
950	Westbound frequency would be increased to 10-minutes in the morning peak, and eastbound service to the Otay Mesa border would be extended later in the evening.	12/20	30	10/15	30			

Figure 16: South County Subarea Map



East County – El Cajon

El Cajon is the most populated city in East County and is a relatively dense mix of minority, low income, zero-vehicle, and disabled populations indicating strong potential for transit ridership. Existing MTS transit service does not operate at frequencies greater than 30 minutes, but multiple routes serving the same streets creates frequent corridor service.

The Orange and Green Line Trolleys offer quick and convenient commuter trips into western portions of the MTS service area. The subarea's Urban Standard routes connect to the Trolley through El Cajon Transit Center and serve as local feeders along El Cajon's main corridors. The El Cajon subarea includes 13 routes that carry just over 8,000 passengers on an average weekday.

The El Cajon subarea recommendations seek to refocus investment along the city's main East-West corridors while limiting service duplication. Realignments within El Cajon also streamline alignments to avoid unproductive deviations in an effort to improve travel time and connections to El Cajon Transit Center.

Figure 17: East County – El Cajon Recommendation



Table 13: El Cajon Route Recommendations

El Cajon Route Recommendations									
Route	Recommendation	Existing Frequency		Proposed Frequency		Service			
		Peak	Base	Peak	Base	Wkdy	Sat	Sun	
815	Weekday service would be increased to a 15-minute frequency. Also, route would be shortened to terminate at E. Main St./Madison Ave. instead of north to Broadway. Continuing service along E. Main St. would be available on Routes 864 and 874/875.	30	30	15	15				
816	Route would be streamlined to operate on Washington St. between Jamacha Rd. and the El Cajon T.C. instead of Main St./Douglas Ave.	30	30	30	30				
832	Service along the loop of El Nopal, Los Ranchitos Rd., and 2nd St. would be discontinued.	60	60	60	60				
833	No proposed changes.	45	45	45	45				
834	Route would be restructured as an hourly, weekday counterclockwise loop from Santee Town Center to West Santee, via Cuyamaca St., Mast Blvd., West Hills Pkwy., and Mission Gorge Rd., and Town Center Pkwy. Service along Mesa Rd. and Prospect Ave. would be discontinued.	4 trips	-	60	60				
838	New Route 838 would replace the eastern part of Route 864 east of East County Square (Los Coches Rd.). Between East County Square and Viejas Casino, Route 838 would follow the same alignment as current Route 864, operating hourly every day between approx. 6 a.m. and 8 p.m.	-	-	60	60				

El Cajon Route Recommendations									
Route	Recommendation	Existing Frequency		Proposed Frequency		Service			
		Peak	Base	Peak	Base	Wkdy	Sat	Sun	
848	Extend slightly east within Lakeside (June 2017).	30	30	30	30				
864	Route would operate between El Cajon Transit Center and East County Square on all days. Continuing service to Alpine/Viejas would be available via a transfer with new Route 838 at East County Square. Route would also be streamlined in El Cajon to remain on Madison Ave. and E. Main St., rather than using 2nd St. and Broadway.	30	30	30	30				
870	Proposed for discontinuation.	7 trips	-	-	-				
871/872	Route would be replaced with a hourly, weekday-only Route 872, operating a shortened loop via Johnson Ave., Chase Ave., Magnolia Ave., and Douglas Ave./Main Street (same as current Route 872A routing).	60	60	60	60				
874/875	Service to the Granite Hills area would be discontinued, with the route using the current 874A/875A routing along E. Main St. and Jamacha Rd. instead.	30	30	30	30				



Figure 18: East County—El Cajon Subarea Map

East County – La Mesa and Spring Valley

The East County region, including La Mesa and Spring Valley, lies on the outskirts of Mid-City with lower population densities of primarily single-family homes. La Mesa has a relatively high density of zero-vehicle households, and there are several large-scale commercial employment centers that drive ridership in the area. San Diego State University (SDSU) serves as a major transit hub for the subarea, with connections to Trolley and BRT service and several key bus routes. In addition to serving as a popular destination for college-aged individuals, SDSU is a major employment hub for the area. In addition to SDSU, the Grossmont Center attracts the largest number of boardings in the sub-area providing connections to the Green Line and Orange Line Trolleys and drawing in shoppers and workers to the commercial center. Similar commercial and transit hubs in this East County region that drive travel patterns include the La Mesa Springs Shopping Center and commercial outlets along Jamacha Rd. All-day, all-week transit service is productive along routes that serve the major commercial centers in East County.

