



Mark Armstrong, Mayor
Marisol Rubio, Vice Mayor
Richard Adler, Councilmember
Robert Jweinat, Councilmember
Sridhar Verose, Councilmember

City of San Ramon City Council Agenda

**San Ramon City Hall
Council Chamber
7000 Bollinger Canyon Road**

**August 11, 2026
6:30 PM
Regular Meeting**

Agenda Questions: Contact the City Clerk (925) 973-2539 or email to cityclerk@sanramon.ca.gov.

Please refer to the end of the agenda to review options for participation in the meeting. This agenda is posted in accordance with Government Code Section 54954.2(a). Unless stated otherwise, every item on the agenda is exempt from CEQA Guidelines § 15060(c), 15061(b)(3), 15273, 15378, 15301, 15323 and/or Public Resources Code § 21065.

1. Call to Order/Roll Call

2. Pledge of Allegiance

3. Announcements

3.1. Changes and Additions to the Agenda

4. Public Comment

Members of the public are welcome to address the City Council during Public Comment on:

- Any item not on this agenda that is within the City Council authority.
- Consent Calendar items, including requests to remove (pull) an item for separate discussion. If requesting to pull the item from the Consent Calendar, state the reason why you wish to pull the item(s). The decision to pull the item from the Consent Calendar is strictly at the discretion of the City Council.
- Special Presentation items (Item 6 of the agenda).
- Requests for future agenda items.

Please direct all comments to the City Council, not to City staff or the public. Each speaker will have up to 3 minutes to speak. The time limit may be reduced if a large number of speakers are anticipated. Speaking time may not be transferred to another person. State law does not allow the City Council to take action on items that are not listed on the agenda.

5. Consent Calendar

The Consent Calendar includes routine items that are usually approved together with one vote. If you would like the City Council to consider a Consent Calendar item separately, you may request that the item be removed by:

- Speaking during Item 4 – Public Comment, or

- Emailing the City Clerk before the meeting.

The City Council will decide, in its sole discretion, whether to remove the item for separate discussion. The title of each resolution or ordinance will be read aloud, and such reading shall be deemed a waiver of the reading of the complete resolution or ordinance, unless a City Council member requests that the entire document be read aloud.

5.1. Minutes of the City Council Regular Meeting – July 14, 2026

Recommendation: Approve Minutes

5.2. Minute Order No. 2026-007 - Designating Mayor Armstrong as the Voting Delegate and Vice Mayor Rubio as the Alternate Voting Delegate to the league of California Cities 2026 Annual Conference.

Recommendation: Approve Minute Order No. 2026-007

5.3. Resolution No. 2026-106 - Approving Amendment No. 3 to the Memorandum of Understanding with the San Ramon Police Officers' Association, Regarding the Association's New Name

Recommendation: Approve Resolution No. 2026-106

5.4. Resolution No. 2026-107 - Authorizing the Mayor to Execute an Agreement with Goodfellow Bros. California, LLC for Construction of the Pavement Management 2026 Project and Portion of Pavement Management 2027 Project (CIP 000017 and CIP 000019) in an Amount Not to Exceed \$5,730,400

Recommendation: Approve Resolution No. 2026-107

6. Special Presentations

7. Deferred Consent Items

8. Unfinished Business

8.1. Resolution No. 2026-108 - Confirming Building and Safety Services Division Statement of Expenses for Unpaid Fees and Fines and Directing the City Clerk to Forward a Certified Copy of This Resolution to the Office of the Auditor-Controller of Contra Costa County

Recommendation: Receive the staff report, conduct the hearing, consider any protest or objections, make any revisions or corrections as necessary, and adopt the Resolution levying special assessments for unpaid fees and fines.

Staff Report by Josh DeMello, Chief Building Official

9. New Business

9.1. Resolution No. 2026-109 - Authorizing the Mayor to Execute a Memorandum of Understanding Between the City of San Ramon and Participating Agencies for the I-680 Corridor Coordinated Adaptive Ramp Metering (CARM) Project

Recommendation: Approve Resolution No. 2026-109

Staff Report by Chris Weeks, Transportation Division Manager

10. City Manager's and City Council Members' Comments / Matters Initiated

11. Adjournment

How to View or Participate in the Meeting

View the Meeting:

1. In person
2. Livestream on YouTube: www.sanramon.ca.gov/YouTube
3. Livestream on the City's Website: <https://sanramonca.portal.civicclerk.com>
4. Livestream on Zoom: <https://cityofsanramon.zoom.us/j/99065730313> Meeting ID: 990 6573 0313

Provide Public Comment:

1. In person, by submitting a request to speak card to the City Clerk.
2. By Zoom, using the "Raise Hand" feature to request to speak.
3. Dial in by phone 1(669) 900-6833, using *9 to "Raise Hand," and *6 to unmute.
4. By email to cityclerk@sanramon.ca.gov, indicating "Public Comment" and the corresponding "Agenda Item #" in the subject line.

Written comments received up to two hours before the meeting will be provided to the City Council and posted online in advance of the meeting at <https://sanramonca.portal.civicclerk.com> under the meeting date.

Comments received after the cutoff will be provided to the Council the following day and posted online as noted above. Written comments will not be read aloud.

Technology Disruption:

If there is a disruption in technology that prevents remote participation, the meeting will be paused for up to one hour while the City works to restore service. If service cannot be restored, the City Council may adjourn or continue the meeting, following the City's adopted [Technology Disruption Policy](#).

Accommodations:

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the City Clerk at (925) 973-2539. Notification 48 hours prior to the meeting will enable the City to provide reasonable accommodations.

Attendee Conduct:

There will be zero tolerance for any person addressing the Council making profane, offensive and disruptive remarks, or engaging in loud, boisterous, or other disorderly conduct, that disrupts the orderly conduct of the public meeting. Specifically, it is important for all speakers to adhere to the following guidelines for participation in this meeting:

- a. No profanity or obscenity.
- b. Refrain from personal threats or attacks.
- c. Refrain from hateful epithets and demeaning language based on any person's race, religion, sexual orientation, ethnicity, gender, or disability.
- d. Respect all people that are present or watching.

At the discretion of the Mayor, a speaker may forfeit speaking time for any of the following reasons:

- a. Exceeding the allotted time to speak;
- b. Yelling, screaming, or other behavior that renders this Council unable to continue the meeting;
- c. Excessive profanity or slander;
- d. Specific threats or "fighting words" that incite violence; or
- e. Speech that is outside the subject matter jurisdiction of the Council or the specific agenda item in which you are speaking.

While the City of San Ramon upholds the First Amendment rights of all participants, we do not accept or endorse offensive or hateful comments made during our meetings. We celebrate the diversity of our community and strive to maintain a welcoming and inclusive environment for all.

**Minutes of the
City of San Ramon
City Council Regular Meeting
July 14, 2026**

1. Call to Order/Roll Call

The meeting was called to order at 7:00 PM.

Present:

Mayor Mark Armstrong
Vice Mayor Marisol Rubio
Councilmember Richard Adler
Councilmember Robert Jweinat
Councilmember Sridhar Verose

Also in attendance: City Manager Steven Spedowfski, City Attorney Martin Lysons, Public Works Director Brian Bornstein, Finance Director Jennifer Wakeman, and City Clerk Joan Snashall.

2. Pledge of Allegiance

3. Announcements

3.1. Changes and Additions to the Agenda

4. Public Comment

Public comment was received from Freedom by God above America, Kathryn Grace, Sara Lashanlo, Yohannes Tilahun, Nick Harvey, and Chirag Kathrani

Written public comment was received from Brian Swanson and AlArthur du Camelot.

5. Consent Calendar

Councilmember Verose's motion to approve the consent calendar items 5.1 -5.11 was seconded by Vice Mayor Rubio. The motion Passed 5-0-0-0.

Result:	Passed [5-0-0-0]
Mover:	Councilmember Sridhar Verose
Second:	Vice Mayor Marisol Rubio
Ayes:	Mark Armstrong, Marisol Rubio, Richard Adler, Robert Jweinat, Sridhar Verose
Nays:	None
Abstentions:	None

5.1. Minutes of the City Council Regular Meeting – June 23, 2026

Recommendation: Approve Minutes

5.2. Minutes of the City Council Special Meeting – June 30, 2026

Recommendation: Approve Minutes

5.3. Register of Demands as Presented by City Treasurer (Period Ending June 30, 2026)

Recommendation: Approve Register of Demands

5.4. Resolution No. 2026-097 - Authorizing the Mayor to Execute an Agreement with Dover Construction for As-Needed Earthwork, Maintenance, General Contracting, and Emergency Response Services for a Term Ending December 31, 2027, with the Option to Renew the Agreement for Up to Two Succeeding One-Year Terms, and in an Amount Not to Exceed \$499,999

Recommendation: Approve Resolution No. 2026-097

5.5. Resolution No. 2026-098 - Authorizing the Mayor to Execute the “Environmental Review for Activity/Project that is Categorically Excluded Subject to Section 58.5” for the San Ramon Intelligent Transportation System (ITS) and Communications Infrastructure Project for the U.S. Department of Housing and Urban Development (HUD) Community Planning and Development (CPD) Community Project Funding (CPF) Grant

Recommendation: Approve Resolution No. 2026-098

5.6. Resolution No. 2026-099 - Authorizing the Mayor to Execute an Agreement with Epik Solutions for On Call GIS Services for a Term Ending June 30, 2029, with the Option to Renew the Agreement for Up to Two Succeeding One-Year Terms, and in an Amount Not to Exceed \$300,000.

Resolution No. 2026-100 - Authorizing the Mayor to Execute an Agreement with Quartic Solutions LLC for On Call GIS Services for a Term Ending June 30, 2029, with the Option to Renew the Agreement for Up to Two Succeeding One-Year Terms, and in an Amount Not to Exceed \$300,000.

Recommendation: Approve Resolution Nos. 2026-099 and 2026-100

5.7. Resolution No. 2026-101 - Accepting Building and Safety Services Division Report for Consideration and Setting a Public Hearing on the Statement of Expenses for August 11, 2026 at the Regular City Council Meeting

Recommendation: Staff recommends the City Council receive the staff report and approve the resolution, accepting the Building and Safety Services Division report for consideration, and setting a public hearing on the Statement of Expenses for the August 11, 2026, City Council meeting.

5.8. Resolution No. 2026-102 - Adopting the Permit-Ready Prototype Accessory Dwelling Unit Plans

Recommendation: Approve Resolution No. 2026-102

5.9. Resolution No. 2026-103 - Accepting Parcel C of Subdivision 9326 for Ownership and Maintenance of Park Acceptance 0018, Critter Crossroads Park, and Authorizing the City Manager to Execute All Necessary Documents to Effectuate the Transfer of Ownership (Shapell Industries, Inc./Toll Brothers)

Recommendation: Approve Resolution No. 2026.103

5.10. Resolution No. 2026-104 - Authorizing the Mayor to Execute an Agreement with Environmental Systems Research Institute (ESRI) for GIS Software Services for a Term Beginning July 1, 2026, and Ending June 30, 2029, in an Amount Not to Exceed \$200,000

Recommendation: Approve Resolution No. 2026-104

5.11. Planning Commission Appointment

Recommendation: Appoint Abhijit Banerjee to serve on the Planning Commission for a term to expire June 30, 2027

6. Special Presentations

6.1. Proclamation Declaring July 2026 as Park and Recreation Month and Parks Make Life Better Month.

Presented to Adam Chow, Parks and Community Services Recreation Supervisor

7. Deferred Consent Items

8. Unfinished Business

9. New Business

9.1. Resolution No. 2026-105 - Authorizing the Mayor to Approve an Amendment to the Southern Contra Costa Joint Exercise of Powers Agreement (SCC JEPA) Pertaining to Fees for Regional Traffic Mitigation

Recommendation: Approve Resolution No. 2026-105

Public Works Director Brian Bornstein presented the staff report and answered questions of the Council.

Mayor Armstrong opened public comment.

Public comment was received from Freedom by God above America and Brian Swanson.

Mayor Armstrong closed public comment.

Councilmember Verose's motion to Approve Resolution No. 2026-105, Authorizing the Mayor to Approve an Amendment to the Southern Contra Costa Joint Exercise of Powers Agreement (SCC JEPA) Pertaining to Fees for Regional Traffic Mitigation was seconded by Councilmember Adler. The motion Passed 5-0-0-0.

Result:	Passed [5-0-0-0]
Mover:	Councilmember Sridhar Verose
Second:	Councilmember Richard Adler
Ayes:	Mark Armstrong, Marisol Rubio, Richard Adler, Robert Jweinat, Sridhar Verose
Nays:	None
Abstentions:	None

9.2. Introduction to the Long-Term Financial Plan

Recommendation: Council's role is to receive the information presented, then discuss the material and provide feedback on the recommendations outlined.

Finance Director Jennifer Wakeman and Russ Branson of Russ Branson Consulting presented the staff report and answered questions of the Council.

Mayor Armstrong opened public comment.

Public comment was received from Freedom by God above America, Yohannes Tilahun, Brian Swanson, and Bryan F.

Mayor Armstrong closed public comment.

The Council provided feedback and recommendation to staff.

10. City Manager's and City Council Members' Comments / Matters Initiated

11. Adjournment

The meeting was adjourned at 9:54 p.m.

Mark Armstrong, Mayor

Attest:

Joan Snashall, City Clerk



City Council Staff Report Item No. 5.2.

Date: August 11, 2026

To: San Ramon City Council

From: Christina Franco, Deputy City Manager
Joan Snashall, City Clerk

Subject: Minute Order No. 2026-007 - Designating Mayor Armstrong as the Voting Delegate and Vice Mayor Rubio as the Alternate Voting Delegate to the league of California Cities 2026 Annual Conference.

Executive Summary:

The proposed Minute Order designates Mayor Armstrong as the City's voting delegate and Vice Mayor Rubio as the alternate voting delegate for the League of California Cities 2026 Annual Conference. City Council approval is required to appoint the City's representatives for the League's General Assembly, where member cities vote on resolutions that establish League policy. There is no fiscal impact associated with this action. Following Council approval, the City Clerk will notify the League of California Cities of the City's designated representatives.

Recommendation:

Adopt this Minute Order designating Mayor Armstrong as the Voting Delegate and Vice Mayor Rubio as the Alternate Voting Delegate for the League of California Cities 2026 Annual Conference.

Background:

The League of California Cities Annual Conference is scheduled for September 23-25, 2026. The General Assembly will be held on Friday, September 25, 2026. The League membership considers and acts on resolutions that establish League policy at the General Assembly. To vote at the General Assembly, the City Council must designate a voting delegate and may designate no more than two alternate delegates. Designating the voting delegate and alternates cannot be done solely by the Mayor and must be approved by City Council action. The voting delegate and alternates must be registered to attend the Conference. At least one must be present at the General Assembly and in possession of the voting card to vote. If the voting delegate or alternate is unable to attend the General Assembly, the voting card may not be transferred to another city official.

Fiscal Impact:

Designating the City's voting delegate and alternate voting delegate has no fiscal impact.

Alternative Option(s):

- Designate a different Councilmember to serve as the City's voting delegate and/or alternate voting delegate.
- Do not appoint voting delegates for the 2026 Annual Conference.

Next Steps:

Upon approval, the City Clerk will notify the League of California Cities of San Ramon's voting delegate and alternate delegate for the 2026 Annual Conference.

Attachment(s):

None



City Council Staff Report Item No. 5.3.

Date: August 11, 2026

To: San Ramon City Council

From: Megan O'Donoghue, Department Director

Subject: Resolution No. 2026-106 - Approving Amendment No. 3 to the Memorandum of Understanding with the San Ramon Police Officers' Association, Regarding the Association's New Name

Executive Summary:

On May 7, 2026, representatives for the San Ramon Police Officers' Association (Association) contacted the City of San Ramon (City) to formally request that the City recognize the Association's new name, the Police Association of San Ramon.

Recommendation:

The City Council's role is to consider authorizing Amendment No. 3 to the Memorandum of Understanding (MOU) with the San Ramon Police Officers' Association, recognizing the Association's new name as the Police Association of San Ramon.

Background:

On July 23, 2024, Council approved Resolution No. 2024-086, authorizing and executing the MOU between the City and the Association, for a term of July 1, 2024, through June 30, 2027. Since that date, Council has approved two previous amendments to the MOU, one regarding Holiday-in-Lieu pay (Resolution No. 2026-020) and another regarding an alternative schedule for non-patrol shifts (Resolution No. 2026-042).

