Regional Transportation Planning Agency - Local Transportation Commission
Monterey County Service Authority for Freeways and Expressways
Monterey County Regional Development Impact Fee Joint Powers Agency
Email: info@tamcmonterey.org

Technical Advisory Committee

Thursday, February 1, 2024
****9:30 AM****

MEETING LOCATION
Voting members must attend a physical meeting location to count towards quorum
55B Plaza Circle, Salinas, California 93901
Transportation Agency Conference Room

Alternate Location with Zoom Connection Open to the Public
2616 1st Avenue, Marina, California 93933
Supervisor Askew's Office

Members of the public & non-voting members may join meeting online at:
https://us02web.zoom.us/j/950428194?pwd=T0N6RkZXWmN3UDAwTEZpUE9iVTlzQT09
OR
Via teleconference at +1 669 900 6833

Meeting ID: 950 428 194
Password: 185498

Please note: If all board members are present in person, public participation by Zoom is for convenience only and is not required by law. If the Zoom feed is lost for any reason, the meeting may be paused while a fix is attempted, but the meeting may continue at the discretion of the Chair.

Please see all the special meeting instructions at the end of this agenda

1. QUORUM CHECK - CALL TO ORDER

Call to order and self-introductions. According to Transportation Agency and Page Committee bylaws, Committee membership consists of representatives from the Transportation Agency voting and ex-officio members, and other agencies that may be appointed by the Transportation Agency. Currently the Committee membership includes representatives from 12 Cities, the County, MST, Caltrans, City of Watsonville, the Air District, and AMBAG, for a total of 18 members. Five members of the Technical Advisory Committee, representing voting members of the Transportation Agency Board of Directors,constitute a quorum for transaction of the business of the committee.

If you are unable to attend, please contact the Committee coordinator. Your courtesy to the other members to assure a quorum is appreciated.

2. PUBLIC COMMENTS

Any member of the public may address the Board on any item not on the agenda but within the jurisdiction of the Board. Under this item, each member of the public is allowed three minutes to address concerns. Comments in items on this agenda may be given when that agenda item is discussed. Persons who wish to address the Board for public comment or on an item on the agenda are encouraged to submit comments in writing to Maria at maria@tamcmonterey.org by 5:00 pm the Monday before the meeting, and such comments will be distributed to the Board before the meeting.

Alternative Agenda Format and Auxiliary Aids: If requested, the agenda shall be made available in appropriate alternative formats to persons with a disability, as required by Section 202 of the Americans with Disabilities Act of 1990 (42 USC Sec. 12132), and the federal rules and regulations adopted in implementation thereof. Individuals requesting a disability-related modification or accommodation, including auxiliary aids or services, may contact Transportation Agency staff at 831-775-0903. Auxiliary aids or services include wheelchair accessible facilities, sign language interpreters, Spanish language interpreters, and printed materials in large print, Braille or on disk. These requests may be made by a person with a disability who requires a modification or accommodation in order to participate in the public meeting and should be made at least 72 hours before the meeting. All reasonable efforts will be made to accommodate the request.

3. CONSENT AGENDA

Approve the staff recommendations for items listed below by majority vote with one motion. Any member may pull an item off the Consent Agenda to be moved to the end of the **CONSENT AGENDA** for discussion and action.

3.1. **APPROVE** the draft Technical Advisory Committee Minutes for January 11, 2024.

- Maria Montiel

The draft minutes of the January 11, 2024 Technical Advisory Committee meeting are attached for review.

3.2. **RECEIVE** an update on the results of the Measure X annual audit and compliance reporting for 2022/23.

- Michael Zeller

The purpose of the Measure X annual audit is to confirm that the funding recipients -- TAMC, the County of Monterey and the twelve incorporated cities -- have complied with the voter-approved requirements specified in Ordinances 2016-01 and 2019-01 for the Transportation Safety and Investment Plan. One of the responsibilities of the Measure X Transportation Oversight Committee is to review the independent audits of the jurisdictions, and prepare and present an annual report regarding the administration of the program.

4. **REVIEW** and **PROVIDE INPUT** on the Draft AMBAG Complete Streets Policy

- Doug Bilse, Regina Valentine (AMBAG)

With the passing of the Infrastructure Investment and Jobs Act/Bipartisan Infrastructure Law of 2021, the Association of Monterey Bay Area Governments (AMBAG) is required to conduct complete streets planning that prioritizes the safe and adequate accommodation of all users of the transportation system, including pedestrians, bicyclists, public transportation users, children, older individuals, individuals with disabilities, motorists, and freight vehicles.

5. **RECEIVE** presentation and **PROVIDE INPUT** on a presentation on advanced vehicle detection systems and associated benefits for traffic data management systems.

- Doug Bilse

TAMC received a Safe Streets for All grant to prepare a safety action plan for each jurisdiction in Monterey County that does not already have a safety action plan or is in the process of developing a safety action plan. As part of this work, TAMC will need to collect, analyze and manage traffic data. Representatives from Wavetronix, Inc. will present an overview of recent developments in vehicle detection.

6. **ANNOUNCEMENTS and/or COMMENTS**

7. **ADJOURN**

ANNOUNCEMENTS
Next Committee meeting:
Thursday, March 7, 2024, at 9:30 A.M.

Transportation Agency for Monterey County
Conference Room
55-B Plaza Circle, Salinas CA 93901

A quorum of voting members is required to be present to hold this meeting.

There will be a zoom link for hybrid participation by members of the public.

If you have any items for the next agenda, please submit them to:
Doug Bilse, Technical Advisory Committee Coordinator
Doug@tamcmonterey.org

Important Meeting Information

Agenda Packet and Documents: Any person who has a question concerning an item on this agenda may call or email the Agency office to make inquiry concerning the nature of the item described on the agenda. Complete agenda packets are on display online at the Transportation Agency for Monterey County website. Documents relating to an item on the open session that are distributed to the Committee less than 72 hours prior to the meeting shall be available for public review at the Agency website. Agency contact information is as follows:

Transportation Agency for Monterey County
www.tamcmonterey.org

55B Plaza Circle, Salinas, CA 93901
TEL: 831-775-0903
EMAIL: info@tamcmonterey.org

Agenda Items: The agenda will be prepared by Agency staff and will close at noon nine (9) working days before the regular meeting. Any member of the Committee may request in writing an item to appear on the agenda. The request shall be made by the agenda deadline and any support papers must be furnished by that time or be readily available.

TRANSPORTATION AGENCY FOR MONTEREY COUNTY

Memorandum

To: Technical Advisory Committee

From: Maria Montiel, Administrative Assistant

Meeting Date: February 1, 2024

Subject: **Draft TAC Minutes**

RECOMMENDED ACTION:

APPROVE the draft Technical Advisory Committee Minutes for January 11, 2024.

SUMMARY:

The draft minutes of the January 11, 2024 Technical Advisory Committee meeting are attached for review.