There are seven existing routes within the subarea that carry just under 8,000 passengers per average weekday. Recommendations for service in La Mesa and Spring Valley were guided by efforts to streamline alignments and promote and expand the available all-day, all-week network.



Figure 19: East County – La Mesa and Spring Valley Recommendation Overview

Table 14: La Mesa and Spring Valley Route Recommendations

La Mesa and Spring Valley Route Recommendations									
Route	Recommendation	Existing Frequency		Proposed Frequency		Service			
		Peak	Base	Peak	Base	Wkdy	Sat	Sun	
851	Route would be streamlined to operate to/from Highway 94 along Bancroft Dr. instead of Kenwood Dr. Also, service west of Hwy. 125 along Elkelton Blvd., would be discontinued, and weekday peak hour frequency would be reduced to 60 minutes.	45	60	60	60				
854	Saturday service would be discontinued. Some weekday night service would be reallocated from regular Route 854 (via Baltimore Dr. & Lake Murray Blvd.) to Route 854x (via SR-125).	60	60	60	60				
855	No proposed changes.	30	30	30	30				
856	Route 856 service to the Rancho San Diego Village area (Calle Verde and Via Mercado) would be discontinued. Minimal service to the area would remain available on Route 894. Also, Routes 856 and 936 would remain on College Ave. without turning through the College Grove Transit Center (which would still be accessible on Routes 916/917).	30	30	30	30				
916/917	No proposed changes.	30/60	60	30/60	60				
936	Routes 856 and 936 would stay on College Ave. without turning into College Grove Transit Center. Service to College Grove Transit Center would remain available on Routes 916/917.	30	30	30	30				

Figure 20: East County—La Mesa and Spring Valley


Rural

The rural subarea is composed of the eastern half of San Diego County beyond the urban and suburban regions of the MTS service area. The Rural subarea consists of four routes: 888, 891, 892, and 894. Route 894 between Morena Village and El Cajon is the only rural route that operates five days a week. The three remaining routes operate one to two days per week in the interest of providing lifeline mobility cost-effectively.

Rural bus operations are inefficient and ineffective because MTS incurs the high cost of providing service to a very small population. The Tecate Port of Entry is the largest trip generator within the southeast rural zone, but subsidies per passenger are still high due to long travel distances. MTS has identified the need to conduct a separate study specifically addressing the challenges associated with rural transit service. Thus, no recommended changes are included in the TOP.

Table 15: Rural Route Recommendations

Rural Route Recommendations								
Route		Existing Frequency		Proposed Frequency		Service		
	Recommendation	Peak	Base	Peak	Base	Wkdy ⁸	Sat	Sun
888	No proposed changes.	2 trips	-	2 trips	-			
891	No proposed changes.	2 trips	-	2 trips	-			
892	No proposed changes.	2 trips	-	2 trips	-			
894	No proposed changes.	6 trips	2 trips	6 trips	2 trips			

⁸ Route 894 is the only Rural route that operates Monday through Friday. Route 888 operates two days a week (Mondays and Fridays), Route 891 operates Fridays only, and Route 893 operates Thursdays only.

Customer Impacts & Benefits

Approximately one-third (32 percent) of MTS riders will experience a positive impact in network frequency through the TOP's recommendations.⁹ The added benefits of individual route improvements include reduced wait times, shorter travel times, and increased reliability. These improvements will help generate additional use by existing riders and attract new riders to begin using the system. A small number of customers that currently use low-ridership routes or route deviations that are recommended for realignment or elimination will experience a change in service. An even smaller group of customers may potentially lose service, resulting in longer walks. These customer impacts were examined extensively in MTS's *Title VI Analysis of the 2017 Transit Optimization Plan Major Service Changes* document. Throughout the recommendation process, the number of potentially impacted riders was among the top considerations for service changes.