Representatives for the Association contacted the City to formally request that the City recognize the Association's new name, the Police Association of San Ramon, on May, 7, 2026. The requested update follows required administrative actions related to State tax compliance and corporate registration for the Association. The name change is procedural and does not alter the terms of the City's current labor agreement or its working relationship with the Association. The proposed Amendment No. 3 reflects the Association's new name and confirms that all other provisions of the MOU between the City and Association, dated July 1, 2024, through June 30, 2027, shall remain in effect.

Fiscal Impact:

Because Amendment No. 3 is procedural in nature and does not impact the terms of the current MOU, approving the amendment will not have a fiscal impact.

Alternative Option(s):

If the City Council prefers an alternative to approving the proposed Amendment No. 3, the following options can be considered:

1. Direct Staff to Pursue a Different Agreement Regarding the Association's Name Change

The Council may provide alternative guidance to staff regarding the Association's request that the City recognize the Association's new name. This option may prompt objections from the Association, as the two parties agreed to Amendment No. 3 as proposed in good faith, without any impacts to the current terms of the MOU.

2. Decline to Approve Amendment No. 3

The Council may decline to approve Amendment No. 3 and deny the request to recognize the Association's new name. This option may prompt objections from the Association, as the two parties agreed to Amendment No. 3 as proposed in good faith, without any impacts to the current terms of the MOU.

Next Steps:

If approved by the Council, Amendment No. 3, along with the Resolution, will be executed as an amendment to the MOU; both documents will be posted on the City's intranet and on the City's web page for access by others. City records will be updated accordingly to reflect the Association's new name.

Attachment(s):

- A. Resolution No. 2026-106
- B. Side Letter_Police Association Name Change
- C. Police Association Amendment No. 3_Final

RESOLUTION NO. 2026-106

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SAN RAMON
APPROVING AMENDMENT NO. 3 TO THE MEMORANDUM OF UNDERSTANDING
WITH THE SAN RAMON POLICE OFFICERS' ASSOCIATION, REGARDING THE
ASSOCIATION'S NEW NAME**

WHEREAS, on July 23, 2024, Resolution No. 2024-086 authorized the execution of the Memorandum of Understanding (MOU) between the City of San Ramon (City) and the San Ramon Police Officers' Association (Association) from July 1, 2024, through June 30, 2027; and

WHEREAS, following the execution of the MOU, the Council approved two previous amendments to the MOU, one regarding Holiday-in-Lieu pay (Resolution No. 2026-020) and another regarding an alternative schedule for non-patrol shifts (Resolution No. 2026-042); and

WHEREAS, on May 7, 2026, representatives for the Association contacted the City to formally request that the City recognize the Association's new name, the Police Association of San Ramon; and

WHEREAS, the requested update follows required administrative actions related to State tax compliance and corporate registration for the Association; and

WHEREAS, the name change is procedural and does not alter the terms of the City's current labor agreement or its working relationship with the Association; and

WHEREAS, the proposed Amendment No. 3 reflects the Association's new name and confirms that all other provisions of the MOU between the City and Association, dated July 1, 2024, through June 30, 2027, shall remain in effect.

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of San Ramon does hereby approve the attached Amendment No. 3 to the MOU with the Association regarding the Association's new name, the Police Association of San Ramon.

PASSED, APPROVED, AND ADOPTED, at the meeting of August 11, 2026, by the following votes:

AYES:

NOES:

ABSENT:

ABSTAIN:

Mark Armstrong, Mayor

ATTEST:

Joan Snashall, City Clerk

**SIDE LETTER AGREEMENT BETWEEN
SAN RAMON POLICE OFFICERS ASSOCIATION
AND CITY OF SAN RAMON
RE: NAME CHANGE TO POLICE ASSOCIATION OF SAN RAMON**

This Side Letter Agreement (Agreement) is made by and between the City of San Ramon ("City") and the San Ramon Police Officers' Association ("Association") (collectively the "Parties").

WHEREAS, the Parties have agreed to a Memorandum of Understanding (MOU) covering wages, hours and terms of employment for the period of July 1, 2024 through June 30, 2027; and

WHEREAS, on May 7, 2026, the Association formally requested that the City recognize the Association's new name, "Police Association of San Ramon;" and

WHEREAS, the Association attests that there is continuity of the Association's identity and representation, including the following:

1. Operations are uninterrupted before and after the name change.
2. The Association retains substantially the same constitution, bylaws, officers, governance structure, or succession process, unless separately amended.
3. The members represented by the Association remain substantially the same.
4. The Association continues to serve the same bargaining unit or constituency.
5. Collective bargaining agreements, and other obligations remain with the Association.
6. The name change is approved according to the Association's governing documents.
7. Any required filings with labor agencies, state corporate registries, the IRS, or other regulators have been made.
8. Existing registrations, employer-recognition records, or labor-board certifications are updated as required; and
9. If incorporated, the corporate entity remains the same and merely amends its name, or if unincorporated, records and evidence show continuity of the same Association despite the new name.

NOW THEREFORE,

The Parties hereby agree to recognize the Association as the "Police Association of San Ramon" and extend that recognition to any references to the Association's previous name in the current MOU.

The Parties agree that all other provisions of the MOU between the City and Association dated July 1, 2024 through June 30, 2027, shall remain in effect.

All recitals are incorporated into this Side Letter Agreement.

This side letter will be incorporated into the successor MOU between the parties unless otherwise negotiated by the parties.

**SIDE LETTER AGREEMENT BETWEEN
SAN RAMON POLICE OFFICERS ASSOCIATION
AND CITY OF SAN RAMON
RE: NAME CHANGE TO POLICE ASSOCIATION OF SAN RAMON**

SO AGREED:



FOR THE CITY

Aug 5, 2026

DATE



FOR THE ASSOCIATION

Aug 5, 2026

DATE

**AMENDMENT NO. 3 TO THE SAN RAMON POLICE OFFICERS' ASSOCIATION
MEMORANDUM OF UNDERSTANDING**

Amendment No. 3 to the Memorandum of Understanding (MOU) between the City of San Ramon (City) and the San Ramon Police Officers' Association (Association), reflects that the City Council of San Ramon has agreed to recognize the Association by the Association's new name, the Police Association of San Ramon, and extend that recognition to any references to the Association's previous name in the MOU.

The parties agree that all other provisions of the MOU between the City and the Association, dated July 1, 2024, through June 30, 2027, shall remain in effect.

Dated: August 11, 2026

City of San Ramon

Police Association of San Ramon

By: Steven Spedowfski, City Manager

By: Ryan Kiefer, President

Attest:

Joan Snashall, City Clerk



City Council Staff Report Item No. 5.4.

Date: August 11, 2026

To: San Ramon City Council

From: Brian Bornstein, Department Director
Suzy Edwards, Associate Engineer

Subject: Resolution No. 2026-107 - Authorizing the Mayor to Execute an Agreement with Goodfellow Bros. California, LLC for Construction of the Pavement Management 2026 Project and Portion of Pavement Management 2027 Project (CIP 000017 and CIP 000019) in an Amount Not to Exceed \$5,730,400

Executive Summary:

The Pavement Management 2026 and 2027 Projects (CIP 000017 and CIP 000019) are part of the City of San Ramon's Pavement Management Program. On June 16, 2026, the City advertised the Pavement Management 2026 Project and portion of Pavement Management 2027 Project (CIP 000017 and CIP 000019). Eleven (11) bids were received and opened on July 15, 2026. The responsive and responsible low bidder for this Project is Goodfellow Bros. California, LLC, with a Base Bid price of \$4,775,321.58. The construction contract amount being requested is the base bid price and an approximate twenty percent (20%) contingency of \$955,078 to cover any unforeseen conditions, for a total contract amount not to exceed \$5,730,400.

Recommendation:

The City Council's role is to consider adopting this Resolution, authorizing the Mayor to execute an Agreement with Goodfellow Bros. California, LLC for construction of the Pavement Management 2026 Project and portion of Pavement Management 2027 (CIP 000017 and CIP 000019), in an amount not to exceed \$5,730,400.

Background:

The Pavement Management Program (PMP) was developed as part of a Citywide Program to provide street maintenance on an annual basis. By performing this maintenance frequently and systematically, the City minimizes long-term maintenance costs associated with complete reconstruction of failed pavement and maintains a higher quality throughout the life of the pavement. The scope of work for the Annual Pavement

Management Program is based on certain factors that include roadway condition and age; repairs and preventative maintenance; and a geographic grouping of roadways.

The Pavement Management 2026 Project (PMP 2026, CIP 000017) is the first year of a two-year plan and will be followed by the Pavement Management 2027 Project (PMP 2027, CIP 000019). Staff structured the two projects to minimize costs while increasing efficiency and flexibility by:

- Preparing the plans, specifications, and engineer's estimates (PS&E) of these projects in-house.
 - This approach reduces design costs and provides greater design flexibility. If necessary, street segments may be reassigned between 2026 and 2027 programs to accommodate changing project needs.
- Separating projects (PMP 2026 and PMP 2027) based on the contractor's specialty (e.g. hot-mix asphalt, slurry seal, chip seal, etc.).
 - The PMP 2026 Project is focused on hot-mix asphalt improvements and therefore primarily includes streets with lower Pavement Condition Index (PCI) ratings, as well as streets requiring localized pavement repairs in preparation for the PMP 2027 Project.

PMP 2026 includes approximately 39 curb ramp upgrades to meet the requirements of the Americans with Disabilities Act (ADA) within the limits of the project, and mill and fill treatments at Crow Canyon Road between Bollinger Canyon Road and San Ramon Valley Boulevard, Crow Canyon Road between Crow Canyon Place and Alcosta Boulevard, May Court, Northland Place from May Way to end of cul-de-sac, Omega Road from Faria Parkway Preserve to 330 feet north of Deerwood Road, San Blas Place, San Ramon Valley Boulevard between Montevideo Drive and Pine Valley Road, and Sota Place.

The contract also includes localized pavement repairs in preparation for PMP 2027, which includes slurry seal and rubberized cape seal pavement treatments at different neighborhoods and selected streets including the following: Adams Place, Almond Court, Ashby Way area, Boxford Place, Cashew Court, Chestnut Court, Crow Canyon Place, E. Branch Pkwy and area north of E. Branch Pkwy, El Molino Place, Ethan Court, Etna Court, Goshen Court, Goshen Place, Haven Place, Hillsboro Avenue, Laguna Place, Lone Tree Court, Northland Place, Omega Road, Pecan Court, Pinenut Court, San Ramon Valley Boulevard (Bollinger Canyon Road to Montevideo Drive), Sedgefield Avenue area, Tareyton Avenue area, Tom Court, Westside Drive area from Majestic Court north, Westwood Avenue, Winthrop Avenue, and Yale Court.

CEQA Compliance

After an initial environmental review of the Projects, staff filed Notices of Exemption for PMP 2026 and PMP 2027 with the Contra Costa County Clerk on July 2, 2026 and July 22, 2026, respectively. Pursuant to Section 15301(c) of Article 19, "Categorical Exemptions" of Chapter 3, "Guidelines for Implementation of the California Environmental Quality Act" of Division 6, "Resources Agency" of Title 14, "Natural Resources" of California Code of

Regulations, the Project is exempt from the provision of CEQA.

Discussion:

On June 16, 2026, the City advertised the Pavement Management 2026 Project and portion of Pavement Management 2027 (CIP 000017 and CIP 000019). The Notice to Contractors was posted at City Hall and on the City's website. The City received and opened eleven (11) bids on July 15, 2026. The bidders' names, their rankings, and bid amounts are as follows:

Rank	Contractor	Total Base Bid
1	Goodfellow Bros. California, LLC	\$4,775,321.58
2	MCK Services, Inc.	\$4,949,287.15
3	Radius Earthwork, Inc.	\$4,999,050.49
4	A. Teichert & Son, Inc. dba Teichert Construction	\$5,222,294.00
5	Mountain Cascade, Inc.	\$5,272,975.00
6	G. Bortolotto & Company, Inc.	\$5,300,964.60
7	McGuire and Hester	\$5,309,047.00
8	DeSilva Gates Construction LLC	\$5,313,313.00
9	Ghilotti Bros., Inc.	\$5,384,687.40
10	O'Grady Paving, Inc.	\$5,420,006.40
11	Bay Cities Paving & Grading, Inc.	\$5,656,243.81

Upon review of the bid results, staff determined that Goodfellow Bros. California, LLC was the lowest responsive and responsible bidder based on the Total Bid as set forth in the bid documents. The low bid amount of \$4,775,321.58 is lower than the Engineer's Estimate of \$6,975,400.04 by \$2,200,078.46, or approximately 31.5%. The Engineer's Estimate incorporates historical cost inflation observed in the bid prices for the City's last hot-mixed paving project in 2024, recent bid results from neighboring cities' paving projects, and current trends in the Construction Cost Index (CCI). The bids received demonstrate a highly competitive bidding environment alongside moderate cost inflation.

Fiscal Impact:

The Five-Year 2026-2031 Capital Improvement Program (CIP) authorized a total Project Budget of \$7,800,000 for design and construction of PMP 2026 (CIP 000017), which is funded by Gas Tax/SB-1 in the amount of \$5,750,004 and Refuse Vehicle Impact Fee in the amount of \$2,049,996.

The Five-Year 2026-2031 CIP authorized a total Project Budget of \$6,000,000 for the design and construction of PMP 2027 (CIP 000019), which is funded by Gas Tax/SB-1 in the amount of \$4,125,002 and Refuse Vehicle Impact Fee in the amount of \$1,874,998.

The construction contract amount being requested is \$4,775,321.58 plus an approximate twenty percent (20%) contingency to cover Base Bid and any unforeseen conditions, for a total contract amount not to exceed \$5,730,400.

Approximately \$960,000 of the total construction cost will be funded by PMP 2027 (CIP

000019) for localized pavement repairs, as preparation work and cost-effectiveness, at all streets included in CIP 000019, with the remainder of the project to be funded by PMP 2026 (CIP 000017).

There are sufficient funds in the FY27 Adopted Budget for PMP 2026 (CIP 000017) and PMP 2027 (CIP 000019) to complete this contract work.

Any unused funds from PMP 2026 (CIP 000017) will be reprogrammed for other pavement work.

Alternative Option(s):

Should the City Council decline to approve the Resolution, staff could postpone PMP 2026. This would result in the City not meeting the delivery requirements associated with the Gas Tax/SB-1 funding for Fiscal Year 2026, which could jeopardize the City's eligibility for future SB-1 funding allocations and may adversely affect the City's ability to secure state transportation funding for future pavement rehabilitation projects. Furthermore, postponing would mean rejecting a highly favorable bid schedule, forfeiting significant cost savings that could be rolled over into future PMPs, and negatively impacting the Citywide average Pavement Condition Index (PCI).

Next Steps:

The City Attorney's Office will forward the contract Agreement to Goodfellow Bros. California, LLC for execution. Upon receipt of the executed contract Agreement, the required bonds, certificate of insurance, and a copy of a current City business license from the contractor, the City Attorney's Office will send a copy of the executed contract Agreement and all attachments to the Public Works - Engineering Services Division. A Notice to Proceed will then be issued to begin construction and staff will then pursue the work to completion.

Attachment(s):

A. Resolution 2026-107

RESOLUTION NO. 2026-107

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SAN RAMON
AUTHORIZING THE MAYOR TO EXECUTE AN AGREEMENT WITH GOODFELLOW BROS.
CALIFORNIA, LLC FOR CONSTRUCTION OF THE PAVEMENT MANAGEMENT 2026
PROJECT AND PORTION OF THE PAVEMENT MANAGEMENT 2027 PROJECT (CIP
000017 AND CIP 000019) IN AN AMOUNT NOT TO EXCEED \$5,730,400**

WHEREAS, the City desires to construct the Pavement Management 2026 Project and Pavement Management 2027 Project(CIP 000017 and CIP 000019); and

WHEREAS, Notices of Exemption for the Projects (CIP 000017 and CIP 000019) were filed with the Contra Costa County Clerk pursuant to Section 15301(c) of the California Environmental Quality Act of 1970, as amended; and

WHEREAS, the Pavement Management 2026 Project, including a portion of the work included in the Pavement Management 2027 Project, was advertised for bids on June 16, 2026 in accordance with the requirements of State Law and local ordinances; and

WHEREAS, the City received and opened eleven (11) bids on July 15, 2026; and

WHEREAS, City staff determined that Goodfellow Bros. California, LLC was the lowest responsive and responsible bidder with a total base bid of \$4,775,321.58.

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of San Ramon does hereby authorize the Mayor to execute an Agreement with Goodfellow Bros. California, LLC for construction of the Pavement Management 2026 Project (CIP 000017), and portion of the Pavement Management 2027 Project (CIP 000019), in an amount not to exceed \$5,730,400, including the base bid and an approximate 20% contingency.