FINANCIAL IMPACT:

DISCUSSION:

ATTACHMENTS:

1. Draft TAC minutes January 11, 2023

WEB ATTACHMENTS:

TECHNICAL ADVISORY COMMITTEE MINUTES

Meeting held at the Transportation Agency for Monterey County Office

55-B Plaza Cir., Salinas CA 93901

Alternate Location: 2616 1st Avenue, Marina, California 93933, Supervisor Askew's Office

Draft Minutes of Thursday, January 11, 2024

COMMITTEE MEMBERS	JAN 23	FEB 23	MAR 23	APR 23	MAY 23	JUN 23	AUG 23	SEP 23	OCT 23	NOV 23	JAN 24
Robert Harary, Carmel-by-the-Sea (Robert Culver)	E	P	P(VC)	P	P	P	E	C	P	P	P(VC)
John Guertin, Del Rey Oaks	A	A	A	A	A	P	-	A	A	-	-
Patrick Dobbins Gonzales, **Vice Chair** (vacant)	P	P	E	E	P	P	E	N	P	E	P
Jamie Tugel, Greenfield (Tony Nisich)	A	P(A)	P	P	E	E	E	C	P	E	P
Octavio Hurtado, King City (Steve Adams)	P	P	P	P	P	P	P	E	P	P(VC)	P
Brian McMinn, Marina (Edrie Delos Santos)	P	P	P	P	P	P	P	L	P	P	-
Marissa Garcia, Monterey **Chair** (Andrea Renny, Fernanda Roveri)	P	P	P	P	P	P(A)	P	L	P	P	P
Daniel Gho, Pacific Grove (Joyce Halabi)	A	P	P	A	A	P	P	E	P	P	-
David Jacobs, Salinas (Adrian Robles)	P	P	P	P	P	E	P	D	P	-	P
Leon Gomez, Sand City (Vibeke Norgaard)	P	P	P	P	P	P	P		E	P(VC)	P
Nisha Patel, Seaside (Patrick Grogan, Leslie Llantero, Carolyn Burke)	A	A	P	P(A)	P(A)	P(A)	P(A)		P	P(A)	-
Don Wilcox, Soledad (Alex Ramos, Bryan Swanson)	P	E	P(A)	P(VC)	E	E	P		P	P(A)	P
Chad Alinio, MCPW (Enrique Saavedra)	E	P	E	P	P	E	P(A)		P(A)	-	P(A)
Chris Duymich, AMBAG (Paul Hierling, Heather Adamson)	P	P	P(VC)	P	P	P	-		P(A)	-	P
Orchid Monroy, Caltrans (K. McClendon)	P	P	P(VC)	A	P	P	-		A	P(VC)	-
Raju Ceerla CSUMB (Kyle Jordan)	P	P	P	A	A	-	-		-	P	P
Tyrone Bell, MBARD	P	A	P	P	P	-	P		P	P	-
Vince Dang, MST (Michelle Overmeyer)	A	P(A)	E	P(VC)	P(VC)	P	P		P	P(VC)	-

P = Present A = Absent P(A) = Alternate Present E = Excused (VC) = Video conference

STAFF	JAN 23	FEB 23	MAR 23	APR 23	MAY 23	JUN 23	AUG 23	SEP 23	OCT 23	NOV 23	JAN 24
T. Muck, Executive Director	P	P	P	P	P	P	E		E	P	P
C. Watson, Director of Planning	A	P	E	A	P	E	E		E	P(VC)	P(VC)
M. Zeller, Director of Programming & Project Delivery	P	P	P	P	E	P	P		P(VC)	P	-
D. Bilse, Principal Engineer	P	P	PV	P	P	P	P		P	P	P
M. Montiel, Administrative Assistant	P	P	P(VC)	P	P	P	P		P	P	P
J. Strause, Transportation Planner	A	P	A	P	P	P(VC)	P		P	-	P(VC)
T. Wright, Public Outreach Coordinator	P	A	A	A	A	-	-		-	-	P(VC)
L. Williamson, Senior Engineer	P	P	P	A	A	-	-		-	P	-
A. Hernandez, Transportation Planner	A	A	P	A	A	P(VC)	P		-	-	P(VC)
A. Guther, Transportation Planner	P	P	P	P	A	P(VC)	P		P	P(VC)	-
J. Kise, Director of Finance and Admin.										P(VC)	P(VC)
A. Sambrano, Transportation Planner									P(VC)	P(VC)	P(VC)

OTHERS PRESENT: Tyrone Bell, MBARD; Paul Hierling, AMBAG; Neal Thompson, Public; Berry Jones, Public; Chris Lindsey, Cambridge Systematics; Matt Deal, Monterey Salinas Transit; Dwight Stump, Public; Courtney Lindberg, Watsonville

1. ROLL CALL

Chair Dobbins, City of Gonzales, called the meeting to order at 9:30 am. Introductions were made and a quorum was established.

2. PUBLIC COMMENTS

None

3. BEGINNING OF CONSENT AGENDA

M / S / C: Jacobs /Garcia /unanimous

3.1 **APPROVED** the Technical Advisory Committee meeting minutes for November 2, 2023.

END OF CONSENT AGENDA

4. US 101 SOUTH OF SALINAS PROJECT UPDATE

Doug Bilse, Principal Engineer reported that the US 101 South of Salinas project was redefined last year after a thorough review of the approved Project Study Report. He noted that the project development team is developing conceptual plans to address safe ty issues along US 101 as follows:

1. Relocating the existing interchanges at Abbott Street and Main Street in Chualar.
2. Constructing frontage roads to maintain access to properties currently served by direct links to US 101
3. Eliminating left turn movements along US 101 at uncontrolled intersections between Salinas and Chualar Page 10 of 16
4. Eliminating uncontrolled rail crossings
5. Working towards the ultimate goal of eliminating all uncontrolled intersections along US 101

5. SCENIC ROUTE 68 CORRIDOR IMPROVEMENT PROJECT UPDATE

Doug Bilse, Principal Engineer reported that The California Department of Transportation (Caltrans) is proposing to improve traffic operations and reduce collisions and connect wildlife habitats on an approximately nine-mile stretch of State Route 68 in Monterey County by modifying the design of nine intersections from Josselyn Canyon Road to San Benancio Road and providing five new underground wildlife crossings animals can use to cross under the highway.

In conclusion, Mr. Bilse reported that two build alternatives are being evaluated in the Project Approval and Environmental Document phase. Alternative 1 would convert nine intersections into roundabouts: eight single-lane roundabouts and one two-lane roundabout (at the intersection of SR 218). He noted that alternative 2 would include expanded signalized intersections with adaptive signal control technology and enhanced lane channelization to provide auxiliary through lanes and additional right and left turn lanes. He noted that both alternatives would provide improved bicycle and pedestrian facilities and replacement lighting where necessary.

6. AMBAG CENTRAL CALIFORNIA SUSTAINABLE FREIGHT STUDY

Paul Hierling, AMBAG introduced Chris Lindsey with Cambridge Systematics, and she reported that they are preparing the California Central Coast Sustainable Freight Study to provide guidance on the policies and projects supporting freight movement across the Central Coast region.

In conclusion Mr. Lindsey noted that the Central Coast region along the U.S. 101 corridor is one of the most important agricultural production areas in the country. In addition, it has significant clusters of freight-dependent industries that rely on the multimodal freight network to serve their customers and contribute to the economic prosperity of the region. Staff will continue to develop the California Central Coast Sustainable Freight Study and work with partner agencies.

