

Low Carbon Transit Operations Program (LCTOP) CERTIFICATIONS AND ASSURANCES

Project Sponsor: San Diego Metropolitan Transit System

Agency Name: San Diego Metropolitan Transit System

Effective Date of this Document: 11-12-2016

The California Department of Transportation (Department) has adopted the following certifications and assurances for the Low Carbon Transit Operations Program. As a condition of the receipt of LCTOP funds, project lead must comply with these terms and conditions.

A. General

- (1) The project lead agrees to abide by the current LCTOP Guidelines and applicable legal requirements.
- (2) The project lead must submit to the Department a signed Authorized Agent form designating the representative who can submit documents on behalf of the project sponsor and a copy of the board resolution appointing the Authorized Agent.

B. Project Administration

- (1) The project lead certifies that required environmental documentation is complete before requesting an allocation of LCTOP funds. The project lead assures that projects approved for LCTOP funding comply with Public Resources Code § 21100 and § 21150.
- (2) The project lead certifies that a dedicated bank account for LCTOP funds only will be established within 30 days of receipt of LCTOP funds.
- (3) The project lead certifies that when LCTOP funds are used for a transit capital project, that the project will be completed and remain in operation for its useful life.
- (4) The project lead certifies that it has the legal, financial, and technical capacity to carry out the project, including the safety and security aspects of that project.
- (5) The project lead certifies that they will notify the Department of pending litigation, dispute, or negative audit findings related to the project, before receiving an allocation of funds.
- (6) The project lead must maintain satisfactory continuing control over the use of project equipment and facilities and will adequately maintain project equipment and facilities for the useful life of the project.
- (7) Any interest the project lead earns on LCTOP funds must be used only on approved LCTOP projects.
- (8) The project lead must notify the Department of any changes to the approved project with a Corrective Action Plan (CAP).
- (9) Under extraordinary circumstances, a project lead may terminate a project prior to completion. In the event the project lead terminates a project prior to completion, the project lead must (1) contact the Department in writing and follow-up with a phone call verifying receipt of such notice; (2) pursuant to

verification, submit a final report indicating the reason for the termination and demonstrating the expended funds were used on the intended purpose; (3) submit a request to reassign the funds to a new project within 180 days of termination.

- (10) Funds must be encumbered and liquidated within the time allowed.

C. Reporting

- (1) The project lead must submit the following LCTOP reports:
 - a. Semi-Annual Progress Reports by May 15th and November 15th each year.
 - b. A Final Report within six months of project completion.
 - c. The annual audit required under the Transportation Development Act (TDA), to verify receipt and appropriate expenditure of LCTOP funds. A copy of the audit report must be submitted to the Department within six months of the close of the year (December 31) each year in which LCTOP funds have been received or expended.
- (2) Other Reporting Requirements: ARB is developing funding guidelines that will include reporting requirements for all State agencies that receive appropriations from the Greenhouse Gas Reduction Fund. Caltrans and project sponsors will need to submit reporting information in accordance with ARB's funding guidelines, including reporting on greenhouse gas reductions and benefits to disadvantaged communities.

D. Cost Principles

- (1) The project lead agrees to comply with Title 2 of the Code of Federal Regulations 225 (2 CFR 225), Cost Principles for State and Local Government, and 49 CFR, Part 18, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments.
- (2) The project lead agrees, and will assure that its contractors and subcontractors will be obligated to agree, that:
 - a. Contract Cost Principles and Procedures, 48 CFR, Federal Acquisition Regulations System, Chapter 1, Part 31, et seq., shall be used to determine the allow ability of individual project cost items and
 - b. Those parties shall comply with Federal administrative procedures in accordance with 49 CFR, Part 18, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments. Every sub-recipient receiving LCTOP funds as a contractor or sub-contractor shall comply with Federal administrative procedures in accordance with 49 CFR, Part 18, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments.
- (3) Any project cost for which the project lead has received funds that are determined by subsequent audit to be unallowable under 2 CFR 225, 48 CFR, Chapter 1, Part 31 or 49 CFR, Part 18, are subject to repayment by the project lead to the State of California (State). All projects must reduce greenhouse gas emissions, as required under Public Resources Code section 75230, and any project that fails to reduce greenhouse gases shall also have its project costs submit to repayment by the project lead to the State. Should the project lead fail to reimburse moneys due to the State within thirty (30) days of demand, or within such other period as may be agreed in writing between the Parties hereto, the State is authorized to intercept and withhold future payments due the project lead from the State or any third-party source, including but not limited to, the State Treasurer and the State Controller.

E. Record Retention

- (1) The project lead agrees, and will assure that its contractors and subcontractors shall establish and maintain an accounting system and records that properly accumulate and segregate incurred project costs and matching funds by line item for the project. The accounting system of the project lead, its contractors and all subcontractors shall conform to Generally Accepted Accounting Principles (GAAP), and enable the determination of incurred costs at interim points of completion. All accounting records and other supporting papers of the project lead, its contractors and subcontractors connected with LCTOP funding shall be maintained for a minimum of three (3) years after the "Project Closeout" report or final Phase 2 report is submitted (per ARB Funding Guidelines, Vol. 3, page 3.A-16), and shall be held open to inspection, copying, and audit by representatives of the State and the California State Auditor. Copies thereof will be furnished by the project lead, its contractors, and subcontractors upon receipt of any request made by the State or its agents. In conducting an audit of the costs claimed, the State will rely to the maximum extent possible on any prior audit of the project lead pursuant to the provisions of federal and State law. In the absence of such an audit, any acceptable audit work performed by the project lead's external and internal auditors may be relied upon and used by the State when planning and conducting additional audits.
- (2) For the purpose of determining compliance with Title 21, California Code of Regulations, Section 2500 et seq., when applicable, and other matters connected with the performance of the project lead's contracts with third parties pursuant to Government Code § 8546.7, the project sponsor, its contractors and subcontractors and the State shall each maintain and make available for inspection all books, documents, papers, accounting records, and other evidence pertaining to the performance of such contracts, including, but not limited to, the costs of administering those various contracts. All of the above referenced parties shall make such materials available at their respective offices at all reasonable times during the entire project period and for three (3) years from the date of final payment. The State, the California State Auditor, or any duly authorized representative of the State, shall each have access to any books, records, and documents that are pertinent to a project for audits, examinations, excerpts, and transactions, and the project lead shall furnish copies thereof if requested.
- (3) The project lead, its contractors and subcontractors will permit access to all records of employment, employment advertisements, employment application forms, and other pertinent data and records by the State Fair Employment Practices and Housing Commission, or any other agency of the State of California designated by the State, for the purpose of any investigation to ascertain compliance with this document.

F. Special Situations

The Department may perform an audit and/or request detailed project information of the project sponsor's LCTOP funded projects at the Department's discretion at any time prior to the completion of the LCTOP.

I certify all of these conditions will be met.

BY:



AUTHORIZING OFFICER, Title
Unit/Department/Agency

Paul Jablonski, Chief Executive Officer

SAN DIEGO METROPOLITAN TRANSIT SYSTEM

Resolution No. 15-16

Resolution Approving Fiscal Year 2015-2016 Low Carbon Transit Operations (LCTOP) Funding

WHEREAS, the San Diego Metropolitan Transit System (MTS) is an eligible project sponsor and may receive state funding from the Low Carbon Transit Operations program (LCTOP) now or sometime in the future for transit projects; and

WHEREAS, the statutes related to state-funded transit projects require a local or regional implementing agency to abide by various regulations; and

WHEREAS, Senate Bill 862 (2014) named the California Department of Transportation as the administrative agency for the LCTOP; and

WHEREAS, the Department has developed guidelines for the purpose of administering and distributing LCTOP funds to eligible project sponsors (local agencies); and

WHEREAS, the MTS wishes to delegate authorization to execute these documents and any amendments thereto to the Chief Executive Officer and designated representatives.

WHEREAS, the MTS will apply for and use \$3,663,014 in Fiscal Year 2015-2016 LCTOP funding for the purchase of 8 Siemens LRV's as part of the Trolley Capacity Improvements Project.

NOW THEREFORE, BE IT RESOLVED, DETERMINED, AND ORDERED by the MTS Board of Directors that MTS agrees to comply with all conditions and requirements set forth in the Certification and Assurances document, and applicable statutes, regulations, and guidelines for all LCTOP funded transit projects.

BE IT FURTHER RESOLVED by the MTS Board of Directors that the Chief Executive Officer, or designated representative, be authorized to execute all required documents of the LCTOP program and any Amendments thereto with the California Department of Transportation.

