

MEMORANDUM

To: Robert Webster
Bohannon Development Company

From: Mike Mowery P.E. and Elizabeth Chau, P.E.
Kimley-Horn and Associates, Inc.

Date: April 14, 2023

Subject: Hillsdale North Block Trip Generation Analysis

In 2016, the City of San Mateo (City) granted Bohannon Development Company (Bohannon) approval for the Hillsdale North Block Redevelopment which allowed for retail and restaurant uses. Bohannon is proposing that office use be allowed for a portion of Building L in the North Block area. This memorandum summarizes the result of a trip generation analysis and level of service review for the proposed change.

Background

Hillsdale Shopping Center is located adjacent to El Camino Real between 29th Avenue and Hillsdale Boulevard in San Mateo, California. The “North Block” area of the shopping center consists of buildings located between 29th Avenue and 31st Avenue. The proposed change is in Building L, located between El Camino Real and Sailer Drive, north of 31st Avenue as shown in **Figure 1**.

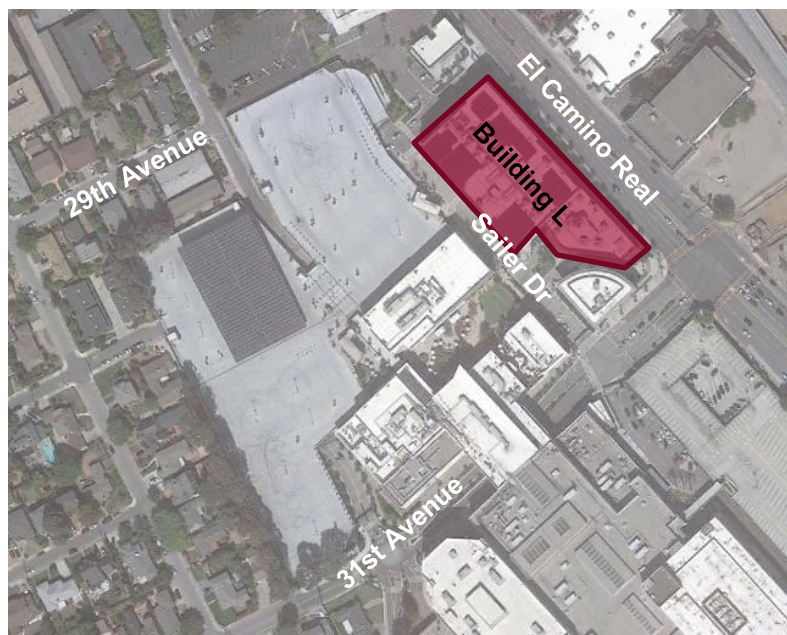


Figure 1: Hillsdale North Block

Bohannon is proposing that 41,289 square-foot of the lower level of the Building L consist of:

- 37,611 square feet office
- 3,678 square feet retail

There are no leasable square footage changes anticipated due to this proposed change. The proposed floor plan is included as **Attachment A**.

Trip Generation

A trip generation analysis was conducted to determine the change in the number of trips between the 2016 approved uses and the proposed uses. The trip generation was determined based on average rates from Institute of Transportation Engineer's (ITE) publication, *Trip Generation, 11th Edition*.

ITE *Trip Generation, 11th Edition* is a standard reference used by jurisdictions throughout the country for the estimation of trip generation potential of proposed projects. This resource provides trip rates based on land use. Even through the square footage of the approach and proposed retail use is less than 150,000 square feet, Land Use 820: Shopping Center (>150k) was assumed because the Project is part of the Hillsdale Shopping Center, a regional shopping mall. Land Use 710: General Office Building was assumed for the proposed office use.

For certain land uses such as retail and restaurant, pass-by trip reductions are typically considered to account for trips that would already be on the road and would likely stop as they pass by the site. However, to be consistent with the 2015 transportation impact analysis (TIA)¹, no pass-by trip reduction was assumed.

Internal capture reductions were considered to account for the interaction between the retail and office uses. The standard engineering reference for determining internal capture reductions for the proposed land uses is the ITE *Trip Generation Handbook, 3rd Edition*. ITE methodology does not include calculations for daily trips, therefore an average percentage of the AM and PM peak hours were used.

As shown in **Table 1**, the proposed project would generate a net -993 daily, +23 AM peak, and -80 PM peak hour trips compared to the land uses approved in 2016.

¹ Hexagon Transportation Consultants, Inc. *Hillsdale Shopping Center North Block Redevelopment Transportation Impact Analysis*. November 2015

Table 1: Lower Level Building L Approved and Proposed Trip Generation Comparison

ITE Land Use Code		Size	Size		Daily Trips	AM Peak			PM Peak		
						Rate	In%	Out%	Rate	In%	Out%
710		General Office Building	1,000 Sq Ft		10.84	1.52	88%	12%	1.44	17%	83%
820		Shopping Center (>150k)	1,000 Sq Ft GLA		37.01	0.84	62%	38%	3.40	48%	52%
Scenario	ITE Land Use Code	Land Use	Size	Units	Daily Trips ¹	AM Peak			PM Peak		
						Total	In	Out	Total	In	Out
Existing	820	Shopping Center (>150k)	41.289	1,000 Sq Ft GLA	1,528	35	22	13	140	67	73
	Total Existing Trips										
Proposed	710	General Office Building	37.611	1,000 Sq Ft	408	57	50	7	57	10	47
	820	Shopping Center (>150k)	3.678	1,000 Sq Ft GLA	136	3	2	1	3	1	2
	Proposed Subtotal				544	60	52	8	60	11	49
	Internal Capture ¹				-9	-2	-1	-1	0	0	0
	Proposed External Trips				535	58	51	7	60	11	49
Difference (Proposed - Approved)					-993	23	29	-6	-80	-56	-24

Source: ITE Trip Generation, 11th Edition

¹ Internal Capture calculated using ITE *Trip Generation Handbook, 3rd Edition* methodology. *Trip Generation Handbook* does not provide daily internal capture; therefore the average AM and PM reduction were assumed.

Level of Service Review

Kimley-Horn reviewed the 2015 TIA to determine if the proposed change would result in any significant changes to the level of service (LOS) of near-by intersections. The 2015 TIA found that all eight (8) study intersections would operate at LOS D or better in the PM peak hour for the Cumulative Plus Project conditions. The LOS for the AM peak hour was not evaluated. It is anticipated that the proposed change would not increase delay since the project would result in a decrease of trips during the PM peak hour. Although the AM peak hour was not previously evaluated, it is reasonably assumed that the project 23 additional trips based on the proposed change would not result in a new intersection deficiency. It should also be noted that this increase in trips is lower than the City's 100 trip threshold² for analyzing an intersection.

VMT Screening

As of July 1, 2020, the State of California has fully adopted a change in the California Environmental Quality Act (CEQA) significant impact methodology for transportation impacts to use vehicle miles traveled (VMT) as opposed to level of service (LOS) via State Bill 743 (SB 743). To address this change, the City of San Mateo developed *Transportation Impact Analysis Guidelines*. This document provides screening criteria to determine if VMT analysis is required for land use projects. A project may be exempt from performing VMT analysis if the project meets at least one screening criteria based on:

- Small Project
- Affordable Housing
- Local-serving retail
- Project located in High-Quality Area (HQTA)
- Project located in a low VMT area

For a mixed-use project, either the dominant use (use generates 80% of total daily trips) or each component are evaluated independently. Based on **Table 1**, neither retail nor office would be considered a dominate use, therefore each land use was evaluated independently.

Results of the VMT land use screening are summarized in **Table 2**. Based on the current Project information given for this analysis, both land uses do not meet any VMT screening criteria and would need to complete a VMT analysis. Detailed evaluation for each criterion is discussed in the following sections.

² City of San Mateo, *Transportation Impact Analysis Guidelines*. July 2020

Table 2: VMT Screening Summary

VMT Screening Criteria	Criterion Met?	
	Office	Retail
Small Project	No	No
Affordable Housing	N/A	N/A
Local-serving Retail	N/A	No
Project located in High-Quality Transit Area (HQTa)	No	No
Project located in a low VMT area	No	No

Small Project

Small projects are defined as projects that generate less than 110 average daily trips. An average of 110 average daily trips roughly equates to:

- 10 single family residential units
- 11 multifamily residential units
- 11,000 square feet of office

As shown in **Table 1**, both land uses generated more than 110 average daily trips and do not meet this criterion.

Affordable Housing

Affordable housing consists of residential projects with 100 percent deed restricted affordable housing. The criterion is not applicable for the Project since there are no components that fits this description.

Local-serving Retail

Local-serving retail develops are less than 50,000 square feet gross floor area and primarily provide goods and services that most people need on a regular basis and are purchase close to where people live. Examples of local-serving retail include groceries, medicine, fast-foot and casual restaurant, and fitness and beauty services.

Even though the retail component of the Project is less than 50,000 square foot, the Project is part of the Hillsdale Shopping Center, which is a regional mall and does not meet this criterion.