Frequency Investments

Frequency of service is the top service attribute that attracts new riders to transit or encourages current riders to use transit for additional trip-making. Routes with high service frequencies benefit passengers by reducing their out-of-vehicle wait times. At higher frequencies, passenger reliance on consulting timetables and planning their arrival at bus stops is less necessary with consumers catching the "next trip" rather than "a trip." Higher service frequencies also provide more convenient and reliable transfer connections with other transit services, making network transit use attractive. This is a critical element in attracting transit lifestyle riders, those who chose to use transit (and walking and biking) over other transportation options. This will be a key attribute to competing with "mobility-on-demand" operators for the growing pool of public mobility consumers.

Reinvesting in frequent service was a major goal the TOP. In total, 22 routes throughout the system were recommended for frequency improvements. Higher frequency will help improve the customer experience by limiting wait times and encouraging spontaneous transit use. Table 15 provides an overview of the routes recommended for frequency improvements.

A significant number of routes were recommended to increase to 10-minute or 12-minute frequency. Since significantly more potential riders want to spontaneously show up to a stop than

⁹ Based upon ridership estimates from July through November of FY 2017.

plan their trip, high frequencies attract a greater portion of the population to transit service. Frequent service limits wait time for passengers, making transit a more attractive mobility option.

TUDIE 10. FIEQUEIILY IIIVESUIIEIILS	Table	16: Fr	equency	Investm	ents
-------------------------------------	-------	--------	---------	---------	------

	Frequency Investments
Route	Frequency Recommendation
Northern	
Route 235	Recommend to SANDAG 15-minute midday frequency
Central	
Route 1	Provide 15-minute weekday service between Fashion Valley Transit Center and La Mesa Blvd Trolley Station
Route 3	Improve weekday frequency from 15 minutes to 12 minutes. Increase Sunday frequency to 30 minutes.
Route 5	Improve weekday frequency from 15 minutes to 12 minutes.
Route 7	Standardize weekday frequencies to every 10 minutes, weekend frequencies to every 12 minutes.
Route 11	Improve weekday frequency to 12 minutes.
Route 13	Increase weekday frequency from 15 minutes to 12 minutes.
Route 35	Increase to 15-minute base frequency during the week.
Route 955	Increase weekday frequency from 15 minutes to 12 minutes.
Route 992	Increase weekend frequency to 15 minutes.
Eastern	
Route 815	Increase weekday frequency to 15 minutes.
Southern	
Route 707	Increase weekday frequency to 30 minutes.
Route 906/907	Increase weekend frequency to 15 minutes.
Route 950	Increase frequency on peak trips—10-minute AM peak frequency and 15- minute PM peak frequency. Increase span of 30-minute frequency on weekends.

Travel Time Improvements

Reducing in-vehicle travel time is critical for attracting new transit customers. The recommendations laid out within the TOP improve travel times by streamlining route alignments. Straighter, more efficient route alignments decrease route distance and travel time, speeding up service for riders and resulting in a more cost-effective operation for MTS.

Discontinuing resource-intensive deviations is an important part of streamlining service, yet not the only method of improving travel times. A critical component of the route evaluation process included analyzing current operating conditions for significant impacts to speed and operability. This includes assessing stop spacing, congestion, and street design along the major MTS service corridors. Both traffic and the physical limitations of the street network can significantly impact MTS's ability to provide quick, reliable, on-time service. With a number of traffic-calming efforts currently underway in the region, MTS service speeds may suffer. An increased emphasis on the use of transit-only lanes and coordination of transit and bike travel needs may help combat the impacts of traffic calming on transit service. MTS should work closely with city governments and Public Works department to coordinate traffic calming measures to mitigate their impact on transit operations.