BE IT FURTHER RESOLVED by the MTS Board of Directors that the MTS be authorized to apply for and use \$3,663,014 in Fiscal Year 2015-2016 LCTOP funding for the purchase of 8 Siemens LRV's as part of the Trolley Capacity Improvements Project.

PASSED AND ADOPTED, by the Board of Directors this 12th day of November 2015 by the following vote:

AYES: Bragg, Cole, Gastil, Gloria, Mathis, McClellan, McWhirter,
Minto, Rios, Roberts, Salas, Sandke, Zapf

NAYS:

ABSENT: Cunningham, Emerald

ABSTAINING:



Chairperson
San Diego Metropolitan Transit System

Filed by:



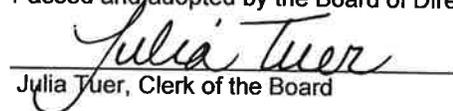
Clerk of the Board
San Diego Metropolitan Transit System

Approved as to form:



Office of the General Counsel
San Diego Metropolitan Transit System

I HEREBY CERTIFY that this
is a full, true, and correct copy of a
DOCUMENT of the San Diego
Metropolitan Transit System (MTS).
Passed and adopted by the Board of Directors.



Julia Tuer, Clerk of the Board

Low Carbon Transit Operations Program (LCTOP)

PROJECT DESCRIPTION AND ALLOCATION REQUEST (SUMMARY)

Project Information:

Lead Agency:	San Diego Metropolitan Transit System (MTS)
Project Name:	Trolley Capacity Improvements Project
Project Type: <i>See Attachment A</i>	A2: Expand/Enhance transit service
Description of Project (Short):	The Trolley Capacity Improvements project includes the procurement of 8 Siemens S70 Ultra Short light rail vehicles (LRVs) and the construction of a new terminal station at the Courthouse Complex in downtown San Diego. The entire apportionment of Fiscal Year 2015-2016 LCTOP funding will be used toward the purchase of 8 LRVs.
Project Location:	1255 Imperial Avenue, Suite 1000 San Diego, CA 92101-7490
Project Start Date (anticipated):	7/1/2016
Project End Date (anticipated):	12/1/2018

Funding Information:

Funding Year:	2015-2016
Requested Amount of PUC 99313:	\$2,349,048
Requested Amount of PUC 99314:	\$1,313,966
Total LCTOP Funding:	\$3,663,014
Total Project Cost:	\$36,944,827

Project Benefits:

Greenhouse Gas Benefits (off of worksheet)

Estimated GHG Reduction:	1421.82 MTCO _{2e}
Project Life:	25
Estimated Total GHG Reduction:	1421.82 MTCO _{2e}

Disadvantaged Communities (DAC) Benefits:

Does your service area have a DAC?	Yes. See attached maps.
Does the Project Benefit a DAC?	Yes. See attached maps.
Identify the DAC Census Tracts?	Yes. See attached maps.
Identify Specific DAC Benefit Criteria? <i>See Attachment B</i>	TP 1A: Project provides improved transit or intercity rail service for stations or stops in a disadvantaged community.
Qualitative Description of DAC Benefit?	The Trolley Capacity Improvements will benefit DACs by providing increased service capacity, improved riding conditions, improved safety, and a reduction in GHGs. There are 26 DACs in all of San Diego County with 20 of these DACs existing within a half mile of a Blue or Orange Line trolley station where the 8 LRVs will be operated. Eight of these DACs contain a Blue or Orange Line station directly within the DAC.

Effective 11/15

Describe the DAC Need Project Addresses?	The Trolley Capacity Improvements project will provide the associated DACs with enhanced capacity on the Blue and Orange lines. Increased capacity will benefit these populations who have particularly high burdens from poverty and traffic congestion. More capacity will reduce the chances of these riders having to wait for the next train when the trips are already at capacity. Reliable transportation is a must when it comes to maintaining employment or travelling to an interview. By adding capacity, the expected benefit is that no passengers will have to wait until the next train due to maximum capacity and also that less of these individuals will be turned off by crowded conditions in our current operating environment. Increased capacity will translate into better access to transit which will provide individuals in these communities with better access to employment opportunities. These communities will also benefit from the reduction in VMTs which should have a positive impact on reducing traffic.
Total GGRF \$ Allocated to DAC	\$3,663,014

Co-benefit

Critical Air Pollution Reduction:	n/a
VMT Reduction:	4,248,474.79 Annual Average VMT Displaced based on LCTOP Calculator
Ridership Increase	Estimated increase of 724,034 annual passengers in first year (2019) and 1,156,030 in final year (2044).
Fuel Use Reduction:	n/a
Energy Use Reduction:	n/a

Low Carbon Transit Operations Program (LCTOP)

PROJECT DESCRIPTION AND ALLOCATION REQUEST (ALLOCATION)

Regional Entity: San Diego MTS	
Project Lead: San Diego Metropolitan Transit System (MTS)	County: San Diego
Project Title: Trolley Capacity Improvements Project	

Project Lead:

I certify the scope, cost, schedule, and benefits as identified in the attached Allocation Request (Request) and attachments are true and accurate and demonstrate a fully funded operable project. I understand the Request is subject to any additional restrictions, limitations or conditions that may be enacted by the State Legislature, including the State's budgetary process and/or auction receipts. In the event the project cannot be completed as originally scoped, scheduled and estimated, or the project is terminated prior to completion, project lead shall, at its own expense, ensure that the project is in a safe and operable condition for the public. I understand this project will be monitored by the California Department of Transportation - Division of Rail and Mass Transportation.

Name: Paul Jablonski
Signature: 
Title: Chief Executive Officer

Agency: San Diego Metropolitan Transit System (MTS)

Date: 1/25/16

Amount: \$3,663,014

Contributing Sponsor(s):

*If this project includes funding from more than one project sponsor, the project lead above becomes the "recipient agency" and the additional contributing project sponsor(s) must also sign and state the amount and type of LCTOP funds (PUC Sections 99313 and 99314) contribution. Sign below or **attach a separate officially signed letter providing that information. If there is more than one contributing sponsor, please submit additional page, or a letter from the additional contributors.**

Name: n/a

Signature: n/a

Title: n/a

Agency: n/a

Date: n/a

Amount:

Low Carbon Transit Operations Program (LCTOP)

PROJECT DESCRIPTION AND ALLOCATION REQUEST (FUNDING)

	<i>LCTOP Allocation</i>	15/16	16/17	17/18
Request Amount per PUC 99313:		\$2,349,048	\$0	\$0
Request Amount per PUC 99314:		\$1,313,966	\$0	\$0
Total Project Allocation Request:		\$3,663,014	\$0	\$0
Project Title:	Trolley Capacity Improvements Project			
Project Location/Address:	1255 Imperial Ave., Suite 1000, San Diego, CA 92101			

Table 1: Project Lead Information

	Legislative District Numbers
Agency Name: San Diego Metropolitan Transit System	Assembly: 75, 76, 77, 78, 79
Contact Person: Gordon Meyer	Senate: 36, 39, 40
Contact Phone #: 619-595-1014	Congressional: 50, 51, 52, 53

Email Address: <u>gordon.meyer@sdmts.com</u>	Amount:	PUC Funds Type:
Address: <u>1255 Imperial Ave., Suite 1000</u>	\$ <u>2,349,048</u>	<u>99313</u>
<u>San Diego, CA 92101-7490</u>	\$ <u>1,313,966</u>	<u>99314</u>

Table 2: Contributing Sponsor Information

Name: <u>n/a</u>	Amount :	PUC Fund Type:
Contact: <u>n/a</u>	\$ _____	
Contact Phone #: <u>n/a</u>	\$ _____	
Email Address: <u>n/a</u>		
Address: <u>n/a</u>		

Other Contributing Sponsors: (Attach sheet with contact information)

Name: _____	Amount:	PUC Fund Type:
Name: _____	\$ _____	
Name: _____	\$ _____	

TOTAL \$3,663,014

(*Contributing project sponsors provide signed letters of verification as to amount and eligibility or sign cover page)

Low Carbon Transit Operations Program (LCTOP)

PROJECT DESCRIPTION AND ALLOCATION REQUEST (PROJECT)

Table 3: Type of Project

See Attachment A for category of project (example: Category 1A Implement new or expanded transit service (for new routes or expansion of existing routes).