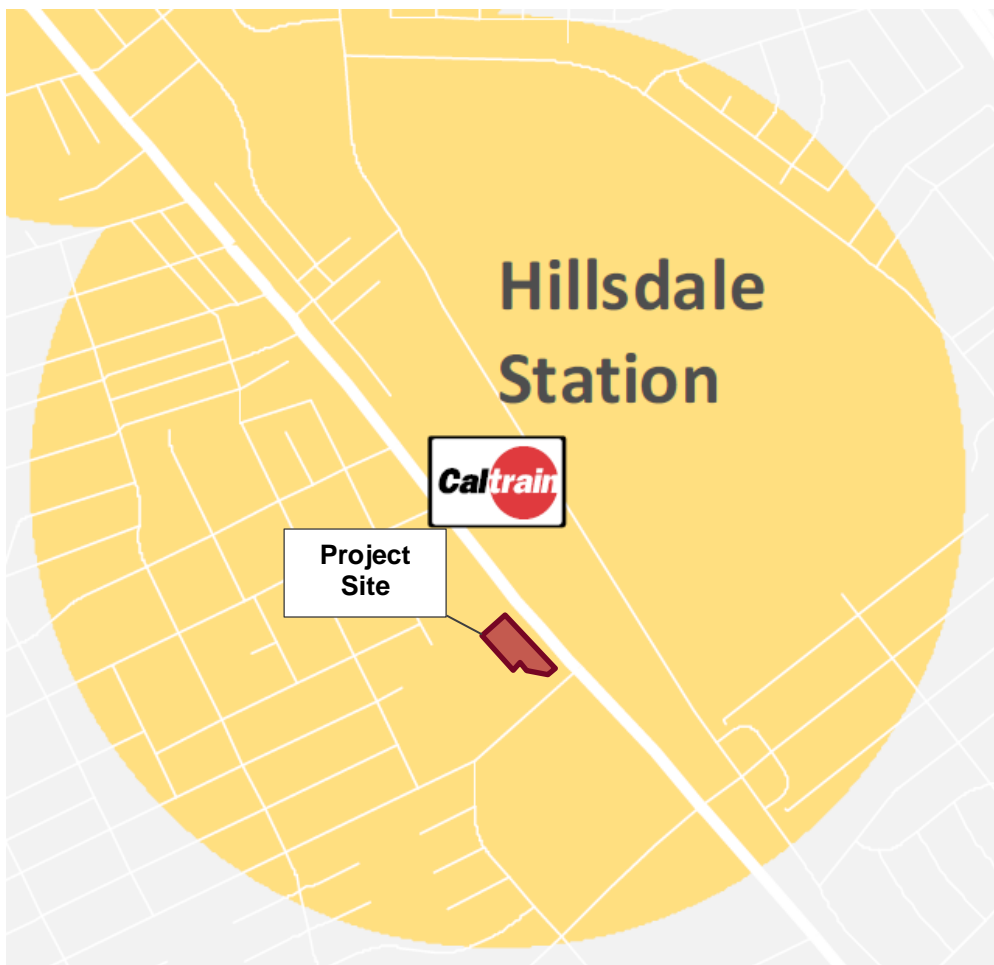
High-Quality Transit Area (HQTa)

A detailed VMT analysis is not required for developments within high-quality transit area (HQTa). Based on the City's HQTa map, **Figure 2**, the project is located in the HQTa. It should be noted that the HQTa screening is not applicable if the project:

- Has floor Area Ratio (FAR) of less than 0.75
- Includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction

- Is inconsistent with the applicable MTC sustainable Communities Strategies (SCS), as determined by the City or,
- Replaces affordable residential units with a smaller number of moderate- or high-income residential units.

The parking requirement for North Block area is 1,029 spaces and 4,443 for the overall shopping center. There are 1,375 spaces in the North Block area and the overall shopping center provides 4,982 spaces. The Project does not qualify as HQTAs since both North Block and the overall shopping center provide more parking than required.

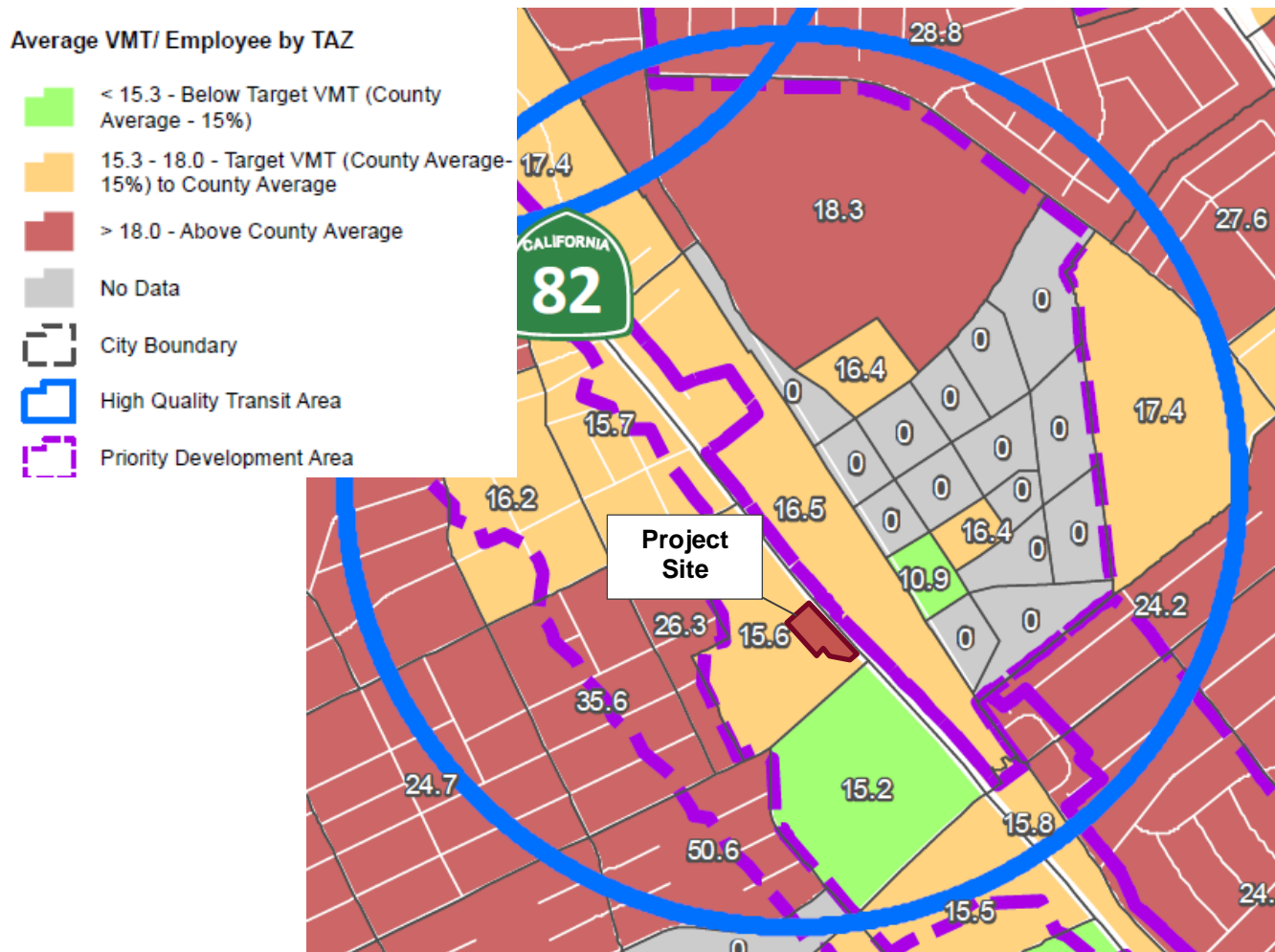


Source: City of San Mateo, *Transportation Impact Analysis Guidelines, 2020 (Attachment A – High-Quality Transit Areas)*

Figure 2: Except of City's High-Quality Transit Area Map

Low VMT area

Developments located in a TAZ that generates VMT below the City's threshold (15 percent lower than County average or 15.3 VMT per employee) may be exempt. As shown in **Figure 3**, the VMT for the Project's TAZ generates more than City's threshold and does not satisfy this criterion.



Source: City of San Mateo, *Transportation Impact Analysis Guidelines, 2020* (Attachment B – Average VMT per Employee by TAZ, VMT per Employee Labeled)

Figure 3: Except of City's VMT per Employee Map

VMT Analysis

Based on **Table 2**, neither land use meets the VMT screening criteria and a VMT analysis is required. For a mixed-use project, either the dominant use (use generates 80% of total daily trips) or each component are evaluated independently. Based on **Table 1**, neither retail nor office would be considered a dominate use, therefore each land use was evaluated independently.

Retail

For retail, a significant impact occurs if the Project causes a net increase in total VMT. Since the retail component of the Project is reducing retail space from 41,239 to 3,678 square feet, this would result in a reduction in total retail VMT and there will not be a significant impact.

Office

Table 3 summarizes the Office VMT for the project. For office, a significant impact occurs if the Project VMT/employee is greater than 15% percent below the existing San Mateo County average (18.0 VMT per employee) which equates to an impact threshold of 15.3 VMT per employee. As shown in **Figure 3**, the Project's VMT without any TDM VMT reduction is 15.6, which exceeds the City's threshold. The project would need to implement TDM measures to reduce its VMT per employee by 0.3 or 2%.

To mitigate the VMT impact, a TDM program (**Attachment B**) for the office use was developed. The office TDM program incorporates elements from the current Hillsdale Shopping Center TDM program for retail uses. Based on the office TDM plan, it is anticipated that the TDM measures would result in a 15% VMT reduction or 13.3 VMT per employee. With the implementation of the TDM program the Project VMT per employee will be less than the City's threshold of 15.3 and would not result in a significant impact.

Table 3: Office VMT Summary

	VMT/employee
San Mateo County Average	18.0
Impact Threshold	15.3
Project (w/o TDM)	15.6
Project (w TDM)	13.3

Office TDM Program Effectiveness

The anticipated effectiveness of the office TDM program for the Project was estimated using Mobility Lab *TDM-ROI Calculator*. The *TDM-ROI Calculator* provides estimate in the reduction of vehicle trips and VMT.