PASSED, APPROVED, AND ADOPTED, at the meeting of August 11, 2026, by the following votes:

AYES:

NOES:

ABSENT:

ABSTAIN:

Mark Armstrong, Mayor

ATTEST:

Joan Snashall, City Clerk



City Council Staff Report Item No. 8.1.

Date: August 11, 2026

To: San Ramon City Council

From: Lauren Barr, Department Director
Josh DeMello, Chief Building Official

Subject: Resolution No. 2026-108 - Confirming Building and Safety Services Division Statement of Expenses for Unpaid Fees and Fines and Directing the City Clerk to Forward a Certified Copy of This Resolution to the Office of the Auditor-Controller of Contra Costa County

Executive Summary:

The Building and Safety Services Division is requesting that City Council receive the staff report, conduct the hearing, consider any protest or objections, make any revisions or corrections as necessary, and adopt the Resolution levying special assessments for unpaid fees and fines.

Recommendation:

The City Council's role is to receive the staff report, conduct the hearing, consider any protest or objections, make any revisions or corrections as necessary, and adopt the Resolution levying special assessments for unpaid fees and fines.

Background:

The Building and Safety Services Division abated property maintenance violations and assessed fees and fines on several properties. Several property owners, after appropriate notifications, failed to correct violations within the time specified. Consequently, these property owners were fined. Each property owner was issued the appropriate legal notices and afforded the opportunity to appeal the nuisance or violation, and the opportunity to appeal each fine.

Pursuant to Municipal Code Title BI Division B6I Chapter VII Article 3 — Abatement of Nuisances by City Special Assessment, Building and Safety Services staff began the process to collect abatement costs, and unpaid fees and fines.

The property owners were notified of the intent to levy a special assessment on their

property on May 18, 2026.

The notice included the property address, assessor parcel number, the case number, the amount due, the due date, and the intent to hold a public hearing.

Exhibit 1 to the Resolution is the Report, specifies for each subject property the itemized and total cost of the abatement, a description of the property that accrued the abatement costs, and the names and addresses of the persons entitled to notice.

On July 14, 2026, the City Council passed Resolution No. 2026 -101 accepting the Building and Safety Services Division Report for consideration and setting a public hearing on the Statement of Expenses for August 11, 2026, at the regular City Council Meeting.

On or before July 20, 2026, certified letters were mailed to each person identified in the Building and Safety Services Division Report attached to Resolution No. 2026 - 101 ("Hearing Notice"). Each person was notified of the day, hour and place when the City Council would hear and pass on the statement of expenses and the procedure to object or protest the statement of expenses.

The Finance Department keeps cost accounting records of the unpaid fees and fines. The proposed Resolution authorizes the appropriate special assessments be added to the regular property tax bills, of an identified property owner, for the unpaid fees and fines incurred to their property.

The Resolution will direct the Office of the Auditor-Controller Contra Costa County to assess the properties for the amounts that remain unpaid ten days after the City Council adopts said Resolution. The administrative procedure will result in the City being reimbursed by the County, negating the City to recover costs through further legal action.

Fiscal Impact:

The Building and Safety Services Division has listed the cost of fees and fines due for each property in Exhibit 1. The costs are fees or fines listed in the City Council Fees Resolution adopted each year.

Without property tax assessments, these costs are unlikely to be recovered voluntarily. Failure to pass the Resolution would result in the city being unable to recover the incurred costs. Further, without property tax assessments for unpaid abatement costs, and unpaid fees and fines, the effectiveness of the administrative citations and fines as an enforcement tool would be diminished.

Alternative Option(s):

If the resolution is not adopted, the proposed assessment will not be imposed for the applicable fiscal year, and staff would return to the City Council with alternative funding options or direction, as appropriate.

Next Steps:

If the property owner does not pay the fees or fines within ten (10) days after the City Council confirms the statement of expenses, the cost shall constitute a special assessment against the real property whereon the nuisance has been maintained.

The City Clerk shall forward a certified copy of the Resolution to the Office of the Auditor-Controller Contra Costa County who shall cause the appropriate assessments to be added to the next regular tax bill levied against the subject real properties.

Attachment(s):

- A. Resolution No. 2026-108
- B. Exhibit 1 - 2026 Assessment Final Report - List and Itemized Abatement Costs

RESOLUTION NO. 2026-108

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SAN RAMON
CONFIRMING BUILDING AND SAFETY SERVICES DIVISION STATEMENT OF EXPENSES
FOR UNPAID FEES AND FINES AND DIRECTING THE CITY CLERK TO FORWARD A
CERTIFIED COPY OF THIS RESOLUTION TO THE OFFICE OF THE AUDITOR-
CONTROLLER FOR CONTRA COSTA COUNTY**

WHEREAS, on July 14, 2026 the City Council accepted Building and Safety Services; Report for consideration and set the date, time and place for a hearing on the statement of expenses; and

WHEREAS, on or before July 20, 2026, the City Clerk notified specific property owners of the intent to levy a special assessment on their property by way of City Council Resolution; and

WHEREAS, on August 11, 2026, the City Council after giving all public notices as required by law, held a public hearing to consider the statement of expenses which detailed assessments and penalties against properties in the City of San Ramon for unpaid fees and fines ("Exhibit 1"); and

WHEREAS, the City Council made any such revisions, corrections or modifications to the statement of expenses as it saw fit.

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of San Ramon does hereby confirm Building and Safety Services Division Statement of Expenses detailing unpaid fees and fines in the amounts listed for each property and reflected in the attached Exhibit 1 to this Resolution.

NOW, THEREFORE, IT BE FURTHER RESOLVED, that the City Council of the City of San Ramon does hereby confirm Building and Safety Services Division Statement of Expenses detailing unpaid fees and fines in the amounts listed for each property and reflected in the attached Exhibit 1 to this Resolution.

NOW, THEREFORE, IT BE FURTHER RESOLVED, that the City Council hereby directs the City Clerk to forward a certified copy of this Resolution to the Office of the Auditor-Controller of Contra Costa County who shall cause the appropriate assessments to be added to the next regular tax bill levied against the appropriate real property for municipal purposes.

PASSED, APPROVED, AND ADOPTED, at the meeting of August 11, 206 by the following vote:

AYES:

NOES:

ABSTAIN:

ABSENT:

Mark Armstrong, Mayor

ATTEST:

Joan Snashall, City Clerk

Exhibit 1: Assessment Report – List and Itemized Abatement Costs

Building and Safety Services' Report of Abatement Cost

<u>NAME OF PROPERTY OWNER</u>	<u>ADDRESS OF PROPERTY</u>	<u>APN</u>	<u>BALANCE DUE</u>
Shannon Zien	653 S. Blackbrush Ln	217450030	\$2,160.00



City Council Staff Report Item No. 9.1.

Date: August 11, 2026

To: San Ramon City Council

From: Brian Bornstein, Department Director
Chris Weeks, Division Manager

Subject: Resolution No. 2026-109 - Authorizing the Mayor to Execute a Memorandum of Understanding Between the City of San Ramon and Participating Agencies for the I-680 Corridor Coordinated Adaptive Ramp Metering (CARM) Project

Executive Summary:

The California Department of Transportation (Caltrans) and the Contra Costa Transportation Authority (CCTA) are proposing ramp metering deployment along the Interstate 680 (I-680) corridor in Contra Costa County. A Memorandum of Understanding (MOU) has been developed in collaboration with Caltrans, CCTA and the local jurisdictions along the I-680 corridor to document the goals, policies, and procedures for the implementation of ramp metering. This item approves and authorizes the Mayor to execute the MOU.

Recommendation:

The City Council's role is to consider adopting this resolution, authorizing the Mayor to execute a Memorandum of Understanding between the City of San Ramon and participating agencies for the I-680 corridor Coordinated Adaptive Ramp Metering (CARM) Project.

Background:

The Interstate 680 (I-680) corridor is a critical north/south transportation artery traversing approximately 25 miles through Contra Costa County, serving the City of San Ramon and neighboring communities. Recurring peak-hour congestion along this corridor results in travel times approximately double those of off-peak periods, with projections indicating continued degradation without active management intervention.

The California Department of Transportation (Caltrans) and the Contra Costa Transportation Authority (CCTA) are partnering to implement ramp metering on I-680. The main goals of ramp metering are to manage recurrent and non-recurrent congestion to

improve operational efficiency for the I-680 corridor without adversely affecting the adjacent local arterials, and to improve traffic and incident detection to enhance corridor operations.

Caltrans had programmed State Highway Operation and Protection Program (SHOPP) funds to install fiber-optic cable communication trunk lines along I-680 and I-780, install/upgrade Traffic Operation Systems (TOS), and install/upgrade ramp metering along the I-680 corridor in Contra Costa County (with the exceptions of the State Route 24 and State Route 242 ramps), including widening and/or creating high-occupancy vehicle (HOV) bypass lanes where feasible in selected locations. Caltrans utilizes an Adaptive Ramp Metering (ARM) system with an algorithm called Fuzzy Logic. The project limits for the Caltrans ARM project are on Southbound I-680 from Alcosta Boulevard to the Martinez-Benicia Bridge and Northbound I-680 from Burnett Avenue to the Martinez-Benicia Bridge.

CCTA developed the Innovate 680 Program over six years ago in partnership with the local agencies along the I-680 Corridor in Contra Costa County to address congestion through an integrated suite of improvements. A central component of that program is the Coordinated Adaptive Ramp Metering (CARM) Project, which will deploy the STREAMS® advanced traffic management platform to operate ramp meters along northbound I-680 from Alcosta Boulevard to Willow Pass Road as a three-year demonstration project. The CARM project will supplement ramp metering improvements being constructed by Caltrans under SHOPP.

To formalize the collaborative framework for ramp metering operations along the corridor, CCTA has led the development of the I-680 Corridor Ramp Metering Memorandum of Understanding (MOU). The MOU establishes the goals, policies, governance structure, performance metrics, and responsibilities of all signatory parties, including Caltrans, CCTA, Contra Costa County, and the cities and towns along the corridor.

The following agencies are parties to this MOU: Caltrans, CCTA, Contra Costa County, and the cities of Concord, Martinez, Pleasant Hill, San Ramon, Walnut Creek, and the Town of Danville.

Discussion:

Staff Review and Input Process

CCTA has employed an iterative drafting process for the MOU, with multiple rounds of review involving all partner agencies. City staff actively participated in this process and provided substantive written feedback.

CCTA's iterative approach has resulted in a document that reflects the collective input of all partner jurisdictions. Staff is satisfied that the current version of the MOU adequately addresses the City of San Ramon's concerns.

Key MOU Provisions

The MOU is a non-legally binding document that addresses the following substantive areas:

- **Governance:** A two-tier governance structure is established, consisting of the I-680 Ramp Metering Technical Committee (RMTC) and the I-680 Ramp Metering Working Group (RMWG). The City of San Ramon is a member of both bodies. Technical issues are to be resolved at the staff level, with unresolved matters elevated to the RMWG and, if necessary, to the Caltrans District 4 Director and CCTA Executive Director.
- **Operations:** Ramp metering along the corridor will use two systems — Caltrans' Adaptive Ramp Metering (ARM) utilizing fuzzy logic algorithms on southbound and northern northbound segments, and CCTA's CARM system using the STREAMS® platform on northbound ramps from Alcosta Boulevard to Willow Pass Road. CARM will operate as a three-year demonstration project.
- **Local Arterial Protections:** The MOU includes specific safeguards to prevent ramp queue spillback onto local streets, including Queue Control (QC) and Queue Override (QO) parameters within the STREAMS® platform. These provisions directly address a key concern of the City.
- **Performance Metrics:** Comprehensive Key Performance Indicators (KPIs) will be tracked for mainline performance, ramp performance, and parallel corridor volumes to assess the effect of ramp metering on local arterials.
- **Incident Response and Emergency Override:** Both the Caltrans TMC and CCTA TMC will maintain the ability to override or deactivate ramp metering signals to facilitate emergency vehicle access. CHP and local emergency services may request overrides through established communications protocols.
- **Reporting:** A semi-annual Ramp Metering Performance Report will be prepared throughout the three-year CARM demonstration period. A preliminary assessment memorandum will be issued after the first three months of operations.
- **Financial Obligations:** The MOU explicitly states that it will not impose any direct financial obligation on any local jurisdiction along the I-680 corridor. Capital and operating costs are the responsibility of Caltrans (SHOPP) and CCTA.
- **Data Sharing:** Corridor stakeholders, including the City, will have read-only access to the STREAMS Smart Motorways Dashboard to monitor real-time and historic ramp metering performance.

Staff supports approval of the MOU as presented. Participation in the MOU formalizes the City's role in corridor governance and ensures San Ramon is a stakeholder to ongoing operational decisions, performance monitoring, and any future changes to ramp metering operations that may affect local streets.

Fiscal Impact:

There is no direct fiscal impact to the City as a result of approving this MOU. The MOU explicitly states that it imposes no direct financial obligation on local jurisdictions. Capital costs and operating costs for ramp metering infrastructure are funded by Caltrans (via SHOPP) and CCTA (via federal, state, and local funds managed by CCTA).

Alternative Option(s):

If the MOU is not executed, then San Ramon cannot participate in the Ramp Metering Technical Committee (RMTC) or Ramp Metering Working Group (RMWG). These working groups are where technical and operational issues are discussed and resolved amongst the partnering agencies, and decisions that could affect San Ramon will be made without staff involvement.

Next Steps:

Next steps following the execution of the MOU include CCTA and Caltrans entering into a Cooperative Agreement for Operations and Maintenance activities for the CARM pilot segment, and CCTA convening a working group with all the local jurisdictions along the corridor, the transit operators, Caltrans, California Highway Patrol, and Metropolitan Transportation Commission for the development of a Ramp Metering Operations and Maintenance Plan (RMOMP), which will also include Standard Operating Procedures for all ramp metering systems along the I-680 corridor.

Attachment(s):

- A. Resolution No. 2026-109
- B. Memorandum of Understanding

RESOLUTION NO. 2026-109

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SAN RAMON
AUTHORIZING THE MAYOR TO EXECUTE A MEMORANDUM OF UNDERSTANDING
BETWEEN THE CITY OF SAN RAMON AND PARTICIPATING AGENCIES FOR THE I-680
CORRIDOR COORDINATED ADAPTIVE RAMP METERING (CARM) PROJECT**

WHEREAS, the Interstate 680 (I-680) corridor is a critical transportation facility serving the City of San Ramon and the broader Contra Costa County region, and congestion along the corridor during peak hours results in travel times approximately double those of non-peak periods; and

WHEREAS, the Contra Costa Transportation Authority (CCTA), in coordination with the California Department of Transportation (Caltrans), has developed the Innovate 680 Program to address congestion through an integrated suite of improvements, including the Coordinated Adaptive Ramp Metering (CARM) Project and the Caltrans I-680 Ramp Metering State Highway Operation and Protection Program (SHOPP) Project; and

WHEREAS, CCTA has prepared the I-680 Corridor Ramp Metering Memorandum of Understanding (MOU) to establish the goals, policies, governance structure, operational responsibilities, and performance metrics for ramp metering operations along the I-680 corridor in Contra Costa County; and

WHEREAS, the MOU identifies the City of San Ramon as a signatory party and includes the City of San Ramon as a member of both the I-680 Ramp Metering Technical Committee (RMTTC) and the I-680 Ramp Metering Working Group (RMWG), ensuring local representation in corridor governance; and

WHEREAS, other local agencies along the I-680 corridor are parties to this MOU, including Caltrans, Contra Costa County, the Cities of Concord, Martinez, Pleasant Hill, Walnut Creek, and the Town of Danville; and

WHEREAS, City staff actively participated in the MOU review and comment process and CCTA's iterative drafting process incorporated that feedback into the final document; and

WHEREAS, the MOU expressly states that it imposes no direct financial obligation on the City of San Ramon or any other local jurisdiction, and that capital and operational costs are the responsibility of Caltrans and CCTA; and

WHEREAS, the MOU includes provisions specifically designed to protect local arterial streets from ramp queue spillback, to monitor parallel corridor volumes on routes such as Bollinger Canyon Road and Crow Canyon Road, and to establish emergency override protocols for incident response; and

WHEREAS, the City Council finds that participation in the MOU is in the public interest and supports improved traffic operations on I-680 while protecting the function and safety of San Ramon's local roadway network.

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of San Ramon does hereby authorize the Mayor to execute the MOU with the Contra Costa Transportation Authority for the installation and operation of the SHOPP and CARM ramp metering projects along I-680 in San Ramon.