<u>Operations Projects</u>		<u>Capital Projects</u>	
<input type="checkbox"/>	A1	<input type="checkbox"/>	Ai
<input checked="" type="checkbox"/>	A2	<input type="checkbox"/>	Aii
<input type="checkbox"/>	A3	<input type="checkbox"/>	Aiii
<input type="checkbox"/>	A4	<input type="checkbox"/>	Aiv
<input type="checkbox"/>	A5	<input type="checkbox"/>	
		<input type="checkbox"/>	B1
		<input type="checkbox"/>	B2
		<input type="checkbox"/>	B3
		<input type="checkbox"/>	B4
		<input type="checkbox"/>	Bi
		<input type="checkbox"/>	Bii
		<input type="checkbox"/>	Bii

Table 4: Project Summary

a) Project Description - Describe the project in your own words, using comprehensive overall project description regarding improvements to be made, increased level of service and performance goals.

Overview: The Trolley Capacity Improvement Project includes two major components: 1) Procurement of eight Siemens S70 Ultra-Short light rail vehicles (LRV's) and 2) Construction of a new trolley station at the courthouse complex located in downtown San Diego. The 2015-2016 LCTOP funds will be used specifically toward funding the purchase of eight Siemens LRV's. The additional eight Siemens S70-US LRV's will be purchased by MTS to be operated on the Blue and Orange Lines. These vehicles will help meet intermediate and long-term goals to expand the peak capacity of the existing rail infrastructure and reduce overcrowding on the current trolley system. By reducing overcrowding on the Blue and Orange Lines, this project intends to enhance the appeal of riding the trolley system and thus provide increased ridership and fewer GHGs from reduced automobile travel. MTS was awarded \$31,936,000 in FY2015 Transit and Intercity Rail Capital Program (TIRCP) funding for the Trolley Capacity Improvements project and plans to leverage the FY 2015-2016 LCTOP funding toward the vehicle purchase component of the project as detailed above.

Increased Service: The Trolley Capacity Improvements project serves to increase capacity on the Blue and Orange trolley lines operated by MTS. The Blue Line serves 18 stations between the international border and downtown San Diego and currently averages 50,000 passengers daily. The Blue Line currently operates 15-minute headways in the off-peaks and 7.5-minute headways in the morning and afternoon peaks. Seven trains are dedicated to the line all day and 14 in the peak period. Running three-car trains, 42 cars are allocated to the line in the peak period, with three additional serving as a gap train. The Orange Line currently serves 19 stations between El Cajon, other East County communities, Southeastern San Diego, and Downtown San Diego. The Orange Line averages 32,800 passengers daily. The Orange Line currently operates 15-minute headways most of the day, with eight trains dedicated to the line all day. Running three-car trains, 24 cars are allocated to the line, with an additional three serving as a gap train. The Trolley Capacity Improvements project will add eight additional vehicles to be used to run four-car trains instead of three-car trains during peak periods. Each LRV has 60 seats with room for 72 standees, providing a total carrying capacity of 132 passengers.

Scope of Work: MTS will be exercising an option on contract #L0914.10-10 between MTS and Siemens Industry, Inc to purchase the eight additional LRVs. The FY2015-2016 LCTOP funding will be applied toward the purchase of eight Siemens S70 Ultra-Short LRVs. The overall project cost for purchasing the eight LRVs is estimated at \$36,944,827 with \$27,463,000 being funded by the Transit and Intercity Rail Capital Program (TIRCP) and \$3,663,014 being requested in this application for FY2015-2016 LCTOP funding. MTS plans on funding the remaining \$5,818,813 with the next two cycles of LCTOP funding. All costs for operating the additional LRVs will be included in MTS' operating budget before the LRVs begin service.

b) Project Location - Describe the location of the project. Also provide an 8 1/2" X 11" project site map that shows the transit service area and project location. Use link to CalEPA website for information, <http://www.calepa.ca.gov/EnvJustice/GHGInvest/default.htm>.

Effective 11/15

The eight Siemens LRVs will be stored and maintained at 1255 Imperial Ave. , San Diego, CA 92101 while not in service. These vehicles will be operated on both the Blue and Orange trolley lines to increase capacity. The Blue Line serves 18 stations between the international border and downtown San Diego and currently averages 50,000 passengers daily. The Orange Line currently serves 19 stations between El Cajon, other East County communities, Southeastern San Diego, and Downtown San Diego. Please see the attached maps detailing the service area where these LRVs will be operated as well as the DACs benefitted by the project.

c) Project Life - For capital projects, state the Useful Life of the Project. For operations project state the number of months service will operate.

Capital: 25

Operations: Indefinite Operation

Low Carbon Transit Operations Program (LCTOP)

PROJECT DESCRIPTION AND ALLOCATION REQUEST (BENEFITS/OUTCOMES)

Table 5: Description of Major Benefits/Outcomes

a) Greenhouse Gas Reduction - Describe how this project will reduce greenhouse gases and any assumptions or data that support this description. For example, "The expanded transit service will reduce VMT and greenhouse gas emissions by replacing auto trips with transit trips. Initial estimates indicate that the expansion could add 50 commuter bus riders per day to replace an average auto trip of 10 miles each way." If available, please provide the expected amount of VMT reductions and greenhouse gas reductions.

The increased capacity on the Blue and Orange Lines will reduce VMT and greenhouse gas emissions by replacing auto trips with trolley trips. Initial estimates indicate that the expansion could add as many as 724,034 annual passengers in the first full year of the project (2019) and as many as 1,156,030 in the final year of the project (2044). These estimates are based on purchasing eight Siemens LRVs based on current funding. However, MTS plans on purchasing a ninth vehicle when funding becomes available. When MTS secures funding for the ninth vehicle, ridership estimates, and subsequent GHG reductions, will be revised upward to reflect the increased capacity. However, given the current budget, the estimates for ridership and GHG reduction are based on the purchase of eight vehicles.

With an "adjustment factor for transit dependency" (A) of 0.69, a "length of average auto trip reduced" (L) of 6.65 miles, an "adjustment factor to account for auto trips used to access transit service" (AA) of 0.05, and a "length of average trip for auto access to transit" (LL) of 2 miles, MTS estimates an average annual auto VMT reduction of 4,248,474.79 based on the LCTOP Calculator results. MTS chose an "adjustment factor for transit dependency" (A) of 0.69 based on a 2009 "Onboard Transit Passenger Survey" published by SANDAG, the region's Metropolitan Planning Organization, that found that 69% of households had at least one car available in their household. This indicates that approximately 69% of riders would not be entirely dependent on transit. Thus, we would expect to see more of these riders shift to using the trolley service with the expanded capacity and improved riding conditions compared to if there were a lower percentage of riders who were already entirely dependent on trolley service. MTS used a value of 6.65 miles for the "length of an average auto trip reduced" based on the Series 12 Regional Growth Forecast published by SANDAG in 2010. MTS used a value of 0.05 for the "adjustment factor to account for auto trips used to access transit service" (AA) based on data in the 2009 "Onboard Transit Passenger Survey" which indicated that only 4.5% of passengers who ride the trolley drive, carpool in an automobile, or are picked up/dropped off by an automobile. Thus, approximately only 4.5% of those who ride the trolley are utilizing automobile travel to reach the trolley station. MTS used 2 miles as the "length of average trip for auto access to transit" (LL). There are currently no default values for trolley service which makes it difficult to assign an accurate value without available data. However, the average trolley trip

length is 5.62 miles as reported in the FY2015 National Transit Database report. Long distance commuter bus had an average trip length of 23.51 miles. Based on these figures, MTS used the default value of 2 miles since our trolley service is closer to a local bus type service than a long distance commuter service. However, in reality, this value is probably lower than 2 considering that this would mean "for every 6.65 mile total trip (average auto trip reduced), 5% of those individuals would be driving 2 miles and using the trolley for the remaining 4.65 miles." Using practical knowledge, it is unlikely that someone would drive 2 miles and park an automobile in order to only take a 4.65 mile trolley ride. However, MTS does not have specific data to justify a stray from the provided defaults. MTS would like to see defaults for local electric train service in future methodologies given that our trolley service is not specifically addressed by any of the defaults provided.

Given the Annual Auto VMT Reduction of 4,248,474.79, and the estimation that the 8 additional vehicles will have a combined annual VMT of 202,652 miles, the resulting GHG reduction is estimated to be 1,421.82 MTCO_{2e} over the project lifecycle. Once again, this estimate is based on having funding for eight vehicles whereas MTS intends to purchase nine when funding is secured. The GHG reduction increases to 6,536.02 MTCO_{2e} when we account for ridership with nine trolleys instead of eight based on the LCTOP calculator.

b) Increased Mode Share - Describe how this project will directly increase mode share.