The tool estimates TDM effectiveness based on inputs such as transportation information, TDM program elements, and number of participants. The number of participants was based on the number of employees calculated in **Table 4** and mode split shown in **Table 5**. For **Table 5**, mode split is based

on existing City's work commute mode split, which may underrepresent the amount of transit riders since the Project is located within 0.25 miles from the Hillsdale Caltrain Station.

Table 4: Number of Employees

Land Use	Employee per SF		Square Feet	# Employees
	Typical Range	Average		
Office	125-175	150	37,611	251

Note: Number of employees was calculated based on average employee per square feet.

Table 5: Project Initial Mode Split

Mode	Mode Split %	Person Trips
SOV	74%	185
Carpool	9%	23
Transit	11%	28
Bicycle	1%	3
Walk	3%	7
Other	2%	5
Total	100%	251

Table 6 summaries the anticipated reduction in number of trip and VMT for each element in the TDM plan. It should be noted that *TDM-ROI Calculator* provides a range in reduction to reflect how the TDM effectiveness may shift over time. In the beginning many TDM programs are less effective as employees may be unaware of the TDM program elements available to them. The TDM program may become more effective as marketing and information spreads and elements are refined to be more robust and reliable. As shown in **Table 6** it is anticipated that TDM measures would result in 57-147 trip reduction or 1,103-3,121 VMT reduction. **Table 7** summaries the TDM percent reduction results from the *TDM-ROI Calculator* analysis compared to the base, with no adjustment totals. It is anticipated that the TDM program would result in a **16-41%** trip and **15-43%** VMT reduction. Results of the Lab *TDM-ROI Calculator* are included as **Attachment C**.

As discussed, the Project VMT per employee of 15.6 exceeds the City's threshold of 15.3. Based on the VMT reduction shown in **Table 7**, it is anticipated that the in the beginning the TDM plan would reduce Project VMT by 15% or 13.3 VMT per employee which satisfies the City's VMT threshold.

Table 6: Trip and VMT reduction by TDM Element

TDM Element	C/CAG Measure ID	# Participants ¹	Lower Bound		Upper Bound	
			Trip	VMT	Trip	VMT
Core Commute Information/Assistance						
Carpool ride matching	1,4,5	12	0	9	1	18
Comprehensive commute assistance	3,4	251	18	334	36	669
Vanpool formation	1,4,5	12	1	46	5	203
Guaranteed/Emergency Ride Home	4	66	1	22	10	176
Commute program website	3,4	251	2	39	4	79
Commute challenges/events	3,4	75	0	1	1	11
General marketing	3,4	251	0	0	0	0
Financial Measures						
Ongoing transit incentive	6,7	28	11	146	12	162
Ongoing multi-modal incentive	6,7,8	15	8	147	9	163
Alternative mode "try it" incentive	4,6,7	185	9	163	40	723
Area-wide vanpool incentive	4,5	23	3	153	15	679
New Mode Options ²						
On-demand, dynamic ride match	3,4	23	0	0	0	2
Commuter express bus	3,4	1	0	0	0	0
Non-express bus	3,4	27	0	0	0	0
Bike commute program	3,4,8,9,24	3	0	1	0	2
Employer Program Support						
Employer Services (Low/Moderate)	1,3,4,5,8,9,24,25	251	2	35	6	87
Telework	3,4	126	0	4	6	98
Compressed work schedule	3,4	126	0	2	3	49
Total	-	-	57	1,103	147	3,121

1 An employees can participate in more than one TDM element.

2 New Mode Options consist of promotion and/or operation of alternative modes for commuters.

Table 7: Vehicle Trips and VMT Reduction Percentage

Mode	Trips	% Reduction	VMT	% Reduction
Base No Adjustment	358	-	7,293	-
TDM Reduction (lower bound)	57	16%	1,103	15%
TDM Reduction (upper bound)	147	41%	3,121	43%

Conclusion

In 2016 the City of San Mateo approved retail and restaurant uses for the Hillsdale North Block Redevelopment project. Currently Bohannon is proposing that 37,611 square feet on the lower level of Building L be allowed for office use. Kimley-Horn conducted a trip generation analysis and reviewed the 2015 transportation impact analysis to determine if the proposed change would result in additional level of service (LOS) impacts. The proposed change would result in net -993 daily, +23 AM, and -80 PM peak hour trips and no new additional LOS deficiencies would result from this change in use.

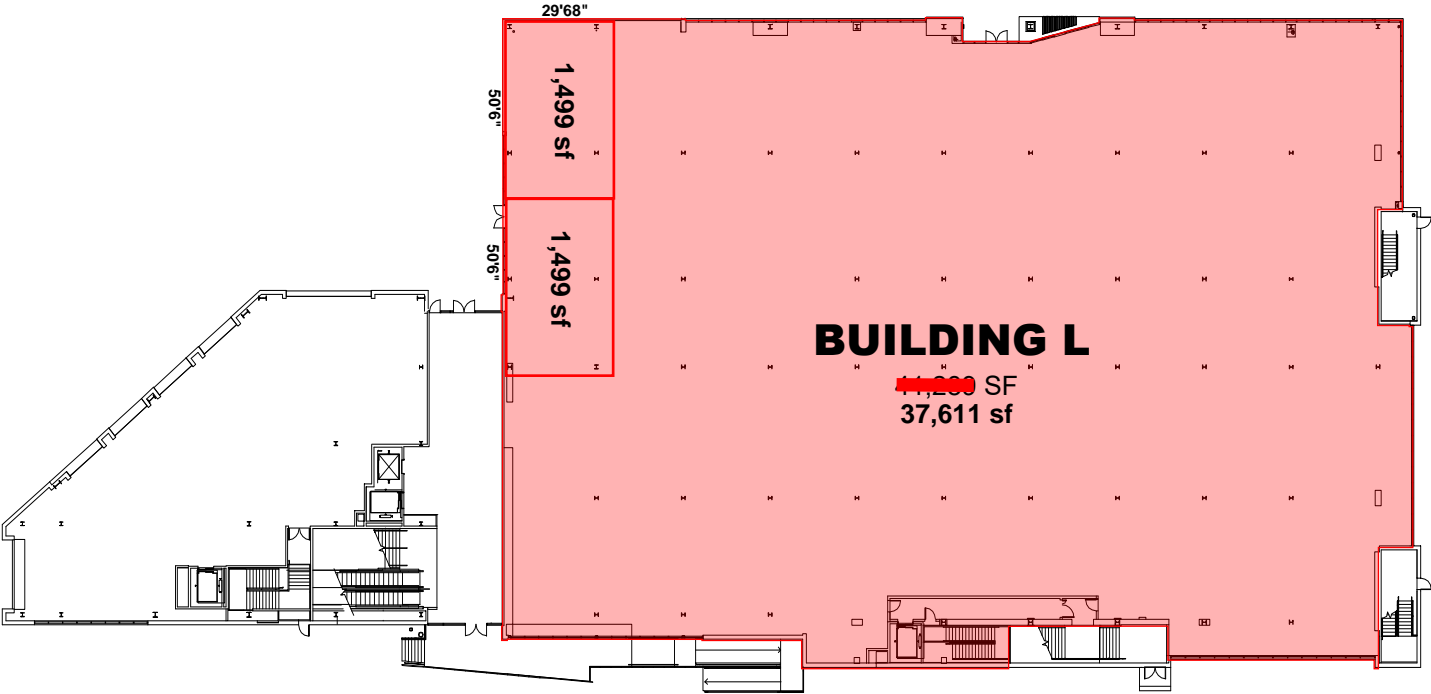
City's VMT land use screening criteria were reviewed to determine if further VMT analysis is required. For this analysis the office and retail components were evaluated independently. Based on the current Project information given for this analysis, both land uses do not meet any of the screening criteria.

VMT analysis was conducted for each land use separately since neither land use generations more than 80% of the daily trips. There is not a significant impact for the retail component because there will be a reduction in VMT due to decreasing the amount of retail from existing condition. For the office component, the City's VMT maps show 15.6 VMT per employee, which exceeds the City's threshold of 15.3. However, the Project updated its TDM program to include the office component, which would result in a 15% reduction in VMT. This result in a 13.3 VMT which is less than the City's threshold and would not result in a significant impact.

Attachment A – Floor Plan

Attachment B – Hillsdale Shopping Center North Block – Building L Professional Office Transportation Demand Management Plan

Attachment C – TDM-ROI Calculator Results



LOWER LEVEL FLOOR PLAN





Hillsdale Shopping Center North Block – Building L Professional Office

Transportation Demand Management (TDM) Plan

March 31, 2023

Contents

1.	Introduction	3
1.1.	Transportation Demand Management (TDM) Background and Policies	3
1.1.1.	City/County Association of Governments of San Mateo County (C/CAG).....	3
1.1.2.	City of San Mateo	3
2.	Project Setting	5
2.1.	Existing Transit Service	5
2.1.1.	SamTrans	5
2.1.2.	Caltrain.....	6
2.2.	Existing Bicycle and Pedestrian Facilities	7
2.2.1.	Bicycle Facilities.....	7
2.2.2.	Pedestrian Facilities.....	7
2.3.	Existing Mode Split.....	7
3.	Transportation Demand Management (TDM) Program	8
3.1.	Framework.....	8
3.1.1.	TDM Coordinator.....	8
3.1.2.	Transportation Management Association (TMA) Membership	8
3.2.	Education	8
3.2.1.	Welcome Packets & Newsletter.....	8
3.2.2.	Hillsdale Shopping Center Website	9
3.2.3.	Customer Service Centers.....	9
3.2.4.	Commute.org	9
3.3.	Program Elements.....	9
4.	Monitoring and Evaluation.....	13
4.1.	Review of TDM Plan	13
4.2.	Monitoring.....	13
4.2.1.	Biannual Travel Survey	13
4.3.	Evaluation	13

1. Introduction

This document presents an update to the current Transportation Demand Management (“TDM”) plan for the Hillsdale Shopping Center North Block (“Project”), which is a mixed-used development located in San Mateo (“City”), California. This TDM is for the **professional office use in Building L** within the mixed-use development.