PASSED, APPROVED, AND ADOPTED, at the meeting of August 11, 2026, by the following votes:

AYES:

NOES:

ABSENT:

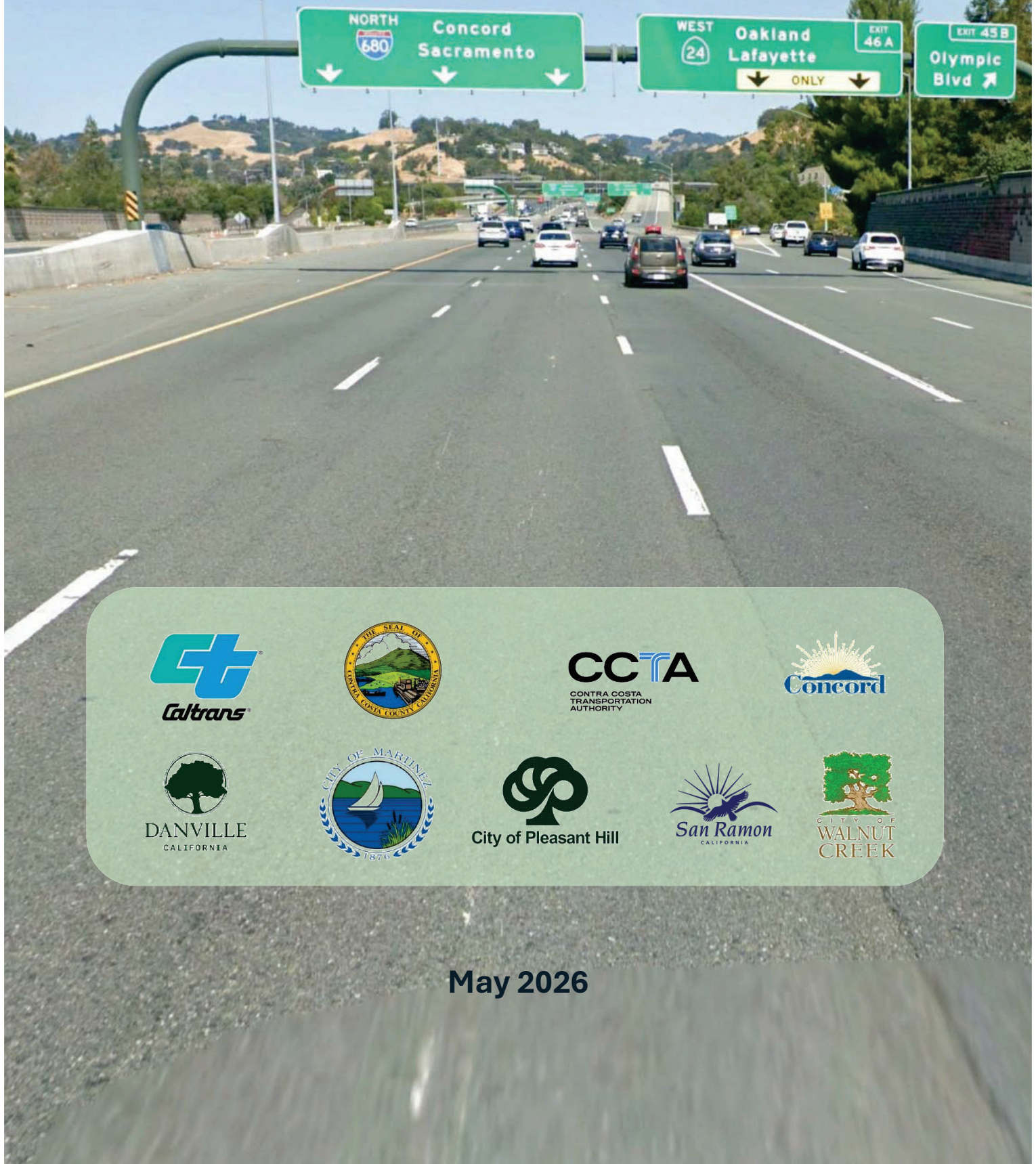
ABSTAIN:

Mark Armstrong, Mayor

ATTEST:

Joan Snashall, City Clerk

I-680 CORRIDOR RAMP METERING MEMORANDUM OF UNDERSTANDING



May 2026

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DOCUMENT HISTORY

Version	Description	Date	Initials	Approval
0.1	Initial draft for internal review	4/1/25	FL	
0.2	Draft for CCTA review	4/14/25	FL	
0.3	Draft for Caltrans and CCTA review	4/21/25	FL	
0.4	Revised Draft for Caltrans and CCTA review	6/9/25	FL/SP	
0.5	Draft for Caltrans, CCTA and Local Agency review	7/21/25	FL/SP	
0.6	Revised Draft for Caltrans, CCTA and Local Agency review	10/29/25	FL/SP	
0.7	Revised Draft for Caltrans, CCTA and Local Agency review	11/10/25	FL	
0.8	Revised Draft for Caltrans and CCTA review	1/2/26	FL	
0.9	Draft for Caltrans, CCTA and Local Agency for technical and legal reviews	1/26/26	FL	
0.95a	Draft for Caltrans legal review	2/23/26	FL	
0.96a	Draft for CCTA and Local Agencies	4/21/26	FL	
1.0	Released for approval and concurrence	5/13/26	FL	

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1. SUMMARY

This Memorandum of Understanding (MOU) summarizes the goals, policies, processes, and procedures intended to be followed by all parties working together in a coordinated manner to enhance traffic operations through the implementation of ramp metering (RM) along the Interstate 680 (I-680) corridor in Contra Costa County. This MOU is intended to identify the overall commitment and responsibilities regarding ownership, operations, and maintenance of the various equipment installed as part of both the Innovate 680 Coordinated Adaptive Ramp Metering (CARM) Pilot Project and the Caltrans I-680 Ramp Metering - State Highway Operations and Protection Program (SHOPP) Project. This MOU also serves as a foundation of how future ramp meters will be operated in the corridor. This MOU is a non-legally binding document.

The following entities are parties to this MOU:

California Department of Transportation (Caltrans), Contra Costa Transportation Authority (CCTA), Contra Costa County (County), the cities of Concord, Martinez, Pleasant Hill, San Ramon and Walnut Creek, and the Town of Danville.

In addition, Caltrans and CCTA will prepare a Ramp Metering Operation and Maintenance Procedures (RMOMP). The RMOMP is intended to be a living document and includes provisions that are often referred to as Standard Operating Procedures (SOPs). It will also provide the foundation for an Operation and Maintenance (O&M) Agreement between Caltrans and CCTA,

2. GOALS

The goals of the MOU are to document the common understanding of all parties regarding the goals, planning, policies, procedures, implementation, ownership and operation of RM along the I-680 corridor in Contra Costa County.

The MOU covers the following areas:

- Decision Process and Governance- this defines the decision-making process and framework for ramp metering operations on both policy and technical matters;
- Performance Metrics- this defines the Freeway Mainline, Entrance Ramp, and Local Arterials performance metrics that will be used as the basis for determining the effectiveness of RM operational strategies;
- Operation Strategies- this provides guidance and protocol to optimize and balance freeway mainline and ramp operations to improve mainline productivity and avoid impacts to local arterials;
- Communications Protocol- this provides the communications protocol amongst Caltrans, CCTA, and local jurisdiction partners;

- Data Sharing- this identifies traffic data that will be shared amongst CCTA, Caltrans and local jurisdiction partners. It also describes how such data will be transmitted and secured, including online access to the CARM Dashboard. In addition, this includes a policy on data privacy protection;
- Public Outreach- this covers protocol and processes on public outreach and messaging, tracking social media, and responses to queries and complaints from the public and elected officials; and
- Performance Reporting- this discusses the contents and metrics in the reporting of the RM performance for the corridor, and the frequency of the reporting.

The capital costs for the Caltrans SHOPP and initial phase of the Innovate 680 CARM projects are the responsibilities of Caltrans and CCTA, respectively. Both agencies will coordinate and continue to seek additional funding to accomplish the ultimate goal of full CARM implementation and operation along the I-680 corridor within Contra Costa County.

The daily operations and maintenance (O&M) of all RM equipment, mainline and ramp traffic detection, and RM and traffic management systems will primarily be the responsibilities of Caltrans and CCTA. This is further discussed in Section 6.4.

3. PROJECT BACKGROUND & DESCRIPTION

3.1 Project Background

The I-680 Corridor is a major transportation feature of Contra Costa County. I-680 provides a six- to ten-lane major north-south freeway for approximately 25 miles through Contra Costa County. I-680 is functionally classified as an Urban Principal Arterial-Interstate Freeway and is considered a Lifeline Highway route along the entire length of the interstate freeway. The segment of I-680 within Contra Costa County includes 24 local service interchanges and 3 major State Route (SR) system interchanges with SR24 in Walnut Creek, SR 242 in Pleasant Hill, and SR 4 in Pacheco. Congestion during the peak hours results in travel times approximately double those of the non-peak times. Future projections indicate travel times to traverse the corridor during peak hours will continue to increase significantly.

CCTA's [Innovate 680 Program](#) was developed to alleviate congestion along the corridor. The Program consists of the following six projects:

- Northbound (NB) I-680 Express Lane Completion;
- Transit Bus on Shoulder (TBOS);
- Shared Mobility Hubs (SMH);

- Advanced Technologies: CARM and Coordinated Adaptive Traffic Signals (CATS);
- Automated Driving System (ADS); and
- Mobility as a Service/Mobility on Demand (MOD).

Each of the 6 projects plays an important role in an integrated approach and, when operating together, will maximize the efficiency of the I-680 Corridor with secondary operational benefits to connecting State highways and local arterials.

Environmental considerations, as well as physical and financial constraints, do not allow for further significant capacity increase to accommodate the increase in traffic demand. As such, Caltrans, CCTA, and the jurisdictions along the corridor are collaborating as part of the Innovate 680 Program to improve operations through an integrated suite of strategic corridor improvements. Additional information is provided at: <https://ccta.net/projects/innovate-680/>.

Caltrans had programmed SHOPP funds to install fiber-optic cable communication trunk lines along I-680 and I-780, install/upgrade Traffic Operation Systems (TOS), and install/upgrade RM along the I-680 corridor in Contra Costa County (with the exceptions of the Route 24 and 242 ramps), including widening and/or creating high-occupancy vehicle (HOV) bypass lanes where feasible in selected locations.

In 2022, CCTA completed the I-680 Advanced Technology Project Coordinated Adaptive Ramp Metering (AT-CARM) Concept Corridor Evaluation. The Evaluation recommended the implementation of CARM along the corridor to supplement the Caltrans SHOPP ramp meter installations to maximize the benefits of ramp metering. In addition, it identifies a possible phased implementation approach based on benefits, costs, physical and environmental considerations.

Construction of the Caltrans SHOPP project (EA 04-1Q721) began in November 2025 and CCTA expects the initial CARM enhancement project construction, from Alcosta Boulevard to Willow Pass Road in the northbound direction, to begin in 2027.

A summary of the ramp meters proposed to be used in this efforts listed is in Table 1 in Appendix A.

3.2 Ramp Metering Goals

The RM implementation along the I-680 corridor in Contra Costa County is intended to:

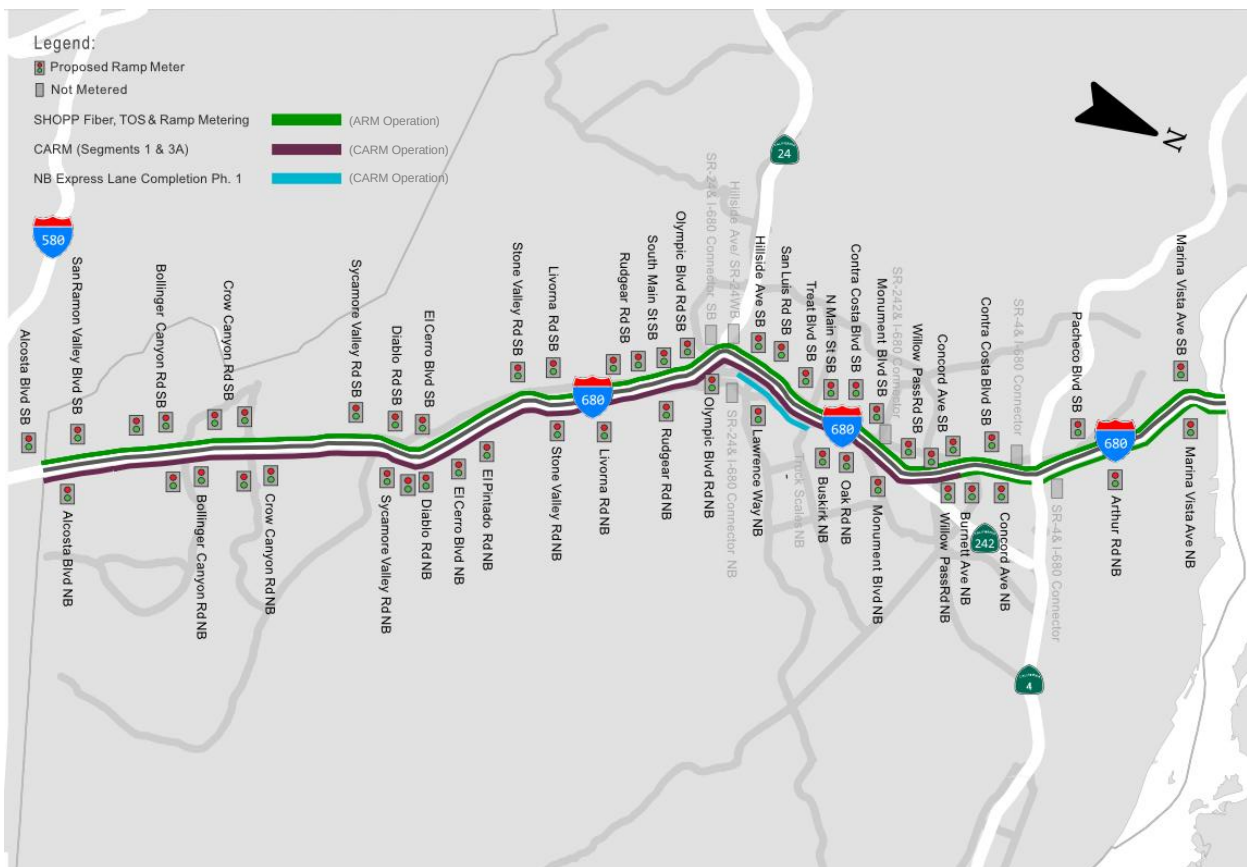
- Manage both recurrent and non-recurrent congestion to improve operational efficiency and reliability of the I-680 corridor without adversely affecting local arterials. This is expected to

result in more uniform travel speed along the mainline and reduce rearend accidents due to sudden speed changes;

- Improve traffic and incident detection to support ramp metering and CARM implementation;
- Promote ridesharing by providing HOV-priority lane where ramp configuration allows; and
- Encourage collaboration with local agencies for further implementation of ITS elements including advanced traffic management system. The details will be identified as those Intelligent Transportation Systems (ITS) projects proceed. A list of related ITS projects is provided in Appendix B.

4. PROJECT SCOPE

Figure 1: Contra Costa County I-680 Funded Ramp Metering Projects



The initial RM implementation along the I-680 corridor will be constructed in phases as described below:

4.1 Funded Projects

Figure 1 shows the three funded projects that will implement ramp metering in the corridor. This includes:

1. SHOPP RM/TOS Project (EA 04-1Q721) – Project Number 0423000277 – PPNO 2020W; Ramp Limits: Alcosta Boulevard to Marina Vista/Waterfront Road (both directions) except for ramps implemented by the two projects listed below; Sponsor: Caltrans
2. CARM Project Segments 1 and 3A (EA 04-0Q960) - Project Number 0418000188 – PPNO 0521L: Ramp Limits: Alcosta Boulevard to Willow Pass Road except for North Main Street (northbound only); Sponsor: CCTA; and
3. Northbound I-680 Express Lane Completion (Phase 1) (EA 04-0Q3100) - Project Number 0418000070 – PPNO 2311B; Ramp Limits: North Main Street (northbound only); Sponsor: CCTA

These projects are discussed in detail in Appendix A.

4.2 Unfunded CARM Segment

In the long-term, Caltrans and CCTA anticipate that CARM will be implemented along the entire I-680 corridor within Contra Costa County, dependent on actual CARM performance and evaluation. However, certain segments of I-680 shown below are currently only funded to implement fuzzy logic based Adaptive Ramp Metering (ARM).