7. ANNOUNCEMENTS

Paul Hierling, AMBAG announced the Active Transportation Program Branch workshops Tuesday, January 16, 2024 1:00pm – 3:00pm Monterey Bay Air Resources District 24580 Silver Cloud Court Monterey, CA 93940.

ADJOURN

The meeting was adjourned at 11:02 a.m.

TRANSPORTATION AGENCY FOR MONTEREY COUNTY

TRANSPORTATION AGENCY FOR MONTEREY COUNTY

Memorandum

To: Technical Advisory Committee

From: Michael Zeller, Director of Programming & Project Delivery

Meeting Date: February 1, 2024

Subject: **Measure X - Fiscal Year 2022/23 Annual Audits**

RECOMMENDED ACTION:

RECEIVE an update on the results of the Measure X annual audit and compliance reporting for 2022/23.

SUMMARY:

The purpose of the Measure X annual audit is to confirm that the funding recipients -- TAMC, the County of Monterey and the twelve incorporated cities -- have complied with the voter-approved requirements specified in Ordinances 2016-01 and 2019-01 for the Transportation Safety and Investment Plan. One of the responsibilities of the Measure X Transportation Oversight Committee is to review the independent audits of the jurisdictions, and prepare and present an annual report regarding the administration of the program.

FINANCIAL IMPACT:

Fiscal year 2018/19 Measure X receipts (the second full year of Measure X) totaled $30.5 million, dropped to $28.2 million in 2019/20, rose to $32.0 million in 20/21, increased again to $38.1 million in 2021/22, and continued to rise to $38.4 million in fiscal year 2022/23. Revenue forecasts estimate that fiscal year 2023/24 receipts will drop slightly to $38.1 million in 2023/24.

DISCUSSION:

The Transportation Agency has fiduciary responsibility for the administration of the voter-approved Transportation Safety and Investment Plan (Measure X) funds. Each jurisdiction entered into a tax sharing agreement with the Transportation Agency in order to receive their share of Measure X Local Streets & Roads revenues. In exchange, these agreements require the jurisdictions to submit audit reports annually to the Transportation Agency detailing the steps taken to comply with the implementing ordinance.

In accordance with the Policies & Project Descriptions for the Transportation Safety & Investment Plan, an Oversight Committee representing a diverse range of community interests was formed. The Measure X Transportation Oversight Committee established a subcommittee to conduct the review of the independent audits of the revenues and expenditure of Measure X funds. The subcommittee was asked to report the results of the audit to the full committee at their next meeting and to prepare the Measure X Annual Report.

The sixth year of Measure X reporting, for fiscal year 2022/23, was due on December 31, 2023. For this year's compliance review, there has again been a marked improvement in compliance by the jurisdictions from the prior reporting period. All the jurisdictions have submitted their complete reports

by the deadline, with the exceptions of Greenfield, Monterey, and Salinas who submitted partial reports. For Monterey and Salinas, their annual city financial audits have been delayed (which includes Maintenance of Effort calculations and the independent audit of their Measure X funds), however they did submit all the remaining required reports. Conversely, Greenfield submitted their independent financial documents, but not the remaining reports. Agency staff has reached out to all three jurisdictions to facilitate finalizing the delinquent reports and bring the jurisdictions into compliance to avoid withholding their Measure X disbursements. Agency staff has also been coordinating with Sand City to attempt to resolve the ongoing issues with the city not being able to meet their maintenance of effort requirement.

A summary of the compliance review is included in the table below:

Jurisdiction	Funds Received	Reports Submitted on Time?	Annual Compliance Report	Maintenance of Effort	5-Year Program of Projects	Independent Financial Audit	Pavement Management Report
Monterey County	$9,804,275	Yes	Yes	Yes	Yes	Yes	Yes
Carmel	$259,005	Yes	Yes	Yes	Yes	Yes	Yes
Del Rey Oaks	$98,188	Yes	Yes	Yes	Yes	Yes	Yes
Gonzales	$335,667	Yes	Yes	Yes	Yes	Yes	Yes
Greenfield	$679,627	Partial	No Report	Yes	No Report	Yes	No Report
King City	$567,199	Yes	Yes	Yes	Yes	Yes	Yes
Marina	$1,001,783	Yes	Yes	Yes	Yes	Yes	Yes
Monterey	$1,324,367	Partial	Yes	No Report	Yes	No Report	Yes
Pacific Grove	$786,743	Yes	Yes	Yes	Yes	Yes	Yes
Salinas	$5,855,296	Partial	Yes	No Report	Yes	No Report	Yes
Sand City	$39,680	Yes	Yes	No	Yes	Yes	Yes
Seaside	$1,273,993	Yes	Yes	Yes	Yes	Yes	Yes
Soledad	$843,992	Yes	Yes	Yes	Yes	Yes	Yes
Total	**$22,869,814**						

ATTACHMENTS:

None

WEB ATTACHMENTS:

TRANSPORTATION AGENCY FOR MONTEREY COUNTY

Memorandum

To: Technical Advisory Committee

From: Doug Bilse, Principal Engineer, Regina Valentine (AMBAG)

Meeting Date: February 1, 2024

Subject: **Draft AMBAG Complete Streets Policy**

RECOMMENDED ACTION:

REVIEW and **PROVIDE INPUT** on the Draft AMBAG Complete Streets Policy

SUMMARY:

With the passing of the Infrastructure Investment and Jobs Act/Bipartisan Infrastructure Law of 2021, the Association of Monterey Bay Area Governments (AMBAG) is required to conduct complete streets planning that prioritizes the safe and adequate accommodation of all users of the transportation system, including pedestrians, bicyclists, public transportation users, children, older individuals, individuals with disabilities, motorists, and freight vehicles.

FINANCIAL IMPACT:

AMBAG, as the federally designated Metropolitan Planning Organization (MPO) for the Monterey Bay region, is required to set aside a portion of the agency's Federal Highway Administration (FHWA) Metropolitan Planning Funds (PL funds) allocation to conduct complete streets planning. The Complete Streets Policy can be used by agencies to guide the development of plans, projects and associated grant applications.

DISCUSSION:

Complete streets prioritize the safe and adequate accommodation of all users of the transportation system, including pedestrians, bicyclists, public transportation users, children, older individuals, individuals with disabilities, motorists, and freight vehicles.

As identified in AMBAG's Overall Work Program, staff developed a Draft Complete Streets Policy in coordination with AMBAG's member agencies, including the Transportation Agency of Monterey County. Although this is a new federal requirement, complete streets planning has been a priority historically for AMBAG and the jurisdictions in the Monterey Bay region. As an example, AMBAG, the Transportation Agency for Monterey County and Santa Cruz Regional Transportation Commission jointly prepared a Monterey Bay Area Complete Streets Guidebook in August 2013. For this reason, this Complete Streets Policy serves more to memorialize the transportation planning work already being conducted in the region.