1.1. Transportation Demand Management (TDM) Background and Policies

This TDM plan was developed to meet County and City requirements.

1.1.1. City/County Association of Governments of San Mateo County (C/CAG)

C/CAG’s *Transportation Demand Management Policy Implementation Guide* requires development that generate at least 100 average daily trips (ADT) is subjected to C/CAG’s TDM policy and must complete a TDM Checklist, as well as conduct regular monitoring and reporting.

The office use for the proposed Building L is considered a “small” project and a transit-oriented development (TOD). TOD has a trip reduction target of 25%.

1.1.2. City of San Mateo

1.1.2.1. Mitigation for VMT impacts

As of July 1, 2020, the State of California has fully adopted a change in the California Environmental Quality Act (CEQA) significant impact methodology for transportation impacts to use vehicle miles traveled (VMT) as opposed to level of service (LOS) via State Bill 743 (SB 743). To address this change, the City of San Mateo developed *Transportation Impact Analysis Guidelines*.

A VMT analysis was completed for the Project and found that the baseline VMT per employee for the Project (15.6 VMT per employee) would exceed the City’s threshold of 15.3 VMT per employee. This TDM plan is required to mitigation VMT impacts of the Project.

1.1.2.2. Hillsdale Station Area Plan

The Hillsdale Station Area Plan (HSAP) encompassing roughly 150 acres surrounding the Hillsdale Caltrain Station such. The HSAP includes the following TDM-related policies:

Policy TRA-4.1: New development on properties in the Station Area must develop a Trip Reduction and Parking Management Program, following the recommendation in Appendix A of this Plan, including implementing the required and optional measures for both employers and residential developments. The Hillsdale Shopping Center shall complete such a program but may make implementation optional for employers that are tenants of the Shopping Center.

Policy TRA-4.2: Expand the Transportation Management Association (TMA) formed under the Rail Corridor Plan to include all properties within the Stations Area and require that all new development join the TMA. The Hillsdale Shopping Center’s participate in the TMA will consist of optional measures, but it will not be subjected to the TMA’s trip reduction goals.

1.1.2.3. San Mateo Rail Corridor Transit Oriented Development Plan

The San Mateo Rail Corridor Transit Oriented Development Plan aims to create TOD within a half-mile of Hillsdale and Hayward Park Caltrain station. The Hillsdale Shopping Center is outside the TOD zone boundary. This plan includes the following TDM policy:

Policy 7.19: All development within the TOD zone shall be required to submit trip reduction and parking management plan as part of the development application. Projects outside the TOD zone, but within the Corridor Plan area shall be strongly encouraged to submit this trip reduction and parking management information as part of the development application. The zoning code shall be modified to establish a threshold defining project such as remodeling or additions to existing development within the Corridor Plan area that trigger the TDM requirement.

1.1.2.4. Hillsdale Shopping Center North Block Reconfiguration Transportation Management Plan (TMP)

The Hillsdale Shopping Center North Block Reconfiguration Transportation Management Plan (TMP), dated November 2015, was developed as part of the North Block Reconfiguration project. This document provides TDM measures to encourage trip reduction for the North Block area. Some of these TDM measures include:

- Site design (sidewalk, pedestrian crossing, etc.)
- Onsite Amenities
- Clean air vehicle parking
- Bicycle parking
- TDM Coordinator
- Website information
- Transit Information Kiosks
- Welcome Packet for new tenants
- TMA membership (emergency ride home, carpool/vanpool incentives, shuttle program, commute employer incentive program)

It is anticipated that the TMP continues to apply to all retail uses.

2. Project Setting

This section provides additional information on the existing transit service and bicycle facilities near the Project site, as well as existing commuting trends.

2.1. Existing Transit Service

The Project is located within 0.25-mile (10-minute walk) from the Hillsdale Caltrain Station and bus stops along El Camino Road, a high-quality transit corridor, as shown in **Figure 3**. **Table 2** presents existing transit service.

2.1.1. SamTrans

SamTrans provide multiple bus routes through San Mateo County. Project employees and patrons may access these bus stops at bus stops located El Camino Real near 27th Avenue, 31st Avenue, and Hillsdale Boulevard. There are three bus stops along El Camino Real. Two are located near 31st Avenue and one near Hillsdale Boulevard. Bus routes 57, 251, 256, 294, 295, 397 and ECR service these bus stops.

2.1.2. Commute.org Shuttle

Commute.org provides first-last mile shuttle services between transit stations and major destinations such as workplaces, hospital, schools, commercial areas, and residential areas throughout San Mateo County. Near the Project, three shuttle lines (Campus Drive, Lincoln Centre, and Mariners') operates Mondays through Fridays during the morning (6:40-9:25 AM) and evening (3:45-6:45 PM) periods and is free for all passenger and is open to the public. The closest Commute.org shuttle stop is at the Hillsdale Caltrain Station.

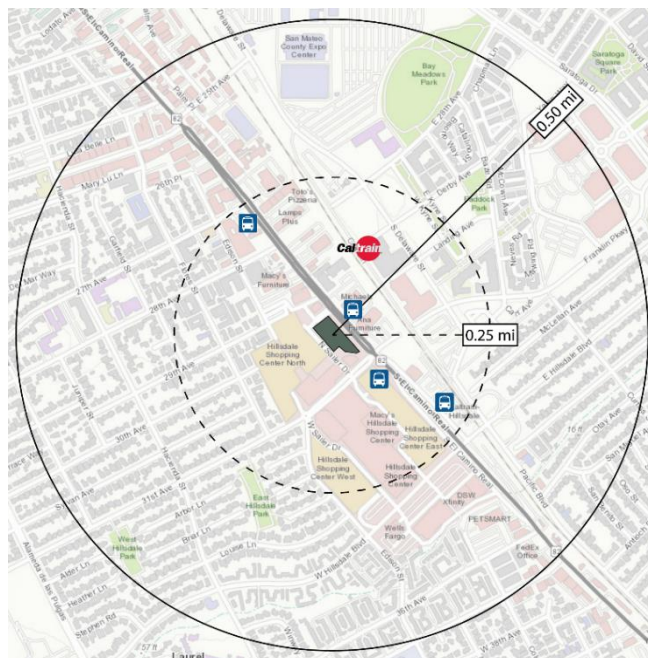


Figure 1: Proximity to Transit

Table 1: Existing Transit Service

Route	Description	Weekday			Weekend	
		Operating Hours ¹	Headway ² (minutes)		Operating Hours ¹	Headway ² (minutes)
			Weekday Peak	Weekday Off-Peak		
SamTrans						
51	Foster City – Hillsdale HS	– ³	-	-	No weekend services	
57	Edgewater/Beach Park – Hillsdale High	– ³	-	-	No weekend services	
250	San Mateo Caltrain – College of San Mateo	6:00 AM to 10:55 PM	30	30-60	7:30 AM to 8:30 PM	60
251	Foster City – Hillsdale Mall	6:40 AM to 8:25 PM	60	60	7:30 AM to 7:15 PM	60
294	Hilldale – Half Moon Bay	6:55 AM to 9:55 PM	60	60-120	7:40 AM to 9:40 PM	60
397	San Francisco – Palo Alto Transit Center (Limited Overnight Service)	1:50 AM to 5:45 AM	-	45-60	1:50 AM to 5:45 AM	45-60
ECR	Daly City BART – Palo Alto Transit Center	4:35 AM to 1:15 AM ⁴	15	15-30	5:20 AM to 1:45 AM ⁴	15-30
Commute.org Shuttle						
CAM	Campus Drive (Hillsdale Caltrain)	6:40 to 8:40 AM; 3:45 to 6:45 PM	60	-	No weekend services	
LC	Lincoln Centre (Hillsdale Caltrain)	7:05 to 9:05 AM; 3:50 PM to 5:50 PM	60	-	No weekend services	
MAR	Mariners’ Island (Hillsdale Caltrain)	6:45 to 9:25 AM; 4:45 to 6:30 PM	45-60	-	No weekend services	
Caltrain						
Northbound	Gilroy – San Francisco	5:20 AM to 10:05 PM	25-45	25-35	8:10 AM to 12:10 AM ⁵	60-105
Southbound	San Francisco - Gilroy	5:35 AM to 10:05 PM	25-45	25-35	9:10 AM to 12:50 AM ⁵	60-90

Notes:

¹ Operating Hours rounded to the nearest 5 minutes for weekdays and weekends. Sunday may have reduced schedules.

² Headways are defined as the time between transit vehicles on the same route.

³ Routes 51 and 57 are a school routes which operate on school days.

⁴ Last Route ECR buses arrives at Hilldale Station the following day.

⁵ Last Caltrain train arrives at Hilldale Station the following day.

Source: SamTrans (December 2022), Commute.org (May 2022) Caltrain (December 2022)

2.1.3. Caltrain

Caltrain provides commuter-oriented passenger rail services between San Francisco County and Santa Clara County. The nearest Caltrain stop is at the Hillsdale Station, which is 0.25-miles, approximately 10-minute walk from the Project site. Currently during the weekday, the station is serviced by Local, Limited, and Baby Bullet trains.

It should be noted that due to the Caltrain Electrification project, there are short-term weekend service changes throughout the year starting in February 2023.