- Northbound from Burnett Avenue to Contra Costa/Solano County line; and
- Southbound along the entire corridor within Contra Costa County.

Caltrans and CCTA agree to collaborate to seek and obtain additional funds to implement CARM for these segments in the future. Information on fuzzy logic based ARM is provided in Appendix C.

5. OPERATION TECHNOLOGIES

It is intended that the best ramp metering and supporting technologies, subject to available funding, environmental and right-of-way constraints, will be implemented along the I-680 corridor. This MOU covers the range of CCTA and Caltrans sponsored RM projects that will deploy a combination of ramp metering technologies.

5.1 Metering Operations

Ramp metering along the corridor will be deployed using a combination of ARM systems including the ARM system utilizing fuzzy logic by Caltrans system and the CARM system utilizing the STREAMS® traffic management platform by CCTA. An overview of the two systems is given in Appendix C.

5.2 Traffic Detection

The Caltrans ARM system utilizes existing mainline count stations and proposed loop detection at the ramps to inform the ramp metering system.

The proposed CARM system requires a robust deployment of advanced vehicle detection devices and other ITS devices, such as field processors, to provide the needed data to manage the ramp meters based on real-time traffic conditions. Traffic detection and monitoring will be provided through a combination of detector loops, mainline The Infra-Red Traffic Logger (TIRTL) devices, and Closed Circuit Television (CCTV) cameras. These devices will be connected to a Caltrans trunk fiber-optic line that runs along the I-680 corridor. The devices necessary to support ramp metering on CARM ramps will be integrated with the STREAMS® platform compatible with standard Caltrans ramp metering equipment with minimal interfacing with local arterial signal systems.

5.3 Traffic Management Centers

The day-to-day ramp metering operations will be managed through Caltrans and CCTA Traffic Management Centers (TMCs). The Caltrans TMC is located at the District 4 office in Oakland and is staffed by Caltrans, California Highway Patrol (CHP) and Freeway Service Patrol (FSP) personnel. The CCTA TMC is intended to primarily reside virtually with operations personnel working remotely. This includes traffic management specialists as well as the technical support staff for the STREAMS® freeway management system and underlying ITS components. In addition, they have direct access to field maintenance and repair personnel to troubleshoot, maintain and repair or replace field devices.

Communication links and protocol between the Caltrans and CCTA TMCs will be discussed in the RMOMP.

5.4 Interface with other Systems and Projects

Caltrans and CCTA utilize multiple strategies along the I-680 corridor to improve safety and productivity, reduce congestion and promote the use of transit and carpooling. Some of these strategies and potential interfaces with the I-680 ramp metering projects are discussed below.

5.4.1 Project Interface

Related Innovate 680 projects include Coordinated Adaptive Traffic Signal (CATS), Northbound Express Lane Completion (ELC) Phase 1, and Transit Bus on Shoulder (TBOS). Additional information is given below.

- CATS - The CATS project includes management of arterial roadway traffic signal systems to optimize traffic flow on selected local arterial corridors that either parallel the I-680 corridor or interact with corridor ramps. One of the goals is to modulate arterial traffic flow in response to congestion or incidents on I-680. Such work will only occur with the consent of the jurisdiction that operates the arterial. The CATS arterial traffic management systems will potentially receive traffic data from the CARM systems traffic detection devices. This project is expected to be implemented in the future, after the CARM initial implementation project (northbound from Alcosta Boulevard to Willow Pass Road) is operational;
- Northbound I-680 ELC Phase 1 – The NB ELC Phase 1 project will construct a new Express Lane from just south of North Main Street to State Route 242 and will convert the existing HOV lane to express lane from SR242 to Arthur Road. It will also reconstruct the northbound Lawrence Way/North Main Street braided entrance ramp. Construction of the NB ELC Phase 1 project will be coordinated and will interface with the SHOPP RM and CARM project construction, including highway and electrical installations in the braided ramp area. The NB ELC Phase 1 construction is expected to start in 2027; and
- TBOS- The TBOS project covers NB I-680 from the Bollinger Canyon Road entrance ramp to the Ygnacio Valley Road exit ramp, within the segment of I-680 with CARM operation. It allows transit buses to utilize the freeway shoulder when mainline speed drops below 35 mph. The TBOS system will interface with the CARM STREAMS® system to hold ramp signals on red as buses pass the ramp using the shoulder to avoid conflict between the transit bus and ramp traffic. Additional information may be communicated to the transit bus driver through an on-board display. If sufficient funding is secured, this project will be implemented in the future, after the CARM project (northbound from Alcosta Boulevard to Willow Pass Road) is operational.

5.4.2 System Interface

CCTA has developed an Innovate 680 AT-CARM Concept of Operations (ConOps)¹ document that outlines the proposed CARM system deployment and operations during the initial three-year CARM demonstration period. The AT-CARM ConOps includes details on the proposed CARM system architecture and system integration. The CARM system is anticipated to be delivered in a cloud-based configuration. CARM operators would access the STREAMS® platform server via a secure firewalled virtual private network (VPN) connection.

The STREAMS® server would be integrated with the Caltrans ITS network to allow communications with individual vehicle detectors, field processors, and ramp meter signal controllers to facilitate CARM operations. It is also anticipated that STREAMS® would have some level of integration with the Caltrans District 4 TMC. The details and level of that integration are still being coordinated at the time this MOU is executed and will be finalized during the CARM Design phase. At a minimum,

¹ DRAFT CCTA Innovate 680 – I-680 Advanced Technology Project – Coordinated Adaptive Ramp Metering (CARM) Concept of Operations (ConOps), November 2024

STREAMS® would be required to provide ramp and mainline vehicle detection data to the Caltrans Performance Measurement System (PeMS), or other similar systems.

The final details of the system interface will be included in the RMOMP.

5.5 Demonstration Period and Evaluation

It is anticipated that initially CARM operations will be deployed for a period of three years as a demonstration project on northbound I-680 from Alcosta Boulevard to Willow Pass Road. CCTA, in collaboration with Caltrans and local agency partners, will monitor and utilize a set of key performance indicators (KPIs) to evaluate the performance of all metered ramps against the pre-metered condition. The same KPIs, or equivalent, would be used for both ARM and CARM operations. This is further discussed in Section 10.

Throughout the demonstration period, Caltrans and CCTA, with support of and input from local stakeholders, will jointly assess the performance of both ramp metering systems. If either the ARM or CARM system does not perform as anticipated, CCTA and Caltrans will work collaboratively to resolve any performance issues. Similarly, towards the end of the demonstration period, Caltrans and CCTA, with support of and input from local stakeholders, will jointly assess the operations and performance of both systems against the pre-metered condition, based on the performance and available funding. If either the ARM or CARM system does not perform as anticipated, CCTA and Caltrans will work collaboratively to resolve any operations and performance issues. This is further discussed in Section 10.

If CARM operations are to continue (or be expanded), CCTA will coordinate with Caltrans and other local stakeholders to secure sufficient funding to support ongoing operations of the initial CARM segment. Upon successful demonstration of CARM, CCTA, with support from Caltrans, will seek funding to implement CARM in the remaining segments. These improvements may include the installation of additional mainline and ramp vehicle detection, CCTV and other supporting ITS devices, and additional ramp storage and/or discharge capacity.

If CARM operations do not continue and ramp meters in the initial CARM segment are to be reverted to ARM operations, CCTA will fund and coordinate with Caltrans and other local stakeholders to reconfigure the entrance ramp metering equipment per Caltrans Ramp Metering Design Manual (RMDM) requirements and remove any equipment supporting CARM operation. The potential conversion to Caltrans ARM operations would also include a re-evaluation of the feasibility of implementing HOV Preferential Lane (HOVPL) on entrance ramps along the corridor.

6. ROLES AND RESPONSIBILITIES

The I-680 corridor in Contra Costa County traverses through multiple cities, towns, and the unincorporated areas of the County. The primary sponsors and operators of ramp metering are Caltrans and CCTA. Their roles and responsibilities are discussed below.

6.1 Ownership

Caltrans is the owner and operator of the I-680 corridor, including all vehicle detection devices, ramp metering equipment, CCTV and associated ITS. CCTA will install devices along the corridor for vehicle detection and to incorporate the STREAMS® freeway management platform to operate ramp meters using CARM algorithms at selected ramp locations with an initial three year demonstration period. If CARM operations continue beyond the initial 3-year period, it is anticipated that ownership of all CARM equipment will rest with Caltrans. This will be addressed as part of a Caltrans-CCTA Operation and Maintenance Agreement.

If CARM operations do not continue and ramp meters in the initial CARM segment are to be converted to ARM operations, any equipment supporting CARM operation that is removed by CCTA during such conversion will become the property of CCTA. All vehicle detection devices and ramp metering equipment will remain the properties of Caltrans.

6.2 Project Implementation

Caltrans plans to implement ramp metering operations in both directions for the entire I-680 corridor within the County. CCTA will supplement the metering operations by incorporating CARM technology and related improvements. Such improvements will be constructed under a Caltrans Encroachment Permit.

In 2022, CCTA prepared and published a feasibility report that recommended implementing CARM in both directions along the full length of I-680 in the County. The report recommended that CARM enhancement be implemented by segments with the following geographical limits:

- Segment 1- northbound from Alcosta Boulevard to Olympic Boulevard;
- Segment 2- southbound from Olympic Boulevard to Alcosta Boulevard; and
- Segment 3- northbound and southbound from SR24 to Marina Vista/Waterfront Road.

Section 4.1 discussed the ramp metering projects along the I-680 corridor that will be implemented by Caltrans and CCTA. It is the intention of both agencies to utilize the best available technology to operate the ramp meters, based on available funding, geometric and other constraints.

The projects will include civil improvements at selected ramps to increase ramp storage and/or discharge capacity, installation of additional Vehicle Detection Station (VDS), ramp metering equipment, and other associated ITS devices.

As of July 2025, funding had been secured for CCTA to implement CARM metering operation, using the STREAMS® freeway management system, in the northbound direction from Alcosta Boulevard to Willow Pass Road. Ramp metering for other ramps in the corridor will be implemented and operated by Caltrans using ARM technology.

CCTA and Caltrans will collaborate to seek additional funding to implement CARM on the other remaining segments.

6.3 Ramp Meter Operation

Ramp meters along the corridor will be operated by Caltrans and CCTA utilizing ARM and CARM technologies. The detailed operation parameters will be included in the RMOMP.

- Initial Start up- The SHOPP ramp metering project is expected to be completed and operational before the CARM project. All the northbound SHOPP meter signals will rest on green during initial activation. When the CARM project also becomes operational, northbound ramp metering operations for both projects will begin simultaneously.
- Hours of Operations- The Caltrans ARM system typically operates during commute hours and on weekdays, if traffic conditions so require. The CCTA CARM system may operate 24/7, based on real-time freeway traffic conditions. STREAMS® activation of ramp meters would typically be expected to occur during periods of increased travel demand including during weekday and weekend peak periods and in response to congestion and incidents;
- Traffic Management Centers- Caltrans will manage ARM ramp metering operations from their TMC in Oakland, where they are co-located with the CHP and FSP. The Caltrans TMC will also have access to the data from the CARM VDS and the CARM-managed signals. CCTA will manage the CARM ramp meters initially from a virtual TMC and ultimately in hybrid manner that includes the potential for a physical TMC to be co-located in their office. The Caltrans and CCTA TMCs will have voice and data links. Communication links and protocol between the two TMCs will be included in the RMOMP; and
- Emergency Override- The RM systems will need to accommodate emergency vehicle access as part of operations during ramp metering operations. Caltrans District 4 TMC staff will have the ability to temporarily override ARM system control and deactivate ramp meter signals on an entrance ramp, especially where shoulders are inadequate to allow emergency vehicle access. Similarly, CCTA Operations staff will have the ability to temporarily override CARM system control and deactivate ramp meter signals on an entrance ramp, if needed to allow emergency vehicle access. This manual override ability will assist incident or emergency response efforts by allowing emergency vehicles to enter the I-680 mainline without waiting through a queue during normal ramp metering. The Emergency Override Procedure, including communications protocol between staff of the Caltrans and CCTA TMCs, will be included in the RMOMP.

6.4 Maintenance

The maintenance of all ramp metering equipment and systems will be covered by an O&M agreement between Caltrans and CCTA. CCTA may enter into additional O&M agreement (s) to cover any local arterial intersections that directly interface with the CARM system. It is anticipated that the day-to-day operations and maintenance of ARM operations will be funded by Caltrans. CARM operation will be funded by CCTA during the demonstration period. CCTA, with support from

Caltrans, will seek funding for CARM operations beyond the demonstration period. This MOU will not impose any direct financial obligation on any local jurisdictions along the I-680 corridor.

7. OPERATION POLICIES

Ramp metering operation is intended to improve freeway operations and where possible, encourage ridesharing, without jeopardizing traffic operation or creating additional congestion on the local arterial network by adhering to a set of operation policies and the RMOMP.

7.1 Operation Principles

The ramp meters will be operated through a combination of the following strategies and policies, as applicable:

- Increase ramp storage- where possible, this includes increasing the storage on the ramp, either by increasing the number of lanes or lengthening the ramp, or utilizing dedicated ramp turn lanes on local arterials such as on northbound Oak Road and southbound Buskirk Avenue at the Elena Court ramp;
- Increase number of lanes at selected ramps- this includes increasing the number of lanes at the ramps to provide General Purpose (GP) and/or HOVPL in accordance with the Caltrans RMDM for ARM operations, or to provide sufficient storage and discharge capacity at the ramp meter stop bar to meet CARM requirements for CARM operations;
- Improve real time traffic detection on the mainline and ramp queues to provide the necessary data need for metering operations. This includes the following:
 - Mainline VDS placement at critical locations along the corridor (e.g. merge and diverge points, lane drops and lane adds, known bottleneck locations) at a nominal 1/3 mile spacing to support CARM operation. This provides more detailed and lower latency data to detect changes in traffic conditions such as volume, speed and lane occupancy (as a measure of traffic density). The more granular traffic data allows the metering operation to more quickly respond to changes in mainline traffic conditions;
 - Ramp detection - the standard Caltrans ramp metering design includes detection at the limit line and the nominal end of the on ramp (actual location is typically the “three-quarter point” of the ARM ramps), as well as the end of ramp of the complementary off ramp. The ramps to be operated under CARM will include an additional detection station at the mid-queue of the on ramp. This allows STREAMS® to more accurately estimate queue length and wait times (time between when vehicle enters ramp and discharged at the meter) allowing the system to

better manage ramp queues to minimize potential spillback to the local arterials. Ramps operated under CARM will also utilize detector loops at all ramps; and

- CCTV- CCTV will be placed at strategic locations for operation staff to visually monitor mainline and ramp operation condition and operation

- Modulate throughput and metering rates across multiple CARM ramps in real-time – exclusively for ramps operated using STREAMS®, the metering rates can be coordinated across all ramps along the corridor to optimize mainline traffic flows and balance ramp queues. This allows ramps at congested segments of the freeway to maintain acceptable metering rates while minimizing impacts to mainline operation;
- Manage maximum ramp wait time - the ramp wait time influences driver experience and long wait time may result in elevated ramp meter violation rates. Currently, ramps with ARM focus on managing queue length and do not have specific measures to manage maximum ramp wait time. For ramp with CARM operations, the maximum wait time is one of several ramp metering parameters assessed using the CARM suite of algorithms in STREAMS®. STREAMS® utilizes a nominal maximum wait time of 4 minutes. The actual typical average wait time is expected to be much lower.

When the CARM system detects a wait time approaching 4 minutes at a ramp meter, it can speed up the ramp release rate, refreshed every twenty seconds, to maintain the wait time under the 4-minute threshold. The system will coordinate with other upstream and downstream ramps to prevent the increase of the metering rate at one ramp from causing a mainline bottleneck; and

- Avoid ramp spillback onto the local arterials - the data from the combination of traffic detectors on the ramp informs the RM system of ramp queuing. For ARM, the system can detect when a queue has reached the back of the ramp prompting the system to adjust metering rates. The ARM operated ramp signals will hold green to release the vehicles in the queue though this has the potential to create a bottleneck on the mainline.

For CARM, the system continuously estimates ramp storage utilization and, as needed, preemptively adjusts the metering rate at the impacted ramps to avoid any spillback to local arterials. STREAMS® has various stages of Queue Control (QC), where it will begin to accelerate the ramp metering rate at a ramp to prevent spillback if the queue gets to nominally 60% to 70% of the ramp storage capacity. The QC parameter would then continue to accelerate the ramp metering rate if the ramp queue continues to grow. If STREAMS® determines the ramp has reached its storage capacity, then the ramp meter would go into Queue Override (QO), where the ramp meter will release vehicles at the fastest rate possible to prevent a back-up. In both cases, STREAMS® would coordinate the release of vehicles across multiple ramps to manage ramp queues. This may occur throughout the entire corridor at different times when all ramps are either under QC, QO, or

assisting other ramps under those conditions to manage ramp queues, while still preventing the breakdown of the mainline.