The Trolley Capacity Improvements Project is intended to address overcrowded conditions that exist on the Orange and Blue Lines. This overcrowding makes traveling by public transit less attractive and counteracts attempts to move people from automobile travel to transit. Transit is less attractive for passengers when passengers must stand in crowded conditions for long periods of time. Under such conditions, it is difficult for passengers to read, work, or otherwise use their time effectively, which eliminates one advantage of transit over the private automobile. Overcrowding can also reduce the safety of transit travel and reduces the ability to maintain on time performance.

By increasing capacity on the Blue and Orange Lines through by purchasing eight LRVs, this project will significantly reduce overcrowding and its negative impact on the trolley system. The increase in comfort and ability to read or work while riding the trolley system will provide greater appeal to those who would otherwise choose private transportation. The improved safety benefits and on-time-performance will also provide enhanced appeal for the public to choose transit over private automobile travel, thus increasing modeshare. The increase in mode-share will be directly attributed to running four-car trains during peak hours which will allow for additional passenger capacity and more attractive riding conditions for MTS customers.

c) Disadvantaged Communities (DAC) Project Criteria

See Attachment B for DAC Criteria to Evaluate Projects (example: Category 1B Project provides transit incentives to residents with a physical address in a disadvantage community (e.g., vouchers, reduced fares, transit passes).

Low Carbon Transportation Projects				Transit Projects			
<input type="checkbox"/>	1A	<input type="checkbox"/>	2A	<input checked="" type="checkbox"/>	1A	<input type="checkbox"/>	2E
<input type="checkbox"/>	1B	<input type="checkbox"/>	2B	<input type="checkbox"/>	1B	<input type="checkbox"/>	2F
<input type="checkbox"/>	1C	<input type="checkbox"/>	2C	<input type="checkbox"/>	1C	<input checked="" type="checkbox"/>	2A
<input type="checkbox"/>	1D			<input type="checkbox"/>	1D	<input type="checkbox"/>	2B
				<input type="checkbox"/>	1E	<input type="checkbox"/>	2C
				<input type="checkbox"/>	1F	<input type="checkbox"/>	2D
						<input type="checkbox"/>	1G
						<input type="checkbox"/>	1H
						<input type="checkbox"/>	2I

d) Disadvantaged Communities (DAC) (if applicable*) - Describe how this project will directly benefit the DAC(s) within your service area in your own words. For agencies whose service area includes disadvantaged communities, at least 50 percent of the total moneys received shall be expended on projects that will benefit disadvantaged communities.

The Trolley Capacity Improvements will benefit DACs by providing increased service capacity, improved riding conditions, improved safety, and a reduction in GHGs. There are 26 DACs in all of San Diego County with 20 of these DACS existing within a half mile of a Blue or Orange Line trolley station. Eight of these DACS contain a Blue or Orange Line station directly within the DAC. 100% of the FY15-16 LCTOP funding will benefit DACs. Please see attached maps showing the project service area and the corresponding DACs.

Low Carbon Transit Operations Program (LCTOP)

PROJECT DESCRIPTION AND ALLOCATION REQUEST (BENEFITS/OUTCOMES)

Table 5: Description of Major Benefits/Outcomes

e) Co-Benefits - Check all additional Benefits/Outcomes.

<input checked="" type="checkbox"/> Improved Safety	<input type="checkbox"/> Coordination with Educational Institutions
<input type="checkbox"/> Improved Public Health	<input type="checkbox"/> College/University <input type="checkbox"/> Grades K-12
<input type="checkbox"/> Reduced Operating/Maintenance Cost	<input type="checkbox"/> Promotes Active Transportation (walking, biking)
<input checked="" type="checkbox"/> Increase System Reliability	<input type="checkbox"/> Promotes integration with other modes of transportation
<input checked="" type="checkbox"/> Other Benefits (describe below)	

f) Co-Benefits - Describe benefits indicated above in d) and any other benefits not listed.

The increased capacity on the Blue and Orange Lines will improve safety for riders due to the reduction of overcrowding. When the LRVs are at or near full capacity, patrons are more likely to trip or fall as a result of crowded conditions. The additional capacity will help ease the problem of overcrowding and provide patrons with more personal space. In addition, overcrowded conditions can spur tempers and can generally effect the mood and atmosphere of the those riding the trolley. Better riding conditions result in happier customers and MTS would expect to see a decrease in incidents related to customers angered by overcrowded conditions. Lastly, improved capacity on the Blue and Orange Lines will provide for better CCTV monitoring when the trains are not at full or near-full capacity. When criminals know that the CCTV cameras have a clear line of sight, they would be less likely to commit a crime. Less crowded conditions on board the LRVs would potentially increase the effectiveness of CCTV monitoring.

The increased capacity will also improve system reliability for those who ride the trolley. By increasing capacity on the Blue and Orange Lines, patrons will be less likely to have to wait for another train in the event that the current trip is at maximum capacity. Also, individuals will be less likely to be turned off by the overcrowding and will view the trolley system as a more reliable source of transportation for going to work, education centers, recreation, etc.

Reducing overcrowding will also have the benefit of improving the ability to enforce regulations and check fares. Overcrowding makes checking fares increasingly difficult and any reduction of overcrowding will have a positive impact on the the ability to collect fares and maximize revenue from services provided.

Table 6: Project Schedule

Capital Projects	
Begin Construction Phase (Contract Award)	
End Construction Phase (Contract Acceptance)	
Begin Vehicle/Equipment Order (Contract Award)	6/30/2016
End Vehicle/Equipment Order (Contract Acceptance)	10/30/2018
Begin Closeout Phase	10/30/2018
End Closeout Phase	11/30/2018
Operations Projects	
Begin expanded/enhanced transit services	12/1/2019

Effective 11/15

End expanded/enhanced transit services	Indefinite
Begin Closeout Phase	
End Closeout Phase	

START DATE FOR LCTOP FUNDED PHASES MAY NOT PROCEED PROJECT APPROVAL LETTER.

Pre-construction costs (e.g design, environmental and right-a-way) are not eligible to be funded by LCTOP funds, they must be funded by other sources.

Low Carbon Transit Operations Program (LCTOP)

PROJECT DESCRIPTION AND ALLOCATION REQUEST (OPERATIONS DESCRIPTION)

Table 7: Operations Project Description

a) Describe the operating plan for this system.

MTS estimates that the expansion of trolley service will require two additional staff on the Orange Line and four additional staff on the Blue Line for cutting the trains at the 12th and Imperial Station and adding them to existing train sets. Based on FY2015 personnel costs, the estimated cost of the additional personnel would be \$221,894 per year. In addition to personnel costs, there are other variable costs associated with vehicle mileage. These costs are for repair/maintenance services, electricity, materials and supplies, and other operating costs. Based on FY2015 data, MTS has calculated a "variable cost per mile" of \$3.58. The proposed expansion would result in an additional 798 miles per weekday. With 254 weekdays during the year and a variable cost per mile of \$3.58, the expansion is estimated to have an annual mileage cost of \$725,637 per year. Combined with personnel costs, the total increase in operating costs per for the proposed service expansion is \$947,531 based on FY2015 cost data. In fiscal year 2015, MTS had a 56.8% farebox recovery ratio on the trolley system. Given this farebox ratio, MTS estimates an average annual net operating cost of \$409,333 for operating the eight additional vehicles. MTS may apply for future LCTOP cycles to fund operations but should grant funding not become available, the operating costs will be included in MTS' annual operating budget. Funding for operations will be budgeted in the fiscal year 2019 MTS operating budget before the LRVs become operational.

b) Describe the fare structure for this system.

MTS patrons who ride on the trolley system have the option to purchase a one-way fare for \$2.50 (\$1.25 for Senior/Disabled/Medicare) or to purchase a "Compass Card" which can be reloaded. The "Compass Card" includes options for 1-day, 2-day, 3-day, 4-day, 14-day, and 30-day passes for either Regional, Premium, or COASTER service. These passes range from \$5 for a 1-day pass to \$72 for a monthly pass for Regional service including full access to the MTS trolley system. The farebox recovery rate for the MTS trolley system in Fiscal Year 2015 was 56.8%.

c) Describe the assumptions and process that were used to develop the ridership projections shown in the request.

Please see the attached "Ridership Estimation Methodology and Calculations" document which includes a detailed description of how ridership was projected for the Trolley Capacity Improvements Project. This methodology was created when MTS intended to purchase nine LRVs. However, due to current funding constraints, this project include eight vehicles instead of nine. The original annual ridership increases have been prorated by (8/9) to arrive at the current ridership projections.

d) Describe the assumptions and process for how the operating cost projections were developed.