Key sections of AMBAG's Complete Streets Policy are listed and described below:

- **Introduction**: Introduction to the policy
- **Purpose and Need**: Why the policy was prepared
- **Complete Streets Definition**: AMBAG's definition of complete streets

- **Complete Streets Vision**: AMBAG's complete streets vision for the region
- **Complete Streets Goals**: The goals of the policy
- **Principles of Complete Streets**: The key policy principles and considerations
- **Complete Streets Policy**: AMBAG's commitment to complete streets during, "…the development of all transportation infrastructures within the Monterey Bay region at all phases of their development, including planning and land use, scoping, design approvals, implementation, and performance monitoring."
- **Consistency with Regulations**: The policy's consistency with federal, state, and local regulations
- **Scope of Complete Streets Policy**: When the policy applies
- **Exceptions**: When the policy does not apply
- **Design Guidance**: Sources for design guidance, standards, and recommendations
- **Context Sensitivity**: AMBAG's recognition that complete streets projects should be context-sensitive to a community's physical, economic, and social setting
- **Evaluation and Performance Measures**: Suggested performance measures to evaluate the implementation of complete streets
- **Implementation and Reporting**: How AMBAG will implement and report progress on the policy
- **References**: Links to design guidance and regional complete streets initiatives

Below are upcoming key dates for developing AMBAG's Complete Streets Policy:

- February 2024: Present the Draft AMBAG Complete Streets Policy to regional Advisory Committees, Planning Directors Forum, and to the AMBAG Board of Directors
- February 1, 2024 – March 15, 2024: Public Comment Period
- March 2024: Prepare the Final AMBAG Complete Streets Policy
- April 2024: Present the Final AMBAG Complete Streets Policy to regional Advisory Committees and Planning Directors Forum
- May 8, 2024: AMBAG Board of Directors will be asked to adopt the Final AMBAG Complete Streets Policy for eventually incorporation into the 2050 Metropolitan Transportation Plan/ Sustainable Communities Strategy (MTP/SCS)

The Draft AMBAG Complete Streets Policy is included as Attachment 1. Committee members are asked to provide comments on the draft policy by March 15, 2024. Comments should be emailed to Regina Valentine at rvalentine@ambag.org.

ATTACHMENTS:

1. 2024 AMBAG Complete Streets Policy Public Draft_PDFA

WEB ATTACHMENTS:

ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS COMPLETE STREETS POLICY

Draft – February 2024

Table of Contents

Association of Monterey Bay Area Governments Complete Streets Policy

Introduction

The Association of Monterey Bay Area Governments (AMBAG) has recognized the importance of multimodal streets to improve accessibility, safety, and equity for all users of the transportation system. In August 2013, AMBAG adopted its *Monterey Bay Area Complete Streets Guidebook*, providing resources and procedures for developing an interconnected, safe, and accessible
active transportation network in the Monterey Bay region to meet the needs of all travel modes, ages, and abilities. Additionally, AMBAG recognizes their partner agencies and local jurisdictions have prioritized creating a safe, accessible, efficient, and coordinated transportation network that accommodates all roadway users within their communities.

AMBAG's Complete Streets Policy will build upon these previous efforts by promoting a transportation system that is designed to be multimodal to safely and comfortably accommodate users of all ages and abilities, including, but not limited to, pedestrians, bicyclists, shared and micromobility users, motorists, transit and school bus riders, persons with disabilities, freight and commercial providers, emergency responders, and adjacent land users.

Research has shown that complete streets enhance job growth, promote economic development, improve safety, public health, and fitness, decrease vehicle emissions, and reduce the overall demand on roadways by allowing people to replace motor vehicle trips with active transportation and transit options. Furthermore, as communities integrate sidewalks, bike facilities, transit amenities, and safe crossings into the initial design of a project, they spare the expense and complications of retrofits implemented at a later date. Proactively planning for a multimodal transportation system can promote its integration with land use policies to encourage sustainable development.

Purpose and Need

Federal, state, and local policies have emphasized the need to accommodate all users of the roadway. The metropolitan planning process specifically includes direction to increase the safety of the transportation system for motorized and non-motorized users. This requires that AMBAG plan, prioritize, promote, and implement measures to accomplish this goal. One way to do so is through adopting a complete streets policy as directed by the Infrastructure Investment and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL) of 2021. Using the complete streets concept, AMBAG is supporting the paradigm shift from "moving cars quickly" to "providing safe access for users of all modes." This work is needed as demonstrated by the 35% increase in pedestrian

fatalities and serious injuries in the tri-county region (Monterey, San Benito, and Santa Cruz) between 2019 and 2022.[1]

The adopted approach will result in the Monterey Bay region's roadways being safer and more accessible for bicycles and pedestrians, while also being realistic and reasonable to implement. As the final approval of roadway designs to achieve safe and efficient operations of the transportation system lies with the licensed traffic engineers, this policy is not too specific regarding street design. Instead, this policy is to provide direction to the design engineers and other decision makers as to what, at a minimum, shall be required to help achieve safe mobility for all roadway users. When doing so, it supports the development of a comprehensive, multimodal transportation system and promotes integration with sustainable land use development. For this reason, AMBAG's Complete Streets Policy is consistent with regional goals and objectives established in the adopted Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS).

Complete Streets Definition

The term "complete streets" describes a transportation network that is routinely planned, designed, operated, and maintained to prioritize safety, comfort, and access to destinations for all people who use the facility. Complete streets increase the level of service for all users, rather than focusing solely on automobiles. This includes older adults, persons living with disabilities, people who walk and bike for transportation, and people who do not have access to a vehicle. Complete streets make it easy to cross the street, walk to shops, jobs, and schools, bicycle to work, move actively with assistive devices, and operate commercial and emergency vehicles efficiently. They also allow buses to run on time and make it safe for people to walk or move actively to and from transit hubs. This work is needed as demonstrated by a May 2023 Monterey-Salinas Transit (MST) passenger survey that found 91% of respondents walked, biked, scooted, or used a mobility aid to get to a bus stop.[2]

When implemented, the complete streets approach to planning streets and roads results in a transportation system that balances the needs of all users, regardless of age, ability, or mode of transportation. Through continued and incremental changes in capital projects, regular maintenance and operations work, the street network gradually becomes safer and more accessible for travelers of all ages and abilities.

As communities have different context, needs, and characteristics, complete streets planning and design should be flexible and comprehensive. There is no specific design prescription; each street is unique, and its design reflects the context of the community and street network. Each street project is considered within the context of the overall transportation system. Some streets may be prioritized for pedestrian travel, others for transit, bicycling, motorists, or goods

[1] UC Berkeley SafeTREC Transportation Injury Mapping System (TIMS) SWITRS Summary, 2018 – 2022 Pedestrian Fatalities and Serious Injuries by County, https://tims.berkeley.edu/summary.php

[2] MST District Board of Directors Meeting Agenda Packet, September 11, 2023, https://mst.org/wp-content/media/Agenda_MST_202309-September-Final.pdf

movement. Some streets will have robust facilities that accommodate all modes; however, many streets might not contain all those features due to physical right-of-way constraints and other considerations.