7.2 Daily Operations

A RMOMP will be prepared to document the protocols, processes and procedures of the day-to-day operations. The RMOMP will cover the following areas:

- Operational Policies and Procedures
 - Ramp Metering Operations including specific performance metrics criteria
 - Ramp Closure Operations
 - Emergency and incident response and override
 - Communications protocol and process
 - Data collection and sharing
 - Operational support tools and procedures
 - Training
- Ramp Meter Maintenance
 - Maintenance needs and resources
 - Maintenance procedures
 - Emergency repair procedures
 - Spare/backup equipment
 - Asset management
 - Training

8. INCIDENT RESPONSE

The improved TOS and additional VDS will improve incident and response time. As a general rule, incident management will be coordinated at the Caltrans TMC. If necessary, CHP or local emergency services can request the Caltrans TMC operators to temporarily override system control and/or deactivate ramps managed by ARM, especially where shoulders are inadequate to allow emergency vehicles to pass. Similarly, Caltrans TMC, CHP or local emergency services can request the CCTA system operator to temporarily override system control and/or deactivate ramps managed by STREAMS®, if needed to allow emergency vehicle access. This manual override ability will assist incident or emergency response efforts by allowing emergency vehicles to enter the I-680 mainline without waiting through a queue during normal ramp metering. The override protocol and process will be included in the RMOMP.

9. MANAGEMENT AND GOVERNANCE

The day-to-day operations of the corridor ramp meters will be managed by Caltrans and CCTA technical staff, including the use of consultants, with oversight and direction provided by a governance structure as shown in Figure 2 and further discussed below.

Figure 2: Governance Structure

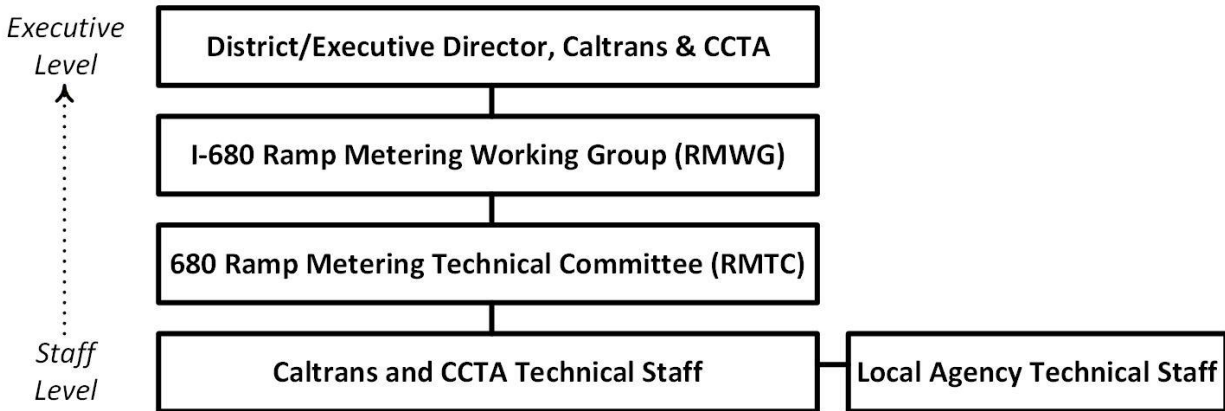


Table 1: Membership of RMTC and RMWG

Agency	RMTC	RMWG
Caltrans	System Operations Chief	Deputy Director- Traffic Operations
CCTA	Director, Projects	Deputy Executive Director, Projects and Operations
Contra Costa County	TBD	TBD
Concord	Traffic Engineer	Deputy Public Works Director
Danville	TBD	TBD
Martinez	Assistant City Engineer	Public Works Director
Pleasant Hill	Associate Engineer (Traffic)	Public Works Director
San Ramon	Senior Engineer (Traffic)	Public work Director and/or City Engineer
Walnut Creek	Traffic Engineer	Traffic Engineer

In general, all technical and operational matters and issues that may arise should be resolved amongst the partnering agencies at the lowest working level. Issues that may arise would first be referred to the I-680 Ramp Metering Technical Committee (RMTC). The RMTC consists of the technical staff of the local jurisdictions along the corridor, including the cities of Concord, Martinez, Pleasant Hill, Walnut Creek, and San Ramon, the town of Danville, and Contra Costa County, as well staff from Caltrans and CCTA. Items that cannot be resolved can then be elevated to the I-680 Ramp Metering Working Group (RMWG). The RMWG includes senior or executive staff from the same agencies as the RMTC. The detailed makeup of the RMTC and RMWG is shown in Table 1. In the event that no consensus is reached by the RMWG, then the issue can be referred to the Caltrans District 4 Director and the Executive Director of CCTA for final resolution.

A more detailed discussion on the roles of the technical staff, RMTC and RMWG is given below.

9.1 Technical Staff

Daily corridor ramp metering operations will be managed by a team of technical staff at the Caltrans (TMC) and the CCTA TMC. Staff from the two TMCs will be connected virtually. The CCTA TMC will manage ramps operating under the CARM system and the Caltrans TMC will manage all other ramp meters in the corridor. Technical staff on the local jurisdictions can communicate and prepare requests as discussed in Section 11.

9.2 I-680 Ramp Metering Technical Committee (RMTC)

The RMTC consists of technical staff from the local jurisdictions along the corridor, including the cities of Concord, Martinez, Pleasant Hill, Walnut Creek, San Ramon, town of Danville, and Contra Costa County, and staff from Caltrans and CCTA. CCTA will provide administrative support for the RMTC.

The RMTC will meet regularly (normally once every six months), and within 30 days of the release of a semi-annual Ramp Metering Performance Report to review such Reports and/or discuss operational issues, as needed. If necessary and upon request, additional meetings may be scheduled to discuss or provide directions on technical or operational matters or issues. If the RMTC cannot reach consensus on an issue, it may forward the issue to the RMWG.

9.3 I-680 Ramp Metering Working Group (RMWG)

The RMWG consists of senior or executive staff from the local jurisdictions along the corridor, including the cities of Concord, Martinez, Pleasant Hill, Walnut Creek, San Ramon, Town of Danville, Contra Costa County, and from Caltrans and CCTA. CCTA will provide administrative support for the RMWG.

The RMWG will nominally meet once every twelve months, or within 30 days of every second regular RMTAC meeting to review Ramp Metering Performance Reports and/or discuss operational issues, as needed. If necessary and upon request by the RMTC, additional meetings may be

scheduled to discuss and provide directions on technical or operational matters or issues. If the RMWG cannot reach consensus on any issue, it may forward the issue to the Caltrans District 4 Director and the Executive Director of CCTA for final resolution.

10. PERFORMANCE METRICS AND REPORTING

Regular performance monitoring and reporting will be conducted for ramp metering operations along the I-680 corridor, for both ARM and CARM segments. At the conclusion of the first three months of operations of the northbound CARM demonstration corridor, a preliminary assessment memorandum will be prepared to summarize the performance of both the ARM and CARM segments and comparing conditions in the I-680 corridor before and after the activation of the ramp meters. Thereafter, a Functional Ramp Metering Performance Report will be prepared every six months during the three-year demonstration period to document and evaluate conditions in the I-680 CARM corridor.

The ability of ramp metering to produce corridor improvements to meet performance goals needs to be measured against the metrics used to assess corridor operations. The following subsection shows the list of measures that were developed in coordination with Innovate 680 CARM stakeholder agencies. They will be used to gauge the effectiveness of ramp metering operations to improve existing deficiencies and to deliver benefits to system users and stakeholders. Additional measures may be added based on request and discussion with stakeholders.

The analysis will utilize data from the existing and new vehicle detectors planned for installation along the corridor mainline, as well as existing and new vehicle detectors installed on corridor entrance and exit ramps. Data from these devices will be used to assess traffic conditions both with and without ramp metering operations, to provide an appropriate comparison. Where necessary, commercially available data may also be used. Additionally, most measures will be assessed for before and during performance of ramp metering at peak periods, when ramp meters are anticipated to be active. An initial review of performance data from existing and new traffic detectors will be necessary before the extent of the AM and PM peak periods can be defined for further analysis.

As further discussed below, the metrics are categorized for mainline, ramp, and other performance. Each metric will be presented by segment along the I-680 corridor. The level of detail in the reporting may vary from segment to segment due to the varying density of the VDS. However, it is important to establish a common set of KPIs to compare the effectiveness of both RM systems, and against the existing condition. Therefore, CCTA and Caltrans will work collaboratively to obtain the necessary data to conduct the assessments. The KPIs are intended to cover mainline and ramp performance as well as other considerations, as further discussed below.

10.1 Mainline Traffic Performance

- Safety and Crashes - Number of total mainline crashes (including serious injuries, fatalities, and property damage only) reported during ramp metering operation. This total value, and reported locations, will then be compared to the same period from previous years. Although the number of crashes will be reported as part of regular performance assessments, it should be recognized that it will be difficult to draw statistically relevant conclusions based on early samples of data, as crashes are typically reported over 3- to 5-year periods;
- Mainline traffic volume- Recorded values during peak periods (weekdays AM/PM), reported as vehicles per hour per lane. This measure is an indication of the efficiency of the freeway corridor. The measure will be used to assess corridor wide efficiency. However, particular attention will be paid to the change in volumes at and downstream of existing bottleneck locations;
- Average travel time- A comparison of average travel times during peak periods (weekdays AM/PM) for before and during ramp metering operations to indicate the ability for the metering systems to better manage traffic flows and reduce congestion. In mainline segments where the data is available, the report may include travel time by traffic lane;
- Average travel delay- A comparison of changes to mainline travel delay throughout the day, based on overall mainline travel at below optimum speeds;
- Travel time reliability- A calculation of Planning Time Index (PTI), or the 95th percentile travel time during peak periods (weekdays AM/PM), divided by the free-flow travel time;
- Productivity- A measure of the relationship between speed and traffic flow during peak periods (weekdays AM/PM). The measure is calculated by multiplying average speed by hourly lane flow in order to gauge the level of freeway optimization; and
- Bottleneck formation- A measure of how ramp metering impacts the Maximum Sustainable Flow Rate (MSFR) of known bottleneck locations prior to traffic breakdown, indicating the level of resiliency of those locations due to ramp metering.

10.2 Entrance Ramp Performance

- Safety and Crashes - Number of total crashes at on ramps and ramp intersections (including serious injuries, fatalities, and property damage only) reported during ramp metering operation. This total value, and reported locations, will then be compared to the same period from previous years. Although the number of crashes will be reported as part of regular performance assessments, it should be recognized that it will be difficult to draw

statistically relevant conclusions based on early samples of data, as crashes are typically reported over 3- to 5-year periods;

- Average ramp meter wait times – Average wait times at ramp meters during peak periods;
- Extended ramp meter wait times – 95th percentile ramp meter wait times, intended to gauge the wait times at the peak of peak periods during long queue conditions;
- Maximum ramp meter wait times – Frequency of maximum ramp meter wait times being utilized by the system during peak periods;
- Average meter queue lengths – Average queue length on ramps during peak periods, expressed as a percentage of ramp length;
- Ramp queue impacts – Occurrences of queue spill back onto adjacent arterials;
- Ramp metering violation rates – Number of ramp meter violations during peak periods;
- Arterial Travel Time – Measure of average travel time along arterial segments adjacent to ramp meters during peak periods. This calculation will be dependent on the availability of commercial 3rd party data sources, or other information from agency partners;
- Arterial Travel Delay – Measure of average travel delay along arterial segments adjacent to ramp meters during peak periods. This calculation will be dependent on the availability of 3rd party data sources, or other information from agency partners; and
- Arterial Impacts – Occurrences of queue spill back from ramp meters blocking through-traffic on adjacent arterials. Impacts to ramp arterial intersections may also be reported, dependent on the availability of 3rd party data sources, or other information from agency partners.

10.3 Other Considerations

- Parallel Corridor Volumes – A comparison of traffic volumes on corridors that parallel I-680, including San Ramon Valley Boulevard, Danville Boulevard, Main Street, Contra Costa Boulevard and Pacheco Boulevard, against general background traffic growth;
- Transit Travel Time – A comparison of transit bus route travel times for routes that travel along the I-680 corridor, that may be changed by ramp meter operations;
- Transit Travel Time Reliability – A comparison of bus route on-time performance for routes that travel along the I-680 corridor, that may be changed by ramp meter operations;

- Total Trip Travel Time – A comparison of total travel time for a set of representative trips that takes into account total travel time on the freeway mainline, entrance ramp, and sections of the adjacent arterials; and
- Performance Trending and Field Observations – There will be a discussion on performance trending and any observed operation abnormalities, deficiencies and issues of concern or significance that are not captured by other performance metrics. This may include operational issues on local arterials that may not be directly related to, but could be exacerbated by, meter operations as observed or reported by local agency partners.

10.4 Functional Performance Reporting

In addition to the traffic and safety performance metrics discussed earlier in this section, Caltrans, in conjunction with CCTA, will prepare a Functional Ramp Metering Performance Report on a semi-annual basis. The report, as a minimum, will cover the following:

- System and operation deficiencies- Occurrences of system outages or operational issues reported by operators, or agency stakeholders;
- Equipment condition - Occurrences of device faults and outage time;
- Recommendations- this will include recommendations to either address deficiencies identified or to improve system performance. It will include separate discussions on:
 - Operations- Including day-to-day operations and monitoring; and
 - Infrastructure- Reports on functionality of overall infrastructure including management systems, communications equipment, and individual devices.

11. PUBLIC OUTREACH

The ramp metering implementation and operation will include a robust public information and education program primarily managed by CCTA and supported by the Caltrans Public Information Office. As the ARM and CARM ramp meters operate differently, outreach and education efforts are needed to prepare the public for the different types of ramp metering operations.

11.1 Public Education

Innovate 680 Program websites and social media will be utilized to educate the public on the proposed ramp metering operations before metering activation. Public education campaigns will help inform the public about the purpose and basics of ramp metering as well as the differences in how meters are operated using ARM and those operated using CARM technologies. This will cover simultaneous discharge, part-time lanes, and different hours of operations, etc.

As the ramp metering activation implementation date approaches, there will be press releases and targeted social media messaging to advise and educate the public of the implementation of ramp metering. In addition, the outreach may include presentations to local jurisdiction governing bodies and public events such as farmers' markets. In addition, the CHP and public transit operators will be provided with project updates as part of the Innovate 680 suite of stakeholder meetings.

11.2 Emergency Communications and Requests

Any communications and requests that are related to emergencies or public safety should be directed to the CHP and to the Caltrans TMC. Where necessary, Caltrans TMC staff can communicate with the CARM TMC. The communication protocol and process will be included in the RMOMP.

11.3 Responses to Public Queries and Comments

Public queries and comments should be anticipated during the initial phase of implementation, and also during the ongoing ramp metering operation. As the public would not be able to distinguish whether a ramp is operated under ARM or CARM and the majority of ramps are operated by Caltrans, they should be encouraged to utilize the Caltrans Customer Service Request portal. CCTA will also monitor news and social media, information received by staff and elected officials at CCTA and local jurisdictions. Additional feedback may be received from the CHP or public transit operators.

Caltrans and CCTA will identify their public information points of contact and collaborate to respond to queries and comments. Any public queries, concerns, issues, or requests that pertains to CARM operations will be forwarded to CCTA for response, action and tracking. Non-CARM related requests will be handled by Caltrans. The names, phone numbers and emails of the Caltrans and CCTA points of contact will be included in the RMOMP. The RMOMP will include protocols on information sharing between agencies about the public's concerns and feedback on ramp metering implementation.

11.4 Stakeholder Agency Change Request (non-emergency)

If a local jurisdiction has a concern, question or request for any changes in the ramp metering operation, they should be sent to both the System Operations Chief, Caltrans District 4 (amjad.naseer@dot.ca.gov) and to Director of Projects, CCTA (StephanieH@ccta.net).