MTS estimates that the expansion of trolley service will require two additional staff on the Orange Line and four additional staff on the Blue Line for cutting the trains at the 12th and Imperial Station and adding them to existing train sets. Based on FY2015 personnel costs, the estimated cost of the additional personnel would be \$221,894 per year. In addition to personnel costs, there are other variable costs associated with vehicle mileage. These costs are for repair/maintenance services, electricity, materials and supplies, and other operating costs. Based on FY2015 data, MTS has calculated a "variable cost per mile" of \$3.58. The proposed expansion would result in an additional 798 miles per weekday. With 254 weekdays during the year and a variable cost per mile of \$3.58, the expansion is estimated to have an annual mileage cost of \$725,637 per year. Combined with personnel costs, the total increase in operating costs per for the proposed service expansion is \$947,531 based on FY2015 cost data. In fiscal year 2015, MTS had a 56.8% farebox recovery ratio on the trolley system. Given this farebox ratio, MTS estimates an average annual net operating cost of \$409,333 for operating the eight additional vehicles.



Low Carbon Transit Operations Program TOTAL PROJECT COST AND FUNDING PLAN

The following Funding Plan has been reviewed and approved by the undersigned. It includes a complete list of funds for this project and is the total cost of the project, including LCTOP funds.

Person preparing this form (please type or print) Gordon V. Meyer	Phone: 619-595-1014	Date: 1-20-2016
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Approval Authority: Sign and date 1/25/16	Typed name and phone number: Paul Jablonski, Chief Executive Officer 619-557-4583
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Shaded fields are automatically calculated. Please do not fill these fields.

Proposed Total Project Cost								Project
Component	Prior	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY	FY	Total
PA&ED	0	0	0	0	0	0	0	0
PS&E	0	0	0	0	0	0	0	0
R/W	0	0	0	0	0	0	0	0
CON	0	0	0	0	0	0	0	0
Veh/Equip Purchase	0	3,663,014	31,126,014	2,155,799	0	0	0	36,944,827
Operations/Other	0	0	0	0	0	0	0	0
TOTAL	0	3,663,014	31,126,014	2,155,799	0	0	0	36,944,827

Low Carbon Transit Operations Program (LCTOP)								
Component	Prior	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY	FY	Total
PA&ED								0
PS&E								0
R/W								0
CON								0
Veh/Equip Purchase		3,663,014	3,663,014	2,155,799				9,481,827
Operations/Other								0
TOTAL	0	3,663,014	3,663,014	2,155,799	0	0	0	9,481,827

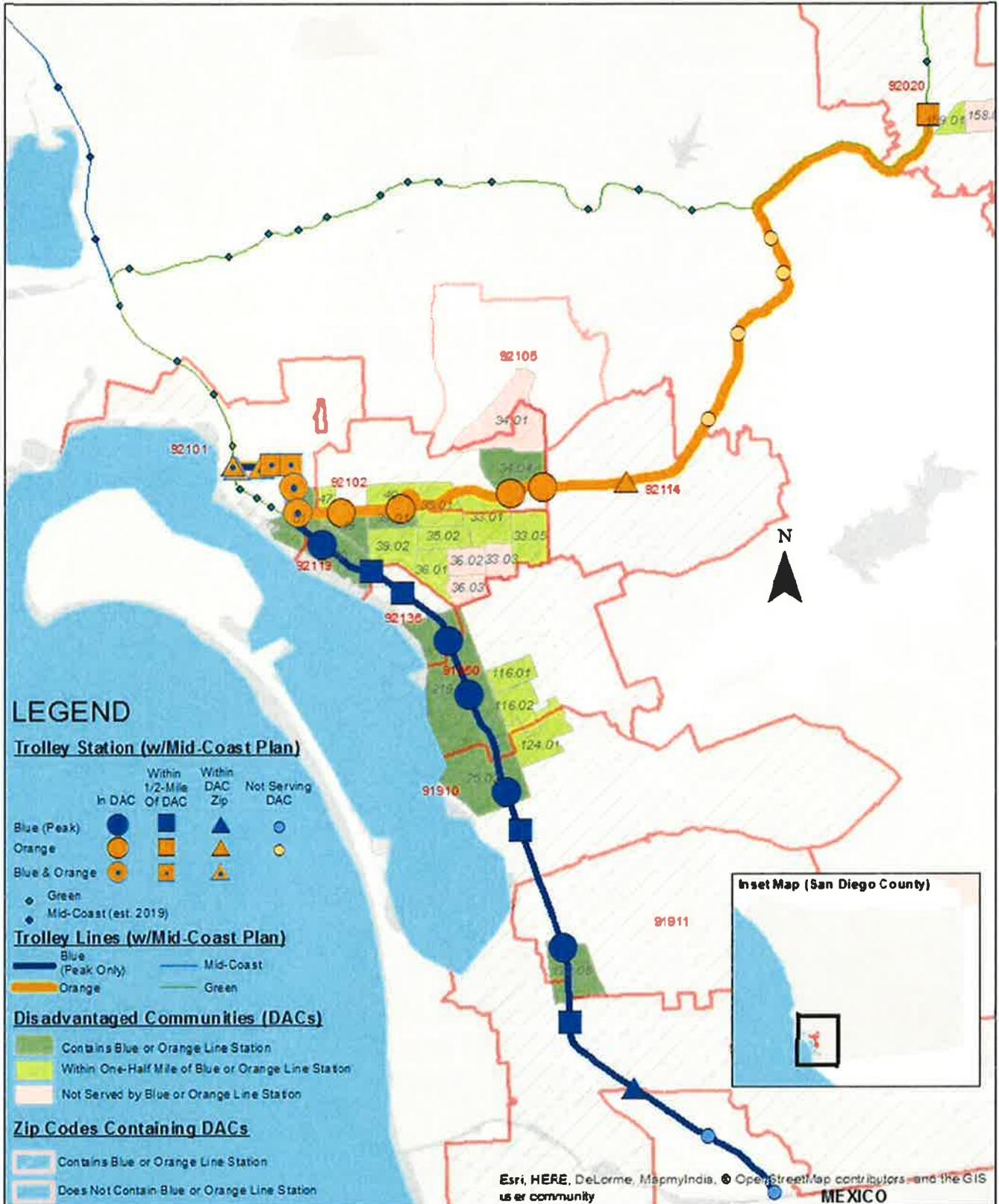
Funding Source: 2015 Transit and Intercity Rail Capital Program (Awarded)								
Component	Prior	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY	FY	Total
PA&ED								0
PS&E								0
R/W								0
CON								0
Veh/Equip Purchase			27,463,000					27,463,000
Operations/Other								0
TOTAL	0	0	27,463,000	0	0	0	0	27,463,000

Funding Source:								
Component	Prior	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY	FY	Total
PA&ED								0
PS&E								0
R/W								0
CON								0
Veh/Equip Purchase								0
Operations/Other								0
TOTAL	0							