2.2. Existing Bicycle and Pedestrian Facilities

2.2.1. Bicycle Facilities

Bicyclists may access the Project through the existing bikeway facilities throughout San Mateo. The City designates Class I bicycle facilities as shared-use path, Class II bicycle facilities as bicycle lanes, Class III bicycle facilities as bicycle boulevards, and Class IV as separated bicycle lanes. Below is a list of bicycle facilities near the Project site:

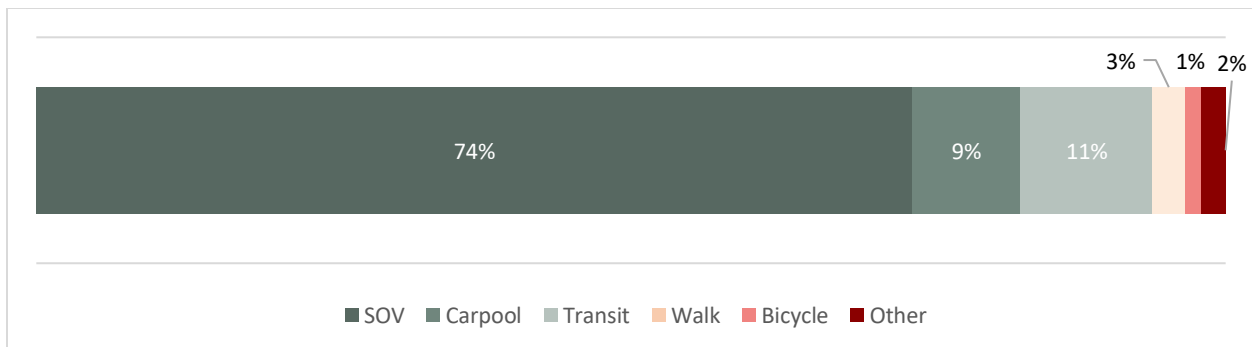
- Delaware Street:
 - Class II bicycle lanes between Fashion Island Boulevard and 28th Avenue
 - Class III Bicycle route between 28th Avenue and Pacific Boulevard
- Hacienda Street: Class III bicycle route between 25th Avenue and 41st Avenue
- Hillsdale Boulevard:
 - Class II bicycle lane between Hillsdale Place and Edison Street
 - Class III bicycle route east of Edison Street
- 28th Avenue
 - Class I lanes between El Camino Real and Delaware
 - Class III bicycle boulevard between Mason Lane and El Camino Real
- Proposed Bicycle Boulevard along 31st Avenue and Flores Street.

2.2.2. Pedestrian Facilities

There are sidewalks and crosswalks along El Camino Real, 31st Avenue, and other nearby streets which connects employees and patrons to transit stops and other uses.

2.3. Existing Mode Split

Figure 4 illustrates the City's work commute transportation mode split based on the recent American Community Survey. The most common mode is automobile where 74% drive alone in cars and 9% carpool. Other modes include transit (11%), bicycle (3%), walking (1%), and other (2%).



Note: Total sum may be off due to margin of error for the data set.

Source: American Community Survey – B08301 Means of Transportation to Work (2019)

Figure 2: AM and PM Transportation Mode Splits

3. Transportation Demand Management (TDM) Program

3.1. Framework

The TDM program will be comprised of three major components: 1) Education, 2) Program Elements, and 3) Monitoring. The Education component is discussed in Section 3.2; the Program Elements component is discussed in Section 3.3; and the Monitoring component is discussed in Section 4.

3.1.1. TDM Coordinator

The Hillsdale Shopping Center has a TDM Coordinator which is responsible for promoting alternative modes of travel and TDM program elements to tenants and their employees. The TDM Coordinator may also organize and distribute transportation information material.

3.1.2. Transportation Management Association (TMA) Membership

Transportation Management Association (TMA) oversee TDM program implementation and assist with oversight and coordinating TDM measures. The Rail Corridor Association is the TMA for developments within the San Mateo Rail Corridor TOD plan area.

3.1.3. Commute.org

Commute.org is San Mateo County's TDM agency and provides variety of TDM-related services, such as:

- Employer-based shuttles program
- Guarantee ride home
- Carpool/vanpool incentive
- Commuter management and reward program (STAR)
- Try Transit Program
- Bike to work day
- Information and resources for employees and employers

3.2. Education

The Education component focuses on awareness and communication to reduce vehicle trips to the building by employees and visitors. This can be done by providing informational kiosks, new employee/residents packages, etc.

3.2.1. Welcome Packets & Newsletter

The TDM Coordinator provides transportation information packets to all new tenant and for distribution to employees commuting to the Hillsdale Shopping Center. This packet includes information on preferential parking programs, bike maps, ride matching services, transit maps/schedule, transit planning resources, and commuter benefit programs.

TDM opportunities are occasionally featured in the shopping center's newsletter.

3.2.2. Hillsdale Shopping Center Website

Hillsdale Shopping Center website, **Figure 4**, has a travel demand management page¹ which provides information related to TDM for the development. This website provides links to transit agencies (SamTrans and Caltrain) as well as City-related transportation websites (i.e. City of San Mateo, Sustainbilty.org)

3.2.3. Customer Service Centers

Hillsdale Shopping Center has two in-line Customer Service Centers where SamTrans and Caltrain schedules and pamphlets are readily available. Customer services are also able to assist with inquiring related to rider sharing (Uber, Lyft, taxi) or other transportation options.

3.2.4. Commute.org

Commute.org provides information related to TMA-shuttle and transit services, carpool/vanpool matching, STAR, employee and employer resources, and other assistance programs.

3.3. Program Elements

Table 3 summarizes the TDM program elements. These elements may change or be adjusted to adapt to changing commute trends and to maximize the efficiency and performance of the program.

¹ <https://hillsdale.com/transportation-demand-management/>



TRANSPORTATION DEMAND MANAGEMENT

is about providing choices to ensure alternative travel reliability.

Transportation Demand Management (TDM) is a combination of services, incentives, facilities, and actions that reduce single-occupant vehicle (SOV) trips to help relieve traffic congestion, parking demand, and air pollution problems. The purpose of TDM is to promote more efficient utilization of existing transportation resources, and to ensure that new developments are designed to maximize the potential for sustainable transportation usage.

Trains and Bus Routes



Figure 3: Screenshot of TDM website

Table 2: TDM Program Elements

C/CAG Required Measures					
	ID	Measure	Type	Measure Description	Vehicle Trip Reduction Impact
Parking Mgmt. For Ridesharing	M1	Free/Preferential Parking for Carpool	Programmatic	Preferential parking is provided carpooling in parking garage	1.0%
TDM Mgmt. & Admin	M3	TDM Coordinator	Programmatic	Hillsdale Shopping Center has a TDM Coordinator which promotes & informs tenants of TDM measures	0.5%
	M4	Actively Participate in TMA	Programmatic	Participate in Rail Corridor TMA or register with Commute.org, dependent on tenant program	6.5%
Shuttle, Transit & Ridesharing	M5	Carpool or Vanpool Program	Programmatic	Encourage carpool/vanpooling via welcome packet and newsletter.	2.0%
	M6	Transit or Ridesharing Passes/Subsides	Programmatic	Offer public transit/ridesharing passes or subsidies for employees, dependent on tenant program	10.0%
	M7	Pre-Tax Transportation Benefits	Programmatic	Offer option for tenants to participate in pre-tax transit program to encourage the use of sustainable transportation modes	1.0%
Active Transportation	M8	Secure Bicycle Storage	Site Design	BikeLink bicycle lockers are available in North Block Plaza.	1.0%
Site Design Initiatives	M9	Design Streets to Encourage Bike/Ped Access	Site Design	Building is closer to street and there is a pedestrian walkway off the corner of El Camino Real and 31 st Avenue	1.0%
TOTAL (Required Measures)					23.0%

C/CAG Additional Recommended Measures					
	ID	Measure	Type	Measure Description	Vehicle Trip Reduction Impact
Active Transportation	M24	Bike Repair Station	Site Design	Offer bicycle repair station or toolkit to encourage bicycling and support employees who cycle, dependent on tenant program	0.5%
Site Design Initiatives	M25	Pedestrian Oriented Uses & Amenities on Ground Floor	Site Design	Within walking distance to retail/restaurant uses in Hillside Shopping Center	3.0%
TOTAL (Recommended Measures)					3.5%
TOTAL (All Measures)					26.5%
Additional Measures					
	ID	Measure	Type	Measure Description	Vehicle Trip Reduction Impact
Education and Marketing	-	Welcome Packet & Newsletter	Programmatic	New tenants receive welcome packet which includes TDM information. TDM opportunities are occasionally features in shopping center newsletter.	-
	-	TDM Website	Programmatic	Dedicated website on shopping center webpage which provided TDM information	-
	-	Customer Service Centers	Programmatic	Two customer service centers that have transit schedule and pamphlets. Centers also have staff that can answer transportation-related inquiries.	-

4. Monitoring and Evaluation

As discussed in Section 1.1.1, C/CAG TDM program requires that Project regularly monitor and report its TDM program. Regular monitoring ensures that the TDM program is working effectively and achieving its target.

4.1. Review of TDM Plan

The TDM program should be reviewed at least on an annual basis. Adjustments should be made based on information from annual commute surveys, shifts in traffic pattern, change in technology. If necessary, adjustments to the TDM program may include:

- Implementing additional TDM elements
- Modifications to existing TDM elements (i.e. adding additional bicycle storage)

If adjustments are made to the TDM program, the TDM coordinator(s) will communicate these adjustments to employees and residents.