12. DATA SHARING

The ramp metering operation produces and relies on traffic data. Such data can also be used to support traffic planning and arterial operations. The collection, storing and sharing of any and all data need to comply with the Caltrans Privacy Policy (<https://dot.ca.gov/-/media/dot-media/documents/privacy-policy.pdf>) and applicable local, state and federal ordinances and/or regulations. It should be noted that CARM operations may generate data that is considered proprietary in nature and therefore cannot be shared or made publicly available

The ownership of data developed from ramp metering rests with Caltrans except that CCTA also has unlimited access to the data developed through the CARM management system and infrastructure. Any party to this MOU can submit a data request to Caltrans. All data provided should only be used for the direct benefit for the requesting party. The data should not be shared with third parties for commercial purposes. That notwithstanding, the recipient of the data may seek a written exception to the limitation on sharing from Caltrans.

12.1 CARM Dashboard

To facilitate real-time system performance data sharing to CARM corridor stakeholders, the web-based STREAMS® Smart Motorways Dashboard monitoring tool will be made available to stakeholder agency staff. The Dashboard will allow stakeholders to observe real-time conditions and display historic performance data, by generating a robust set of charts, heat-maps, performance schematics, etc. It will highlight both mainline and ramp conditions, including volumes, speed, occupancy, ramp wait times, and queue information. In addition, stakeholders will be able to view real-time and historic ramp metering parameters and ramp metering rates at all ramp meter locations along the CARM corridor. The Dashboard would be available to corridor stakeholders with an assigned log-in on a read-only web interface. Group training will be provided to stakeholder agencies prior to CARM implementation and periodically thereafter. In order to protect proprietary information, the Dashboard does not offer direct data export capabilities of ramp metering parameters and ramp metering rates.

12.2 Caltrans PeMS or Similar System

As discussed previously, the CARM project will result in a substantial deployment of VDS on I-680 entrance ramps, exit ramps, and at regular intervals along the I-680 freeway mainline. Vehicle detector data will be readily available on the Caltrans ITS network, and will be made publicly available on the Caltrans Performance Measurement System (PeMS) or a similar system. Reports, summaries, and spreadsheets could be generated on an as-needed basis.

The systems engineering process for the initial Innovate 680 CARM demonstration corridor is ongoing at the time of this writing. Although the CARM system is proposed to have a cloud-based configuration for initial operations during the three-year demonstration period, vehicle detection and ramp metering data will still be made available to Caltrans. This data will be in a raw format with minimal or no processing. Hence, no proprietary information related to system algorithms will be provided. This data feed is proposed to flow from the STREAMS® field processor or cloud environment to the Caltrans District 4 TMC data center for provision to PeMS or other Caltrans systems.

If desired, CARM detector data could also be provided at regular intervals to local stakeholder agency systems, subject to the local agency having the appropriate communications and database infrastructure in place to accommodate this data feed.

12.3 Information Request

Additional ramp metering information beyond what is anticipated to be made available through the CARM Dashboard and Caltrans PeMS, or similar, could be provided by either Caltrans or CCTA upon request. However, both CARM and ARM operations may include proprietary information that cannot be made publicly available. Such requests should be sent to both System Operations Chief, Caltrans District 4 (amjad.naseer@dot.ca.gov) and to Director of Projects, CCTA (StephanieH@ccta.net).

13. COST AND FUNDING

Ramp metering on I-680 will be implemented and managed by Caltrans and CCTA. Funding for the Caltrans implemented segment is provided by the SHOPP Program. For the CARM segments currently being implemented, the capital construction, ramp meter system and the initial 3-years of initialization costs are being funded by federal, state, and local funds managed by CCTA. CCTA and Caltrans are coordinating to seek additional funding to complete CARM enhancement for the remaining segments and future CARM operations.

Future ongoing operation of the ramp meters using ARM fuzzy logic algorithms are funded by Caltrans.

The CARM ramps will be funded and operated by CCTA for an initial three years as a demonstration project. Subsequent operating methodology will be determined based on an evaluation of CARM performance and available funding. Funds for operating the meters using CARM beyond the 3-year initialization will be identified by CCTA during the final year of the demonstration period. If it is determined that such ramps will revert to ARM operations, CCTA will be responsible for converting these ramps for ARM operations. These converted ramp meters will be operated by Caltrans using its own funds.

14. MOU UPDATES

This MOU is not a legally binding document. Given the changes in traffic management and vehicle connectivity technologies, traffic pattern and volume, the MOU should be considered a living document, subject to regular review and update.

Members of the RMTC, RMWG or any party to this MOU can request and propose changes to the MOU. Any proposed changes will be reviewed and have to be approved by both the RMTC and RMWG. Revisions to this MOU will require approval, either administratively or by the agency governing body as determined by the party, of all parties to this MOU and to be formalized by a written amendment by all the signatories of this MOU.

Terms for future enforceable contracts or agreements between the PARTIES may be amended or modified as necessary to comply with applicable law(s), even if such amendments or modifications are inconsistent with the terms of this MOU.

APPENDIX

Appendix A – Proposed I-680 Ramp Metering on I-680 in Contra Costa County

Appendix B – Related ITS Projects

Appendix C – Comparison of ARM and CARM Functionalities

Appendix D – Glossary of Terms and Acronyms

Appendix A – Proposed I-680 Ramp Metering on I-680 in Contra Costa County

Caltrans and CCTA are jointly implementing ramp metering along I-680 within Contra Costa County. This includes metering of all ramps with the exception of freeway-to-freeway ramps. The implementation will utilize both ARM and CARM operations. The CARM operations will initially cover the northbound ramps from Alcosta Boulevard to Willow Pass Road as a three-year demonstration project. It is intended that CARM will be implemented in additional segments of I-680 if the initial segment performs as anticipated and additional funding becomes available,

Figure 1 shows the three currently funded projects that will implement ramp metering in the corridor. They are further discussed below.

1. SUOPP RM/TOS Project (EA 04-1Q721) – Project Number 0423000277 – PPNO 2020W;
Sponsor: Caltrans
Ramp Limits: Alcosta Boulevard to Marina Vista/Waterfront Road (both directions)

This project installs/upgrades Traffic Operation Systems (TOS), fiber optics line and ramp metering elements along I-680 in both directions from the I-580/I-680 interchange in Alameda County, along Contra Costa County and through to the I-680/I-780 interchange in Solano County. This includes widening and/or creating High-Occupancy Vehicle (HOV) preferential lanes along I-680 at selected ramps in both directions in Contra Costa County. There are a total of 55 ramp metering locations, and 6 monitoring stations proposed within the project limits. The project also includes fiber-optic cable communication trunk lines along the I-680 corridor. The project is funded under the SHOPP program. Caltrans intends to use the Adaptive Ramp Metering (ARM) and fuzzy logic to operate the ramp meters associated with this project unless funding is secured to implement CARM at the ramp metering locations in Contra Costa County.

2. CARM Project Segments 1 and 3 (EA 04-0Q960) - Project Number 0418000188 – PPNO 0521L: Sponsor: CCTA
Ramp Limits: Alcosta Boulevard to Willow Pass Road (northbound)

This Innovate 680 CARM project is intended to supplement and enhance the RM operations of the EA 04-1Q720 project for select ramp locations in Contra Costa County. As an initial deployment, CARM will be implemented in the northbound direction on I-680 from Alcosta Boulevard to Willow Pass Road (with the exception of the North Main Street on-ramp) within the following municipalities: Dublin, San Ramon, Danville, Walnut Creek, Pleasant Hill, Concord, and the unincorporated areas of Alamo and Pacheco. Within the project limits, seven ramps will be geometrically modified and the local arterials at one ramp location will be re-stripped. Additional real-time information on traffic conditions on I-680 in the northbound direction would be collected using 71 The Infra-Red Traffic Logger (TIRTL) vehicle detection stations (VDS) installed along the freeway mainline. CARM will involve the use of the STREAMS® advanced traffic management

platform to operate the CARM ramp metering system. This initial phase of the Innovate 680 CARM project will operate as a three-year pilot project to gauge the performance of CARM on I-680 as a proof of concept, prior to the development of CARM on other freeway segments.

3. Northbound I-680 Express Lane Completion Phase 1 (EA 04-0Q3100) - Project Number 0418000070 – PPNO 2311B; Sponsor: CCTA
Ramp Limits: North Main Street/Lawrence Way (northbound)

This project is the initial phase to complete the express lane on northbound I-680 within Contra Costa County. Proposed improvements include a new express lane from just south of North Main Street to State Route 242, converting existing HOV lane from SR-242 to Arthur Road, and the construction of braided ramps between Lawrence Way and Treat Boulevard. The braided ramps construction will include CARM elements at the North Main Street entrance ramp to NB I-680. The project aims to address the existing express lanes gap, relieve congestion, reduce travel delays, and improve operations.

A summary of the current funded ramp improvements and configurations is summarized in Table 1.

**Table 1: Summary of I-680 Ramps in Contra Costa County
Northbound Ramps**

Postmile	Arterial and Direction	Operation		General Purpose		HOV Priority		Geometrically Modified
		ARM	CARM	No. of Lanes	Storage (ft.)	No. of Lanes	Storage (ft.)	
R0.1	Alcosta		X	3	1,520	0	0	Yes
R3.0	Bollinger Canyon EB		X	1	1,340	0	0	Yes
R3.1	Bollinger Canyon WB		X	3	2,480	0	0	Yes
R4.3	Crow Canyon EB		X	2	2,170	0	0	Yes
R4.4	Crow Canyon WB		X	3	1,820	0	0	Yes
R6.9	Sycamore Valley		X	4	1,680	0	0	Yes
R7.520	Diablo EB		X	1	730	0	0	No
R7.719	Diablo WB		X	1	585	0	0	No
R8.3	El Cerro		X	2	1,100	0	0	Yes
R8.844	El Pintado		X	1	370	0	0	No
15.734	Stone Valley		X	2	1,360	0	0	Yes
16.848	Livorna		X	2	780	0	0	Yes
12.717	Rudgear		X	2	1,040	0	0	Yes
14.1	Olympic		X	3	1,580	0	0	Yes
15.734	Lawrence/North Main		X	2	1,081	0	0	Yes
16.695	Buskirk/Treat		X	2	935	0	0	Yes
16.848	Buskirk/Oak/Elena		X	2	360	0	0	Yes
R17.865	Monument		X	2	890	0	0	Yes
19.2	Willow Pass		X	3	1,520	0	0	Yes
19.836	Burnett	X		1	250	0	0	No
20.040	Concord WB	X		1	1,080	0	0	No
22.830	Arthur	X		1	425	0	0	No
24.253	Waterfront/Marina Vista	X		1	330	0	0	No

Southbound Ramps

Postmile	Arterial and Direction	Operation		General Purpose		HOV Priority		Geometrically Modified
		ARM	CARM	No. of Lanes	Storage (ft.)	No. of Lanes	Storage (ft.)	
R0.1	Alcosta	X		1	350	1	350	No
R0.2	San Ramon Valley	X		2	1,300	1	630	No
R2.9	Bollinger Canyon EB	X		1	810	1	420	Yes
R3.0	Bollinger Canyon WB	X		1	340	1	510	Yes
R4.2	Crow Canyon EB	X		1	610	1	930	No
R4.3	Crow Canyon WB	X		1	550	1	510	No
R6.9	Sycamore Valley	X		1	550	1	510	No
XR7.428	Diablo	X		1	745	0	0	No
R8.060	El Cerro	X		1	725	0	0	No
X15.7	Stone Valley	X		1	840	1	840	Yes
16.8	Livorna	X		1	830	0	0	No
12.416	Rudgear	X		2	1,600	1	650	No
13.2	South Main	X		1	530	1	730	No
13.809	Olympic EB	X		1	1,150	0	0	No
13.810	Olympic WB	X		1	2,080	0	0	No
14.858	Ygnacio Valley/Hillside	X		2	1,780	0	0	No
15.501	North Main	X		2	1,440	0	0	Yes
16.287	Geary/Treat	X		1	255	0	0	No
16.549	North Main/Geary	X		2	254	0	0	Yes
XR17.358	Boyd/Contra Costa SB	X		1	1,185	0	0	No
R17.513	Monument	X		2	1,746	0	0	Yes
19.094	Willow Pass WB	X		1	560	0	0	No
R19.095	Willow Pass EB	X		1	744	0	0	No
19.702	Concord/Chilpancingo	X		1	510	0	0	No
19.889	Contra Costa	X		1	685	0	0	No
22.363	Pacheco	X		1	1,280	0	0	No
24.256	Marina Vista/Waterfront	X		1	1,305	0	0	No

Appendix B – Related ITS Projects

This Appendix provides information on planned local arterial ITS projects that will interface with I-680 ramps.

Project Name: Countywide Smart Signal Project
Project Sponsor(s): CCTA
Project Description and I-680 Interface: This project will modernize traffic signal infrastructure at 365 intersections throughout Contra Costa County. Improvements include upgrading signal controllers, video detection systems, battery backup systems, and communications networks at signalized intersections along Routes of Regional Significance and other key parallel and intersecting arterial routes along the I-680 corridor. The project will also provide upgrades to local Advanced Traffic Management Systems (ATMS) as well as implement a central “Center-to-Center” ATMS system that will provide inter-agency and Countywide connectivity. Other project components include implementation of cloud-based Transit Signal Priority (TSP) and Emergency Vehicle Pre-emption (EVP) hardware upgrades. These upgrades will enhance multimodal traffic operations, improve system reliability and resilience during power disruptions, and enable real-time data sharing with coordinated signal timing. Collectively, the project will reduce congestion, improve travel time reliability, enhance safety for all roadway users, and support more efficient regional mobility.
Current Status: In Design with Construction schedule to begin in late July 2026.

Project Name: Danville Townwide Traffic Signal Modernization
Project Sponsor(s): Danville/CCTA
Project Description and I-680 Interface: The project will modernize traffic signal infrastructure at 26 signalized intersections along the Sycamore Valley Road, Camino Tassajara, and Crow Canyon Road corridor—designated as a Route of Regional Significance that provides key access to the I-680 corridor. Improvements include upgrades to video detection systems and signal cabinets to enhance traffic operations and reliability. The project will also deploy a cloud-based Advanced Traffic Management System (ATMS) and implement communication infrastructure upgrades to support real-time monitoring, coordination, safety, and systemwide efficiency.
Current Status: In Construction

Project Name: City of Concord ITS/ Signal Modernization
Project Sponsor(s): Concord/CCTA
Project Description and I-680 Interface: The Project will upgrade and modernize 32 signalized intersections along Concord Boulevard, Concord Avenue, and Oak Road. Project components include installation of video detection systems, ADA-accessible pedestrian push buttons, PTZ cameras, signal controller upgrades, communications hardware (ethernet switches), ATC cabinets, and battery backups systems.
Current Status: In Construction

Project Name: Innovate 680 Coordinated Adaptive Traffic Signals (CATS) Danville Blvd-Hartz Ave-San Ramon Valley Blvd (SRVB) Demonstration Project
Project Sponsor(s): CCTA
Project Description and I-680 Interface: CATS is the primary arterial management system for the Innovate 680 Program. CATS will operate across jurisdictions in traffic adaptive mode on specified corridors based on real time traffic demand. CATS will also enable multi-jurisdictional signal timing coordination, TSP, and other traffic management functions across the Program area, including key arterial corridors currently operated by local agencies, as well as ramp terminal intersection signals currently operated by Caltrans. The CATS Demonstration Project will focus on signalized intersections along the Danville Blvd/Hartz Ave/San Ramon Valley Blvd corridor, a key Route of Regional Significance that runs parallel to the I-680 corridor in southern Contra Costa.
Current Status: Systems Engineering in-progress. Design and Construction is currently unfunded.

Appendix C – Overview of ARM and CARM Systems

The ramp meters on I-680 will use two different systems:

- ARM on Caltrans-operated segments- this includes northbound ramps north of Willow Pass Road and all southbound ramps; and
- CARM on CCTA operated segment- this includes northbound ramps from Alcosta Boulevard to Willow Pass Road.

Caltrans ARM System

Caltrans ARM manages traffic volumes at the freeway on-ramps during recurring congestion, likely between 5AM and 8 PM on weekdays, and freeway incidents. The operation relies on mainline and ramp traffic detection devices (typically loops) to provide real-time traffic data. All ramp signal controllers are connected to a central server at the Caltrans TMC. The ARM utilizes fuzzy logic algorithms to adjust metering rates at each on-ramp based on the prevailing or real-time corridor traffic conditions on the I-680 mainline. The system includes loop at the end of entrance ramp to detect potential spillback to local arterials. Under spillback conditions, the meter signals will rest on green to avoid impacts to the local arterials. Incident-related congestion will be managed through the use of more restrictive metering upstream and less restrictive metering downstream of the incident. Metering rates are determined based on the traffic conditions in the vicinity of the ramp and are not coordinated with other ramps.

CCTA CARM System

CCTA plans on utilizing the STREAMS® platform to operate the northbound ramps from Alcosta Boulevard to Willow Pass Road for the initial CARM segment.