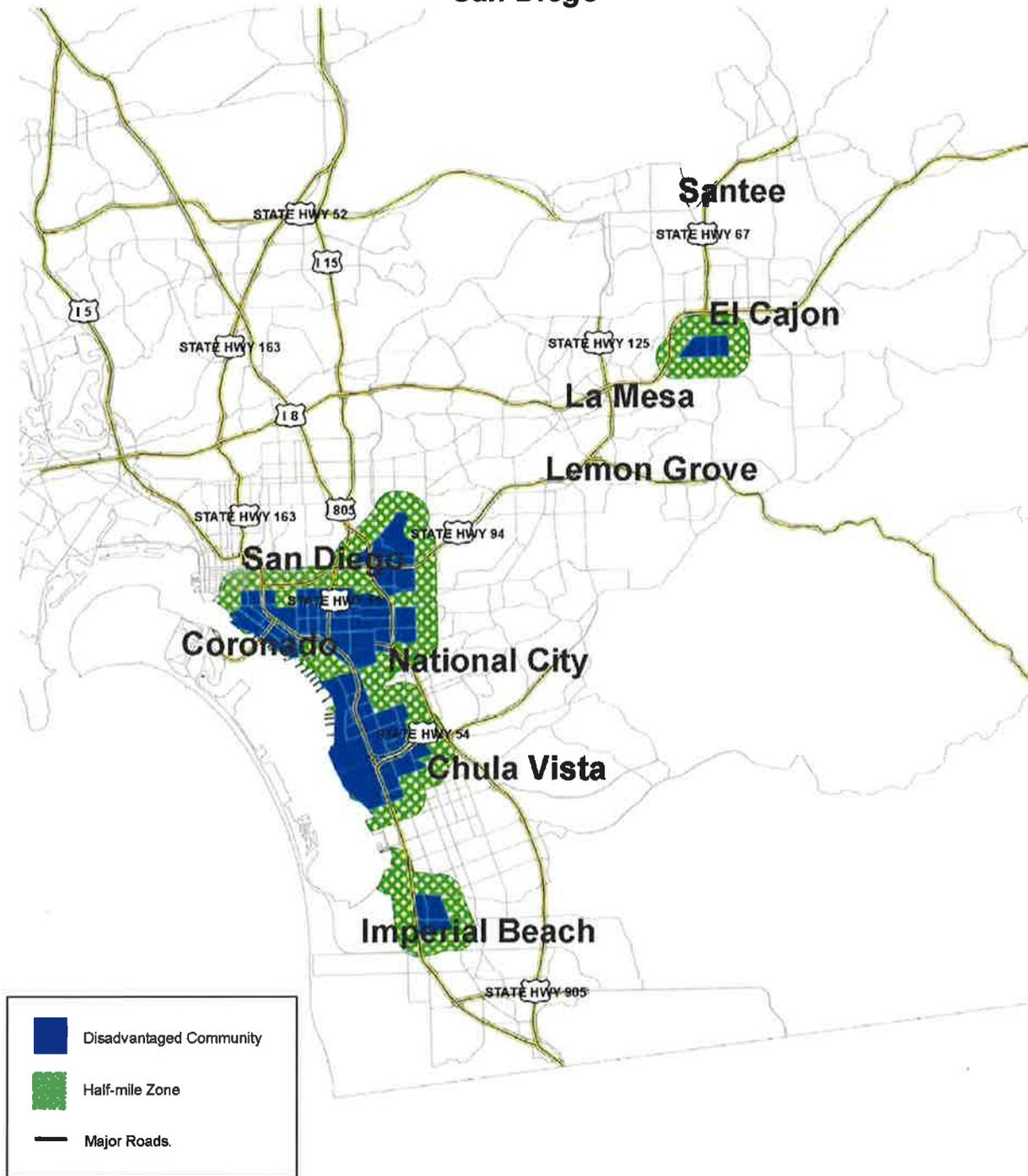
Funding Source:								
Component	Prior	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY	FY	Total
PA&ED								0
PS&E								0
R/W								0
CON								0
Veh/Equip Purchase								0
Operations/Other								0
TOTAL	0							



FIGURE 2: Disadvantaged Communities Served by Project



San Diego



DAC COMMUNITIES SERVED BY TROLLEY CAPACITY IMPROVEMENTS FILE

Census Tract	County	Zip Code(s)	Contains Blue or Orange Line Station (Served by Additional Vehicles)	Within 1/4-mile of Blue or Orange Line Station (Served by Additional Vehicles)	Within 1/2-mile of Blue or Orange Line Station (Served by Additional Vehicles)	Census Tract's Zip Code Contains Blue or Orange Line Station (Served by Additional Vehicles)	Census Tract's Zip Code Served by Courthouse
25.02	San Diego	91910	YES	YES	YES	YES	*
33.01	San Diego	92102, 92113		YES	YES	YES	*
33.03	San Diego	92113			YES	YES	*
33.05	San Diego	92113			YES	YES	*
34.01	San Diego	92102, 92105					*
34.04	San Diego	92102	YES	YES	YES	YES	*
35.01	San Diego	92102, 92113		YES	YES	YES	*
35.02	San Diego	92113			YES	YES	*
36.01	San Diego	92113			YES	YES	*
36.02	San Diego	92113				YES	*
36.03	San Diego	92113				YES	*
39.01	San Diego	92113	YES	YES	YES	YES	*
39.02	San Diego	92113		YES	YES	YES	*
40	San Diego	92102, 92113		YES	YES	YES	*
47	San Diego	92102, 92113		YES	YES	YES	*
49	San Diego	92113	YES	YES	YES	YES	*
50	San Diego	92113	YES	YES	YES	YES	*
51	San Diego	92101, 92113	YES	YES	YES	YES	YES
116.01	San Diego	91950			YES	YES	*
116.02	San Diego	91910, 91950			YES	YES	*
124.01	San Diego	91910, 91950			YES	YES	*
132.05	San Diego	91911, 92154	YES	YES	YES	YES	*
158.02	San Diego	92020				YES	*
159.01	San Diego	92020		YES	YES	YES	*
200.18	San Diego	92078				*	*
219.00	San Diego	91950, 92136	YES	YES	YES	YES	*

RIDERSHIP ESTIMATION METHODOLOGY & CALCULATIONS

Methodology & Final Estimates Per Year; Complete Calculations are Attached Separately as an Excel File (Ridership Estimates Calculation)



RIDERSHIP ESTIMATION METHODOLOGY (See Attached Spreadsheet)

SUMMARY (FROM PROJECT NARRATIVE)

To determine projected demand, MTS used the following methodology:

- 1) Use SANDAG forecasted ridership during the peak periods for 2020¹
- 2) Apply a factor for peak hour ridership based on current ridership data for each line
- 3) Reduce ridership by two percent for 2019; apply a 2 percent growth rate beyond 2020
- 4) Determine maximum loads and total ridership during the peak periods and peak hours for the Orange and Blue Lines

To determine the projected ridership gains, MTS used the following groups of passengers:

- **Passengers that would not be able to board, but now could with the expansion of capacity:**
 - If there was a forecasted demand over the 396-passenger capacity of a three-car train, it is assumed that the extra passengers would have to choose an alternative mode, or would not make the trip. With the additional vehicle available for those peak trips, those passengers were considered new transit riders, until the projected demand reached 528 for a four-car train. If the demand was greater than 528, MTS did not count those as new passengers.
- **Passengers that would experience an improvement in service:**
 - On most trips on the Orange Line and in the off-peak direction of the Blue Line,² the 396-capacity was not forecasted to be reached. However, these passengers would still experience an improvement in capacity (roughly 17% on each line) and in performance (due to shorter dwell times and better on-time performance). MTS took the total passengers during these time periods and applied a service elasticity of 0.5³ to project ridership gains. *For example: if there were 1,000 passengers in the peak period, MTS would project a ridership gain of 85 ($1,000 * 0.17 * 0.5$)*

CALCULATION (REFER TO ATTACHED SPREADSHEET)

SHEET #1 2020 SANDAG Regional Forecasts

Base data from SANDAG regional forecasts for 2020, grouped by route, station, direction, and time period.

SHEET #2 Peak Hour %

Use passenger counts from current service to determine % of riders in the peak hour of the peak direction for each route. See Column J. This is fall 2014 service change data.

- Route 510 = Blue
- Route 520 = Orange

¹ SANDAG Series 13 Regional Growth Forecast

² Non-peak-direction trips were considered on the Blue Line because the yard is in the center of the system and to make a peak-direction trip, a non-peak-direction trip is required. On the Blue Line, while these trips are not at capacity, they are beyond comfortable conditions

³ 0.5 was a representative elasticity for service improvements in "Transit Price Elasticities and Cross-Elasticities," Todd Litman; Victoria Transport Policy Institute; April 3, 2014.



SHEET #3 Estimated Loads

Determine forecasted peak of the peak loads and other peak hour loads

- COLUMNS A-H: Took data from Sheet #1 for peak directions of each route
- COLUMN J: Applied peak hour factor from Sheet #2
- COLUMNS L-N: Applied factor from Column J to transit activity in Columns F-H
- COLUMNS P-Q: Divided Columns L-N to determine per trip activity, including maximum load in Column R.
- COLUMNS T-V: Total passenger activity in the other two hours of the peak (Columns F-J minus Columns L-N). For Blue Line only.
- COLUMN X: Identified average maximum load per trip

SHEET #4 Short Trip, Peak Direction Loads

- Copy of data from Sheet #1 with only data included from the short trips on the Blue Line in the peak hour and in the peak direction.
- Passengers that would benefit from the extra capacities (those getting off by 12th & Imperial northbound, or getting on at 12th & Imperial southbound) are shown in Column M on Sheet #4.

SHEET #5 Peak Hour, Off-Peak Direction Loads

- Copy of data from Sheet #1 with only data included from the passengers in the off-peak direction during the peak time periods.
- Passengers that would benefit from the extra capacities (those getting off by 12th & Imperial northbound, or getting on at 12th & Imperial southbound) are shown in Column R on Sheet #5.

SHEET #6 Calculations

Key inputs in Column B:

- Blue Line service increase: 17% (28 cars per hour vs 24 cars per hour)
- Orange Line service increase: 17% (14 cars per hour vs 12 cars per hour)
- Service elasticity: 0.5 for service improvements
- Annual ridership change: 2%, based on historic MTS trends
- Weekdays per year: 254

A number of steps were used to calculate the projected ridership. All calculations used 2020 as base year.