A refocused effort on the impact of congestion on transit was especially relevant to the central portions of the MTS service area. Routes throughout Mid-City and Downtown San Diego operate along high-traveled corridors and must share the road with a considerable number of vehicles and cyclists.

Financial and Operating Impacts

On September 21, 2017, the MTS Board of Directors unanimously approved changes to the network, adding \$2 million in new bus service. The recommended

plan is within the operating budget approved by the board. Phasing

Changes to MTS bus and Trolley services are typically implemented three times a year in the fall, winter, and summer. The phasing of Transit Optimization Plan recommendations is largely dictated by the distinction of major versus minor service changes. These service change classifications determine if the MTS Board must approve the change for implementation. MTS's Policy 42 provides guidance on service changes and implementation, including a basis for major and minor service changes.

- Minor Service Change: service adjustments that do not represent more than a 25 percent change in a route's weekly in-service miles, hours, or span of service, and impacts 25 percent or less of both directional route mileage and bus stops served by the route. No action is required of the MTS Board for approval and implementation of these changes. These service changes will likely be implemented in June and September of 2017.
- Major Service Change: service adjustments that represent a change that is greater than 25 percent of a route's weekly in-service miles, hours, or span of service, and impacts over 25 percent of both directional route mileage and bus stops served by the route. A properly noticed public hearing is required for approval of these changes. These service changes will likely be implemented in January of 2017.

Minor service changes typically include such modifications as scheduling or trip-level adjustments for greater efficiency, slight routing changes to introduce a new stop or remove an unproductive portion, and other efforts to streamline and optimize service.

Major service changes typically include significant changes in frequency, substantial route realignments, or subarea restructuring. These major service changes could potentially impact a significant number of riders and thus necessitate a public hearing.

Per MTS's Policy 42, all new services will be implemented on a trial basis for the duration of one year. This can include not only new routes, but also new days of operation, significant route extension, or increased frequencies for a large part of the service day. These services should perform equal to or better than MTS's system average for passenger per revenue hour and subsidy per passenger within the first year of operation. Upon completion of this year-long trial period, a Title VI analysis must be completed and presented to the MTS Board.

Immediate-Term Changes (Summer 2017)

There are several routes slated for June 2017 implementation of service changes due to their minor service change distinction. These changes may quickly improve service efficiency and productivity, thus making it especially beneficial to implement expeditiously. This immediate implementation includes the following routes:

- Route 2 (June 2017): Discontinue segment along Adams Avenue.
- **Route 10** (June 2017): Provide better stop spacing in Hillcrest to reduce delay and improve travel times for riders.
- Route 31 (September 2017): Straighten alignment along La Jolla Village Drive.
- **Route 848** (June 2017): Extend Lakeside terminal slightly east to provide more coverage for apartments along Mapleview. Provide greater stop spacing along Winter Gardens Blvd.
- Route 961 (September 2017): Increase Saturday frequency to 30 minutes.
- Route 965 (June 2017): Realign service to operate on University between Fairmount and Euclid.

Near-Term Changes (Fall 2017)

Near-term changes based on recommendations in the TOP are critical for routes that impact surrounding universities and schools, as well as any seasonal adjustments. Implementing adjustments to routes that are heavily-traveled by college students at the beginning of the school year may help streamline students' travel throughout the remaining year. Targeted outreach surrounding these services changes may benefit from higher campus attendance at the start of the school year.

Mid-Term Changes (Winter 2018)

The designation of major service change will likely push back the implementation of several recommendations until the winter. This will allow time for the proper outreach and public hearing processes necessary for major service changes. A complete list of both major and minor service changes based upon the criteria of 25 percent of weekly revenue hours or miles is included in Appendix A.

Regional Coordination

There are a number of recommendations that require coordination with SANDAG. This includes Routes 204, 215, 237. The recommendations for Routes 204 and 237 are considered major service

changes and thus require public hearing. These route adjustments, however, do not impact MTS's budget as they are funded through TransNet. MTS has drafted formal recommendations to the agency to begin coordination on these route adjustments.