The operation relies on a dense network of mainline and ramp traffic detection devices which include The Infra-Red Traffic Logger (TIRTL) and detector loops to provide real-time traffic data. The TIRTLs are placed on the freeway mainline at approximately 1/3-mile interval and at specific locations specific to each entrance ramps. The detector loops are placed at similar locations as the Caltrans ARM system except that additional loops are placed at the mid-point of an entrance ramp to detect lengthening queues at the ramps.

CARM uses the STREAMS® traffic management platform that will monitor freeway and ramp traffic conditions 24/7. Though it is expected to operate at peak commute hours, similar to AM, It has the capability to activate or deactivate ramp meters at any location along the corridor at any time of the day or night based on real-time traffic conditions to optimize traffic flows along the freeway mainline and/or to manage ramp queues.

The system includes the use of a STREAMS® field/edge processor installed in the standard Caltrans ramp meter signal controller cabinet to enhance network security and provide a level of autonomy in case of communications or power disruptions. The STREAMS® server will be hosted in a cloud-

based configuration, and will communicate with vehicle detectors, ramp meter controllers, and other devices through a secure firewalled connection to the Caltrans trunk fiber-optic communication line that runs along the I-680 corridor.

STREAMS® facilitates optimization and coordination of the metering rates at the ramps along the corridor, allowing metering rates to be adjusted every 20 seconds based on real-time traffic conditions along the mainline and ramps. In the rare event of a communications outage, the STREAMS® field processor will continue to modulate the metering rate locally, with no noticeable disruption for drivers.

The STREAMS® platform utilizes the Asservissement Linéaire d'Entrée Autoroutière/Heuristic Ramp Metering Coordination (ALINEA/HERO) suite of control algorithms to assess a range of freeway mainline and ramp performance parameters simultaneously allowing all ramps along a corridor (or across a network) to work together to cooperatively manage the number of vehicles waiting at ramp meters corridor-wide enabling the system to minimize the breakdown of freeway traffic flow, while simultaneously preventing impacts to adjacent arterials and keeping wait times at ramp meters at an acceptable level. The operational intent of CARM is to manage flow along the freeway mainline to minimize the probability of breakdown of freeway traffic flow into a congested state.

Functionally, individual ramp meters, or groups of ramp meters working cooperatively, will activate once elevated lane occupancy (as a measure of traffic density) is detected anywhere along the corridor to prevent lane occupancy from increasing further and to reduce the risk of traffic flow from breaking down. This means that drivers may wait temporarily at a ramp meter while traffic on the freeway adjacent to the ramp is flowing without congestion because the system is managing a location experiencing elevated lane occupancy elsewhere in the corridor. Additionally, the ramp metering rates on one entrance ramp may be adjusted to manage growing ramp queues at another ramp location to prevent impacts to adjacent arterials and better manage ramp wait times.

CARM requires operational flexibility to increase or decrease ramp metering rates based on real-time traffic conditions on the mainline and ramps, which emphasizes the need for adequate entrance ramp storage and discharge capacity. As such, ramp capacity was assessed, and modifications will be included at selected locations to maximize available storage and discharge capacity. It requires a high discharge rate and the ramps are designed for simultaneous release operations.

The uneven queue across the ramp lanes, due to the lower relative volumes in the HOVPL, will limit the ability of the system to manage traffic flows and prevent back-ups onto the adjacent city street. As such, all entrance ramp lanes along CARM corridors will operate as GP lanes. The Riverside County Transportation Commission is implementing a CARM project on northbound I-15 in Temecula.

A comparison of selected features of the two systems are given in Table B1 below.

Table B1 – Comparison of Selected Features of ARM and CARM Systems

Features	ARM	CARM
Respond to real-time traffic condition	Metering rates adjust every thirty seconds based on real-time traffic data.	Metering rates adjust every twenty seconds based on real-time traffic data.
Predictive response capability	System is reactive based on current real-time traffic condition only.	System able to predict and respond based on anticipated change in traffic conditions.
Coordinate across multiple ramps	Not supported.	Supports coordination to optimize metering rates across multiple ramps for improved mainline management.
Compatibility with HOVPL	System is compatible with HOVPL.	System is currently not optimized for HOVPL though that capability may be developed in the future.
Need for Simultaneous Release	System does not release vehicles simultaneously.	System requires simultaneous release to achieve the operational flexibility.
Capital Cost	Lower- does not require separate field processor, Dynamic Message Signs, etc.	Higher- requires higher density of traffic detection, CCTVs, STREAMS platform licenses, etc.
Operating Costs	Lower- operation managed as part of the Caltrans TMC operation.	Higher- ongoing software licensing costs, dedicated CCTA TMC staff.

Appendix D – Glossary of Terms and Acronyms

- **ADS** – Automated Driving Systems is designed to collectively tackle corridor-wide congestion, travel delays, and ongoing operational challenges along Interstate 680 to deliver greater mobility access and opportunity to underserved communities with limited transportation options, while preparing for the future of mobility for everyone who lives or works along the corridor
- **ARM** – Adaptive Ramp Metering – Caltrans ramp metering system that will be implemented as part of the Caltrans SHOPP project on portions of I-680. The system uses a “fuzzy logic” approach, where individual ramp meters activate based on mainline traffic conditions.
- **Caltrans** – State Department of Transportation – California State agency with ultimate responsibility for the operations and maintenance of the State highway system, including I-680.
- **CARM** – Coordinated Adaptive Ramp Metering – Innovate 680 ramp metering system that will be deployed on northbound I-680 from Alcosta Blvd to Willow Pass Rd. CARM coordinates ramp signals throughout the entire corridor using CARM algorithms such as ALINEA (Asservissement Linéaire d’Entrée Autoroutière in French; or “Freeway Entrance Linear Control” in English), HERO (Heuristic Ramp Metering Coordination), and other parameters to manage mainline and ramp conditions. The corridor-wide direct coordination of ramps to manage mainline traffic flow, while preventing back-ups onto adjacent arterials, is what differentiates CARM from other ramp metering systems. CARM will operate as a three-year demonstration project. CCTA and Caltrans will coordinate on next steps for Innovate 680 CARM based on the results of the demonstration project.
- **CATS** – Coordinated Adaptive Traffic Signals – Innovate 680 project to optimize arterial traffic flow on select arterials through the coordination of traffic signals, transit vehicles, and pedestrian and bicycle priority. The CATS system is not anticipated to be operational until after the CARM system begins operations. However, CATS system components may coordinate with the CARM system and use data from CARM vehicle detection.
- **CCTA** – Contra Costa Transportation Authority – Transportation agency for Contra Costa County, responsible for managing the Innovate 680 program and projects including CATS, CARM, and ELC. Innovate 680 is managed in close coordination with Caltrans, MTC, transit operators, and local jurisdictions.
- **CCTV** – Closed circuit television – Pole-mounted cameras strategically placed throughout the I-680 corridor for the purpose of monitoring freeway conditions, and assisting in incident detection and response. CCTV cameras are operated by Caltrans and its partners through the Caltrans District 4 Traffic Management Center (TMC).
- **CHP** – California Highway Patrol – CHP is responsible for the enforcement of traffic violations and response to traffic incidents on the California state highway system, including the I-680 mainline and ramps. CHP officers will enforce ramp meter violations for both the CARM and Caltrans SHOPP projects.

- **Con Ops** – Concept of Operations – The Con Ops is a key document within the systems engineering process for complex ITS projects, that is intended to confirm the user needs and operational practices of projects. CCTA is currently developing the CARM Con Ops in coordination with Caltrans and other stakeholders. The CARM Con Ops describes the purpose of the CARM project, how the system will be configured and operated, how the demonstration project will be evaluated, and stakeholder roles and responsibilities.
- **ELC** – Express Lane Completion – An Innovate 680 project involving the installation of an Express Lane from Livorna Rd to Will Pass Rd, including the reconstruction of the north Main St entrance ramp. ELC project design and construction will be closely coordinated with both the CARM and CATS projects.
- **FSP** – Freeway Service Patrol – FSP is a service managed by MTC, Caltrans, and CHP, where staff patrol regional freeways, including I-680, during congested periods to assist in the detection and response to incidents. FSP staff operations are coordinated through the Caltrans TMC.
- **GP** – General Purpose – A regular travel lane on the I-680 freeway mainline or ramps that is open to all vehicles, and not restricted to HOV, transit, toll payers, etc.
- **HOV** – High Occupancy Vehicle – A vehicle with a driver and a certain number of passengers to be eligible to use HOV facilities on the freeway mainline and ramps.
- **HOVPL** – HOV Preferential Lane – A lane on entrance ramps with a Caltrans ramp meter that is restricted to vehicles with two or more occupants. The ramp meter signals for HOVPLs are operated with a faster metering rate than adjacent general purpose lanes. The Caltrans SHOPP project will implement HOVPLs on several ramps. The CARM project will not include HOVPLs.
- **ITS** – Intelligent Transportation System – ITS refers to any transportation project or system that uses technology and communication networks to improve traffic flow, safety, security, and access. All Innovate 680 projects, and the Caltrans SHOPP project, can be considered ITS.
- **KPI** – Key Performance Indicator – Performance metric related to traffic congestion, safety, or system functionality that will be used to gauge the performance of both the CARM and Caltrans SHOPP ramp metering projects.
- **MOD** - Mobility On Demand is an app that provides real-time, personalized trip planning. This, along with Mobility as a Service (MaaS), integrates public and private transportation with features like on-demand data on traffic, mode availability, and rewards for green travel.
- **MOU** – Memorandum of Understanding – This document, which describes the scope, operations, roles and responsibilities, and data assumptions of both the Innovate 680 CARM project and the Caltrans SHOPP ramp metering projects along I-680 in Contra Costa County.

- **O&M** – Operation and Maintenance – The phase of a project following construction and testing involving the day to day functionality of a system, and the maintenance of the underlying infrastructure, software, devices, and related systems.
- **PeMS** - Performance Measurement System – Online platform operated by Caltrans, where select users are able to access real-time and historical traffic performance and safety information for the state highway system, including I-680.
- **PTI** - Planning Time Index – A traffic performance metric or KPI used to measure travel time reliability, specifically defined as the 95th percentile travel time. PTI is intended to represent a particularly poor travel time that may be experienced from time to time throughout a month, that a driver may use to plan a high-value trip such as driving to the airport or an important appointment.
- **Queue length** – The total length of the line of vehicles waiting at a ramp meter within each lane of an entrance ramp.
- **Queue spill back** – The occurrence of the ramp queue, or line of vehicles attempting to enter the freeway, backing up onto the adjacent city street and blocking traffic.
- **QC** – Queue Control – A parameter of the CARM system, where the ramp metering rate on an entrance ramp will begin to speed-up the release of vehicles to proactively manage the ramp queue and prevent the entrance ramp from filling with vehicles. This is an adjustable setting specific to each entrance ramp location. However, queue control will typically begin when the ramp queue exceeds 60-70% of the available ramp storage. When this occurs, the CARM system will coordinate with upstream ramp meter signals to prevent the increased release of vehicles from one ramp from causing the flow of the freeway from breaking down.
- **QO** – Queue Override – A parameter of both the CARM and Caltrans ARM ramp metering systems, where a ramp meter releases vehicles as quickly as possible to prevent impacts to the adjacent city street. This occurs when traffic detection devices at the ramp entrance confirm that the ramp queue has filled the entire length of the ramp. During queue override, the Caltrans ARM system may hold the ramp meter signals on green to completely clear the ramp.
- **RM** – Ramp Metering – ITS system and traffic management practice where vehicles entering a freeway are released individually by traffic signals installed on the entrance ramp. Ramp meters are intended to improve congestion and safety, by limiting the number of vehicles attempting to merge onto the freeway at once. There are several different ramp metering system with unique goals, practices, and requirements.
- **Ramp Meter Storage** – The amount of space available on an entrance ramp with a ramp meter, where vehicles will wait to be released by the ramp meter.
- **Ramp Meter Discharge Capacity** – The number of lanes on a freeway entrance ramp at the ramp meter. The greater the number of lanes at the ramp meter, the faster the ramp meter can release vehicles to increase throughput and control the ramp queue.

- **Ramp Meter Wait time** – The time that a vehicle must wait on an entrance ramp when a ramp meter is activated, from the time the vehicle enters the ramp until it is released by the ramp meter. The maximum ramp meter wait time is another parameter in the CARM system. If the wait time is calculated as being above the maximum wait time assigned to a particular ramp, the CARM system will speed-up the metering rate in order to bring the wait time back to an acceptable level.
- **RMDM** – Ramp Metering Design Manual – Caltrans document that details design standards, requirements, and options for entrance ramps with ramp meters on the state highway system including lane striping, equipment, and signage.
- **RMOMP** – Ramp Metering Operations and Maintenance Procedures – Document detailing the specific policies and procedures for day-to-day ramp metering operations and maintenance as part of the CARM and Caltrans SHOPP projects along I-680. The RMOMP will be developed as a follow-up to this MOU document, in coordination with Caltrans and Innovate 680 stakeholders. It includes provisions commonly referred to as Standard Operating Procedures.
- **RMTC** – I-680 Ramp Metering Technical Committee – Committee of I-680 stakeholders that will oversee technical and operational matters as part of CARM and Caltrans SHOPP ramp metering. The RMTC will be made up of technical staff from CCTA, Caltrans, and local jurisdictions along the corridor. Issues and questions that cannot be resolved by the RMTC will be elevated to the RMWG.
- **RMWG** – I-680 Ramp Metering Working Group – The RMWG will oversee the RCTC and high-level decisions as part of I-680 ramp metering operations. The RMWG will be made up of senior or executive staff from CCTA, Caltrans, and local jurisdictions along I-680. The RMWG will address any questions or issues that cannot be resolved through the RMTC.
- **SHOPP** – State Highway Operations and Protection Program – The Caltrans program that funds traffic operations improvements on the state highway system. The Caltrans SHOPP project referenced in this document will involve the installation of ramp meters and HOVPL along I-680, outside of the CARM demonstration corridor.
- **Simultaneous release** – The ramp metering practice where ramp meter signals above all lanes turn from red to green and vice versa at the same time. This practice releases all vehicles at the ramp meter simultaneously, allowing individual drivers to merge and reposition themselves. This practice allows for greater control of the ramp meter as part of CARM operations.
- **SMH** - Shared Mobility Hubs bring together biking, walking, transit, carpooling, ride-hailing, and more in one convenient place, with potential upgrades like improved transit station access, enhanced waiting areas, and electric bike charging.
- **Staggered release** – The ramp metering practice where ramp meter signals release vehicles from one lane at a time. This is a standard Caltrans practice and will be part of Caltrans ARM operations.

- **STREAMS®** - Surface Traffic Enhancement and Automation Support System – The freeway management software that operates the CARM system. STREAMS® is an automated web-based platform, where an operator can monitor corridor and system conditions, including device functionality. A read-only version of STREAMS® will be made available to corridor stakeholders in order to monitor conditions and performance of the CARM system. Since CARM will operate as a demonstration project, STREAMS® will be configured in a cloud-based environment, and will not have a physical server integrated into the Caltrans TMC.
- **TBD** – To be determined.
- **TBOS** – Transit Bus on Shoulder – Innovate 680 project that facilitates transit buses operating on I-680 to use the right-hand shoulder when the mainline speed drops below 35 mph. TBOS is currently in the testing and planning stages, but will be integrated with both CARM and the Caltrans ARM systems, to prevent vehicles from entrance ramps from merging into the bus while operating on the freeway shoulder.
- **TIRTL** – The InfraRed Traffic Logger – Light-based vehicle detection system that operates with a transmitter and receiver installed on opposite sides of the freeway mainline. The device detects vehicles when a vehicle’s tires break the light-beam. TIRTLs will be used to provide real-time data to the CARM system, and will also feed data to PeMs.
- **TMC** – Traffic Management Center – A physical location that operates CCTV cameras, vehicle detection, and other tools to monitor urban freeway operations, and to detect and coordinate response to crashes or other incidents. Current I-680 operations are managed through the Caltrans District 4 TMC in Oakland, CA. CCTA staff (or consultants) will supplement the Caltrans TMC to operate the CARM system during the demonstration period.
- **TOS** – Traffic Operations System – Program used by Caltrans to operate Bay Area freeways through the TMC. This program will be used operate the Caltrans SHOPP project.
- **VDS** - Vehicle Detection Stations – Vehicle detection locations installed along the I-680 mainline and ramps. Vehicle detection installed as part of the CARM and Caltrans SHOPP projects will include a combination of inductive loops and TIRTL devices.