4.2. Monitoring

Regular monitoring is needed to assess effectiveness of the TDM program. The monitoring process would include the following:

- Biannual Travel Survey
- Commute.org Biannual TDM Survey

4.2.1. Biannual Travel Survey

Biannual travel survey will be conducted to assess the current use of alternative transportation options by employees. Results of the survey should be used to identify adjustments that could be made to sustain or increase the use of transit, carpool, bicycle, and walking. Results of this survey will also be used to fill out Commute.org biannual TDM survey.

4.2.2. Commute.org Biannual TDM Survey

Commute.org will distribute a survey to TDM coordinator. This survey will consist of TDM Self-Certification Form along with brief questionnaire about implemented TDM measures and user travel behavior at the project site.

4.3. Evaluation

Results of the TDM survey will be submitted to Commute.org. Commute.org will record and analyze survey response. If needed Commute.org will follow up with tenants reporting incomplete TDM measures or not achieving trip reduction goals.

TDM-ROI Calculator - Entry Worksheet

Welcome to the TDM-ROI Calculator. This spreadsheet-based method is a simple way to estimate the societal benefit return on investment (ROI) of transportation demand management services. The method:

- Estimates vehicle trip and VMT reductions from TDM services
- Converts vehicle trip and VMT travel impacts into societal benefits, such as reduction in travel time delay
- Calculates the cost savings from each benefit and the overall cost savings from all benefits combined
- Compares the societal cost savings to the TDM program "investment" cost to estimate ROI

To use the calculator, you will enter information about the TDM services you offer, commuter participation in the services and the area in which the services are implemented.

The calculator also requires data about travel changes (e.g., shifts to non-drive alone modes) resulting from use of services, which typically are derived from a survey of people who use the services or other feedback from users. The TDM-ROI calculator will insert an approximate default value for your type of area, but you can override those defaults if you have data about your services from surveys or other sources. (See the TDM-ROI User Guide for more information.)

A - Your Region, Service Area Type, and Transit Availability

First - answer the questions below to define the type of geographic setting that most closely reflects the area in which you provide TDM services:

Metropolitan Region (select from dropdown list at right)

San Francisco-Oakland-Hayward, CA

If your region is not listed, choose the national average or the area you think is most representative of your area.

In each of the four sections below, enter an "x" in the box that BEST represents your TDM area

1 - Primary land use density and development pattern (Select **ONLY ONE** option)

<input type="checkbox"/>	High density urban core, large city downtown
<input checked="" type="checkbox"/>	Moderate-high density, activity center (e.g., office park)
<input type="checkbox"/>	Moderate density urban or small city/town
<input type="checkbox"/>	Moderate density, suburban
<input type="checkbox"/>	Low density, suburban or rural

2 - Primary focus of TDM program outreach (Select **ONLY ONE** option)

<input checked="" type="checkbox"/>	Primarily to commuters at worksites/through employers
<input type="checkbox"/>	Primarily to commuters at residential areas
<input type="checkbox"/>	Balanced mix of outreach to commuters at worksites and residential areas

Your TDM Service Area classification is:

Urban/Activity center

3 - Percentage of commuters within 1/2 mi of bus/train stop in the service area (Select **ONLY ONE** option)

<input checked="" type="checkbox"/>	<u>76% to 100% of commuters</u> are within 1/2 mile of a bus or train stop
<input type="checkbox"/>	<u>51% to 75% of commuters</u> are within 1/2 mile of a bus or train stop
<input type="checkbox"/>	<u>26% to 50% of commuters</u> are within 1/2 mile of a bus or train stop
<input type="checkbox"/>	<u>1% to 25% of commuters</u> are within 1/2 mile of a bus or train stop
<input type="checkbox"/>	There is NO bus or train service in the TDM service area

4 - Average public transit frequency in the service area in the morning peak period (Select **ONLY ONE** option)

<input type="checkbox"/>	High - Average rush hour frequency for most routes is <u>less than 15 minutes</u>
<input checked="" type="checkbox"/>	Moderate - Average rush hour frequency for most routes is <u>16-30 minutes</u>
<input type="checkbox"/>	Low - Average rush hour frequency for most routes is <u>31 minutes or more OR there is no transit service</u>

Your Transit Availability classification is:

High Transit

B - Your TDM Services and Their Role in the Total TDM Program

Next - Indicate in the list below all the TDM services you currently include in your TDM program

If you need more information about a service, mouse over the service name or refer to the User Guidance.

In the column labeled "Participation," enter the number of service users/participants for your services

- This is typically the number of registered users, but to see the specific definition for each service, mouse over the "?" to the "?" to the right of the participation box.
- For services you do not offer, enter "0."

In the columns labeled "Service Role," enter an "x" in the box that best represents the role of the service to users, relative to other services you offer - Is it PRIMARY OR SUPPORT:

- Primary - one of the most important services influencing commuters' travel change; it is frequently the only service from your program that a commuter uses (service is often used alone)
- Support - less important/influential as a stand-alone; service is often/usually used in combination with other services OR the service's role is primarily informational, to acquaint users with other services offered

Core Commute Information/Assistance	Participation		Service Role	
			Primary	Support
Carpool ridematching	12	?		X
Comprehensive commute assistance	251	?		X
Vanpool formation	12	?		X
Guaranteed/Emergency Ride Home	66	?		X
Commute program website	251	?		X
Commute challenges/events	75	?		X
General marketing	251	?		X
Targeted residential marketing	0	?		

Financial Measures/Commute subsidies	Participation		Service Role	
			Primary	Support
Ongoing transit incentive	28	?	X	
Ongoing multi-modal incentive	15	?	X	
Alternative mode "try it" incentive	185	?		X
Area-wide vanpool incentive	23	?		X

New Mode Options	Participation		Service Role	
			Primary	Support
On-demand, dynamic ridematch	23	?		X
Commuter express bus	1	?		X
Non-express bus	27	?		X
Shuttle bus to transit stop/station	0	?		
Bike commute program	3	?		X
Bikeshare	0	?		
Carshare	0	?		
Park & Ride facilities	0	?		

Employer Support (Assist employers to offer TDM services)	Participation		Service Role	
			Primary	Support
Employer Services (Low/Moderate)	251	?	X	
Employer Services (High)	0	?		
Telework	126	?		X
Compressed work schedule	126	?		X

C - Your Organization's Role in Delivering/Providing the TDM Services

For each service that you offer, in the column labeled "Administrator," enter an "X" in the box that represents who is primarily responsible for providing or delivering the service to commuters or employers.

- My Organization - your organization is primarily or completely responsible for the service - you administer/operate/ manage all or nearly all service delivery functions OR you contract with a vendor to provide the service for you
- Other Organization - your organization performs some supportive functions (e.g., marketing/promotion), but a county or state agency, transit agency, employer, or other organization primarily administers/operates the service.

Core Commute Information/Assistance	Administrator	
	My Org	Other Org
Carpool ridematching	X	
Comprehensive commute assistance	X	
Vanpool formation		X
Guaranteed/Emergency Ride Home		X
Commute program website	X	
Commute challenges/events		X
General marketing	X	
Targeted residential marketing		

Financial Measures/Commute subsidies	Administrator	
	My Org	Other Org
Ongoing transit incentive	X	
Ongoing multi-modal incentive	X	
Alternative mode "try it" incentive		X
Area-wide vanpool incentive		X

New Mode Options	Administrator	
	My Org	Other Org
On-demand, dynamic ridematch		X
Commuter express bus		X
Non-express bus		X
Shuttle bus to transit stop/station		
Bike commute program	X	
Bikeshare		
Carshare		
Park & Ride facilities		

Employer Services (for employers offering TDM services at worksites)	Administrator	
	My Org	Other Org
Employer Services (Low/Moderate)	X	
Employer Services (High)		
Telework		X
Compressed work schedule		X

D - Other Services You Offer - User Defined (Optional)

If your program includes services not listed above, AND you have information on the use and likely travel change from the services, enter them below. For more details on this section, refer to the TDM-ROI User Guide.

Service 1:	<u>Service Name</u>			
		Participation	Primary	Support
Participation/Service Role (Enter "x" for primary/support)		0	<input type="checkbox"/>	<input type="checkbox"/>
			My Org	Other Org
Administrator (Enter "x" for My org/Other org)			<input type="checkbox"/>	<input type="checkbox"/>
Placement rate (%)		0%		
Vehicle Trip Reduction (VTR) factor		0.0		
One-way commute distance		0.0		
Drive alone access percentage		0%		

To enter data for additional services, click on the "+" sign by the service name in the left sidebar to show entry fields

Service 2:	<u>Service Name</u>			
		Participation	Primary	Support
Participation/Service Role (Enter "x" for primary/support)		0	<input type="checkbox"/>	<input type="checkbox"/>
			My Org	Other Org
Administrator (Enter "x" for My org/Other org)			<input type="checkbox"/>	<input type="checkbox"/>
Placement rate (%)		0%		
Vehicle Trip Reduction (VTR) factor		0.0		
One-way commute distance		0.0		
Drive alone access percentage		0%		

Service 3:	<u>Service Name</u>			
		Participation	Primary	Support
Participation/Service Role (Enter "x" for primary/support)		0	<input type="checkbox"/>	<input type="checkbox"/>
			My Org	Other Org
Administrator (Enter "x" for My org/Other org)			<input type="checkbox"/>	<input type="checkbox"/>
Placement rate (%)		0%		
Vehicle Trip Reduction (VTR) factor		0.0		
One-way commute distance		0.0		
Drive alone access percentage		0%		