Appendix A: MTS TOP Recommendations and Service Change Distinctions

MTS TOP Recommendations			
Route	Recommendation	Service Change Distinction	
Route 1	Discontinue 1A variant to 70th Street Trolley Station and provide 15-minute weekday service to La Mesa Blvd Trolley Station. Extend western terminus to Fashion Valley TC. East of La Mesa Blvd Station is served by Route 52.	Minor	
Route 2	Discontinue Sunday segment along Adams Avenue (June 2017). Adams Avenue covered by Route 11 alignment.	Minor	
Route 3	Improve weekday frequency from 15 minutes to 12 minutes. Increase Sunday frequency to 30 minutes.	Major	
Route 4	No proposed changes.	N/A	
Route 5	Improve weekday frequency from 15 minutes to 12 minutes.	Minor	
Route 6	No proposed changes.	N/A	
Route 7	Discontinue the long/short pattern and end all trips at College Ave. Standardize weekday frequencies to every 10 minutes, weekend frequencies to every 12 minutes. Service east of College Avenue served by new Route 52.	Minor	
Route 8	Seasonaldecrease weekday frequency from 20 to 30 minutes October - May. Maintain weekend frequencies year-round and 15 minute frequency between June-September.	Minor	
Route 9	Seasonaldecrease weekday frequency from 20 to 30 minutes October - May. Maintain weekend frequencies year-round and 15 minute frequency between June-September.	Minor	

MTS TOP Recommendations			
Route	Recommendation	Service Change Distinction	
Route 10	Provide better stop spacing in Hillcrest to reduce delay and improve trip times for riders (June 2017).	Minor	
Route 11	Split northern portion into NEW Route 12. Extend Sunday shortline to accommodate for Sunday service discontinuation of Route 2 along Adams. Improve weekday frequency to 12 minutes.	Major	
Route 12	New Route 12 covers the downtown San Diego to SDSU segment of Route 11. Weekday frequency to 15 minutes. 30-minute Saturday service and 60 minute Sunday service.	Major	
Route 13	Increase weekday afternoon frequency from 15 min to 12 min.	Minor	
Route 14	No proposed changes.	N/A	
Route 18	Minor reduction in service span.	Minor	
Route 20	Streamline routing between Kearny Mesa and Mira Mesa to use I-15 and SR-163 instead of Kearny Villa Road.	Minor	
Route 25	Discontinue service through Linda Vista to provide faster connection between Tierrasanta and Fashion Valley TC. Streamlines routing between Mesa College Drive and Fashion Valley via 163. Alternate service available on Route 41 and/or 120.	Major	
Route 27	Realign along Kearny Villa Rd to avoid duplication on Convoy St.	Minor	
Route 28	No changes. If funding permits, increase midday frequency to 15 minutes.	N/A	
Route 30	No changes. With implementation of the Mid Coast Trolley, truncate at Balboa or OTTC.	Minor	
Route 31	Straighten alignment along La Jolla Village Dr (September 2017).	Minor	

MTS TOP Recommendations			
Route	Recommendation	Service Change Distinction	
Route 35	Terminate service all week at Cable St & Newport Ave. Service south of Newport Ave operated by extended Route 923. Increase weekday headway to 15 minute base frequency. Improves layover % and saves a vehicle.	Major	
Route 41	No proposed changes.	N/A	
Route 44	Realign to serve Kearny Mesa TC instead of Claremont Town Square. From Mesa College, Route 44 would operate north along Convoy Street and east on Claremont Mesa Blvd. Existing service along Claremont Mesa Blvd would be operated every 15 minutes by extended Route 105.	Major	
Route 50	Reduce to peak service only. Realign route along Regents/Governor to replace 105 service. Discontinue route after Mid-Coast completion.	Major	
Route 52	NEW Route that replaces eastern portions of Route 1 and Route 7 between University/54th and Grossmont Trolley.	Major	
Route 60	No proposed changes.	N/A	
Route 83	Streamline route by discontinuing service along Washington Street in Hillcrest. Shift northern end of route to Sunset Blvd with new terminal at Old Town. Retain service only middays (approximately 8am-3pm).	Major	
Route 84	Retain service on just two roundtrips during each peak period between Old Town, SPAWAR Main Gate, and Naval Base Pt. Loma Main Gate.	Major	
Route 85	New weekday hourly route. Same alignment as existing 905B pattern.	Major	
Route 88	No proposed changes.	N/A	