Complete Streets Vision

AMBAG's Complete Streets Policy aims to enhance the quality of life in the Monterey Bay region through improvements to transportation safety, equity, mobility, accessibility, connectivity, sustainability, and resiliency as well as public health and economic vitality. This vision will be implemented through street design that is context sensitive and incorporates principles and practices that focus the function of a street around the movement of people, balance mobility for everyone, and minimize negative impacts on the environment. This work will require coordination across disciplines and across jurisdictional lines, including when projects are located on California Department of Transportation (Caltrans) right-of-way.

Complete Streets Goals

The goals of this Complete Streets Policy are to:

1. Consider the needs of all road users, including the most vulnerable such as children, seniors, persons with disabilities, and persons of limited means, throughout the Monterey Bay region to the greatest extent possible and practicable.
2. Encourage the integration of the vision, purpose, and goals of this Complete Streets Policy into the project development process for surface transportation projects in the Monterey Bay region.
3. Create a safe, equitable, balanced, comprehensive, integrated, fully interconnected, functional, reliable, convenient, resilient, and visually attractive surface transportation network in the Monterey Bay region.
4. Promote the use of the latest and best complete streets design standards, principles, policies, and guidelines within the context of the community.
5. Support flexibility for different types of streets, communal areas, and users to enhance the access and mobility experience.
6. Plan, design, operate, and maintain a multimodal network of complete streets that supports sustainable development and provides livable, healthy, equitable, and prosperous communities.
7. Make active transportation and transit safer and more convenient to increase use of these modes of transportation.
8. Support transportation options that improve public health.

Principles of Complete Streets

The following are key principles of AMBAG's Complete Street Policy:

1. It is context-sensitive, considering economic, social, and environmental objectives.
2. Emphasizes transportation facility connectivity for all modes of travel.

3. Takes into account not only the presence of a facility, but also the level of comfort (including future average temperature rises due to climate change) and safety (based on national data for bicycles and pedestrians) that the facility provides for all users of that facility.
4. Ensures that the entire right-of-way is planned, designed, funded, and operated with consideration for safe access for all users of all ages and abilities and that all users and transportation modes are equally deserving of safe travel facilities.
5. Encourages the use of national best practice design standards.
6. Allows design flexibility in balancing user and stakeholder needs including maintenance needs.
7. Encourages that the purchase of operations and maintenance vehicles are well suited for current and proposed infrastructure.
8. Encourages consistency of transportartion projects with current and future land use goals and policies of local land use plans.
9. Benefits all users equitably, particularly vulnerable users and in the most underinvested and underserved communities, including facility maintenance.
10. Actively works to consider how to preserve right-of-way for all users.
11. Encourages the prioritization of complete streets projects in areas that have the potential to serve high concentrations of vulnerable users.
12. Encourages collaboration and interagency coordination with all transportation planning agencies and partners including public health and housing.
13. Supports the involvement of local transit agencies to ensure that sufficient accommodation for transit vehicles and access to transit facilities is provided.

Complete Streets Policy

AMBAG encourages the above principles be used for the purpose of planning, designing, building, operating, and maintaining a safe, reliable, efficient, integrated, balanced, equitable and connected multimodal transportation network that will provide access, mobility, safety, and connectivity for all users. This policy is a regional commitment that future transportation projects in the Monterey Bay region will consider and value the needs of all users regardless of age, ability, income, ethnicity, or chosen mode of travel, including pedestrians, bicyclists, shared and micromobility users, motorists and transit riders, as early as practicable and throughout the transportation planning process consistent with and supportive of the surrounding communities.

AMBAG will promote the complete streets concept throughout the Monterey Bay region and, therefore, recommends that all local jurisdictions adopt comprehensive complete streets policies, consistent with the regional Complete Streets Policy. AMBAG will seek incorporation of the complete streets concept and policy into the development of all transportation infrastructures within the Monterey Bay region at all phases of their development, including planning and land use, scoping, design approvals, implementation, and performance monitoring. Additionally, AMBAG encourages the prioritization of funding for the implementation of complete streets projects.

Consistency with Regulations

The U.S. Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations supports the development of fully integrated active transportation system networks, which foster safer, more livable, family-friendly communities; promote physical activity and health; and reduce vehicle emissions and fuel use. The policy encourages transportation agencies to go beyond the minimum requirements and to proactively provide convenient, safe, and context-sensitive facilities that accommodate people of all ages and abilities, including people too young to drive, people who cannot drive, and people who choose not to drive. Furthermore, federal transit law specifies that all pedestrian improvements located within one-half mile and all bicycle improvements located within three miles of a public transportation stop or station be integrated with public transportation.

The State of California has emphasized the importance of complete streets by enacting the California Complete Streets Act of 2008 (AB 1358), which requires that when cities or counties make substantive revisions to the circulation elements of their General Plans, they identify how they will provide for the mobility needs of all users of the roadways. The California Global Warming Solutions Act of 2006 (AB 32) sets a mandate for the reduction of greenhouse gas emissions in the state, and the Sustainable Communities and Climate Protection Act of 2008 (SB 375) requires emissions reductions through coordinated regional planning that integrates transportation, housing, and land use policy. Caltrans Director's Policy 37 established Caltrans' organizational priority to encourage and maximize walking, biking, transit, and passenger rail as a strategy to not only meet state climate, health, equity, and environmental goals but also to foster socially and economically vibrant, thriving, and resilient communities. To achieve this vision, Caltrans will maximize the use of design flexibility to provide context-sensitive solutions and networks for travelers of all ages and abilities.

Achieving the goals of these laws will require significant increases in travel by public transit, bicycling, micromobility, and walking. Strategies to achieve greenhouse gas emissions targets in support of SB 375 were adopted by AMBAG in the 2045 MTP/SCS. Additionally, AMBAG has been a champion of complete streets with the August 2013 adoption of its *Monterey Bay Area Complete Streets Guidebook*, providing resources and procedures for developing an interconnected, safe, and accessible active transportation network in the Monterey Bay region. The development of this Complete Streets Policy is a continuation of the agency's commitment to supporting an integrated multimodal transportation system.

AMBAG also recognizes their partner agencies and local jurisdictions should and have prioritized creating a safe, accessible, efficient, and coordinated transportation network that accommodates all roadway users within their communities. Within the Monterey Bay region, a number of local jurisdictions have adopted policies and resolutions or updated the circulation element of their General Plans, or in the process of doing so, to support complete streets and advance the health, safety, welfare, economic vitality, and environmental well-being of their residents. AMBAG also recognizes that complete streets is an essential component of Vision

Zero, for which many jurisdictions incorporate strategies to slow traffic speeds and eliminate all traffic fatalities and severe injuries. AMBAG views Vision Zero strategies, including lower speed limits, as complementary and can be integrated into local complete streets efforts.

Scope of Complete Streets Policy

The transportation network includes, but is not limited to, streets, bridges, intersections, sidewalks, shared-use paths, trails, lighting, street crossings such as crosswalks and median refuges, signage, accommodations for bicyclists and transit, landscaping, street furniture, and drainage facilities.

AMBAG's Complete Streets Policy shall apply to all projects at all phases including but not limited to, planning, design, right-of-way acquisition, new construction, reconstruction and retrofit, rehabilitation, repair, operation, and maintenance that will use funding under AMBAG's discretion unless otherwise exempted. Locally funded projects are encouraged to comply with this policy or a similar locally adopted complete streets policy. Accommodations for all existing modes of transportation shall be planned for and provided during construction and maintenance work.