Service 4:	<u>Service Name</u>			
		Participation	Primary	Support
Participation/Service Role (Enter "x" for primary/support)		0	<input type="checkbox"/>	<input type="checkbox"/>
			My Org	Other Org
Administrator (Enter "x" for My org/Other org)			<input type="checkbox"/>	<input type="checkbox"/>
Placement rate (%)		0%		
Vehicle Trip Reduction (VTR) factor		0.0		
One-way commute distance		0.0		
Drive alone access percentage		0%		

Service 5:	<u>Service Name</u>			
		Participation	Primary	Support
Participation/Service Role (Enter "x" for primary/support)		0	<input type="checkbox"/>	<input type="checkbox"/>
			My Org	Other Org
Administrator (Enter "x" for My org/Other org)			<input type="checkbox"/>	<input type="checkbox"/>
Placement rate (%)		0%		
Vehicle Trip Reduction (VTR) factor		0.0		
One-way commute distance		0.0		
Drive alone access percentage		0%		

E - Annual TDM Program Cost

On this screen, enter costs for developing and implementing the services you indicate above

If you know ONLY the total program cost, enter it HERE

If you know costs of individual cost line items, enter them in the categories below:

Capital Costs

			Exp Life (yrs)
- Item 1	Enter name here		
- Item 2	Enter name here		
- Item 3	Enter name here		
Total Capital Cost (Annualized, 5%)		\$	-

Operating Costs

Staff - Directly Assigned to Commute Program

- Annual salary cost	
- Annual fringe benefit cost	

Administrative Expenses/Support

- Office space and equipment	
- Office expenses dedicated to program	
- Marketing/promotion	
- Vendor support	

Commute Financial Incentives

- Cash subsidies paid to commuters	
- Non-cash incentives	\$ -

Facilities/Vehicles/Equipment

- Vehicle lease/ownership costs	\$ -
- Information kiosks/displays/signage	
- Other facilities/equipment	

Other costs (not defined above)

- Item 1	Enter name here	\$ -
- Item 2	Enter name here	\$ -
- Item 3	Enter name here	\$ -

Total Operating Cost (Annual)	\$ -
-------------------------------	------

Program Revenue (if applicable)

Total Program Revenue	\$ -
-----------------------	------

Total Annual and Total Daily Program Costs

ESTIMATED NET ANNUAL COST	\$ -
---------------------------	------

F - Additional Regional/Service Area Data (Optional)

Finally, enter factors for your region or service area IF you have data from a regional or local source

Regional Travel Factors

IF LOCAL DATA ARE KNOWN for the any of the following items, enter the value in the "USER DEFINED" boxes below

If you do not have data for an item, leave the User Defined box as 0. The calculator will apply the regional default value.

	Regional Default	User Defined
Ave one-way commute distance (mi)	9.6	15.6
Average home-to-work commute miles for the region or service area (one-way distance)		

Commute drive alone percentage	63.2%	73.7%
Percentage of regional/service area commuters who drive alone or percentage of commute trips made by driving alone		

Commute transit percentage	17.6%	11.1%
Percentage of regional/service area commuters who ride public transit or percentage of weekly commute trips made by transit		

Regional Vehicle Pollutant Emission Factors

IF LOCAL DATA ARE KNOWN for the any of the following items, enter the value in the "USER DEFINED" boxes below

If you do not have data for an item, leave the User Defined box as 0. The calculator will apply the national default value.

	National Default	User Defined
Oxides of Nitrogen (NOx)	0.445	0.000
NOx emission rate in grams per mile of travel		

Volatile Organic Compounds (VOC)	0.075	0.000
VOC emission rate in grams per mile of travel		

Greenhouse Gas (CO2_Equivalent)	387.460	0.000
Greenhouse gas (Carbon Dioxide Equivalent) emission rate in grams per mile of travel		

Regional Benefit Cost Factors

IF LOCAL DATA ARE KNOWN for the any of the following items, enter the value in the "USER DEFINED" boxes below

If you do not have data for an item, leave the User Defined box as 0. The calculator will apply the regional default value.

	Regional Default	User Defined
Median average wage rate	\$ 24.90	\$ -
Median wage rate for commuters in the service area or in the metropolitan region		

Road construction/ maintenance cost	\$ 165,000	\$ -
Estimated average <u>annualized</u> cost to build/maintain one lane-mile of major roadway (Interstate/limited access roadway)		

Ave gasoline price per gallon	\$ 3.36	\$ 5.50
Average pump price for regular unleaded gasoline		

TDM-ROI Calculator - Results Summary

Shown below are the results of the impact and ROI calculations.

The top section (1 - Societal Benefits Summary and ROI) presents:

- Overall ROI for the program
- Overall societal cost savings from all benefits combined
- Program cost-effectiveness (Cost per vehicle trip reduced and cost per VMT reduced)
- Program travel and emission impacts (Reductions in daily vehicle trips, VMT, and kg of pollutant emissions)

The bottom section (2 - Daily Cost Saving by Benefit) presents:

- Daily cost saving for each societal benefit individually
- Base units and cost per unit for each benefit individually

In each section, results are presented for TWO CASES that estimate a RANGE of possible results:

- Influenced Changes - Calculates impacts/cost-saving only for changes to alternative modes that service users indicated were assisted/influenced by the TDM services. This is the lower bound of the likely range of impacts.
- All Changes - Calculates impacts/cost-saving for all changes to alternative modes, regardless of what influenced the changes (e.g., program services or other factors). This is the upper bound of the likely range of impacts.

We recommend you report BOTH the lower and upper bound results as a range, e.g., "Actual ROI is likely to be between x and y."

1 - Societal Benefits Summary (\$ cost saving per day) and ROI

Cost Saving and ROI for ALL CHANGES Impacts - Lower and Upper Bounds

	INFLUENCED CHANGES Impacts (Lower Bound)	ALL CHANGES Impacts (Upper Bound)
<u>PROGRAM ROI</u>	#DIV/0!	#DIV/0!
Total cost saving from all benefits	\$ 159,728 per year	\$ 471,000 per year
Total program cost (annual)	\$ - per year	\$ - per year

PROGRAM COST-EFFECTIVENESS

	Influenced Changes	All Changes
Cost per vehicle trip reduced	\$ -	\$ -
Cost per VMT reduced	\$ -	\$ -

PROGRAM IMPACTS

	Influenced Changes	All Changes
<u>Travel Impacts</u>		
Total daily vehicle trips reduced	57	147
Total daily VMT reduced	1,103	3,121
<u>Emission Impacts</u>		
NOx - oxides of nitrogen (kg)	0.5	1.4
VOC - volatile organic compounds (kg)	0.1	0.2
CO2 - carbon dioxide (kg)	427	1,209

2 - Cost Saving by Benefit

INFLUENCED CHANGES IMPACTS (Lower Bound)

	<u>VT/VMT</u>	<u>Adj factor</u>	<u>Adj base unit</u>	<u>Cost/unit</u>	<u>Est Cost Saving</u>
Air pollution (total)					\$ 1
NOx - oxides of nitrogen	---	---	0.5	\$ 1.78	\$ 1
VOC - volatile organic compounds	---	---	0.1	\$ 0.15	\$ 0
Global climate change (CO2)	---	---	427	\$ 0.04	\$ 17
Congestion (hours of delay reduction)	160	61.26	10	\$ 24.90	\$ 244
Road construction deferred (lane miles)	36	1,700	-	\$ 660	\$ -
Excess fuel consumption (fuel saved)	1,103	18.0	61	\$ 5.50	\$ 337
Vehicle safety (crashes avoided)	1,103	1.01136	0.001	\$ 15,952	\$ 16
Noise pollution (vehicle noise eliminated)	1,103	1.0	1,103	\$ 0.0223	\$ 25
TOTAL DAILY COST SAVING (Influenced Changes)					\$ 639
TOTAL ANNUAL COST SAVING (Influenced Changes)					\$ 159,728

ALL CHANGES IMPACTS (Upper Bound)

	<u>VT/VMT</u>	<u>Adj factor</u>	<u>Adj base unit</u>	<u>Cost/unit</u>	<u>Est Cost Saving</u>
Air pollution (total)					\$ 3
NOx - oxides of nitrogen (kg)	---	---	1.4	\$ 1.78	\$ 2
VOC - volatile organic compounds (kg)	---	---	0.2	\$ 0.15	\$ 0
Global climate change (CO2) (kg)	---	---	1,209	\$ 0.04	\$ 48
Congestion (hours of delay reduction)	456	61.26	28	\$ 24.90	\$ 696
Road construction deferred (lane miles)	95	1,700	0.1	\$ 660	\$ 66
Excess fuel consumption (fuel saved)	3,121	18.0	173	\$ 5.50	\$ 953
Vehicle safety (crashes avoided)	3,121	1.01136	0.003	\$ 15,952	\$ 48
Noise pollution (vehicle noise eliminated)	3,121	1.0	3,121	\$ 0.0223	\$ 70
TOTAL DAILY COST SAVING (All Changes)					\$ 1,884
TOTAL ANNUAL COST SAVING (All Changes)					\$ 471,000

Notes on calculation of base units:

Air pollution and CO2 - kg of pollutants eliminated calculated using regional emission factors

Congestion delay reduction - estimate congested VMT; convert congested miles to hours of delay

Road construction deferred - estimate vehicle trips on congested lanes; convert congested VT to lane miles eliminated

Excess fuel consumption - Apply 18 mpg fuel efficiency factor to total VMT reduced

Vehicle safety - Apply vehicle crash occurrence factor per 1 M VMT to total VMT reduced