MTS TOP Recommendations			
Route	Recommendation	Service Change Distinction	
Route 105	Discontinue Milton St/Burgener Blvd segment and service along Genesee (served by Route 41). From Claremont Town Square, extend Route 105 east to KMTC. Service would operate every 15 minutes between KMTC and Claremont Town Square, and every 30 minutes between Claremont Town Square and Old Town TC. Provides 30 minute weekend service along Clairemont Mesa Blvd	Major	
Route 110	No proposed changes.	N/A	
Route 115	No proposed changes.	N/A	
Route 120	Route would operate between Fashion Valley TC and KMTC via Sharp Hospital. Service between Hillcrest and FVTC available on Route 1. Service between Hillcrest and Downtown available on Route 3.	Minor	
Route 150	No proposed changes.	N/A	
Route 201/202	No changes proposed. Realign service along La Jolla Village Drive as part of Mid Coast Trolley construction at Voigt Drive Overpass.	Minor	
Route 204	Recommend to SANDAG to reduce to 30 minute weekday service and discontinue weekend service. Reinvest resources in 235.	Major	
Route 215	No changes.	N/A	
Route 235	No proposed changes. Recommend to SANDAG 15-minute midday frequency	Minor	
Route 237	Discontinue service along I-15 north of Miramar College Transit Station. Alternate service available on Route 235.	Minor	
Route 280	No proposed changes.	N/A	

MTS TOP Recommendations			
Route	Recommendation	Service Change Distinction	
Route 290	No proposed changes.	N/A	
Route 701	Add Sunday service at 60 min frequency.	Minor	
Route 703	Discontinue route. Sunday service replaced by New Sunday service on Routes 709 and rerouted 701.	Major	
Route 704	Shift alignment to operate along 3 rd Avenue instead of 4 th Avenue, and F Street instead of E Street. Restore Sunday service Palomar TC – Sharp Hospital.	Minor	
Route 705	No proposed changes.	N/A	
Route 707	When South Bay Rapid operations begin, increase weekday frequency to 30 min and change start of service to 5am to match existing 707 Eastlake service.	Major	
Route 709	Add Sunday service to Otay Ranch at 60 min frequency. When South Bay Rapid operations begin, eliminate long line trip pattern to Eastlake (covered by additional Route 707 service). Keep mid and short line trip patterns to SW College and Otay Ranch as is. Continue to operate limited stop trip pattern in peaks.	Major	
Route 712	No proposed changes.	N/A	
Route 815	Operations between El Cajon Transit Center and Oakdale/Madison. Increase weekday frequency to 15 min.	Major	
Route 816	Reroute to serve Washington instead of Main Street to provide faster connection to El Cajon TC.	Major	
Route 832	Realign loop north of Santee Trolley station to west along Mast to Fanita Pkwy. Maintain hourly minibus service.	N/A	