1. This Complete Streets Policy will focus on developing a connected, integrated transportation network that serves all users.
2. Transportation projects receiving funding in the Monterey Bay region are encouraged to implement a complete streets approach.
3. AMBAG shall approach each transportation project as an opportunity to create safer, more accessible facilities for all users.
4. AMBAG does not subscribe to one singular design prescription for complete streets; each street is different in function and context. Roadways that are planned and designed using a complete streets approach may include a wide variety of transportation solutions.
5. This policy informs and encourages all local transportation agency representatives and consultants responsible for planning, designing, constructing, or maintaining projects within the Monterey Bay region to apply complete streets design and standards.
6. The planning or design of a project or plan within the Monterey Bay region will be supported by this policy, where appropriate.
7. AMBAG will work with local municipal, state and public agencies to educate the general public about the importance of complete streets, safe driving, bicycling, micromobility, public transit, and walking practices.

Exceptions

AMBAG's Complete Streets Policy applies to all projects at all phases within the Monterey Bay region. All exemptions should be documented with supporting data and evidence for the basis of an exemption then be made publicly available. Exemptions should only be considered if one or more of the following conditions are met:

1. Where bicyclists, pedestrians, or another particular use is prohibited by law from using a roadway. Accommodations should be made to ensure that all users can still cross these areas, so they do not become barriers.
2. Where the street or road is already designed to accommodate all users.
3. Where cost would be excessively disproportionate to probable use or need considering economic conditions, cost, and economic benefit. Excessively disproportionate is defined in Federal Highway Administration's (FHWA) "Accommodating Bicycle and Pedestrian Travel: A Recommended Approach" as bicycle and pedestrian facilities together exceeding twenty percent (20%) of the cost of the larger transportation project.
4. Where a project consists primarily of the installation of traffic control safety devices. All new pedestrian crossing devices must meet the most current accessibility standards for controls, signals, and placement.
5. Where lack of population or other factors indicate an absence of need under both current and future conditions. This exception should take the long view and consider probable use throughout the life of the project—usually a minimum of 20 years for roadways and 50 or more years for bridges.
6. Where roadway standards or bicycle and pedestrian standards cannot be met due to constraints excessively difficult to mitigate. The feasibility of alternative routes of similar or better quality to accommodate all users and connect to the transportation network should be studied.
7. Where all improvements would be very likely removed in the near future due to projects in the same area.
8. Where transit service is non-existent and not planned as confirmed by the local transit agencies, therefore there is no need for direct public transit accommodations.
9. Where fire and safety specification conflicts and environmental concerns, such as abutting conservation land or severe topological constraints, exist.

Design Guidance

AMBAG promotes the adoption of the best and latest design guidance, standards, and recommendations available to maximize design flexibility and innovation, and to always be aware that design solutions should balance user and modal needs. This includes a shift toward designing at the human scale for the needs and comfort of all people and travelers, as well as considering issues such as street design and width, desired operating speed, turn radii, hierarchy of streets, and connectivity. Design criteria should not be purely prescriptive but should be based on the thoughtful application of engineering, architectural, and urban design principles. A non-exhaustive list of complete streets resources is provided in the References section of this policy.

Context Sensitivity

AMBAG recognizes that there is no singular design for complete streets, therefore this Complete Streets Policy is flexible to allow consideration of other appropriate design standards to accommodate the needs of many users and sensitive to the local context, provided that a comparable level of safety for all future users is achieved. The development and

implementation of current and future projects should be context-sensitive to the community's existing and planned physical, economic, and social setting, and consider community input and the lived experience of residents. This context-sensitive approach to process and design includes a range of goals that gives significant consideration to stakeholder and community values. The overall goal of this approach is to preserve and enhance scenic, aesthetic, historical, neighborhood character, and environmental resources while improving or maintaining safety, mobility, and infrastructure conditions.

Evaluation and Performance Measures

AMBAG promotes the establishment of publicly shared performance measures to evaluate the implementation of complete streets. Performance measures that contribute to complete streets goals could include, but are not limited to:

1. Number of locally adopted complete streets policies
2. Number of people within a 30-minute walk, bike, or transit trip to key locations
3. Percent of people taking transit, walking, and bicycling
4. Walk and Bike Scores
5. California Healthy Place Index Scores
6. Multimodal Level of Service (MMLOS)
7. Expansion of a comfortable, low-stress transportation network for non-motorized traffic, as measured by an appropriate Level of Traffic Stress (LTS) analysis
8. With an emphasis in underserved or underinvested communities, decrease in rate of crashes, injuries and fatalities by mode, including using the UC Berkeley SafeTREC Transportation Injury Mapping System (TIMS) as a suggested tool
9. Transit travel time reliability (consistency in the time required to travel the roadway segment during a given time of day)
10. Average transit travel speed relative to automobile travel speed
11. Transit delay (the additional time riders spend on a given segment relative to the time required during free-flow travel conditions)
12. Transit passenger delay weighted by the number of passengers experiencing the delay
13. Miles of bicycle facilities, including but not limited to on-street bike lanes, signed routes, and separated multi-use paths
14. Number of new bike racks installed, both public and private
15. Miles of new or reconstructed sidewalk
16. Number of new or reconstructed curb ramps
17. Number of new or repainted crosswalks
18. Miles of new non-motorized traffic facilities added to roads within ¼ mile of transit routes
19. Number of new streetscape amenities such as street trees, lighting, etc.
20. Percentage completion of bicycle and pedestrian networks as envisioned in plans and programs
21. Number of completed transportation projects that demonstrate how they are meeting current land use plan goals

22. Number of complete streets projects in underserved or underinvested communities
23. Progress of community ADA Transition Plans
24. Project-specific road audits and public surveys
25. Metrics included in the most recently adopted California Transportation Commission Active Transportation Program Guidelines

Implementation and Reporting

AMBAG encourages implementation of this Complete Streets Policy to be carried out cooperatively among all transportation partners and local jurisdictions within the Monterey Bay region to the greatest extent possible. AMBAG will incorporate complete streets principles into its plans and programs as well as encourage incorporation of this Complete Streets Policy into all planning and design documents in the Monterey Bay region.

AMBAG's Complete Streets Policy provides network-level planning and design considerations intended to ensure that safe, comfortable, and connected transportation facilities are available to all users, regardless of age, ability, or income. AMBAG will help facilitate workshops and other training opportunities for transportation staff, community leaders, and the general public to underscore the importance of the complete streets vision. AMBAG is committed to developing and instituting better ways to measure performance and collect data on how well streets are serving all users.

Starting with the 2050 MTP/SCS, this Complete Streets Policy will help guide the development of all future AMBAG MTP/SCSs. Therefore, examining the implementation of the MTP/SCS over time will be the primary means by which the impact of this policy will be measured. Progress will be reported as part of each MTP/SCS and Metropolitan Transportation Improvement Program (MTIP) update process. At a minimum, these reports will include a description or analysis of how the MTP/SCS and MTIP advances complete streets, which may include:

1. Complete street projects completed during the previous MTIP cycle or since the last MTP/SCS update.
2. Complete street projects and their associated funding amounts expected to be completed in the next MTIP and MTP/SCS.
3. How the MTIP and MTP/SCS project prioritization process advances complete streets.