Noise pollution - Use total VMT reduced as base benefit

TDM-ROI Calculator - Service List and Descriptions

Services by Category	Typical Service Description	Participation Definition
Core Commute Information/Assistance		
Carpool ridematching	Service to match potential carpool/vanpool partners for regular, ongoing carpool or vanpool; typically online matching	Commuters requesting/accessing ridematch service
Comprehensive commute assistance	Service offering personalized information/assistance on all non-SOV travel options (carpool, vanpool, transit, bike/walk)	Commuters requesting/accessing commute assistance
Vanpool formation	Outreach and assistance to commuters to start/maintain commute vanpools; typically residence based vanpool outreach	Total riders in program supported vans
Guaranteed/Emergency Ride Home	Emergency or after work rides for transit/rideshare commuters who do not have personal vehicle available during the work day	Commuters registered/actively eligible
Commute program website	Web-based/online portal to provide commute information and registration for services (e.g., ridematch, GRH/ERH, commute challenges, etc)	Unique website visitors
Commute challenges/events	Short-term (one day, week, month) commute challenge/event to encourage trial use of modes for commuting (e.g., Bike to Work, Car-Free, Try Transit, etc)	Commuters registered/pledging
General marketing	Regional/area-wide informational mass marketing/advertising campaigns about commuting/TDM services	Commuters in program area who are targeted with messaging
Targeted residential marketing	Direct-mail/other mass marketing <u>targeted to residents or employees in specific geographic areas</u> (e.g., neighborhood, roadway corridor, office park)	Commuters in program area who are targeted with messaging
Financial Measures		
Ongoing transit incentive	Ongoing subsidy or discounted transit pass for commuters who ride transit to work	Registered incentive participants
Ongoing multi-modal incentive	Ongoing subsidies/other financial benefits for travelers who use any non-drive alone mode (transit, carpool, vanpool, bike/walk)	Registered incentive participants
Alternative mode "try it" incentive	Short-term/temporary (e.g., one week, one to three month) financial benefit for drive-alone commuters to try non-drive alone modes	Registered incentive participants
Area-wide vanpool incentive	Ongoing financial assistance (leasing, insurance, driver/rider subsidy) for vanpools that travel within the area or to/from priority locations (e.g., activity centers, corridors)	Vanpool incentive recipients
New Mode Options		
On-demand, dynamic ridematch	On-demand, immediate ridematching for single-trip purpose for registered users (web-based/smartphone app)	Registered users
Commuter express bus	Promotion and/or operation of commuter express bus service typically operating between residential areas and work areas	Total weekday boardings
Non-express bus	Promotion and/or operation of fixed-route, non-express bus service - from home area or work area	Total weekday boardings
Shuttle bus to transit stop/station	Promotion and/or operation of shuttle from home or work area to bus stop/train station ("first mile" or "last mile")	Total weekday boardings
Bike commute program	Education/events/incentives/services to assist commuters to bike to work	Participating bike commuters

<u>Services by Category</u>	<u>Typical Service Description</u>	<u>Participation Definition</u>
Bikeshare	Bicycle fleet available for short-term rental by members – home area, work area, at train stations, at activity centers	Registered bikeshare members
Carshare	Short-term rental of shared vehicles available to members – home area, work areas, at train stations, at activity centers	Registered carshare members
Park & Ride facilities	Promotion/operation of commuter Park & Ride lots (carpool, vanpool, transit access)	Total weekday vehicles parked
Employer Program Support		
Employer Services (Low/Moderate)	Assistance to employers that offer ONLY commute information and other low/moderate level commute support services (e.g., GRH, flextime, preferential parking, etc)	Employees at Low/Moderate program worksites
Employer Services (High)	Assistance to employers that offer high level commute support services (e.g., financial incentives, company vanpool assistance, parking charges, shuttles to transit stops, etc)	Employees at High program worksites
Telework	Assistance to employers that offer telework program at worksites	Employees at sites that offer TW option
Compressed work schedule	Assistance to employers that offer compressed work schedules at worksites	Employees at sites with CWS

TDM-ROI Calculator - Compilation of Participation by Service and Impact Calculation Factors

This worksheet compiles participation data and calculation factors from other worksheets. Users who have locally-collected data for a TDM service from a user survey or other source may insert those values in the yellow highlighted boxes.

	Core Commute Information/Assistance							
Default Values	CP Match	CommAsst	HB Vanpool	GRH	Website	Comm Events	Gen Mkt	Targ Res Mkt
- Placement rate (Max 100%)	25%	40%	100%	40%	40%	25%	0%	2%
- Continued VTR (Max 2.0)	0.6	0.9	1.0	1.2	0.3	0.3	0.4	0.5
- Continued distance (Max 150 mi)	26.9	18.7	46.8	18.7	18.7	18.7	18.7	18.7
- % changers who DA to alt mode	20%	10%	90%	10%	10%	10%	10%	10%

INSERT VALUES IN YELLOW SHADED BOXES ONLY IF you have local data on the use or impacts of the service from a survey or other data source

If you do not have data for an item, leave the User Defined box as 0. The calculator will apply the default value for that service.

	Core Commute Information/Assistance							
User-Defined Values	CP Match	CommAsst	HB Vanpool	GRH	Website	Comm Events	Gen Mkt	Targ Res Mkt
- Placement rate (Max 100%)	0%	0%	0%	0%	0%	0%	0%	0%
- Continued VTR (Max 2.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Continued distance (Max 150 mi)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- % changers who DA to alt mode	0%	0%	0%	0%	0%	0%	0%	0%

TDM-ROI Calculator - Compilat

This worksheet compiles participation data
a user survey or other source may insert th

	Financial Incentives/Commute Subsidies			
Default Values	Transit Sub	M-mode Sub	"Try it" Inc	Vanpool Inc
- Placement rate (Max 100%)	35%	50%	60%	95%
- Continued VTR (Max 2.0)	1.2	1.2	1.2	1.0
- Continued distance (Max 150 mi)	14.0	18.7	18.7	46.8
- % changers who DA to alt mode	10%	20%	20%	80%

INSERT VALUES IN YELLOW SHADED BOXES

If you do not have data for an item, leave th

	Financial Incentives/Commute Subsidies			
User-Defined Values	Transit Sub	M-mode Sub	"Try it" Inc	Vanpool Inc
- Placement rate (Max 100%)	0%	0%	0%	0%
- Continued VTR (Max 2.0)	0.0	0.0	0.0	0.0
- Continued distance (Max 150 mi)	0.0	0.0	0.0	0.0
- % changers who DA to alt mode	0%	0%	0%	0%

TDM-ROI Calculator - Compilat

This worksheet compiles participation data
a user survey or other source may insert th

	New Mode Options							
Default Values	Dynamic RS	Expr Bus	Non-Exp Bus	Shuttle	Bike Comm	Bikeshare	Carshare	Park & Ride
- Placement rate (Max 100%)	7%	85%	60%	60%	25%	40%	15%	20%
- Continued VTR (Max 2.0)	0.2	1.4	1.4	1.4	1.2	0.2	0.3	0.8
- Continued distance (Max 150 mi)	23.4	23.4	11.7	11.7	4.5	4.5	14.0	18.7
- % changers who DA to alt mode	0%	20%	10%	10%	0%	0%	0%	90%

INSERT VALUES IN YELLOW SHADED BOXES

If you do not have data for an item, leave th

	New Mode Options							
User-Defined Values	Dynamic RS	Expr Bus	Non-Exp Bus	Shuttle	Bike Comm	Bikeshare	Carshare	Park & Ride
- Placement rate (Max 100%)	0%	0%	0%	0%	0%	0%	0%	0%
- Continued VTR (Max 2.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Continued distance (Max 150 mi)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- % changers who DA to alt mode	0%	0%	0%	0%	0%	0%	0%	0%

TDM-ROI Calculator - Compilat

This worksheet compiles participation data
a user survey or other source may insert th

	Employer Worksite TDM Assistance			
Default Values	Emp-Low/Mod	Emp-High	Telework	CWS
- Placement rate (Max 100%)	2%	18%	25%	25%
- Continued VTR (Max 2.0)	1.4	1.4	0.4	0.2
- Continued distance (Max 150 mi)	15.6	15.6	15.6	15.6
- % changers who DA to alt mode	20%	20%	0%	0%

INSERT VALUES IN YELLOW SHADED BOXES

If you do not have data for an item, leave th

	Employer Worksite TDM Assistance			
User-Defined Values	Emp-Low/Mod	Emp-High	Telework	CWS
- Placement rate (Max 100%)	0%	0%	0%	0%
- Continued VTR (Max 2.0)	0.0	0.0	0.0	0.0
- Continued distance (Max 150 mi)	0.0	0.0	0.0	0.0
- % changers who DA to alt mode	0%	0%	0%	0%

TDM-ROI Calculator - Compilat

This worksheet compiles participation data
a user survey or other source may insert th

	User Defined Strategies				
Default Values	Service Name	Service Name	Service Name	Service Name	Service Name
- Placement rate (Max 100%)	0%	0%	0%	0%	0%
- Continued VTR (Max 2.0)	0.0	0.0	0.0	0.0	0.0
- Continued distance (Max 150 mi)	0.0	0.0	0.0	0.0	0.0
- % changers who DA to alt mode	0%	0%	0%	0%	0%

INSERT VALUES IN YELLOW SHADED BOXES

If you do not have data for an item, leave th

	User Defined Strategies				
User-Defined Values	Service Name	Service Name	Service Name	Service Name	Service Name
- Placement rate (Max 100%)	0%	0%	0%	0%	0%
- Continued VTR (Max 2.0)	0.0	0.0	0.0	0.0	0.0
- Continued distance (Max 150 mi)	0.0	0.0	0.0	0.0	0.0
- % changers who DA to alt mode	0%	0%	0%	0%	0%