PASSENGER GROUP 1: Passengers in Peak Direction (For Blue Line, only the long trips)

- COLUMNS D-F: Blue Line passengers in peak direction, during peak hour, on long trips only
- COLUMNS H-K: Blue Line passengers in peak direction, in peak time period, not during peak hour
- COLUMNS L-O: Orange Line passengers in peak direction, in peak hour



TO CALCULATE RIDERSHIP ESTIMATE FOR 2020

- 1) ROW 8: Determine project passenger demand south of 12th & Imperial (from Sheet #3)
- 2) ROW 36: Apply service elasticity to passenger demand (Row 20 * B4/5 * B6), to determine increased demand with improved service
- 3) ROW 64: Determine existing trip peak loads in peak hour (from Sheet #3)
- 4) ROW 92: Determine added passengers per trip in peak hour (Row 36 / 4 trips). From ridership analyses, the vast majority of these would be on the train at the peak load point, so they were applied to that.
- 5) ROW 120: Determine total peak load demand per trip per peak hour (Row 64 + Row 92)
- 6) ROW 148: Based on demand, determine maximum passenger load with current capacities of 132 per car or 396 per three-car train. If Row 120 was greater than 396, then 396 was used. If Row 120 was less than 396, then that number was used.
- 7) ROW 176: Based on demand, determine maximum passenger load with proposed capacities of 132 per car or 528 per four-car train. If Row 120 was greater than 528, then 528 was used. If Row 120 was less than 528, then that number was used.
- 8) ROW 204: Passenger trips gained per vehicle trip (Row 176 – Row 148)
- 9) ROW 232: Passenger trips gained per day (Row 204 multiplied by trips operated in period (Column E-F * 4, Column I-J * 8, Columns M-N * 4)).

TO CALCULATE RIDERSHIP ESTIMATE FOR ALL OTHER YEARS

- 1) Apply 2% ridership decrease for 2019, and 2% ridership increase for 2021 and beyond on Steps 1 & 3. Follow all other steps.

PASSENGER GROUP 2: Blue Line Passengers in Peak Direction During Peak Hour, on Short Trips (Columns Q-T)

Blue Line passengers in the peak direction in the peak hour on the short trips (the ones with lighter loads) would still benefit with the increased capacity and improved service, so the elasticity figure was applied to them.

TO CALCULATE RIDERSHIP ESTIMATE FOR 2020

- 1) ROW 8: Use passenger demand from Column M on Sheet #4
- 2) ROW 36: Apply service elasticity to passenger demand (Row 20 * B4/5 * B6), to determine increased demand with improved service

TO CALCULATE RIDERSHIP ESTIMATE FOR ALL OTHER YEARS

- 1) Apply 2% ridership decrease for 2019, and 2% ridership increase for 2021 and beyond on Steps 1.

PASSENGER GROUP 3: Blue Line Passengers in Off-Peak Direction in Peak Period (Columns V-Y)

Blue Line passengers in the off-peak direction will benefit from the extra capacity as well. The off-peak direction is not experiencing capacity loads, but often standing or crowded loads. These passengers will benefit from the service improvement. Orange Line passengers in the off-peak direction would not be



expected to benefit due to the fact that the trips returning in the off-peak direction would be very early in the morning or late in the evening. The Blue Line trips would be more spread out since the project is not just targeting the peak of the peak on that line.

The number of passengers was determined from Sheet #5, which is a copy of the data from Sheet #1, with only off-peak direction in the peak-hour included. Passengers that would benefit from the extra capacities (those getting off by 12th & Imperial northbound, or getting on at 12th & Imperial southbound) are shown in Column R on Sheet #6.

TO CALCULATE RIDERSHIP ESTIMATE FOR 2020

- 1) ROW 8: Use passenger demand from Column R on Sheet #5
- 2) ROW 36: Apply service elasticity to passenger demand (Row 20 * B4/5 * B6), to determine increased demand with improved service

TO CALCULATE RIDERSHIP ESTIMATE FOR ALL OTHER YEARS

- 1) Apply 2% ridership decrease for 2019, and 2% ridership increase for 2021 and beyond on Steps 1.

SHEET #7 Final Calculations

Add up the various passenger groups

DAILY RIDERSHIP

BLUE LINE

- COLUMN B – Peak Direction Long Trips
 - Year 2020 from Sheet #6, G232+K232
- COLUMN C – Peak Direction Short Trips
 - Year 2020 from Sheet #6, T36
- COLUMN D – Off-Peak Direction, Peak Period
 - Year 2020 from Sheet #6, Y36

ORANGE LINE

- Year 2020 from Sheet #6, O232

ANNUAL RIDERSHIP

Daily Ridership multiplied by 254 weekdays

NOTE: 2018 ridership is included on the spreadsheet, but was not included in the proposal since 2019 would be the first full year of operation.



SHEET #7 FINAL ESTIMATES

TOTAL PASSENGERS GAINED (PER DAY)									
BLUE	Peak Direction, Long Trips	Peak Direction, Short Trips	Off Peak Direction	TOT	ORANGE	Peak Direction, Peak Hour	TOT	TOTAL	TOT
2018	1,966	423	482	2,871	2018	221	221	2018	3,091
2019	2,059	431	492	2,982	2019	225	225	2019	3,207
2020	2,142	440	501	3,084	2020	230	230	2020	3,313
2021	2,227	449	511	3,187	2021	234	234	2021	3,422
2022	2,314	458	522	3,293	2022	239	239	2022	3,532
2023	2,403	467	532	3,402	2023	244	244	2023	3,645
2024	2,427	476	543	3,446	2024	249	249	2024	3,695
2025	2,434	486	554	3,473	2025	254	254	2025	3,726
2026	2,440	495	565	3,500	2026	259	259	2026	3,759
2027	2,509	505	576	3,590	2027	264	264	2027	3,854
2028	2,580	515	587	3,683	2028	269	269	2028	3,952
2029	2,653	526	599	3,778	2029	275	275	2029	4,052
2030	2,727	536	611	3,874	2030	280	280	2030	4,154
2031	2,803	547	623	3,973	2031	286	286	2031	4,258
2032	2,880	558	636	4,073	2032	291	291	2032	4,365
2033	2,958	569	649	4,176	2033	297	297	2033	4,473
2034	3,039	580	662	4,281	2034	303	303	2034	4,584
2035	3,121	592	675	4,387	2035	309	309	2035	4,696
2036	3,168	604	688	4,460	2036	315	315	2036	4,775
2037	3,168	616	702	4,486	2037	322	322	2037	4,808
2038	3,168	628	716	4,512	2038	328	328	2038	4,840
2039	3,168	641	730	4,539	2039	335	335	2039	4,874
2040	3,168	654	745	4,567	2040	341	341	2040	4,908
2041	3,168	667	760	4,595	2041	348	348	2041	4,943
2042	3,168	680	775	4,623	2042	355	355	2042	4,978
2043	3,168	694	791	4,652	2043	376	376	2043	5,028
TOTAL PASSENGERS GAINED (PER YEAR)									
BLUE	Peak Direction, Long Trips	Peak Direction, Short Trips	Off Peak Direction	TOT	ORANGE	Peak Direction, Peak Hour	TOT	TOTAL	TOT
2018	499,363	107,369	122,414	729,147	2018	56,077	56,077	2018	785,224
2019	522,960	109,517	124,863	757,340	2019	57,198	57,198	2019	814,538
2020	544,148	111,707	127,360	783,215	2020	58,342	58,342	2020	841,558
2021	565,760	113,941	129,907	809,609	2021	59,509	59,509	2021	869,118
2022	587,804	116,220	132,505	836,530	2022	60,699	60,699	2022	897,229
2023	610,289	118,544	135,155	863,989	2023	61,913	61,913	2023	925,902
2024	616,548	120,915	137,858	875,322	2024	63,152	63,152	2024	938,474
2025	618,150	123,334	140,616	882,100	2025	64,415	64,415	2025	946,514
2026	619,784	125,800	143,428	889,013	2026	65,703	65,703	2026	954,716
2027	637,209	128,316	146,296	911,822	2027	67,017	67,017	2027	978,839
2028	655,318	130,883	149,222	935,423	2028	68,357	68,357	2028	1,003,780
2029	673,789	133,500	152,207	959,496	2029	69,724	69,724	2029	1,029,221
2030	692,629	136,170	155,251	984,051	2030	71,119	71,119	2030	1,055,169
2031	711,846	138,894	158,356	1,009,096	2031	72,541	72,541	2031	1,081,637
2032	731,448	141,672	161,523	1,034,642	2032	73,992	73,992	2032	1,108,634
2033	751,441	144,505	164,754	1,060,700	2033	75,472	75,472	2033	1,136,172
2034	771,834	147,395	168,049	1,087,278	2034	76,981	76,981	2034	1,164,260
2035	792,636	150,343	171,410	1,114,388	2035	78,521	78,521	2035	1,192,909
2036	804,672	153,350	174,838	1,132,860	2036	80,091	80,091	2036	1,212,951
2037	804,672	156,417	178,335	1,139,423	2037	81,693	81,693	2037	1,221,117
2038	804,672	159,545	181,901	1,146,118	2038	83,327	83,327	2038	1,229,446
2039	804,672	162,736	185,539	1,152,947	2039	84,994	84,994	2039	1,237,941
2040	804,672	165,991	189,250	1,159,913	2040	86,694	86,694	2040	1,246,606
2041	804,672	169,311	193,035	1,167,018	2041	88,427	88,427	2041	1,255,445
2042	804,672	172,697	196,896	1,174,265	2042	90,196	90,196	2042	1,264,461
2043	804,672	176,151	200,834	1,181,656	2043	95,464	95,464	2043	1,277,121