MTS TOP Recommendations			
Route	Recommendation	Service Change Distinction	
Route 833	No proposed changes.	N/A	
Route 834	Restructure into an hourly weekday loop serving Mast Blvd. and Mission Gorge Rd.	Major	
Route 838	New route to cover Eastern portion of existing 864. Shorten route to operate between East County Square (Walmart) and Viejas. Western portion of service covered by Route 864. Will operate hourly throughout the week in a minibus.	Major	
Route 848	Extend slightly east within Lakeside (June 2017).	Minor	
Route 851	Shorten route slightly by streamlining route via Bancroft Dr. and reduce frequency in the afternoon to 60 minutes to save a vehicle. This would become a one vehicle route all day.	Minor	
Route 854	Minor adjustment of night service between 854 and 854X.	Minor	
Route 855	No proposed changes.	N/A	
Route 856	Remove College Grove and RSD Village deviations. Discontinue segment into College Grove Drive.	Minor	
Route 864	Service would operate along existing Route 864 service between El Cajon TC and East County Square every 30 minutes. Replace service east of East County Square and Route 864x with new Route 838.	Major	
Route 870	Discontinue due to low ridership.	Major	
Route 871/872	Operate a shortened one-way loop (same as current Route 872A) as route 872, weekdays only.	Major	
Route 874/875	Streamline route along Jamacha Rd, and E. Main St., discontinuing service into Granite Hills area. Operate 874A/875A pattern trips all week. 30 min weekday service, 60 min weekend service	Minor	

MTS TOP Recommendations			
Route	Recommendation	Service Change Distinction	
Route 888	No proposed changes.	N/A	
Route 891	No proposed changes.	N/A	
Route 892	No proposed changes.	N/A	
Route 894	No proposed changes.	N/A	
Route 901	Minor trip adjustments, to be determined by ridership demand.	Minor	
Route 904	No proposed changes.	N/A	
Route 905	Operate a single Route 905 variant at a frequency of 30 minutes on weekdays, 60 on weekends. Implement new Rt. 85 to cover NE, SW Otay Mesa. Extend Route 85 to Britannia/Siempre Viva area.	Major	
Route 906/907	Increase weekend frequency to 15 minutes.	Minor	
Route 916/917	No proposed changes.	N/A	
Route 921	No proposed changes.	N/A	
Route 923	Extend service to Sunset Cliffs along the existing Route 35 alignment. Discontinue Saturday service.	Minor	
Route 928	No proposed changes.	N/A	
Route 929	Truncate route at 12th & Imperial. Maintain existing frequency.	Minor	
Route 932	No proposed changes.	N/A	

MTS TOP Recommendations			
Route	Recommendation	Service Change Distinction	
Route 933/934	No proposed changes.	N/A	
Route 936	Remove College Grove deviation.	Minor	
Route 944	Move eastern turnaround from Garden Rd. area to Midland Rd/Hillery Place.	Major	
Route 945	No proposed changes.	N/A	
Route 950	Increase frequency on peak trips - 10 min frequency in AM and 15 min in PM peaks. Expand service span into evening.	Major	
Route 955	Reroute to Market and 47th instead of Euclid and Imperial. Construct crosswalk at 47th St Trolley Station. Increase weekday frequency from 15 min to 12 min.	Minor	
Route 961	Increase Saturday frequency to 30 min (September 2017).	Minor	
Route 962	Discontinue deviation on Potomac St and continue along Paradise Valley Rd to Plaza Blvd. Consolidate some stops on Plaza Blvd. Increase weekday frequency to 15 min along entire line. Increase weekend frequency to 30 min.	Major	
Route 963	Restructure to replace local portion of Route 962.	Major	
Route 964	No proposed changes.	N/A	
Route 965	Change alignment to operate on University between Fairmount and Euclid (June 2017). All existing service on Landis within 1/4 mile of Route 965 or Route 13.	Minor	
Route 967	Shift leg of loop from Harbison Ave to Euclid Ave. Discontinue Saturday service.	Minor	

MTS TOP Recommendations			
Route	Recommendation	Service Change Distinction	
Route 968	Restructure on the east end to travel south on Euclid Ave to Plaza Bonita. Discontinue service to Bayview Hills and Saturday service.	Minor	
Route 972	No changes. Draft recommendation on future vanpool/microtransit options.	N/A	
Route 973	No changes. Draft recommendation on future vanpool/microtransit options.	N/A	
Route 978	No changes. Draft recommendation on future vanpool/microtransit options.	N/A	
Route 979	No changes. Draft recommendation on future vanpool/microtransit options.	N/A	
Route 992	Increase weekend frequency to 15 minutes.	Minor	