AMBAG will, at a minimum, evaluate this Complete Streets Policy and the documents associated with it periodically and in parallel with the AMBAG MTP/SCS updates. This evaluation may include recommendations for amendments to the Complete Streets Policy and subsequently be considered for adoption by the AMBAG Board utilizing its then current public and member involvement procedures.

References

Links to recommended complete streets design guidance are provided below. Traffic engineers and other decision makers can review these references for specific complete streets designs and elements for implementation.

1. FHWA Manual on Uniform Traffic Control Devices for Streets and Highways, https://mutcd.fhwa.dot.gov/
2. FHWA Road Diets, https://highways.dot.gov/safety/proven-safety-countermeasures/road-diets-roadway-configuration
3. FHWA Bikeway Selection Guide, https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf
4. FHWA Incorporating On-Road Bicycle Networks into Resurfacing Projects, https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/re surfacing_workbook.pdf
5. FHWA Separated Bike Lane Planning and Design Guide, https://highways.dot.gov/safety/pedestrian-bicyclist/safety-tools/pg-89-101-separated-bike-lane-planning-and-design-guide
6. FHWA Pedestrian Safety Guide and Countermeasure Selection System, https://highways.dot.gov/safety/pedestrian-bicyclist/safety-tools/resources-pedestrian-safety-guide-and-countermeasure
7. FHWA Roundabout Guidance, https://www.fhwa.dot.gov/publications/research/safety/00067/00067.pdf
8. FHWA Small Town and Rural Multimodal Networks, https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/
9. FHWA Guidebook for Measuring Multimodal Network Connectivity, https://highways.dot.gov/safety/pedestrian-bicyclist/safety-tools/pg-10-33-guidebook-measuring-multimodal-network
10. FHWA Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts, https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/multimodal_networks/
11. FTA Manual on Pedestrian and Bicycle Connections to Transit, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/64496/ftareportno0111.pdf
12. U.S. Access Board's Public Right-of-Way Accessibility Guidelines (PROWAG), https://www.access-board.gov/prowag/
13. Americans with Disabilities Act (ADA) Standards for Accessible Design, https://www.ada.gov/law-and-regs/design-standards/
14. National Complete Streets Coalition, https://smartgrowthamerica.org/program/national-complete-streets-coalition/
15. AASHTO A Policy on Geometric Design of Highways and Streets, https://store.transportation.org/item/collectiondetail/180

16. AASHTO A Guide for Achieving Flexibility in Highway Design, https://nacto.org/docs/usdg/flexibility_in_highway_design.pdf
17. AASHTO Guide for the Development of Bicycle Facilities, https://nacto.org/references/aashto-guide-for-the-development-of-bicycle-facilities-2012/
18. AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, https://store.transportation.org/item/collectiondetail/224
19. NACTO Urban Street Design Guide, https://nacto.org/publication/urban-street-design-guide/
20. NACTO City Limits: Setting Safe Speed Limits on Urban Streets, https://nacto.org/safespeeds/
21. NACTO Urban Bikeway Design Guide, https://nacto.org/publication/urban-bikeway-design-guide/
22. NACTO Transit Street Design Guide, https://nacto.org/publication/transit-street-design-guide/
23. NACTO Urban Street Stormwater Design Guide, https://nacto.org/publication/urban-street-stormwater-guide/
24. ITE Designing Walkable Urban Thoroughfares: A Context Sensitive Approach, https://ecommerce.ite.org/IMIS/ItemDetail?iProductCode=RP-036A-E
25. ITE Traffic Calming Measures; https://www.ite.org/technical-resources/traffic-calming/traffic-calming-measures/
26. ITE Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges, https://ecommerce.ite.org/IMIS/ItemDetail?iProductCode=RP-039A
27. California Manual on Uniform Traffic Control Devices, https://dot.ca.gov/programs/safety-programs/camutcd
28. Caltrans Highway Design Manual, https://dot.ca.gov/programs/design/manual-highway-design-manual-hdm
29. Caltrans Active Transportation Emphasis Area Guidance for Corridor Planning, https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/active-transportation-complete-streets/20220131active-transportation-emphasis-area-guidance-final-version-v7a11y.pdf
30. Caltrans Pedestrian Safety Countermeasures Toolbox, https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/ped-bike/caltrans-ped-safety-countermeasures-toolbox-a11y.pdf
31. Caltrans Design Information Bulletin 82-6 “Pedestrian Accessibility Guidelines for Highway Projects,” https://dot.ca.gov/-/media/dot-media/programs/design/documents/dib82-06-a11y.pdf
32. Caltrans Design Information Bulletin 89-02 “Class IV Bikeway Guidance,” https://dot.ca.gov/-/media/dot-media/programs/design/documents/dib-89-02-final-a11y.pdf
33. Caltrans Traffic Calming Guide, https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/traffic-calming/final-traffic-calming-guide_v2-a11y.pdf
34. California Safe Routes to School, http://www.casaferoutestoschool.org/

35. Monterey Bay Area Complete Streets Guidebook, https://www.ambag.org/sites/default/files/2022-05/PDFAAppendix%20H_%20Complete%20Streets.pdf
36. Monterey-Salinas Transit (MST) Designing for Transit: A Guide for Supporting Public Transit Through Complete Streets, https://mst.org/wp-content/media/DesigningForTransit-2020-Edition.pdf
37. Southern California Association of Governments' Transit Priority Best Practices Report, https://scag.ca.gov/post/transit-priority-best-practices-report-0
38. American Planning Association Planning Advisory Service Report Number 559, "Complete Streets: Best Policy and Implementation Practices," https://www.planning.org/publications/report/9026883/
39. Vision Zero Network, https://visionzeronetwork.org/
40. Model Design Manual for Living Streets, http://www.modelstreetdesignmanual.com/

Sample of Complete Streets Initiatives in the Monterey Bay Region

1. Caltrans District 5 Active Transportation Plan Summary Report, https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/active-transportation-complete-streets/district5-finalreport-a11y.pdf
2. City of San Juan Bautista Active Transportation and Community Connectivity Plan, https://www.san-juan-bautista.ca.us/departments/planning/active_transportation_plan.php
3. City of Seaside Broadway Avenue and Yosemite Street Complete Streets Project, https://www.ci.seaside.ca.us/781/Broadway-Avenue-and-Yosemite-Street-Comp
4. City of Watsonville Downtown Specific Plan, https://www.watsonville.gov/1626/Downtown-Specific-Plan
5. Highway 9/San Lorenzo Valley Complete Streets, https://sccrtc.org/projects/streets-highways/hwy-9-plan/

TRANSPORTATION AGENCY FOR MONTEREY COUNTY

TRANSPORTATION AGENCY FOR MONTEREY COUNTY

Memorandum

To: Technical Advisory Committee

From: Doug Bilse, Principal Engineer

Meeting Date: February 1, 2024

Subject: **Advanced Vehicle Detection Systems for Signalized Intersections**

RECOMMENDED ACTION:

RECEIVE presentation and **PROVIDE INPUT** on a presentation on advanced vehicle detection systems and associated benefits for traffic data management systems.