TOTAL PASSENGERS GAINED (9 Vehicles)										8 Vehicles
BLUE	Peak Direction, Long Trips	Peak Direction, Short Trips	Off Peak Direction	TOT	ORANGE	Peak Direction, Peak Hour	TOT	TOTAL	TOT	
2018	1,966	423	482	2,871	2018	221	221	2018	3,091	2,748
2019	2,059	431	492	2,982	2019	225	225	2019	3,207	2,851
2020	2,142	440	501	3,084	2020	230	230	2020	3,313	2,945
2021	2,227	449	511	3,187	2021	234	234	2021	3,422	3,042
2022	2,314	458	522	3,293	2022	239	239	2022	3,532	3,140
2023	2,403	467	532	3,402	2023	244	244	2023	3,645	3,240
2024	2,427	476	543	3,446	2024	249	249	2024	3,695	3,284
2025	2,434	486	554	3,473	2025	254	254	2025	3,726	3,312
2026	2,440	495	565	3,500	2026	259	259	2026	3,759	3,341
2027	2,509	505	576	3,590	2027	264	264	2027	3,854	3,426
2028	2,580	515	587	3,683	2028	269	269	2028	3,952	3,513
2029	2,653	526	599	3,778	2029	275	275	2029	4,052	3,602
2030	2,727	536	611	3,874	2030	280	280	2030	4,154	3,693
2031	2,803	547	623	3,973	2031	286	286	2031	4,258	3,785
2032	2,880	558	636	4,073	2032	291	291	2032	4,365	3,880
2033	2,958	569	649	4,176	2033	297	297	2033	4,473	3,976
2034	3,039	580	662	4,281	2034	303	303	2034	4,584	4,074
2035	3,121	592	675	4,387	2035	309	309	2035	4,696	4,175
2036	3,168	604	688	4,460	2036	315	315	2036	4,775	4,245
2037	3,168	616	702	4,486	2037	322	322	2037	4,808	4,273
2038	3,168	628	716	4,512	2038	328	328	2038	4,840	4,303
2039	3,168	641	730	4,539	2039	335	335	2039	4,874	4,332
2040	3,168	654	745	4,567	2040	341	341	2040	4,908	4,363
2041	3,168	667	760	4,595	2041	348	348	2041	4,943	4,394
2042	3,168	680	775	4,623	2042	355	355	2042	4,978	4,425
2043	3,168	694	791	4,652	2043	376	376	2043	5,028	4,469
2044	3,168	707	806	4,682	2044	438	438	2044	5,120	4,551
2045	3,168	722	823	4,712	2045	510	510	2045	5,223	4,642
TOTAL PASSENGERS GAINED (PER YEAR)										
BLUE	Peak Direction, Long Trips	Peak Direction, Short Trips	Off Peak Direction	TOT	ORANGE	Peak Direction, Peak Hour	TOT	TOTAL	TOT	
2018	499,363	107,369	122,414	729,147	2018	56,077	56,077	2018	785,224	697,977
2019	522,960	109,517	124,863	757,340	2019	57,198	57,198	2019	814,538	724,034
2020	544,148	111,707	127,360	783,215	2020	58,342	58,342	2020	841,558	748,051
2021	565,760	113,941	129,907	809,609	2021	59,509	59,509	2021	869,118	772,549
2022	587,804	116,220	132,505	836,530	2022	60,699	60,699	2022	897,229	797,537
2023	610,289	118,544	135,155	863,989	2023	61,913	61,913	2023	925,902	823,024
2024	616,548	120,915	137,858	875,322	2024	63,152	63,152	2024	938,474	834,199
2025	618,150	123,334	140,616	882,100	2025	64,415	64,415	2025	946,514	841,346
2026	619,784	125,800	143,428	889,013	2026	65,703	65,703	2026	954,716	848,636
2027	637,209	128,316	146,296	911,822	2027	67,017	67,017	2027	978,839	870,079
2028	655,318	130,883	149,222	935,423	2028	68,357	68,357	2028	1,003,780	892,249
2029	673,789	133,500	152,207	959,496	2029	69,724	69,724	2029	1,029,221	914,863
2030	692,629	136,170	155,251	984,051	2030	71,119	71,119	2030	1,055,169	937,928
2031	711,846	138,894	158,356	1,009,096	2031	72,541	72,541	2031	1,081,637	961,455
2032	731,448	141,672	161,523	1,034,642	2032	73,992	73,992	2032	1,108,634	985,453
2033	751,441	144,505	164,754	1,060,700	2033	75,472	75,472	2033	1,136,172	1,009,930
2034	771,834	147,395	168,049	1,087,278	2034	76,981	76,981	2034	1,164,260	1,034,897
2035	792,636	150,343	171,410	1,114,388	2035	78,521	78,521	2035	1,192,909	1,060,364
2036	804,672	153,350	174,838	1,132,860	2036	80,091	80,091	2036	1,212,951	1,078,179
2037	804,672	156,417	178,335	1,139,423	2037	81,693	81,693	2037	1,221,117	1,085,437
2038	804,672	159,545	181,901	1,146,118	2038	83,327	83,327	2038	1,229,446	1,092,840
2039	804,672	162,736	185,539	1,152,947	2039	84,994	84,994	2039	1,237,941	1,100,392
2040	804,672	165,991	189,250	1,159,913	2040	86,694	86,694	2040	1,246,606	1,108,095
2041	804,672	169,311	193,035	1,167,018	2041	88,427	88,427	2041	1,255,445	1,115,951
2042	804,672	172,697	196,896	1,174,265	2042	90,196	90,196	2042	1,264,461	1,123,965
2043	804,672	176,151	200,834	1,181,656	2043	95,464	95,464	2043	1,277,121	1,135,218
2044	804,672	179,674	204,850	1,189,196	2044	111,338	111,338	2044	1,300,534	1,156,030



**California Air Resources Board (ARB)
 Greenhouse Gas Emission Reduction Calculator for the
 California Department of Transportation (Caltrans)
 Low Carbon Transit Operations Program (LCTOP)
 Greenhouse Gas Reduction Fund
 Fiscal Year 2015-16**

Project Name:	Trolley Capacity Improvements
Project ID:	0

Inputs in RED must be filled out

Results	GHG Emissions (MTCO2e)	Description
Net GHG Benefits	1,421.82	Total GHG Emission Reductions (MTCO2e)
LCTOP Funds Requested (\$)	3,663,014.00	Funds requested per State Controller's Office Eligible list for FY 2015-16
Total LCTOP Funds Requested (\$)	3,663,014.00	Includes all LCTOP allocations the applicant intends to utilize (up to three FY allocations including FY 2015-16) for the proposed project. Use the State Controller's Office Eligible list for FY 2015-16 allocation funding amounts to estimate the subsequent funding allocations.
Total GGRF Funds Requested (\$)	36,944,826.61	Includes the Total LCTOP fund requested and any other GGRF Program monies
Total GHG Emission Reductions / Total GGRF Funds Requested (\$)	0.0000	The metric to be reported in the application.

Displaced Autos Details					New/Expanded Vehicle Details		
YrF Annual Ridership	Adjustment (A)	Length (L)	Adjustment (AA)	Length (LL)	Annual Average VMT Displaced	Fuel Type	Engine MY
1,156,030	0.69	6.65	0.05	2.00	4,248,474.79	Electric (Light Rail)	
					-		
					-		
					-		
					-		
					-		
					-		
					-		