SUMMARY:

TAMC received a Safe Streets for All grant to prepare a safety action plan for each jurisdiction in Monterey County that does not already have a safety action plan or is in the process of developing a safety action plan. As part of this work, TAMC will need to collect, analyze and manage traffic data. Representatives from Wavetronix, Inc. will present an overview of recent developments in vehicle detection.

FINANCIAL IMPACT:

TAMC received a Safe Streets for All grant to prepare a safety action plan for each jurisdiction in Monterey County that does not already have a safety action plan or is in the process of developing a safety action plan. As part of this work, TAMC will need to collect, analyze and manage traffic data. TAMC may decide to procure a system to assist in developing the safety action plans. TAMC has not yet published a request for proposals to do this work.

DISCUSSION:

Most roadway collisions occur at intersections. Traffic signals typically control intersection movements. Traffic Engineers have been trying to reduce roadway collisions by implementing better detection. These advances are designed, engineered, and built for specific applications that allow engineers to have situational awareness and spatial awareness of vehicles as they approach an intersection.

Current safety systems attempt to understand different aspects of vehicles on a roadway by creating points of detection to better understand gaps between vehicles, vehicle speeds, and vehicle queues. Vehicle detection is typically done by the following options:

- Inductive loops;
- Visual products (e.g., cameras);
- Radar detection; and
- Some visual products have tried to compensate for the visual shortcomings by adding some form of Radar to their product.

New technology using these detection systems includes advances in situational awareness and spatial awareness to give engineers more information. This also leads to more alerts to safety that can better guide vehicles through intersections. Some of the issues the traffic signal detection industry is trying to address include:

Dynamic Dilemma Zone Protection: As vehicles approach an intersection, detection using advanced technology can track each individual vehicle over 900 feet away from the sensor. Some systems can categorize individual vehicles by type (passenger vehicle, semi-truck) and track the distance that vehicle is from the stop bar and the speed it is traveling at. This real time information allows dynamic dilemma zone extensions and that means situational awareness can help a signal controller to serve the larger vehicles differently than smaller vehicles and provide alerts as needed. If congestion occurs, and all vehicles can safely stop when the signal transitions, there is no need to extend time for the vehicles traveling over the preset zones or loops.

High Volume Green Extension: Many signal controllers add an extension time based on data supplied from the advanced, or setback, detection zones, and this will often set the signal phase to Max Extension. A true dynamic dilemma zone provides an alert or extension only when a high volume, or high density, of vehicles is present. With detailed vehicle detection information, an output can be provided if the number of vehicles and the speed of the vehicles reach a particular location that warrants green extension to clear the developing queue.

Queue Warning Detection: Long vehicle queues can be dangerous if they encroach into the upstream intersection or block critical vehicle movements through the intersection. Advanced vehicle detection can dynamically watch for dropping speeds in the area before the queue blocks a closely-spaced intersection or fire station driveway. The detection system can provide an output that the controller uses to enact a low-priority preemption and transition the signal to flush the vehicles through the intersection or avoid blocking the fire station access. This can also be used for short freeway ramps that have the potential of backing up onto the freeway.

Gap Detection: Gap detection is critical to a safe and efficient transition of phasing of the intersection. A good stop bar detection on side streets identifies when there is demand. The challenge is knowing when to safely serve a side street, or find a safe gap on both sides of the current green approach. With knowledge of the position and speed of the vehicle on the road, the system understands the true spatial distance of the vehicles and discovers their true gap. A vehicle driving in lane one at 45 MPH and a vehicle driving in lane two at 30 MPH with a 10-foot distance between them has a very different spatial gap than a vehicle in lane one traveling at 45 MPH and a vehicle in lane two traveling at the same speed with the same 10-foot separation distance. Spatial awareness can dynamically track two vehicles and use both their speed and position to discover their true gap and find more safe gaps to transition the intersection safely and efficiently.

Stop Line Queue Detection: When vehicles are stopped at a red light, a queue begins to form as vehicles stop behind each other. Once the signal turns green and vehicles start moving, it is good practice to hold that green until the vehicle flow is optimized. This is typically done by placing a loop or detection zone further back from the stop bar (about 150 feet) and looking for a three-second gap between detections. When there is a 3-second gap, the controller releases the hold on green and other detections such as gap or dilemma zone detection is used to define the phase duration. The problem often comes with distracted or slow-to-start vehicles waiting in the queue just past the queue detection point. Since some detection options (loops and vision detection) cannot see the spatial differences in both positioning and speed, they will often mistake a gap from a distracted or slow-to-start vehicle as free flowing traffic, even though there may be a large queue behind the problem vehicle (i.e., the intersection has not actually met the requirements of free flow). Understanding the spatial relationship of the vehicles and using speed as the indicator of a free-flowing intersection,

specialized detection can add additional detection zones and look for vehicle speeds above a target speed (say 35 MPH on a 45 MPH roadway). Once the trigger speed has been met, the intersection can turn off the stop-bar detection and more efficiently use dynamic dilemma zone to transition at the right time.

Yellow Flashing Left Turn: Protected/ permitted intersections introduce unique challenges. When an agency uses flashing yellow arrows for a left-turn movement, the spatial awareness of that lane is critical. Providing too many protective movements will create less efficiency in the signal cycle. Providing too much permissive turning movement can lead to safety issues. Effective placement of detection zones can accurately detect the spatial relationship of the vehicles in the left-turn lane and this allows for more precise and dynamic turning movements. Placing two long zones with about two vehicle lengths in between allows for spatial awareness to accurately detect when the signal should be in protective and when it should be in permissive. If the controller can accept a speed input from the approaching traffic and monitors vehicle speeds from the previous phase, the controller could provide a protective turning movement at the end of the next phase based on the speed measured in the field. If the average speeds are below this threshold for a given phase, the controller could revert to a permissive indication for a short queue in the turning lane.

Long Zone Efficiency: One of the most important settings in an actuated signal is the vehicle extension interval, or passage time. When the passage time is reduced or the controller relies solely on detection to extend green times, it can lead to more efficient operations at intersections. Long detection zones determine where vehicles are spatially placed on the roadway, allowing technicians to set the passage time at zero or below zero. The difficulty with some detection systems is the inability to detect individual vehicles in a zone that can be over sixty feet long. Some detection systems have difficulty determining distance and vehicle placement in the proper lane when two vehicles are the same distance from the sensor but are in two different lanes. This can limit the use of long zone detection and the associated benefits that reduced passage time provides. An example of long detection zones is seen in a 65-foot zone that can have a passage time set to a half a second to a second if the speeds are less than 25 MPH and one-second passage times if the speeds are greater than 30 MPH. This could better serve side street traffic that would otherwise wait for the longer cycle.

Representatives from Wavetronix will share information on the latest developments in vehicle detection designed to help make intersections safer and more efficient.

ATTACHMENTS:

None

WEB ATTACHMENTS: