

Meeting Notice

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Multimodal Arterial Plan Technical Advisory Committee

Tuesday, July 21, 2015, 10:00 a.m.

**1111 Broadway, Suite 800
Oakland, CA 94607**

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The mission of the Alameda County Transportation Commission (Alameda CTC) is to plan, fund, and deliver transportation programs and projects that expand access and improve mobility to foster a vibrant and livable Alameda County.

Public Comments

Public comments are limited to 3 minutes. Items not on the agenda are covered during the Public Comment section of the meeting, and items specific to an agenda item are covered during that agenda item discussion. If you wish to make a comment, fill out a speaker card, hand it to the clerk of the Commission, and wait until the chair calls your name. When you are summoned, come to the microphone and give your name and comment.

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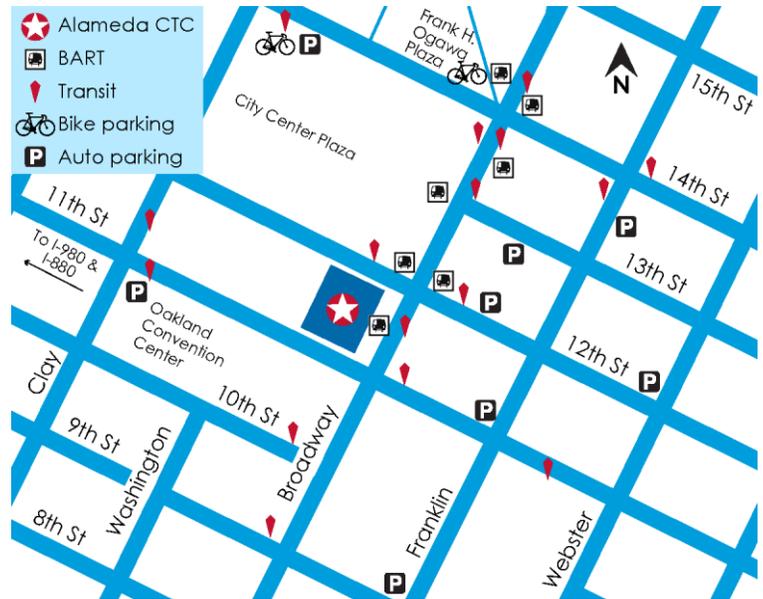
A glossary that includes frequently used acronyms is available on the Alameda CTC website at www.AlamedaCTC.org/app_pages/view/8081.

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Alameda CTC

1111 Broadway, Suite 800
Oakland, CA 94607

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Multimodal Arterial Plan Development Technical Advisory Committee Meeting Agenda Tuesday, July 21, 2015, 10:00 a.m.

1111 Broadway, Suite 800, Oakland, CA 94607 • 510.208.7400 • www.AlamedaCTC.org

Staff Liaisons: Tess Lengyel and Saravana Suthanthira
Technical Team Members: Alameda County Technical Advisory Committee
Consultant: Matthew Ridgeway, Fehr & Peers
Public Meeting Coordinator: Angie Ayers

1. Welcome and Introductions	Page	A/I
2. April 9, 2015 Meeting Minutes (Emailed before the meeting) Recommendation: Approve the April 9, 2015 meeting minutes.		A
3. Work Update (Verbal) Staff/consultants will present a project update and discuss complete and in-progress deliverables.		I
4. Overview of Updated Draft Street Typology and Modal Priority Comments and Responses Staff/consultants will provide overview of comments received on the draft typology and modal priority memorandum and maps (presented at the April 9 th PlanTAC) and updates made to address these comments.	1	I
5. Overview of Updated Draft Performance Objectives Comments and Responses Staff/consultants will provide overview of comments received on the draft performance objectives (presented at the April 9 th PlanTAC) and updates made to address these comments.	79	I
6. Next Steps/Next Meeting		
7. Adjournment		

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MEMORANDUM

Date: July 16, 2015
To: Saravana Suthanthira, Alameda CTC
Cc: Matthew Ridgway and Francisco Martin, Fehr & Peers
From: Phil Erickson, Bharat Singh, and Warren Logan
Re: Alameda Countywide Multimodal Arterial Plan: Draft Arterial Street Typology and Modal Priority Comments and Responses

Philip Erickson, Architect, AIA
Timothy Rood, AICP, LEED AP ND

The Alameda CTC Multimodal Arterial Plan (MMAP) is developing a street typology framework to enhance the traditional arterial-collector-local functional classification system with a system that recognizes the importance of land use context and all the transportation modes. The development of a Countywide typology framework is an unprecedented effort that identifies the characteristics of major streets across Alameda County. The MMAP evaluates street performance as *multimodal complete streets*, and will suggest potential improvements to streets that do not adequately serve their multimodal function within the Countywide network.

In April 2015, a draft typology framework (Figure 1) was developed for the MMAP Study Network, and applied to identify the modal priority for the Study Network segments. The three components of the typology framework are:

- **Land Use Context Types** – that define the context of built and natural environments that the streets pass through.
- **Base Street Types** – that are defined by their role in carrying sub-regional and local traffic along the 'Study Network's' streets.
- **Multimodal Transportation Overlays** – that define the priority given to other transportation modes: transit, bicycle, pedestrian, and goods movement.

The typology framework and modal priority methodology were described in separate memos along with the mapping of street typology (land use types, street types, and multimodal overlays) and were first presented to ACTAC on April 9, 2015. These materials were distributed prior to Planning Area meetings taking place during the week of April 20, 2015 and at a meeting with non-agency stakeholders on April 20, 2015 for review and comment. The review period was until May 15, 2015. Stakeholders also had an option to provide comments on the typology and modal priority directly on a GIS server in addition to separate comments by email. The memos that were distributed to stakeholders for review and comment are in Appendices A1 and A2 to this memorandum.

This memorandum describes the comments received and updates made to the typology framework and modal priority in response to those comments. It first provides a high-level summary of the comments received and the approach adopted to

¹ The *Study Network* consists of the arterials and collectors that are part of the California Road System (CRS) which was sent to all Alameda County jurisdictions for review, and to support data collection in December 2014.



addressing the comments and then describes the comments and responses by each component of the typology framework – land use context, base street type, modal overlays by mode (transit, bicycle, pedestrian, and goods movement). Finally, it describes the updated modal priority for the Study Network. Revised mapping of the typology, overlays, and modal priorities will be distributed at or prior to the July PlanTAC meeting. Appendix J to this memorandum documents specific comments received and responses to each of those comments.

Typology

Comments were primarily received on the maps directly on the GIS server on the modal emphasis and priority and some comments were received via emails. Comments received well after the deadline have been addressed using the same approach, and changes have been incorporated into the mapping that will be distributed prior to or at the July 21, 2015, PlanTAC meeting.

Overview of Comments

Many comments were received on the **land use layer** requesting change for certain areas of a jurisdiction. The land use data used for the typology task is based on a combination of Priority Development Area (PDA) place types and the land use types developed in close coordination with the local jurisdictions planning departments for the purposes of Plan Bay Area Sustainable Community Strategy (SCS) and used in the adopted *2012 Countywide Transportation Plan*. Therefore, the project team incorporated changes requested to the land use only if the change influences any of the modal emphasis, mainly pedestrian emphasis and left the land use for the other areas unchanged with the intent of generally maintaining consistency with the SCS land use adopted for the model.

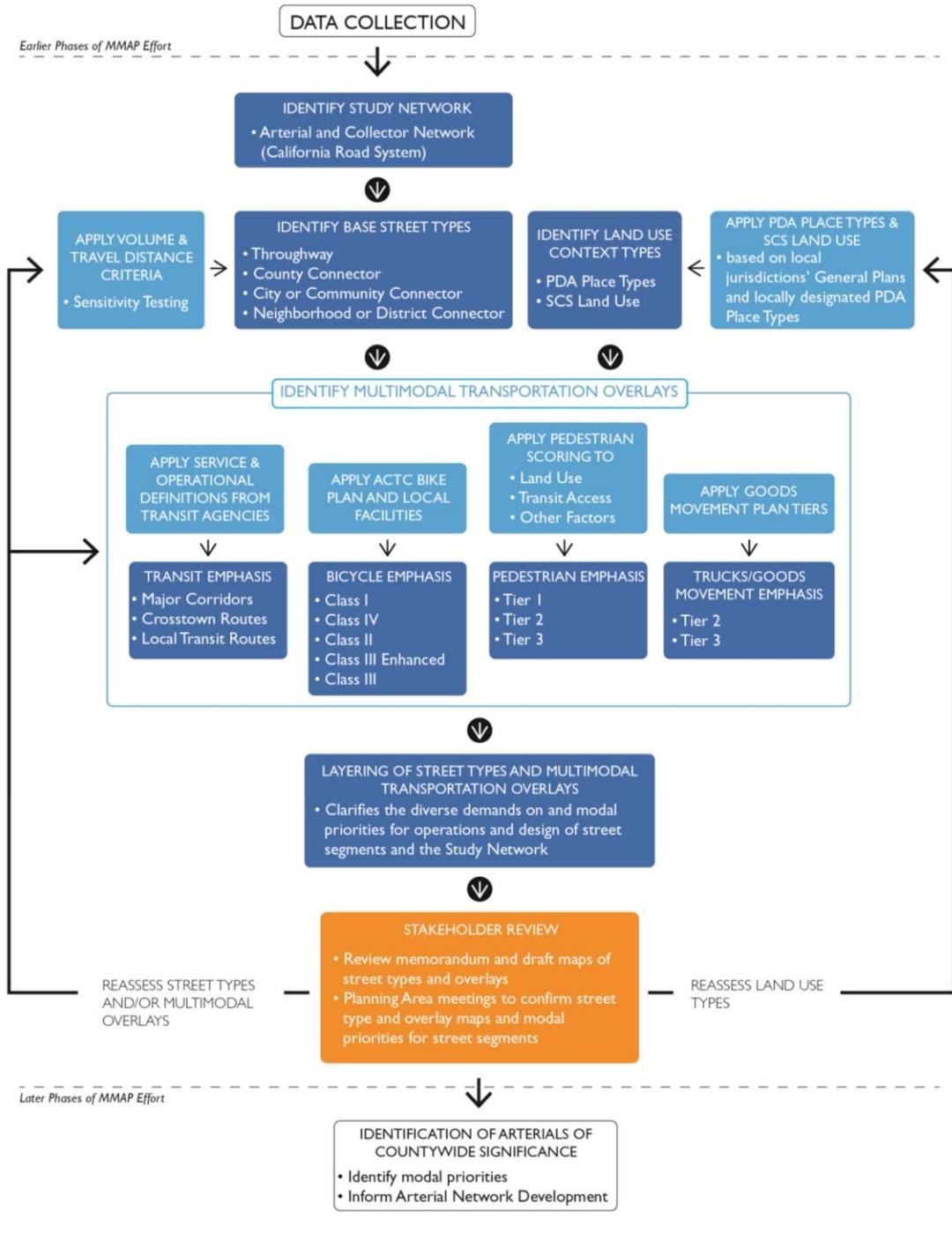
Comments on **street typology** focused on street types reflecting local priorities and sometimes to appropriately reflect the function of the street if the MMAP methodology was not resulting in the street type that jurisdiction staff would expect given their local knowledge and experience. Most of these changes were incorporated.

Comments on **transit emphasis** include identifying new major corridors from transit agencies based on their respective Comprehensive Operations Analysis (COA) studies and also reflecting the transit corridor alternatives developed from the Countywide Transit Plan.

Comments on **bicycle emphasis** generally include providing information on built and planned bicycle facilities that were not in the draft data, as well as several regarding bicycle planning efforts that are in process and that will likely result in future changes to the bicycle network. Comments from several jurisdictions around the County regarding the initial draft typology mapping have also led to many refinements to the bicycle emphasis overlay.

Pedestrian emphasis comments generally related to jurisdictions desiring a higher level of emphasis on some downtown and mixed use commercial “main street” street segments, and as mentioned above, some land use comments were focused on areas where recently adopted land use policies are more oriented to pedestrian activity and providing transit-oriented development.

Figure 1: Multimodal Arterial Plan Typology Framework Process Diagram



Comments and Responses on Land Use Context

A key element of the typology framework defines the physical context of streets using land use types developed for the Alameda County Land Use Scenario approved through the 2012 Countywide Transportation Plan, this was then used as an input for the Plan Bay Area Sustainable Community Strategy (SCS).

Several jurisdictions have asked for revisions and updates to the land use mapping provided for review. For the purposes of the MMAP effort, the project team determined that if a requested land use change will not affect the resulting modal priorities for a street segment then land use change will not be made. For example:

- If a proposed land use does not shift the street segment from one land use context modal group to another (see Table 1 in the modal priority memorandum in Appendix A1), the land use change will not be made; or
- If the parcel is relatively small (a street frontage of about 250 feet or less), the land use change will not be made because modal priorities should not change for such a small length of street frontage, given that a change in street design over this short of a distance is unlikely.

There are several large areas throughout the County where new land use plans have been adopted since land use mapping was developed during the *2012 Countywide Transportation Plan*:

- Fremont asked that the detailed land use designations for the Warm Springs Community Plan be used in the land use context type mapping for the MMAP. But the detailed land uses are not necessary for the MMAP typology and modal priority mapping, because land use for this area is defined by PDA place type, and the PDA place type is mapped correctly in the MMAP land use context mapping.
- At the request of City of Alameda and Dublin, Alameda Point and Dublin Crossings respectively will be updated to the MMAP land use type of Town Center Mixed Use, based on their PDA place types of Transit Town Center and Suburban Town Center respectively. They had been mapped according to their 2012 Countywide Transportation Plan Land Use Scenario designation of public lands.

A revised map of land use context overlay is provided in Appendix B.

Comments and Responses on Street Typology

A range of specific comments about street typology has been provided by jurisdictions throughout the County. Most of these relate to changing a City or Neighborhood Connector street segment to County Connector, such as E. 14th Street in San Leandro and Alameda County, and Grant Line Road in the unincorporated East County. The majority of these changes were made to the street typology mapping. Some comments regard details of street function that the regional model does not fully reflect. For example, Livermore requested changing First Street to Neighborhood Connector from County Connector given the character and function of First Street as Downtown Livermore's main street and that Railroad Avenue provides parallel vehicle functionality as a County Connector. Similarly, Fremont has asked for classification of several streets in the downtown area that are not included in the Study Network. The Study Network is based on the California Roadway System classification, which was previously presented to stakeholders in December 2014 for review and comment, therefore additions to the Study Network will no longer be considered. Finally, a few jurisdictions requested that planned and funded

streets in new development areas (e.g., Innovation Way in the Warm Springs area of Fremont) be included as part of the Study Network. Planned and funded roadways to be constructed in the future will be shown on future year maps, but will not be included as part of the Study Network. It is assumed that planned and funded new streets will be designed to the latest complete street standards; therefore, the Multimodal Arterial Plan will not evaluate these new street segments for future needs assessments. However, new street segments are included in the travel demand modal and considered in the development of future year (2020 and 2040) Study Network forecasts. Appendix J provides detailed comments and responses. A revised map of the base street type overlay is provided in Appendix C.

Comments and Responses on Transit Emphasis

Comments received on the transit emphasis overlay are:

- AC Transit requested additional roadway segments be designated as Major Corridors reflective of their COA study draft alternatives and the draft alternative corridors from the Alameda CTC Countywide Transit Plan. These have been marked as an alternative layer while keeping the initial modal priority in the base layer until the final future network or corridors are adopted, which is expected in October 2015. Keeping the alternative layer showing the new transit emphasis corridors serves two purposes –
 1. enables the project team to verify that the potential suggested improvements in the next steps do not adversely impact transit performance on these roadway segments identified in the final transit network; and
 2. to inform the jurisdictions on the potential modal emphasis change or added modal emphasis and help to initiate discussions between AC Transit and jurisdictions, as appropriate
- The City of Emeryville requested that Emery Go-Round service be added to the transit network and this has been done as discussed above.
- Several cities and LAVTA asked that transit service be located on segments of the network where it had not been indicated. These revisions have been made except for those routes that are not on the Study Network.

A revised map of the transit emphasis overlay is provided in Appendix D.

Comments and Responses on Bicycle Emphasis

Bicycle emphasis overlay was developed by reviewing the existing bicycle facilities, *2012 Countywide Bicycle Plan* and the four trail types². The Countywide Bicycle Plan defines five categories of Countywide significance: inter-jurisdictional network, access to transit, access to central business districts, inter-jurisdictional trails, and access to *Communities of Concern*.

Comments from eight cities across the County regarding the initial draft typology mapping have also led to many refinements to the bicycle emphasis overlay. To a great degree, this is reflective of the rapid changes that have been occurring at a national level regarding the planning and design of bicycle facilities since the adoption of the Countywide Bicycle Plan in 2012. Piedmont has only recently adopted a bicycle plan, Berkeley is currently doing a major update to their bicycle plan, and Oakland requested comprehensive refinements to their network in anticipation of planned improvement projects, future

² SF Bay Trail, East Bay Greenway, Iron Horse Trail and Inter-jurisdictional Trails.

improvement projects and updates to their bicycle plan. The majority of these refinements will be made by either adding or revising bicycle facilities on Study Network streets or by providing “markers” on non-Study Network streets that can be used to identify them as parallel facilities to Study Network streets during the development of design options. These updates were facilitated by several cities providing updated GIS data regarding bicycle improvements. Some requested refinements were about bike trails that are not part of the Study Network. These updates were not made, as they do not directly influence the Modal Priority approach described below. See the detailed comments in Appendix J for further clarifications. A revised map of the bicycle emphasis overlay is provided in Appendix E.

Comments and Responses on Pedestrian Emphasis

The mapping for the Pedestrian Emphasis, unlike the other transportation modes, is node- or area-based, instead of street network-based as pedestrian activity is driven by proximity to various uses, destinations, or by living in transit-dependent communities. This includes pedestrian facilities and planning areas of Countywide significance as defined in the *2012 Countywide Pedestrian Plan*. These are areas where higher volumes of pedestrians exist or are expected, as well as locations where walking serves an important transportation function, such as access to transit or schools. Pedestrian emphasis also includes central business districts, activity centers, inter-jurisdictional trails, and access within “communities of concern” as defined in the Alameda CTC’s Community-Based Transportation Plans.

Several cities have commented that they have pedestrian-oriented main streets or commercial districts that were not emphasized to the degree that they would expect or desire, and adjustments to the Pedestrian Emphasis overlay have been made to correct for these comments. Several cities had comments regarding the desire to increase pedestrian emphasis on certain street segments to reflect either community center or downtown pedestrian activity, or levels of pedestrian activity on particular commercial streets or districts. The majority of these revisions have been made. In addition, Oakland had comments related to broader conditions in the city and numerous commercial main streets or districts, and Berkeley commented about pedestrian activity adjacent to narrow PDA corridors. Oakland, as part of its Complete Streets Plan that is underway, has proposed a more comprehensive refinement of the pedestrian scoring method. It includes increasing the score for commercial mixed use zoning component that relate to their pedestrian-oriented main streets, as well as adjustments to some transit access component.. It added additional pedestrian emphasis score for areas within an eighth-mile buffer around the commercial main street zones. This additional score reflects the higher levels of pedestrian activity in areas around main streets both from patrons parking adjacent to the main street and from local residents and employees walking to the services on the main streets, such as areas around Piedmont Avenue, College Avenue, 4th Street, and other streets. Considering the reasonableness of this additional step in scoring method, , it was incorporated into the Pedestrian Scoring method for the MMAP. Additionally, these changes reflect similar comments made by other cities for manual changes to streets in downtowns or commercial main streets. A revised map of the pedestrian emphasis overlay is provided in Appendix F.

Comments and Responses on Goods Movement Emphasis

This multimodal overlay is coordinated with the *Countywide Goods Movement Plan* that has defined three tiers of goods movement routes – Tier 1 (interstate highways), which is not included in the Arterial Plan; Tier 2(state highways); and Tier 3 (designated arterials and collectors). A map of the goods movement emphasis overlay is provided in Appendix G.

Few cities had specific comments about adding or increasing the level of Goods Movement emphasis designations on specific street segments and the majority of these refinements have been made. Some comments were made regarding streets that are not part of the Study Network, and these changes were not made. There was also some confusion regarding the tier levels of the Goods Movement emphasis, in relation to federal and state truck route designations. The tiers used in the MMAP work are those that have been determined by the Countywide Goods Movement Plan, and this emphasis does not include the word “truck” and instead only refers directly to “goods movement.” The Goods Movement Plan consultant team is evaluating the following three-tier goods movement network:

- Tier 1 network refers to state highways that are designated to handle a majority of the through truck traffic.
- Tier 2 network refers to other state highways and designated arterials that provide intra-County and intercity connectivity and last-mile connection to the Port of Oakland and Oakland International Airport.
- Tier 3 network refers to designated arterials and collectors that are used in a majority of local pickup and delivery.

Oakland had a general comment about the Goods Movement emphasis not aligning with where staff would expect to see more truck activity, and therefore had some methodological concerns. Following discussions with city staff, the general concerns were addressed and the result was changes in emphasis for specific street segments.

Modal Priority

As explained in the draft modal priority memorandum in Appendix A2, applying the base street types, land use context types, and multimodal overlays results in a nuanced set of modal priorities for street segments along the *Study Network*. Based on the comments received on the draft typology, the approach to identifying the modal priority remains unchanged except for the bicycle emphasis. However, many specific comments were made to the identified modal priority reflecting the local priorities and local knowledge on the function of a particular street.

Regarding the modal priority approach, per recent legislative mandate (AB 1193 signed into law in September 2014) that added an additional class and provided emphasis for the protected bike lanes, enhanced class II and enhanced class III bicycle facilities that provide more protection for bicyclists over the other classes were also added to the highest emphasis for bicycles and have the same priority as Class I and IV. The redline changes to the modal priority approach are shown in Table 1 and the updated example on the following page shows the application of the revised modal priority on Mission Boulevard.

Regarding the specific modal priority changes for certain streets (segments), a majority of the comments have been incorporated by manually overwriting the draft modal priority list. The cities of Oakland and Berkeley are currently in the process of developing their Citywide Complete Streets Plan and to the extent feasible, modal priorities identified as part of the ongoing citywide plans will be incorporated into the Countywide Multimodal Arterial Plan. The attached (Appendix I) maps show the updated top modal priority for the Study Network. All maps presented in this memo, including the full modal priority list map, can be viewed online via the Fehr & Peers GIS Server site, access instructions are provided below:

- <http://gis.fehrandpeers.com/AlamedaCTC/Typology/>
- Username: AlamedaCMAP

- Password: fpgis_Alameda

The online map also highlights the segments where modal priority was modified based on comments received on either of the land use and modal emphasis overlays, or comments received online via the GIS Server site. Appendix J provides a summary of stakeholder comments received on the modal priority methodology and the consultant team’s responses.

Table 1 MMAP Modal Priorities – Specific		
Column 1	Column 2	Column 3
Land Use Context Types <ul style="list-style-type: none"> ▪ Downtown Mixed Use ▪ Town Center Mixed Use ▪ Corridor/Neighborhood Mixed Use ▪ Education/Public/Semi-Public ▪ Parks 	Land Use Context Types <ul style="list-style-type: none"> ▪ Mixed Use ▪ Commercial ▪ Residential ▪ Rural/Open Space ▪ Other/Unknown 	Land Use Context Types <ul style="list-style-type: none"> ▪ Industrial
Associated Modal Priorities <ol style="list-style-type: none"> 1. Transit: Major Corridors 2. Pedestrian: Tier 1 3. Bicycle: Class I, enhanced Class II, enhanced Class III or Class IV 4. Auto: Throughway 5. Goods Movement: Tier 2 6. Transit: Crosstown Routes 7. Pedestrian: Tier 2 8. Bicycle: Class II 9. Auto: County Connector 10. Pedestrian: Tier 3 11. Bicycle Class III 12. Transit: Local Routes 13. Goods Movement: Tier 3 14. Auto: Community Connector 15. Auto: Neighborhood Connector 	Associated Modal Priorities <ol style="list-style-type: none"> 1. Transit: Major Corridors 2. Auto: Throughway 3. Goods Movement: Tier 2 4. Bicycle: Class I, enhanced Class II or enhanced Class III or Class IV 5. Pedestrian: Tier 1 6. Transit: Crosstown Routes 7. Auto: County Connector 8. Goods Movement: Tier 3 9. Bicycle: Class II 10. Pedestrian: Tier 2 11. Auto: Community Connector 12. Bicycle Class III 13. Pedestrian: Tier 3 14. Transit: Local Routes 15. Auto: Neighborhood Connector 	Associated Modal Priorities <ol style="list-style-type: none"> 1. Transit: Major Corridors 2. Goods Movement: Tier 2 3. Auto: Throughway 4. Bicycle: Class I, enhanced Class II, enhanced Class III or Class IV 5. Pedestrian: Tier 1 6. Transit: Crosstown Routes 7. Goods Movement: Tier 3 8. Auto: County Connector 9. Bicycle: Class II 10. Pedestrian: Tier 2 11. Auto: Community Connector 12. Bicycle Class III 13. Pedestrian: Tier 3 14. Transit: Local Routes 15. Auto: Neighborhood Connector

The following illustrates an example of determining modal priority for a street segment, Mission Boulevard from Driscoll Road to I-680

Land use Context = Residential, Education, and Commercial (see column 2 of Table 2)

- | | | |
|---|-----|----------------------------------|
| 1. Is it a Transit Major Corridor? | NO | |
| 2. Is it a Throughway? | YES | 1 st priority – Auto |
| 3. Is it part of the Tier 2 Goods Movement network? | YES | 2 nd priority – Truck |
| 4. Is it a Class I or Class IV Bicycle facility? | NO | |
| 5. Is it a part of the Pedestrian Tier 1 network? | NO | |
| 6. Is it a Transit Crosstown Route? | NO | |

7. Is it a County Connector?	NA	
8. Is it part of the Tier 3 Goods Movement network?	NA	
9. Is it a Class II Bicycle facility?	YES	3 rd priority - Bicycle
10. Is it part of the Tier 2 Pedestrian network?	NO	
11. Is it a Community Connector?	NA	
12. Is it a Class III or Class III Enhanced Bicycle facility	NA	
13. Is it part of the Tier 3 Pedestrian network?	NO	
14. Is it a Transit Local Route?	YES	4 th priority - Transit
15. Is it a Neighborhood Connector?	NA	
16. Does it have no Pedestrian emphasis?	YES	5 th priority - Pedestrian

Next Steps

This memorandum describes how the project team had categorized the *Study Network* streets by land use context types, street types, and multimodal overlays, and reflects the first feedback loop of stakeholder review and comment as illustrated in Figure 2. The typology framework and initial mapping of the typologies and modal priorities were presented to the stakeholders for review in April – ACTAC on April 9, 2015; Planning Area meetings during April 20-22, 2015; and non-agency stakeholder meeting on April 20, 2015.

The consultant team has responded to the stakeholder comments received and detailed responses are listed in Appendix J. This memorandum summarizes those comments that are being incorporated into the final typology framework for the Study Network. Updated typology mapping that address stakeholder comments will be presented to PlanTAC at the July meeting. Jurisdictions and stakeholders will then have another opportunity to review and comment on the revised materials, particularly on segments where modal priorities may have changed by incorporating first round of comments, with responses from 2nd review due on July 31, 2015. The consultant team and Alameda CTC staff will present the typology framework and maps for final approval at the September 2015 ACTAC, PPLC and Commission meetings.

The typology for the MMAP will inform the modal priority for the *Study Network* segments, which in turn will lead to identifying the modal needs on the *Study Network* in combination with the Performance Objectives.

Attachments:

Appendix A1 – April 2015 Draft Typology Memorandum

Appendix A2 - April 2015 Draft Modal Priority Memorandum

Appendix B – Updated Draft Land Use Context Type Maps

Appendix C – Updated Draft Base Street Type Maps

Appendix D – Updated Draft Transit Emphasis Maps

Appendix E – Updated Draft Bicycle Emphasis Maps

Appendix F – Updated Draft Pedestrian Emphasis Maps

Appendix G – Updated Draft Goods Movement Network Maps

Appendix H – Updated Draft Street Typology with Layered Modal Emphasis Maps

Appendix I – Updated Draft Modal Priority Maps

Appendix J – Summary of Stakeholder Comments on Draft Arterial Street Typology and Modal Priority Framework Methodology and Response

APPENDIX A1: April 2015 Draft Typology Memorandum

(maps to this memorandum will be provided upon request)

MEMORANDUM

Date: April 15, 2015
To: Saravana Suthanthira, Alameda CTC
Cc: Matthew Ridgway and Francisco Martin, Fehr & Peers
From: Phil Erickson, Bharat Singh, and Warren Logan
Re: Alameda CTC Countywide Multimodal Arterial Plan: Draft Arterial Street Typology Framework Concepts

Philip Erickson, Architect, AIA
Timothy Road, AICP, LEED AP ND

The Alameda CTC Multimodal Arterial Plan (MMAP) is developing a street typology framework to enhance the traditional arterial-collector-local functional classification system with a system that recognizes the importance of land use context and all the transportation modes. The development of a countywide typology framework is an unprecedented effort that identifies the characteristics of major streets across Alameda County. The MMAP will evaluate street performance as *multimodal complete streets*, and suggest potential improvements to streets that are deficient do not adequately serve their multimodal function within the countywide network.

Alameda CTC defines multimodal complete streets and their benefits as—

Streets that are designed, built and maintained to be safe, convenient and inviting for all users of the roadway, including pedestrians, bicyclists, motorists, persons with disabilities, movers of commercial goods, users and operators of public transit, seniors, and children.

Streets that are built for all users have multiple benefits, including increased safety, improved air quality through the reduction of auto traffic, improved health through increased physical activity, and greater cost effectiveness.¹

Jurisdictions such as Alameda, Emeryville and Fremont have developed similar street typology systems unique to these communities' General Plans or Specific Plans. Alameda CTC's typology framework will consider these jurisdictions' adopted typology systems, and ensure that they nest within the MMAP street typology framework. Similarly, the typology framework is expected to inform or provide a base for any future effort to develop street typologies by other local jurisdictions in Alameda County as a part of their implementation of their complete streets policies.

Introduction

Definition of the MMAP Typology Framework

This memorandum describes the street typology framework for the MMAP. The typology framework consists of three components: a set of land use context types, a set of base street types defined by vehicular functionality, and a set of multimodal emphasis overlays.

¹ From the Alameda CTC's Complete Streets web page: http://www.alamedactc.org/app_pages/view/8563



The following are characteristics that street typology address, and therefore are the key components of the typology framework:

- **Land Use Context Types** – These define the context of built and natural environments that the streets pass through. Land use types have a relationship to specific street cross section elements, such as parking and loading lanes, and the desired width and use of different zones of the sidewalk.
- **Base Street Types** – Base street types are defined by their role in carrying sub-regional and local traffic along the *Study Network*'s² streets. If a street is serving a high volume of vehicles that are traveling a longer distance, through movement is likely more important to those driving along the street than access to local destinations.
- **Multimodal Transportation Overlays** – While the base street types focus primarily on vehicular function, overlays define the priority given to other transportation modes: transit, bicycle, pedestrian, and goods movement. The multimodal transportation overlays identify levels of multimodal emphasis for segments of the *Study Network*.

At a minimum, all street segments will have a land use context and a street type, and some will have one or more multimodal transportation overlays. A map of the *Study Network* streets and the PDA place types and SCS land use is provided in Appendix B to illustrate the relationship between land use context and the network.

Further detail about how the land use and street types and multimodal overlays were determined, and examples of streets throughout Alameda County are provided in this memorandum, along with mapping in appendices.

How the Typology Framework will be used in the MMAP effort

Traditional functional classification - the arterial, collector, and local functional classification system - is based only on vehicular mobility and access characteristics and fails to consider other street characteristics. Typologies diversify the consideration of the street to include land use context and other modes. For the MMAP, street typologies and multimodal overlays will inform modal priorities of each street. The street types and multimodal overlays will also help identify *arterials of countywide significance* that are the *Arterial Network*³.

This process is illustrated in Figure 1. Data collected from local jurisdictions, the ACTC Countywide model, MTC, ABAG, transit agencies, and other sources were used to identify land use context and base street types and to develop the multimodal overlays. This information is used to define the multimodal demands of the network and determine the modal priorities of each segment of the countywide network. Modal priorities are discussed further in a forthcoming memorandum.

The typology framework will not only inform modal priorities, but in subsequent phases of the MMAP effort, it will be critical to defining desirable street design attributes, particularly using the land use

² The *Study Network* consists of the arterials and collectors that are part of the California Road System (CRS) which was sent to all Alameda County jurisdictions for review, and to support data collection in December 2014.

³ The *Arterial Network* is a subset of the *Study Network* consisting of those streets which satisfy the criteria for countywide significance that have been defined in a separate MMAP memorandum.

context. For example, a pedestrian priority street along a commercial corridor would have a wider desired sidewalk than a pedestrian priority street in a residential corridor. Thus, street typologies are a critical component of the MMAP development, as a particular street segment's land use type, street type, and multimodal overlays will directly inform the design solutions.

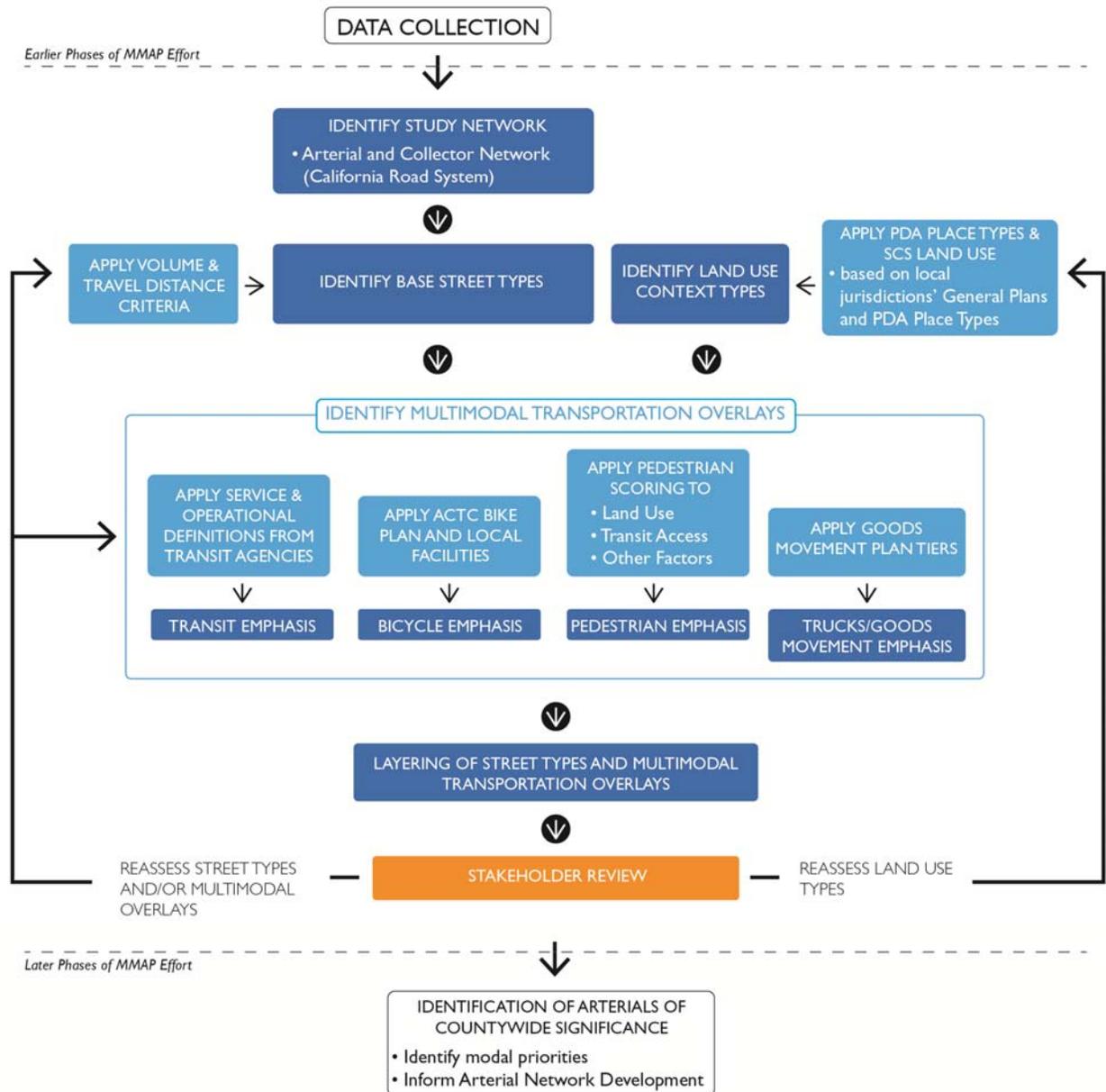


Figure 1: Multimodal Arterial Plan Typology Framework Process Diagram

A series of initial maps of the land use types, street types, and multimodal overlays were presented to ACTAC on April 9, 2015 and will be distributed prior to Planning Area meetings taking place during the week of April 20, 2015. A description of the methodologies used in generating the various mappings is included in the detailed discussion of the land use types, street types, and multimodal overlays. In

addition, jurisdictions will be given access to the online GIS Server maintained by Fehr & Peers to review the typology mapping and provide comments as necessary.

Land Use Context Types

A key element of the typology framework is the land use context types which define the physical context of streets. The land use types relate to desired design and operational characteristics, such as a priority for on-street parking and loading and a wider sidewalk frontage zone for window shopping and outdoor seating where the land use context is more intensive commercial or mixed use. The land use types are defined by a combination of Priority Development Area (PDA) place types and the land use types developed for the Alameda County version of the Plan Bay Area Sustainable Community Strategy (SCS), which was used in the adopted *2012 Countywide Transportation Plan*. Both intensity and mix of land use are important to consider in terms of defining context for major streets because the context has a relationship to the mix of various transportation modes and the priorities amongst modes. For example, industrial warehousing areas tend to have lower pedestrian activity and high levels of goods movement, while intensive mixed use areas have a mix of modes with an emphasis on pedestrian and transit activity. In addition, land use context affects specific street cross section elements, such as parking and loading lanes and the desired width and use of the sidewalk. Two types of land use classifications provide the starting point for developing land use context types for the MMAP:

ABAG - PDA place types defined by ABAG that exist in Alameda County⁴:

- **Regional Center** – PDAs located in the most urbanized centers of the region’s major cities, and are assumed under Plan Bay Area to accommodate high volumes of housing growth in the coming decades. ABAG suggests density ranges of 75-300 dwelling units per acre for housing and a 5.0 floor area ratio for employment.
- **City Center** – PDAs in already-established secondary cities in the Bay Area. ABAG suggests density ranges of 50-150 dwelling units per acre for housing and a 2.5 floor area ratio for employment.
- **Suburban Center** –PDAs with mixed-use character surrounding existing or planned transit stations, and typically have densities similar to City Centers but featuring more recent development. ABAG suggests density ranges of 35-100 dwelling units per acre for housing and a 4.0 floor area ratio for employment.
- **Transit Town Center** – PDAs with mixed-use areas that offer relatively robust transit services within urban areas, but serve a more localized population of residents and workers, rather than attracting significant patronage from beyond the local area. ABAG suggests density ranges of 20-75 dwelling units per acre for housing and a 2.0 floor area ratio for employment.
- **Urban Neighborhood** – PDAs with moderate- to high-density residential uses that also feature supportive retail and employment centers, rather than being primarily commercial areas. Transit is present but not necessarily a focal point of the neighborhoods. ABAG suggests density ranges of 40-100 dwelling units per acre for housing and a 1.0 floor area ratio for employment.
- **Transit Neighborhood** – PDAs that are primarily residential areas, well served by transit, but with existing low- to moderate densities. ABAG suggests density ranges of 20-50 dwelling units per acre for housing and a 1.0 floor area ratio for employment.
- **Mixed-Use Corridor** –linear PDAs served by transit lines, and typically feature commercial development extended along a major surface roadway with residential neighborhoods flanking

⁴ PDA place type definitions are from PDA Readiness Assessment Final Report, 3/29/13.

these commercial strips. ABAG suggests density ranges of 25-60 dwelling units per acre for housing and a 2.0 floor area ratio for employment.

Alameda CTC SCS Land Use Types – These are the land use types developed in the SCS process that were part of the Alameda CTC’s 2012 *Countywide Transportation Plan*. The land use types were developed in coordination with the local jurisdictions and are based on the jurisdictions’ general plan designations. The land use types are:

- Mixed Use (Commercial & Industrial)
- Mixed Use (Commercial & Residential)
- Commercial
- Industrial
- Education/Public/Semi-Public
- Residential
- Parks/Open Space
- Rural Residential & Open Space
- Agriculture/Resource Extraction
- Other/Unknown

The PDA place type designations and the SCS land use types have been combined into a set of 11 land use types for the MMAP street typology system, as illustrated in Table 1. These were determined by considering which combinations of land use and density affect the function and design of the streets.

Table 1 MMAP Land Use Context Types		
MMAP Land Use Types	Related PDA Place Types	Related SCS Land Use Designations
Downtown Mixed Use	<ul style="list-style-type: none"> ▪ Regional Center ▪ City Center 	<ul style="list-style-type: none"> ▪ Mixed Use: Commercial & Industrial ▪ Mixed Use: Commercial & Residential ▪ Commercial ▪ Industrial ▪ Education/Public/Semi-Public ▪ Residential
Town Center Mixed Use	<ul style="list-style-type: none"> ▪ Suburban Town Center ▪ Transit Town Center 	<ul style="list-style-type: none"> ▪ Mixed Use: Commercial & Industrial ▪ Mixed Use: Commercial & Residential ▪ Commercial ▪ Industrial ▪ Education/Public/Semi-Public ▪ Residential ▪ Agriculture/Resource Extraction
Corridor/Neighborhood Mixed Use	<ul style="list-style-type: none"> ▪ Urban Neighborhood ▪ Transit Neighborhood ▪ Mixed-Use Corridor 	<ul style="list-style-type: none"> ▪ Mixed Use: Commercial & Industrial ▪ Mixed Use: Commercial & Residential ▪ Commercial ▪ Industrial ▪ Education/Public/Semi-Public ▪ Residential ▪ Agriculture/Resource Extraction
Mixed Use	N.A.	<ul style="list-style-type: none"> ▪ Mixed Use: Commercial & Residential
Commercial	N.A.	<ul style="list-style-type: none"> ▪ Commercial ▪ Mixed Use: Commercial & Industrial
Industrial	N.A.	<ul style="list-style-type: none"> ▪ Industrial
Education/Public/Semi-Public	<ul style="list-style-type: none"> ▪ All except City Center 	<ul style="list-style-type: none"> ▪ Education/Public/Semi-Public
Residential	N.A.	<ul style="list-style-type: none"> ▪ Residential
Parks	<ul style="list-style-type: none"> ▪ All 	<ul style="list-style-type: none"> ▪ Parks/Open Space

Table 1 MMAP Land Use Context Types		
MMAP Land Use Types	Related PDA Place Types	Related SCS Land Use Designations
Rural/Open Space	N.A.	<ul style="list-style-type: none"> ▪ Rural Residential & Open Space ▪ Agriculture/Resource Extraction
Other/Unknown	N.A.	<ul style="list-style-type: none"> ▪ Other/Unknown

A map of the *Study Network* overlaid on the land use context types is provided in Appendix B.

Base Street Types

The base street types define a streets’ vehicular mobility and access functions. Table 2 outlines the functions and characteristics of the proposed *Base Street Types* and the expected degree to which each street type will be included in the MMAP *Arterial Network* as arterials of countywide significance. The final prioritized improvements for MMAP will focus on improvements to the *Arterial Network*.

The proposed base street type system consists of the following four classification types based on vehicular mobility functions:

1. *Throughway*
2. *County Connector*
3. *City or Community Connector*
4. *Neighborhood or District Connector*

This framework is similar to the street types developed by various cities in and outside of Alameda County. The City of Alameda’s *General Plan* defines major streets as: Regional Arterial, Island Arterial, Transitional Arterial, Island Collector, and Transitional Collector. Another example is the Urban Corridor street types in Fremont’s *Warm Springs/South Fremont Community Plan*, which are a combination of the three MMAP connector typologies as shown in Table 2. Fremont’s *City Center Community Plan*’s regional mobility corridors align with the MMAP’s county connectors as shown in Table 2. The MMAP’s street type system is also similar to the system used in the update to the City of Pasadena’s *Mobility Element*, which defines the city’s major streets as: *Connector City* and *Connector Neighborhood*.

Street Type Criteria

A set of planning area maps showing the initial network by applying the proposed *Base Street Types* is provided in Appendix C. Base street types are determined using two sets of criteria shown in Table 2, collectively called *Vehicular Mobility Criteria*:

- **Traffic volume measured by Average Daily Traffic (ADT).** An ADT threshold of 10,000 was used countywide to identify throughways and county connectors. The rationale for this volume threshold is that for a street with 10,000 ADT, typical peaking characteristics would result in it carrying between 800 and 1,200 vehicles during the peak hour of traffic (assuming 8 to 12 percent of daily trips occur in the peak hour) and about 480 to 720 peak hour, peak direction trips (assuming a 60/40 directional split). From a capacity perspective, a simple two-lane local or collector street could carry this volume, and therefore any street with a volume lower than 10,000 ADT would not meet the functional characteristics for being a throughway or county connector.
- **Travel distance** data generated by the Alameda Countywide Travel Demand Model for base year conditions is being used to identify street segments that meet the criteria listed in the table.

Sensitivity Analysis of Street Type Criteria

A sensitivity analysis was undertaken to determine the travel distance thresholds that are appropriate for the various street types. The analysis looked at applying various combinations of ADT volumes and percent trips by travel distance, and reviewed the results for reasonableness to finalize the suitable thresholds for these criteria. For example, for *Throughways*, a combination of ADT volumes and percent trips by travel distance was selected to exclude any obvious *Neighborhood Connectors* or *City Connectors* while still resulting in a reasonable network of streets. The criteria for North and Central Alameda County are different than those for South and East County because the network connectivity and density of these areas differ. Because of the generally lower density and more dispersed land use patterns, and less interconnected street networks, the percentage of trips threshold is higher for South and East County as compared with North and Central County. Therefore, a higher percentage of longer distance trips generally occurs on collectors and arterials in the South and East County.

One issue that the sensitivity analysis and initial mapping of the street types has highlighted is that some streets that parallel freeways (e.g., Frontage Road parallel to I-80, Lewelling Boulevard parallel to I-238, and Pleasanton-Sunol Road parallel to I-680) are used as “reliever routes” when freeways are congested; as evidenced by observation of traffic patterns and driver behavior. Some of these parallel streets may be designated as throughways because of the traffic volume (ADT) criteria, but this may not be a desired function for the streets. This is something to address as the MMAP study proceeds and stakeholders are reviewing the initial mapping.

Table 2 Typology Framework Summary and Criteria				
Base Street Type	Base Functions and Characteristics	Vehicular Mobility Criteria	Expected Extent Street Type included in Arterial Network ^[1]	Examples
Throughway	Primarily high speed, with at-grade intersections, little direct relationship to surrounding context, and in some cases segments of streets connecting to a freeway with a good portion of trips crossing through multiple cities.	Countywide: at least 10,000 ADT South & East County: at least 55% of total volume traveling 8+ miles North & Central County: at least 50% of total volume traveling 8+ miles	Part of Arterial Network	Portions of Hegenberger Road in Oakland, Hesperian Boulevard in Alameda County, and Stanley Boulevard in Pleasanton and Livermore.
County Connector	Generally moderate speed with a good portion of trips crossing through multiple cities/communities, and segments of streets connecting to a freeway. This will also be applied to multiuse and pedestrian trails that connect to adjacent counties.[2]	Countywide: at least 10,000 ADT South & East County: at least 50% of total volume traveling 6+ miles North & Central County: at least 45% of total volume traveling 6+ miles	Part of Arterial Network	Ashby Avenue in Berkeley, Washington Avenue in San Leandro, A Street in Hayward, Alvarado-Niles Road in Union City, Santa Rita Road in Pleasanton, and South Vasco Road in Livermore.
City or Community Connector	Streets and trails with a good portion of trips made by those traveling across a city/community or to an adjacent city/community. [2]	Countywide: at least 50% of total volume traveling 4+ miles	Many will be part of the Arterial Network	Colusa Avenue in Albany and Berkeley, Tilden Way in Alameda, Fruitvale Avenue in Oakland, and Central Parkway in Dublin.
Neighborhood or District Connector	Streets and trails where most trips by those traveling across a neighborhood/district and to an adjacent neighborhood / district.	Countywide: at least 50% of total volume traveling less than 4 miles	Many will not be part of the Arterial Network	Portions of Solano Avenue in Albany and Berkeley, Encinal Avenue in Alameda, portions of Logan Drive in Fremont, and Rosewood Drive in Pleasanton.

Notes:

1. Criteria for countywide significance that makes a street part of the *Arterial Network* are defined in a separate memorandum. The *Arterial Network* is a subset of the *Study Network*.
2. Trails will be mapped when the *Arterial Network* is developed.

Multimodal Transportation Overlays

Four multimodal transportation overlays are used to provide additional definition to the multimodal characteristics and function of the streets in the *Study Network*. The overlays are used in combination with the base street types and land use context types to define street segments with respect to the vehicular function, multimodal emphases, and land use context. The combined definition of street segments will be used to establish modal priorities that define the design and operational needs of the street; this is discussed further in a forthcoming memorandum on modal priorities.

At a minimum, all street segments will have a land use context type and a street type, and some will have one or multiple transportation overlays. The multimodal transportation overlays indicate if particular modes should have an emphasis in the function and design of a particular street segment, and include transit, bicycle, pedestrian, and truck route/goods movement emphases.

Transit Emphasis

The transit emphasis overlay will be used to identify transit priority street segments in addition to being part of the selection criteria for arterials of countywide significance for inclusion in the *Arterial Network*. Transit emphasis categories have been defined by the transit providers and consist of three tiers:

- **Major Corridors** for bus rapid transit (BRT) either with or without dedicated lanes as identified by AC Transit's "Priority Corridors," and Wheels Tri-Valley Rapid. These corridors will be part of the *Arterial Network*.
- **Crosstown Routes** for other high capacity transit service as identified by AC Transit as their "Cross Town" routes, and potential for similar routes to be identified by LAVTA and Union City Transit.
- **Local Routes** for other bus transit service on segments of the *Study Network* for AC Transit, LAVTA Wheels, and Union City Transit.

Maps of the proposed transit emphasis overlay are provided in Appendix D. MMAP transit overlay will coordinate with the proposed transit network from the *Countywide Transit Plan*, to the extent feasible from a timing standpoint. When the Transit Plan network becomes available, the MMAP transit overlay will be reviewed and adjusted if the network is available prior to the review of *Arterial Network* cross section recommendations. Similarly, AC Transit is preparing an updated Comprehensive Operational Analysis (COA) which could restructure some routes. To the extent that information from the COA and other studies that transit agencies may have underway is available within time to be incorporated into the MMAP (late spring), adjustment may be made to the transit emphasis overlay.

Bicycle Emphasis

Bicycle emphasis is developed by reviewing the existing bicycle facilities, *2012 Countywide Bicycle Plan* and the four trail types⁵. The Bicycle Plan defines five categories of countywide significance: inter-jurisdictional network, access to transit, access to central business districts, inter-jurisdictional trails, and access to *Communities of Concern*. This includes existing and planned bicycle facilities on streets that are part of the *Study Network*, as well as some facilities that are on parallel non-*Study Network* streets or multiuse paths that serve significant connectivity functions. For example, some communities in Alameda

⁵ SF Bay Trail, East Bay Greenway, Iron Horse Trail and Inter-jurisdictional Trails.

County currently focus on placing primary bicycle facilities on non-arterial streets (e.g., Berkeley and Hayward).

The bicycle overlay types are shown below, from highest to lowest bicycle emphasis:

- Class I – bicycle and multiuse paths
- Class IV⁶ – cycle tracks and similar protected bicycle facilities
- Class II – bicycle lanes, buffered bicycle lanes, and green bicycle lanes
- Class III enhanced – bike boulevards and similar enhanced bike routes
- Class III – bike routes, shared use arrows, shoulders, and curb lanes

A map of the bicycle emphasis overlay is provided in Appendix E.

Pedestrian Emphasis

The mapping for the Pedestrian Emphasis, unlike the other transportation modes, is node- or area-based, instead of street network-based as pedestrian activity is driven by proximity to various uses, destinations, or by living in public transit-dependent communities. This includes pedestrian facilities and planning areas of countywide significance as defined in the *2012 Countywide Pedestrian Plan*. These are areas where higher volumes of pedestrians exist or are expected, as well as locations where walking serves an important transportation function, such as access to transit or schools. Pedestrian emphasis also includes central business districts, activity centers, inter-jurisdictional trails, and access within “communities of concern” as defined in the Alameda CTC’s Community-Based Transportation Plans. Portions of the *Study Network* that are not within the areas described above, but are within PDAs, have a lower level of pedestrian emphasis. A map of the pedestrian emphasis overlay is provided in Appendix F.

There are three levels of pedestrian emphasis designated by pedestrian priority “scoring,” which combines scores given to street segments based on the following characteristics:

- **Priority Development Area (PDA) Place Type** – Each PDA type within the County was given a score with Regional Centers scoring the highest, while Suburban Center score the lowest.
- **Commercial and Mixed Use Areas** – Commercial and Mixed Use areas as identified from the ABAG standardized Local Jurisdiction General Plan data. These were scored with downtown or city center and other mixed use types scoring higher than predominantly single use type commercial areas.
- **Census Tracts identified as Communities of Concern per MTC Equity Analysis** – Census tracts in the County were scored by MTC on eight categories wherein tracts over the score of 4 are considered as a Community of Concern. For mapping purposes, tracts with a MTC score of 6 are scored higher for pedestrian emphasis than ones with MTC scores between 4 and 6.
- **Employment Growth Opportunity Areas identified in ACTC 2012 CTP** – These areas were given an additional score.
- **Proximity to BART/ACE/Capitol Corridor stations** – half mile and quarter mile distances are scored.
- **Half-mile buffer off AC Transit’s priority corridor** – half mile and quarter mile distances are scored.

⁶ Class IV bike facilities is a new category that includes facilities that provide a higher level of cyclist separation from traffic than class II facilities.

- **Half-mile buffers around LAVTA Rapid stops** – half mile and quarter mile distances are scored.
- **Quarter mile buffers around local bus stops** – quarter mile distance is scored.
- **Quarter mile buffers around activity & education centers, and parks** – quarter mile distance is scored.

Appendix A provides the methodology for how these scores combine and the thresholds to determine the three levels of pedestrian emphasis:

- Tier 1: High Pedestrian Score
- Tier 2: Medium Pedestrian Score
- Tier 3: Low Pedestrian Score

The three levels of pedestrian emphasis define increasing levels of improvement to the pedestrian environment⁷.

Truck Routes/Goods Movement Emphasis

This multimodal overlay is coordinated with the *Countywide Goods Movement Plan* that has initially defined three tiers of truck routes⁸ (a map of the truck emphasis overlay is provided in Appendix G).

- Tier 1 consists of interstate and state highways that carry the majority of through truck traffic in the county; note this tier is listed for reference but *it is only designated to freeways and is not designated to any street segments that are part of the Study Network*.
- Tier 2 consists of state highways and designated arterial streets that provide intra-county and intercity connectivity.
- Tier 3 routes are designated arterials and collectors used for local truck traffic.

Next Steps

This memorandum describes how the project team had categorized the *Study Network* roadways by land use context types, street types, and multimodal overlays. This process and the feedback loop of stakeholder review and comment is illustrated in Figure 2. This typology framework and initial mapping of the typologies are being presented to the stakeholders for review in April – ACTAC on April 9, 2015; Planning Area meetings during April 20-22, 2015; and non-agency stakeholder meeting on April 20, 2015. Comments will be incorporated and the final typology addressing comments received will be presented for approval in June or July.

The typology for the MMAP is expected to inform the modal priority for the *Study Network* segments, which in turn will lead to identifying the modal needs on the *Study Network* in combination with the Performance Objectives. A separate memorandum on modal priorities will be presented at the Planning Area meetings.

⁷ All streets should satisfy Americans with Disabilities Act (ADA) requirements and guidance.

⁸ See the Alameda County Goods Movement Plan, Draft Technical Memorandum for Task 3c – Identify Gaps, Needs, Issues, and Deficiencies, pages 2-5 and 2-6.

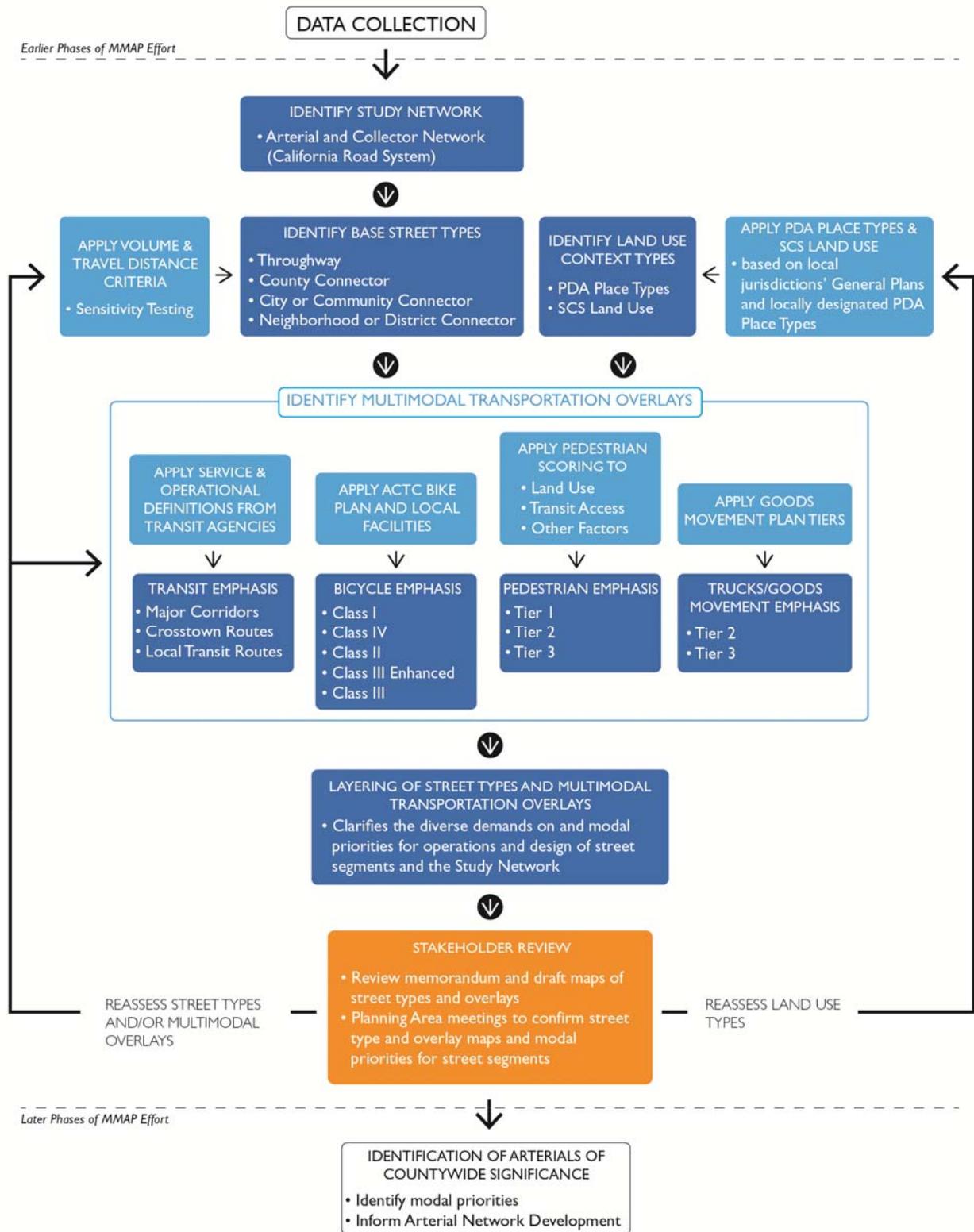


Figure 2: Multimodal Arterial Plan Typology Framework Detailed Process Diagram

APPENDIX A: Pedestrian Emphasis Scoring Methodology

The Pedestrian emphasis scoring was performed by layering the categories listed in Table 4 through GIS mapping. The overlaying individual scores were summed to create a pedestrian emphasis intensity map of the combined layers scores. Maps in Appendix F show the gradation of these scores.

The Transit scores range from .25 to 2 points based upon the existing and planned transit capacity on those routes. Hence, BART Stations, AC Transit Priority and LAVTA Rapid corridors have higher scores than local routes. Locations where multiple transit facilities overlap have higher cumulative scores.

The Land Use/Demographic category scoring is more variable, ranging from .25 to 4 points depending upon the characteristic being scored. This breadth of scoring occurs, because this category includes factors such as intensity of uses, high activity destinations, and demographic profiles through the scoring of MTC's *Community of Concern* assessment. Land use scoring includes PDA typologies with the highest score assigned to the highest PDA intensity type, a score of 4 for Regional Center. Many of the PDAs contain several types of high-activity uses (commercial and mixed use areas as defined in jurisdictions' general plans); therefore, those areas were assigned additional scores (ranging from .25 to 1) based upon the intended intensity of those specific uses. This additional scoring allows for gradation of pedestrian emphasis of streets within large PDAs. Areas identified as future employment zones in the County's RTP were given one point to highlight activity centers that aren't necessarily within transit corridors or PDAs, but would have a need for pedestrian improvements. Points were given to educational, cultural and government offices areas, as they bring additional pedestrian activity from employees, users, and visitors. Lastly, census tracts identified as Communities of Concern under the MTC equity analysis were scored (1 to 1.5) based upon whether more than four of the demographic factors identified in the MTC analysis were met. Tracts that met more than 6 factors were scored half a point higher.

Across categories, the scoring was scaled to relative expected level of pedestrian activity. For example, BART stations typically have a high level of pedestrian activity around them and a scored a 2. But those in city centers generally have even higher levels of activity, so a PDA place type score of 4 for a Regional Center or 3 for a City Center was added to the BART score. The relatively higher scoring for the PDA designation compared to the BART score is reflective of the pedestrian activity that occurs in these centers regardless of how a person travels to and from the center, such as an employee walking to get lunch or run errands.

Table 4: Pedestrian Priority Scores

PEDESTRIAN PRIORITY MEASURE	SCORE	PEDESTRIAN PRIORITY MEASURE	SCORE
TRANSIT (range of 0.25 to 2 point scores)			
1. BART STATIONS		117 - General Commercial	0.25
.25 Miles	2	117 - San Lorenzo Village	0.5
.5 Miles	1	117 - Light Industrial and Research & Development/Office	0.25
2. ACE STATIONS		117 - General Comm'l or Medium/ High Density Res.	0.5
.25 Miles	0.75	117 - General Comm'l/Low-Medium Density Res. allowed	0.25
.5 Miles	0.5	117 - General Comm'l/Medium & High Density Res. allowed	0.5
3. AMTRAK CAPITOL CORRIDOR		117 - General Comm'l/Medium Density Res. allowed	0.5
.25 Miles	0.75	117 - High Density Res/General Commercial allowed	0.5
.5 Miles	0.5	117 - Low-Medium Density Res/General Commercial	0.25
4. AC TRANSIT PRIORITY CORRIDOR		DUBLIN	
.25 Miles	2	104 - Campus Office	0.25
.5 Miles	1	104 - General or Neighborhood Commercial	0.25
5. LAVTA CORRIDOR		104 - General Commercial/Campus Office	0.5
.25 Miles	1.75	104 - Retail/Office	0.5
.5 Miles	0.75	104 - Retail/Office and Automotive	0.25
6. LOCAL BUS STOPS (AC/LAVTA/UCT)		104 - Mixed Use	0.5
0.125 Miles	0.5	FREMONT	
.25 Miles	0.25	106 - Central Business District	1
LAND USE/DEMOGRAPHIC (range of 0.25 to 4 point scores)		106 - Community or Office Commercial	0.25
7. PRIORITY DEVELOPMENT AREAS		106 - Neighborhood Commercial	0.5
Regional Center	4	106 - Mixed Use-Neighborhood Commercial (Res. 15-18 d/a)	0.25
City Center	3	106 - Mixed Use-Neighborhood Commercial (Res. 18-23 d/a)	0.5
Suburban Center	2	106 - Mixed Use-Neighborhood Commercial (Res. 23-27 d/a)	1
Transit Town Center	1.5	106 - Mixed Use-Neighborhood Commercial (Res. 27-35 d/a)	1
Urban Neighborhood	1	HAYWARD	
Transit Neighborhood	0.75	107 - City Center - Retail and Office Commercial	1
Mixed Use Corridor	1	107 - General Commercial	0.25
8. EMPLOYMENT GOWTH OPPORTUNITY AREAS	1	107 - Retail and Office Commercial	0.5
9. COMMUNITIES OF CONCERN		107 - Commercial/High Density Residential	1
below 6	1	LIVERMORE	
6 and above	1.5	108 - Community Serving General Commercial	0.25
10. ACTIVITY CENTERS		108 - Neighborhood Commercial	0.5
.25 Miles	0.25	108 - Office Commercial	0.25
11. LAND USE		108 - Mixed Use-Downtown Area SP	1
ALAMEDA		108 - Mixed Use-Neighborhood Medium Density	0.5
101 - Business Park or Office	0.25	108 - Mixed Use-Neighborhood Low Density	0.25
101 - Community Commercial	0.25	NEWARK	
101 - Island Auto Movie or Mariner Square	0.5	109 - Community or General Commercial	0.25
101 - Neighborhood Business or Northern Waterfront	0.5	109 - Neighborhood Commercial	0.5
ALAMEDA COUNTY		109 - Office Commercial	0.25
199 - Mixed Use	0.5	109 - Regional or Specialty Commercial	0.25
ALBANY		OAKLAND	
102 - Community Commercial	0.5	110 - Business Mix	0.5
102 - General Commercial	0.25	110 - Central Business District	1
102 - Research	0.25	110 - Community Commercial	0.25
102 - Commercial/Service/Light Industrial	0.25	110 - Neighbor'd Ctr. Mixed Use or Hsg./Business Mix	0.5
102 - Medium Density Res./Recreational/Comm'l	0.5	PLEASANTON	
102 - Planned Res./Commercial or Res./Commercial	0.5	112 - Comm'l and Office	0.25
BERKELEY		(Retail/Highway/Service/Professional)	
103 - Avenue or Neighborhood Commercial	0.5	112 - Business Park (Industrial/Commercial and Office)	0.25
103 - Downtown	1	SAN LEANDRO	
103 - Manufacturing Mixed Use	0.25	113 - General Commercial or Office	0.25
CASTRO VALLEY		113 - Neighborhood Commercial or Corridor Mixed Use	0.5
116 - GeneralRetail Commercial	0.25	113 - Downtown Mixed Use	1
116 - Office	0.25	UNION CITY	
116 - Restaurants & Entertainment	0.5	114 - Office Commercial or R&D Campus	0.25
116 - Mixed Use	0.5	114 - Retail Commercial	0.25
CHERRYLAND		114 - Station Mixed-Use Commercial	1

APPENDIX A2: April 2015 Draft Modal Priority Memorandum

MEMORANDUM

Date: April 17, 2015
To: Saravana Suthanthira, Alameda CTC
Cc: Matthew Ridgway and Francisco Martin, Fehr & Peers
From: Phil Erickson, Bharat Singh, and Warren Logan
Re: Alameda CTC Countywide Multimodal Arterial Plan (MMAP): Draft Modal Priority Approach

The memorandum below presents information on how typologies inform modal priorities. Typologies are presented in the *Alameda CTC Countywide Multimodal Arterial Plan: Draft Arterial Street Typology Framework Concepts* memorandum (April 15, 2015). Together, these documents describe a technical process for using area character (land use context), street vehicular function (base street type), and modal networks (multimodal overlays) identified from on-going or recent plans (Alameda Countywide Transit, Goods Movement, Bicycle and Pedestrian Plans) to derive modal priorities for specific street segments. As this study progresses, there will be opportunities to adjust these recommendations:

- Consistent with the Vision statement, the Alameda Countywide Multimodal Arterial Plan will be sensitive to local context. If the technically generated modal priorities are inconsistent with local values, they will be modified in consultation with the local agencies.
- While the land use context includes information on aspirational (long term vision) land uses (SCS, PDAs, etc.), the base street types derive from current functions. To the extent that local agencies have aspirations to change the function of streets, the Multimodal Arterial Plan can reflect aspirations for the 2040 planning horizon.
- For analysis purposes, the Study Network is segmented based on CMP segmentation, PDA boundaries, changes in street cross-section and other reasons. Network analysis will be conducted after recommended improvements are generated to assure that segment-level improvements assemble into continuous and connected networks that supports system efficiency. Continuity analysis will include a review of user experience such that the comfort of bicycle improvements is consistent over the length of a corridor and transit improvements knit together into a cohesive/consistent alignment.
- Ultimately, the most important part of the MMAP will be a set of recommendations that enhance multimodal mobility in Alameda County while meeting the MMAP's goals; and doing this through an efficient investment strategy. Capital and operating cost estimates will be used in combination with other performance measures to prioritize those improvements that provide the greatest cost-benefit ratio.



Philip Erickson, Architect, AIA
Timothy Road, AICP, LEED AP ND



350 Frank Ogawa Plaza, 5th Flr
Oakland, California 94612
Telephone 510.839.4568
Facsimile 510.839.4570
www.community-design.com

Land use context types and base street types of the MMAP’s street typology framework inform the modal priority for streets. For example, the throughway street type has the highest level of auto mobility emphasis in most land use contexts. But a throughway in a Downtown Mixed Use land use context will prioritize pedestrians, bicycles, and transit because of the intensity of activity for these modes in the dense mixed use environment of a downtown.

Multimodal transportation overlays, or combinations of overlays, represent priority networks for specific modes – transit, bicycle, pedestrian and goods movement, modify modal priorities. Applying the street types, land use context types, and multimodal overlays results in a nuanced set of modal priorities for street segments in the *Study Network*. Considering the above points, to facilitate the process of identifying modal priority, three types of priority order were developed based on the land use context as shown in Table 1.

Table 1 MMAP Modal Priorities – General		
Land Use Context Types <ul style="list-style-type: none"> ▪ Downtown Mixed Use ▪ Town Center Mixed Use ▪ Corridor/Neighborhood Mixed Use ▪ Education/Public/Semi-Public ▪ Parks 	Land Use Context Types <ul style="list-style-type: none"> ▪ Mixed Use ▪ Commercial ▪ Residential ▪ Rural/Open Space ▪ Other/Unknown 	Land Use Context Types <ul style="list-style-type: none"> ▪ Industrial
Associated Modal Priorities <ol style="list-style-type: none"> 1. Transit 2. Pedestrian 3. Bicycle 4. Auto 5. Goods Movement/Truck 	Associated Modal Priorities <ol style="list-style-type: none"> 1. Transit 2. Auto 3. Goods Movement/Truck 4. Bicycle 5. Pedestrian 	Associated Modal Priorities <ol style="list-style-type: none"> 1. Transit 2. Goods Movement/Truck 3. Auto 4. Bicycle 5. Pedestrian

This order iterates through the first highest order facilities for each mode; then the next highest order, and third highest order. For example, for transit, the highest order facilities are the Major Transit Corridors and the second highest are the Crosstown routes. This approach intends to balance autos as the dominant form of transportation in Alameda County with State, regional and local policies related to reducing greenhouse gas emissions that focus on directing local development to creates and enhances activity nodes that support transit, walking and bicycling. It also provides an implementation tool for continuous and connected multimodal networks to facilitate travel by all modes. Table 2 displays the resulting priorities.

Table 2 MMAP Modal Priorities – Specific		
Column 1	Column 2	Column 3
Land Use Context Types <ul style="list-style-type: none"> ▪ Downtown Mixed Use ▪ Town Center Mixed Use ▪ Corridor/Neighborhood Mixed Use ▪ Education/Public/Semi-Public ▪ Parks 	Land Use Context Types <ul style="list-style-type: none"> ▪ Mixed Use ▪ Commercial ▪ Residential ▪ Rural/Open Space ▪ Other/Unknown 	Land Use Context Types <ul style="list-style-type: none"> ▪ Industrial
Associated Modal Priorities <ol style="list-style-type: none"> 1. Transit: Major Corridors 2. Pedestrian: Tier 1 3. Bicycle: Class I or Class IV 4. Auto: Throughway 5. Goods Movement: Tier 2 6. Transit: Crosstown Routes 7. Pedestrian: Tier 2 8. Bicycle: Class II 9. Auto: County Connector 10. Pedestrian: Tier 3 11. Bicycle Class III or Class III Enhanced 12. Transit: Local Routes 13. Goods Movement: Tier 3 14. Auto: Community Connector 15. Auto: Neighborhood Connector 	Associated Modal Priorities <ol style="list-style-type: none"> 1. Transit: Major Corridors 2. Auto: Throughway 3. Goods Movement: Tier 2 4. Bicycle: Class I or Class IV 5. Pedestrian: Tier 1 6. Transit: Crosstown Routes 7. Auto: County Connector 8. Goods Movement: Tier 3 9. Bicycle: Class II 10. Pedestrian: Tier 2 11. Auto: Community Connector 12. Bicycle Class III or Class III Enhanced 13. Pedestrian: Tier 3 14. Transit: Local Routes 15. Auto: Neighborhood Connector 	Associated Modal Priorities <ol style="list-style-type: none"> 1. Transit: Major Corridors 2. Goods Movement: Tier 2 3. Auto: Throughway 4. Bicycle: Class I or Class IV 5. Pedestrian: Tier 1 6. Transit: Crosstown Routes 7. Goods Movement: Tier 3 8. Auto: County Connector 9. Bicycle: Class II 10. Pedestrian: Tier 2 11. Auto: Community Connector 12. Bicycle Class III or Class III Enhanced 13. Pedestrian: Tier 3 14. Transit: Local Routes 15. Auto: Neighborhood Connector

By way of example, Table 3 highlights some example streets by Planning Area, listing their land use context and base street types, and multimodal transportation overlays. The final column shows their modal priorities (in ranked order). Walking through the first example – Hegenberger Road, the stepwise process proceeds as follows:

Hegenberger Road from San Leandro Street to International Boulevard

Land use Context = Town Center Mixed Use (see column 1 of Table 2)

- | | | |
|---|-----|---------------------------------------|
| 1. Is it a Transit Major Corridor? | NO | |
| 2. Is it a part of the Pedestrian Tier 1 network? | NO | |
| 3. Is it a Class I or Class IV Bicycle facility? | NO | |
| 4. Is it a Throughway? | YES | 1 st priority – Auto |
| 5. Is it part of the Tier 2 Goods Movement network? | NO | |
| 6. Is it a Transit Crosstown Route? | YES | 2 nd priority - Transit |
| 7. Is it part of the Tier 2 Pedestrian network? | YES | 3 rd priority - Pedestrian |
| 8. Is it a Class II Bicycle facility? | YES | 4 th priority - Bicycle |

- 9. Is it a County Connector? NA
- 10. Is it part of the Tier 2 Pedestrian network? NA
- 11. Is it a Class III or Class III Enhanced Bicycle facility NA
- 12. Is it a Transit Local Route? NA
- 13. Is it part of the Tier 3 Goods Movement network? YES 5th priority – Truck
- 14. Is it a Community Connector? NA
- 15. Is it a Neighborhood Connector? NA

NA (not applicable) occurs when a question relates to a mode that is a priority based on a prior question. As an example, the response to “Is it a County Connector?” - a question that could result in the facility being designated as auto priority- is NA because the facility was already designated as auto priority from the question – “Is it a Throughway?”

In a few cases, the land use context of a segment includes categories within multiple columns of Table 2, such as with Foothill Boulevard between Castro Valley Boulevard and Grove Way. In these cases, the predominant land use contexts are used. In the case of Foothill Boulevard, column 2 of Table 2 is used as the predominant land uses are Mixed Use and Residential.

Table 3 Example Streets with Street Type and Overlay Designations								
Planning Area	Street Segment	Land Use Context Overlay	Street Type	Transit Overlay	Bicycle Overlay	Pedestrian Overlay	Truck Overlay	Modal Priority (in order)
NORTH COUNTY	Hegenberger Rd (San Leandro St to International Blvd)	Town Center Mixed Use	Throughway	Crosstown	Class II	<p>Tier 2 - (4.1-9.0 score)</p> <ul style="list-style-type: none"> Transit Town Center PDA. Partially within 1/2 mile of BART station. Partially within 1/2 mile of ACT Priority Corridor. Partially within 1/2 mile of Capitol Corridor station. Community of Concern Tract. 	Tier 3	Auto Transit Pedestrian Bicycle Truck
	Telegraph Ave (40 th to 51 st St)	Corridor/ Neighborhood Mixed Use	Neighborhood Connector	Major Corridor	Class II	<p>Tier 2 - (4.1-9.0 score)</p> <ul style="list-style-type: none"> Neighborhood Mixed Use PDA On AC Transit Priority Corridor. Within 1/4 mile of local bus stops. Community of Concern Tract. 	None	Transit Bicycle Pedestrian Auto Truck
	Sacramento St (Dwight Way to Ashby Ave)	Commercial and Residential	Neighborhood Connector	Crosstown	None	<p>Tier 3 - (1.1-4.0 score)</p> <ul style="list-style-type: none"> Within 1/2 Mile of ACT Priority Corridor. Within 1/4 mile of local bus stops. Community of Concern Tract. 	None	Transit Pedestrian Auto Bicycle Truck

Table 3 Example Streets with Street Type and Overlay Designations								
Planning Area	Street Segment	Land Use Context Overlay	Street Type	Transit Overlay	Bicycle Overlay	Pedestrian Overlay	Truck Overlay	Modal Priority (in order)
CENTRAL COUNTY	Foothill Blvd (Castro Valley Blvd to Grove Way)	Mix-use (Comm. & Res.) and Residential	Throughway	Local (on part of segment)	None	Tier 3 - (1.1-4.0 score) <ul style="list-style-type: none"> Within 1/2 Mile of ACT Priority Corridor. Partially within 1/4 mile of local bus stops 	Tier 2	Auto Truck Pedestrian Transit Bicycle
	D Street (Mission Blvd to 1st Street)	Town Center Mixed Use	Neighborhood Connector	Local (on part of segment)	Class II	Tier 1 - (>9.0 score) <ul style="list-style-type: none"> City Center PDA. Within 1/4 mile of ACT Priority Corridor. Within 1/4 mile of BART station. Community of Concern Tract. 	None	Pedestrian Bicycle Transit Auto Truck
	Watkins St (A St to B St)	Town Center Mixed Use	Neighborhood Connector	Local	None	Tier 1 - (>9.0 score) <ul style="list-style-type: none"> City Center PDA. Within 1/4 mile of ACT Priority Corridor. Within 1/4 mile of BART station. Community of Concern Tract. 	None	Pedestrian Transit Auto Bicycle Truck

Table 3 Example Streets with Street Type and Overlay Designations								
Planning Area	Street Segment	Land Use Context Overlay	Street Type	Transit Overlay	Bicycle Overlay	Pedestrian Overlay	Truck Overlay	Modal Priority (in order)
SOUTH COUNTY	Mission Blvd (Driscoll Rd to I-680)	Residential, Education, and Commercial	Throughway	Local	Class II	<i>Pedestrian Emphasis not considered</i>	Tier 2	Auto Truck Bicycle Transit Pedestrian
	Thornton Ave (Paseo Padre Parkway to Fremont Ave)	Corridor/ Neighborhood Mixed Use	Community Connector	Local	Class II	Tier 2- (4.1-9.0 score) <ul style="list-style-type: none"> ▪ Transit Neighborhood PDA. ▪ On ACT Priority Corridor. ▪ Partially within 1/2 mile of Capitol Corridor/ACE station 	Tier 3	Pedestrian Bicycle Transit Truck Auto Transit
	Fremont Blvd (Nicolet Ave to Thornton Ave)	Corridor/ Neighborhood Mixed Use	County Connector	Major Corridor	Class II	Tier 2- (4.1-9.0 score) <ul style="list-style-type: none"> ▪ Transit Neighborhood PDA. ▪ On ACT Priority Corridor. ▪ Partially within 1/2 mile of Capitol Corridor/ACE station. 	None	Auto Pedestrian Bicycle Truck

Table 3 Example Streets with Street Type and Overlay Designations								
Planning Area	Street Segment	Land Use Context Overlay	Street Type	Transit Overlay	Bicycle Overlay	Pedestrian Overlay	Truck Overlay	Modal Priority (in order)
EAST COUNTY	Stanley Blvd (Bernal Ave to Isabel St)	Rural/Open Space	Throughway	None	Class II	<i>Pedestrian Emphasis not considered</i>	Tier 2	Auto Truck Bicycle Pedestrian Transit
	Dublin Blvd (Arnold Rd to Hacienda Dr)	Commercial	County Connector	Major Corridor	Class II	Tier 3 - (1.1-4.0 score) <ul style="list-style-type: none"> ▪ On LAVTA Rapid Corridor. ▪ Within Commercial Land use 	Tier 3	Transit Auto Truck Bicycle Pedestrian
	Central Pkwy (Grafton St to Lockhart St)	Mixed Use	Community Connector	None	Class II	Tier 3 - (1.1-4.0 score) <ul style="list-style-type: none"> ▪ Within 1/2 Mile of LAVTA Rapid stops. ▪ Suburban PDA. 	None	Auto Bicycle Pedestrian Truck Transit

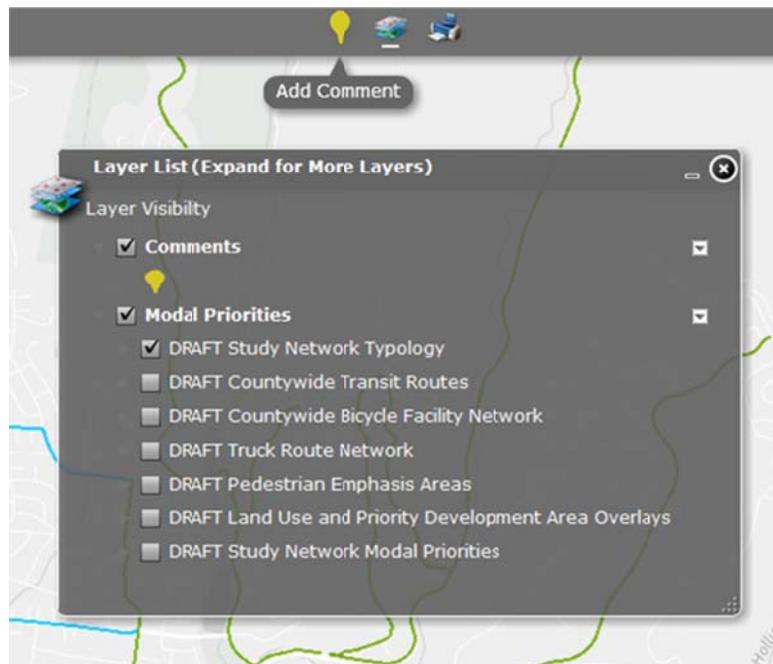
Next Steps

Local jurisdictions are requested to review the technically derived modal priorities applying the process explained in this memorandum and provide comments. Comments can be made on any of the underlying analyses elements (land use context types, base street types and multimodal overlays), which will influence the technically derived modal priorities, or directly to the modal priorities. There are data layers available for each of these elements and each layer contains a function allowing comments to be added. The segmentation of the GIS network may be more fine-grained than is necessary for comments, in which case agency staff should comment on any segment with a note about the limits to which the comment applies. As an example, a comment from the City of Oakland on the first segment in Table 3 – Hegenberger Road between San Leandro Street and International Boulevard – could potentially note that the comment applies to the segment between Foothill/Macarthur Boulevard and I-880 rather than the smaller segment of San Leandro Street to International Boulevard contained within.

All typology, modal overlays, and modal priority maps are available for review online via the Fehr & Peers GIS Server. Access the maps by going to the following link:

- <http://gis.fehrandpeers.com/AlamedaCTC/Typology/>
- Username: AlamedaCMA
- Password: fpgis_Alameda

To view specific maps, turn on the appropriate GIS data layer by clicking the box as shown in the screen capture below.



To add a comment, ensure that the comment layer is turned on and click on the yellow “Add Comment” icon at the top of the screen, then click on the roadway segment you wish to comment on and type your comments in the provided text box. Please include your name and agency in the comment field.

Community Design + Architecture

Re: Alameda CTC Countywide Multimodal Arterial Plan (MMAP): Draft Modal Priority Approach

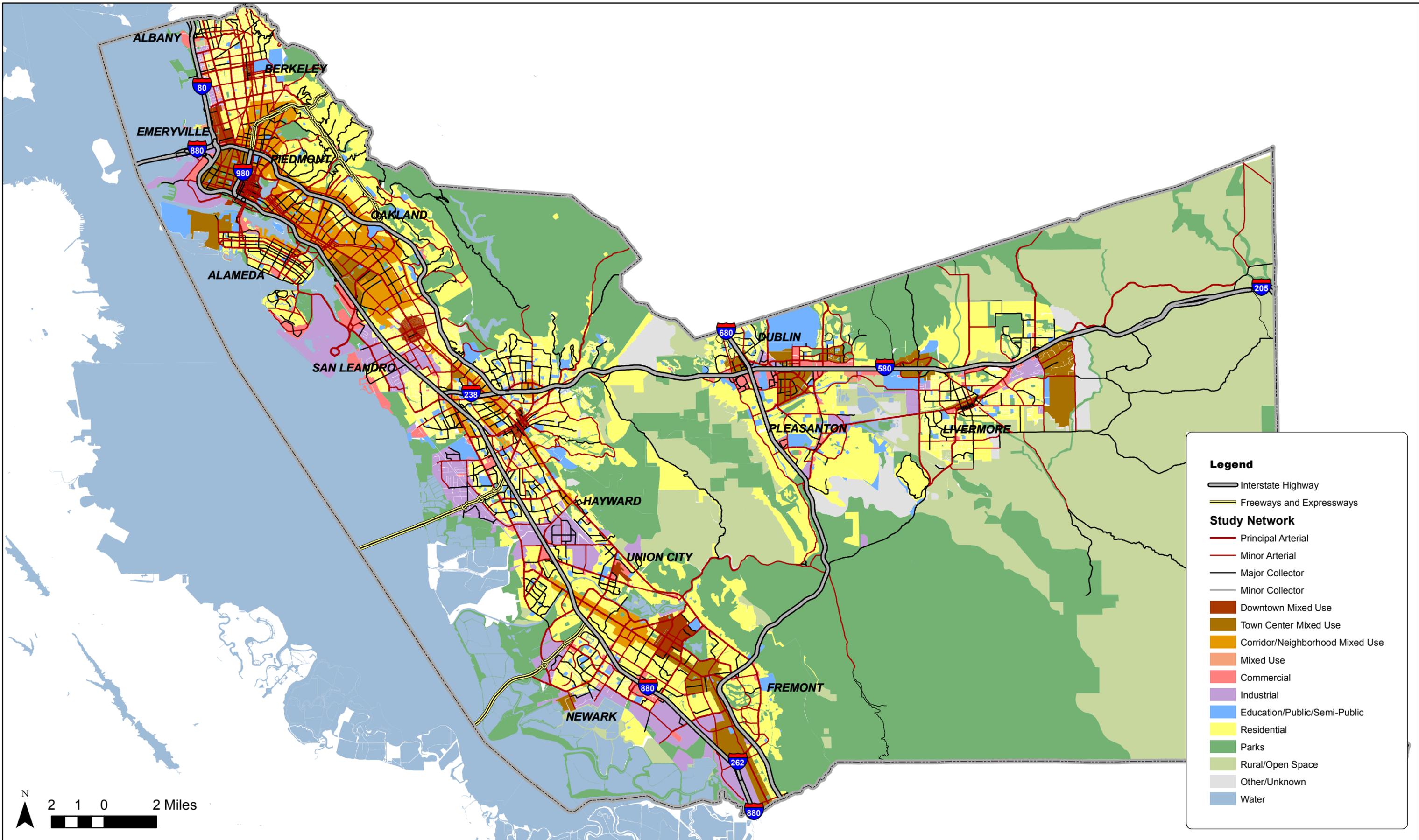
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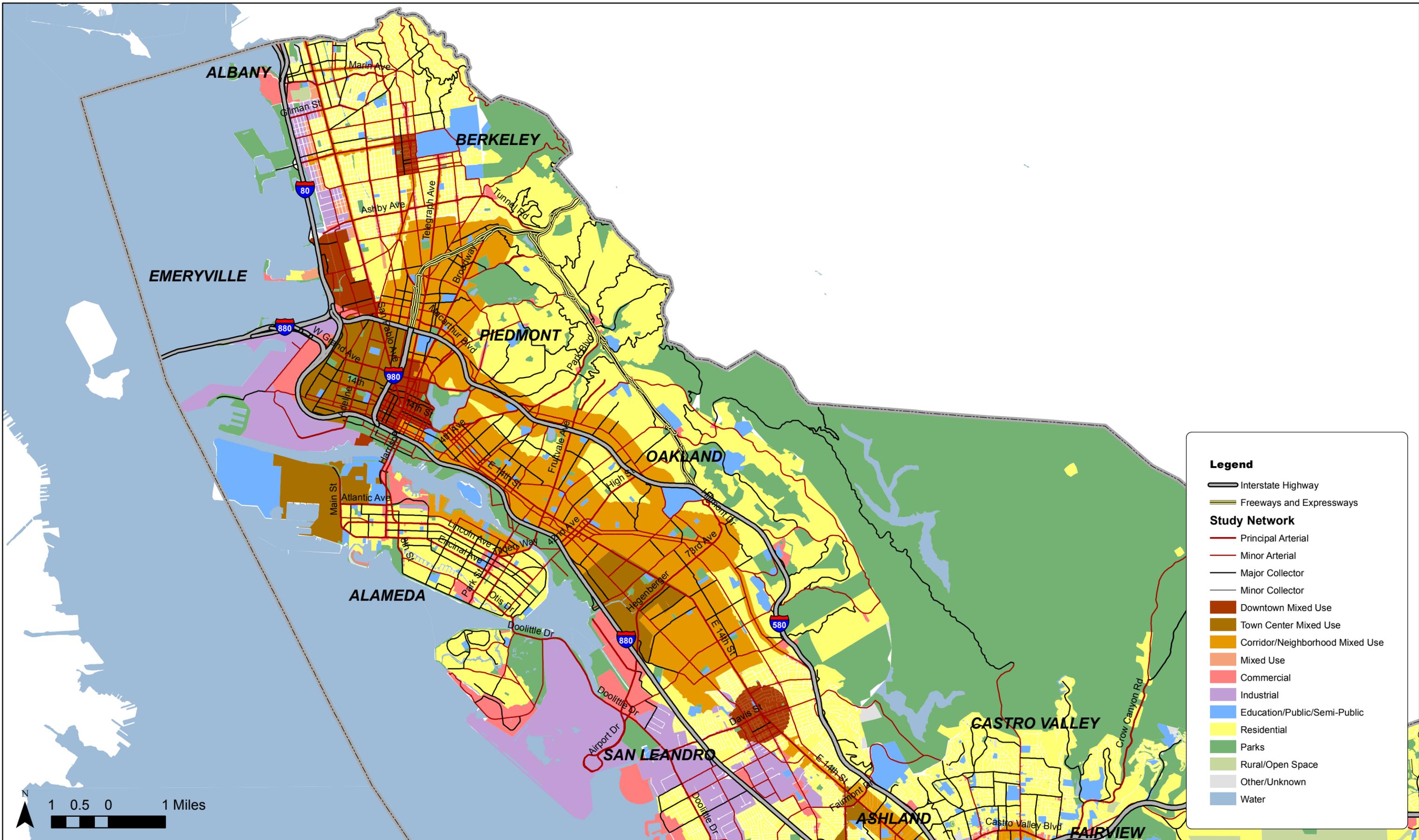
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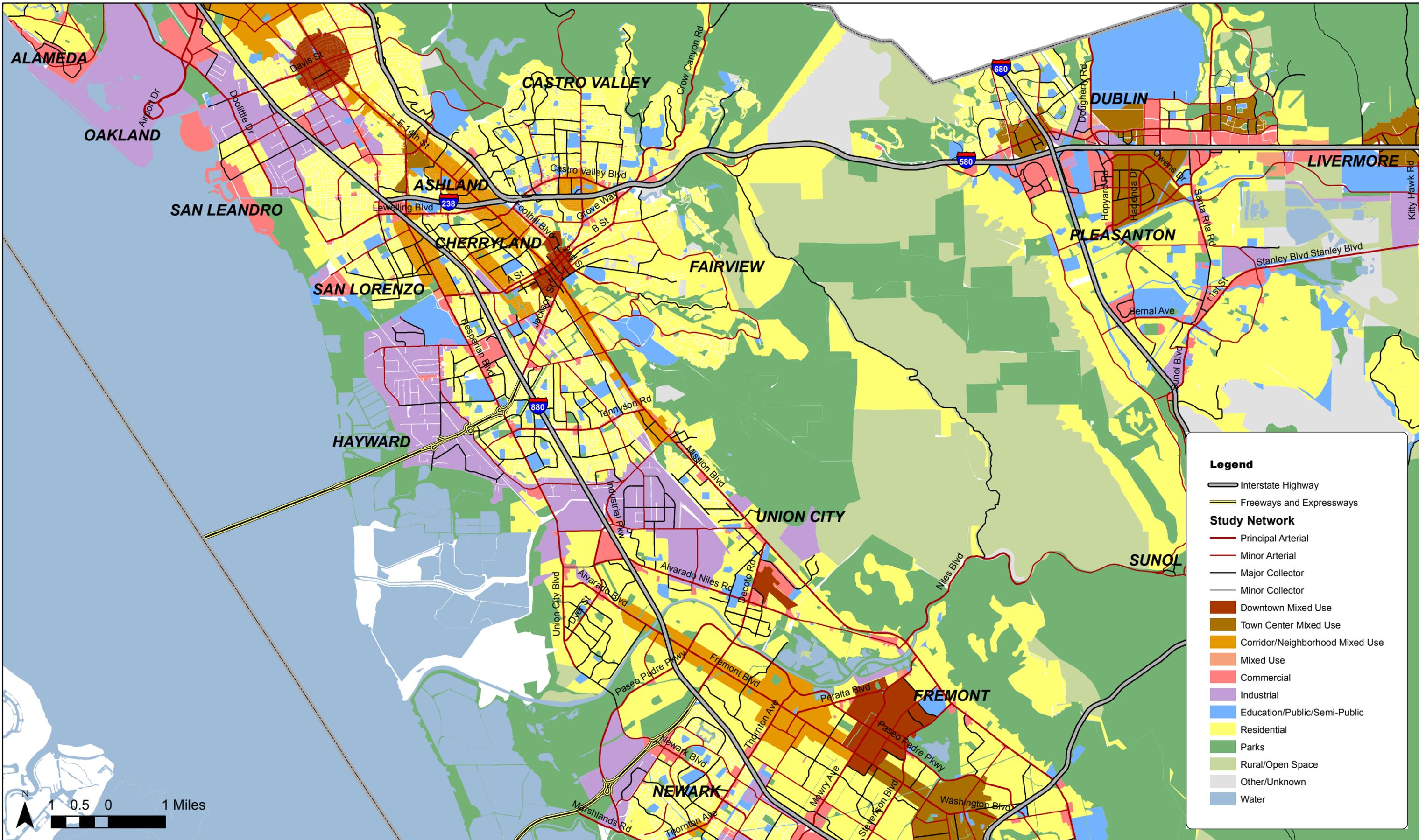
Comments Due

We request that your review and comments of proposed modal priorities be completed by May 8, 2015. If you have any issues accessing the GIS Server site, please contact Francisco Martin at 510-587-9422.

APPENDIX B: Updated Draft Land Use Context Type Maps







June 29, 2015

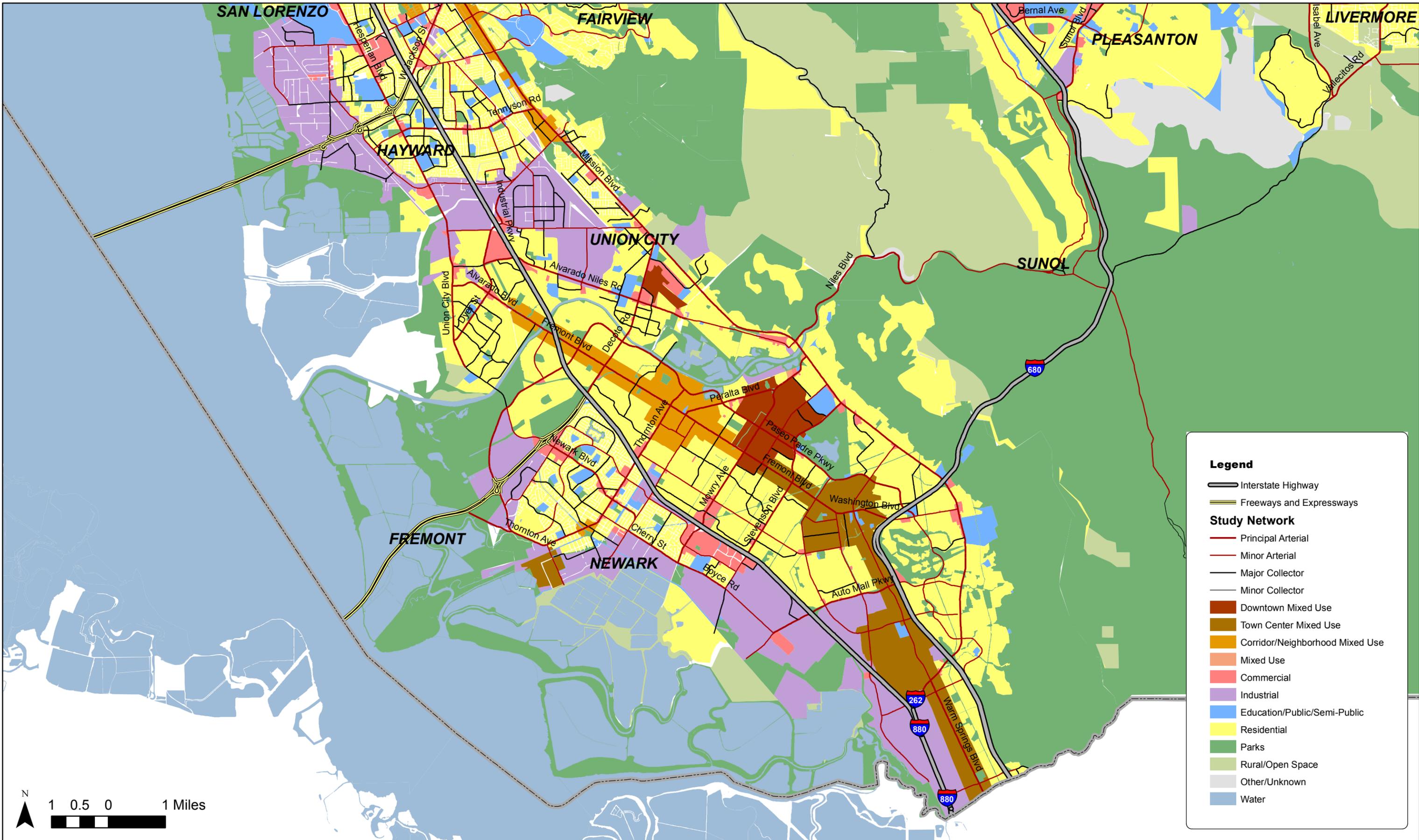
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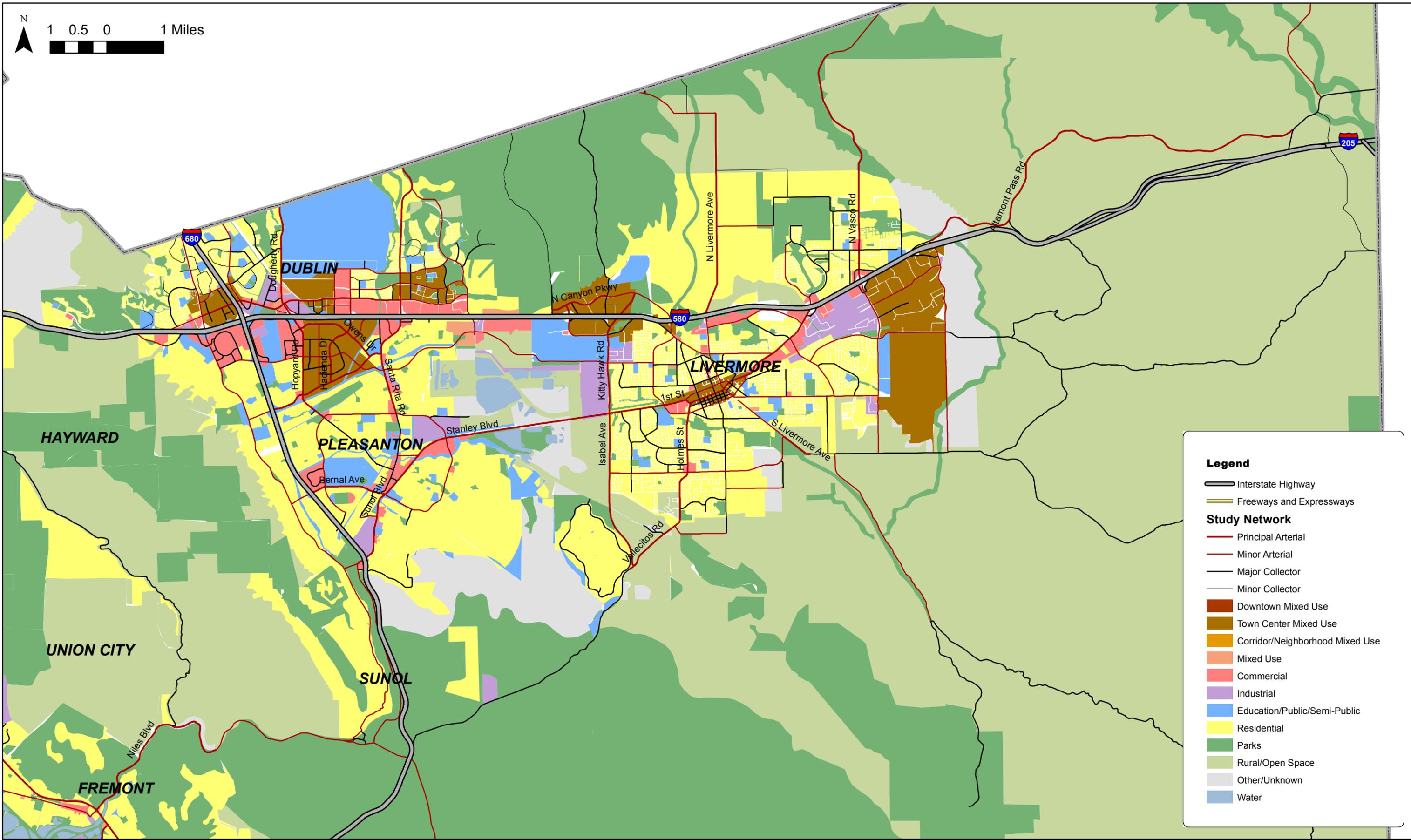
ACTC Multimodal Arterial Study Network

Appendix B - Land Use Context Type

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Central County

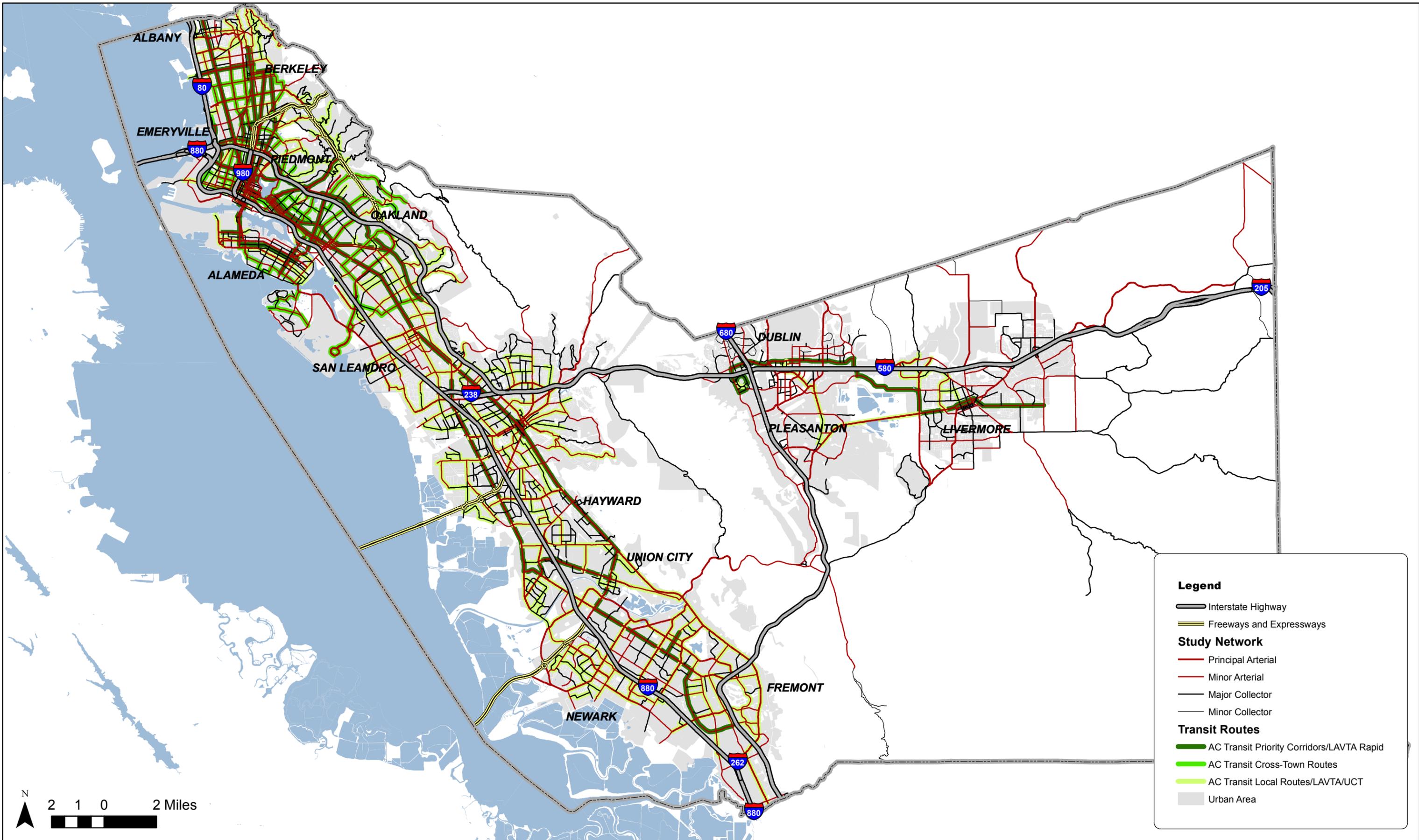


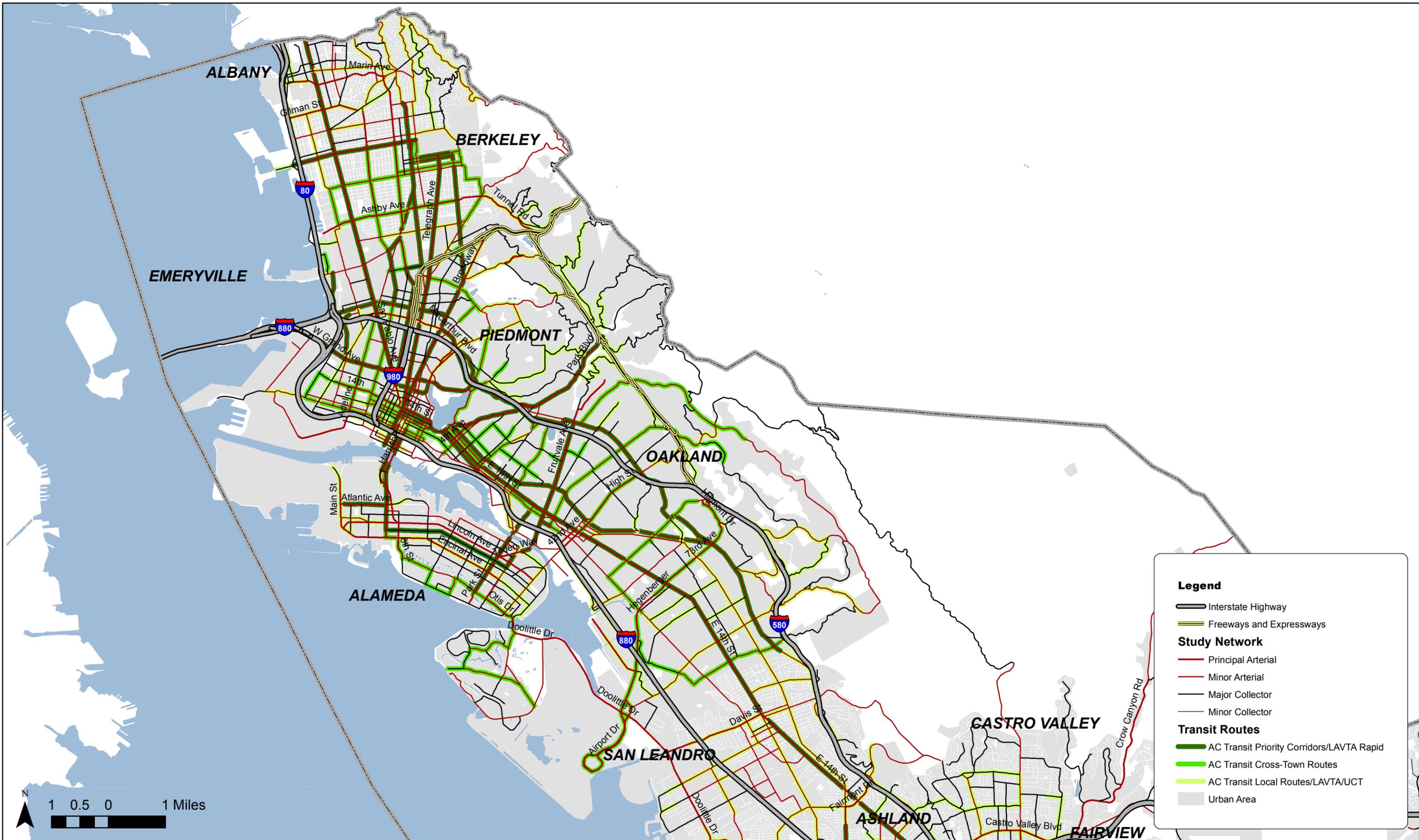


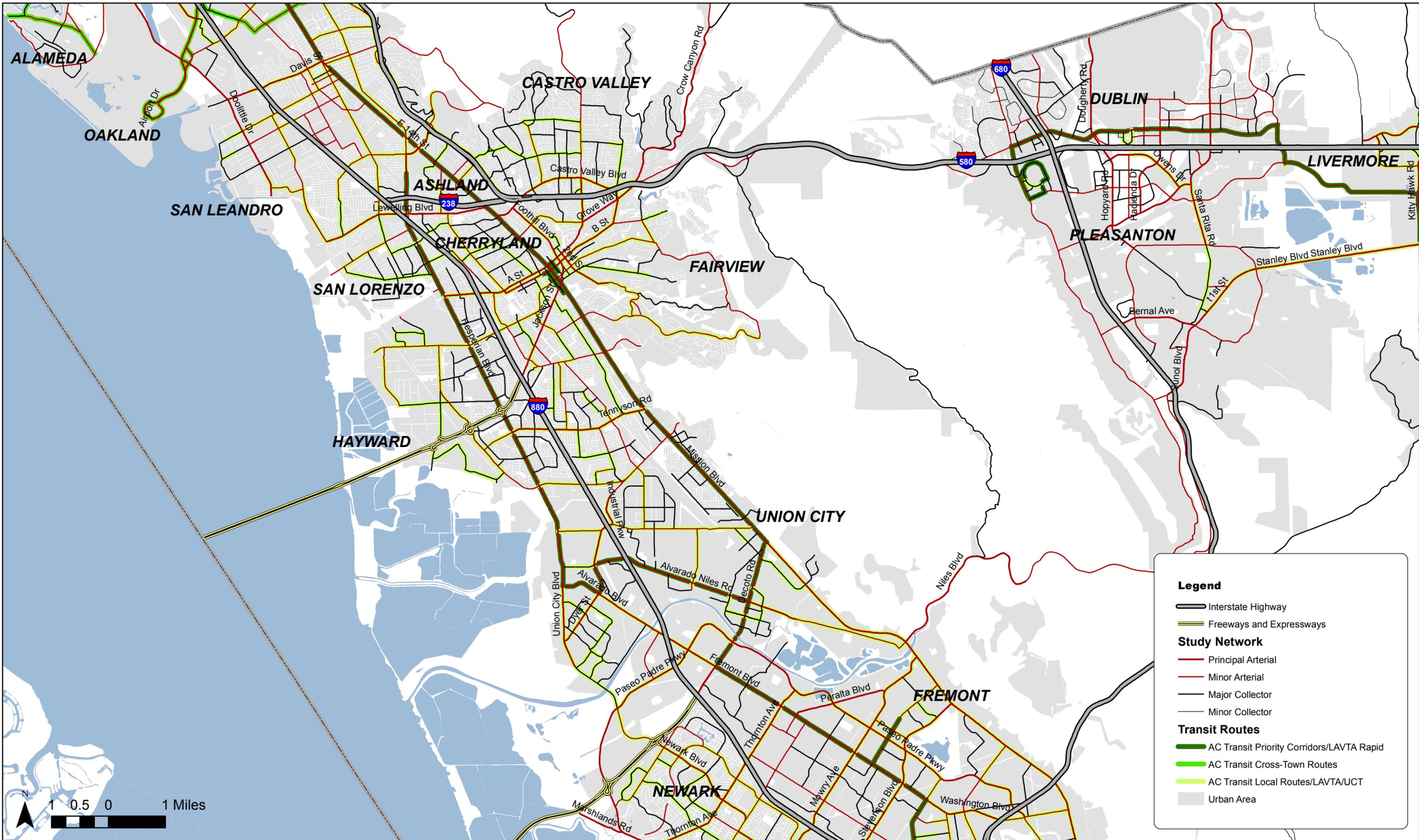
APPENDIX C: Updated Draft Base Street Type Maps

(will be posted prior to the meeting)

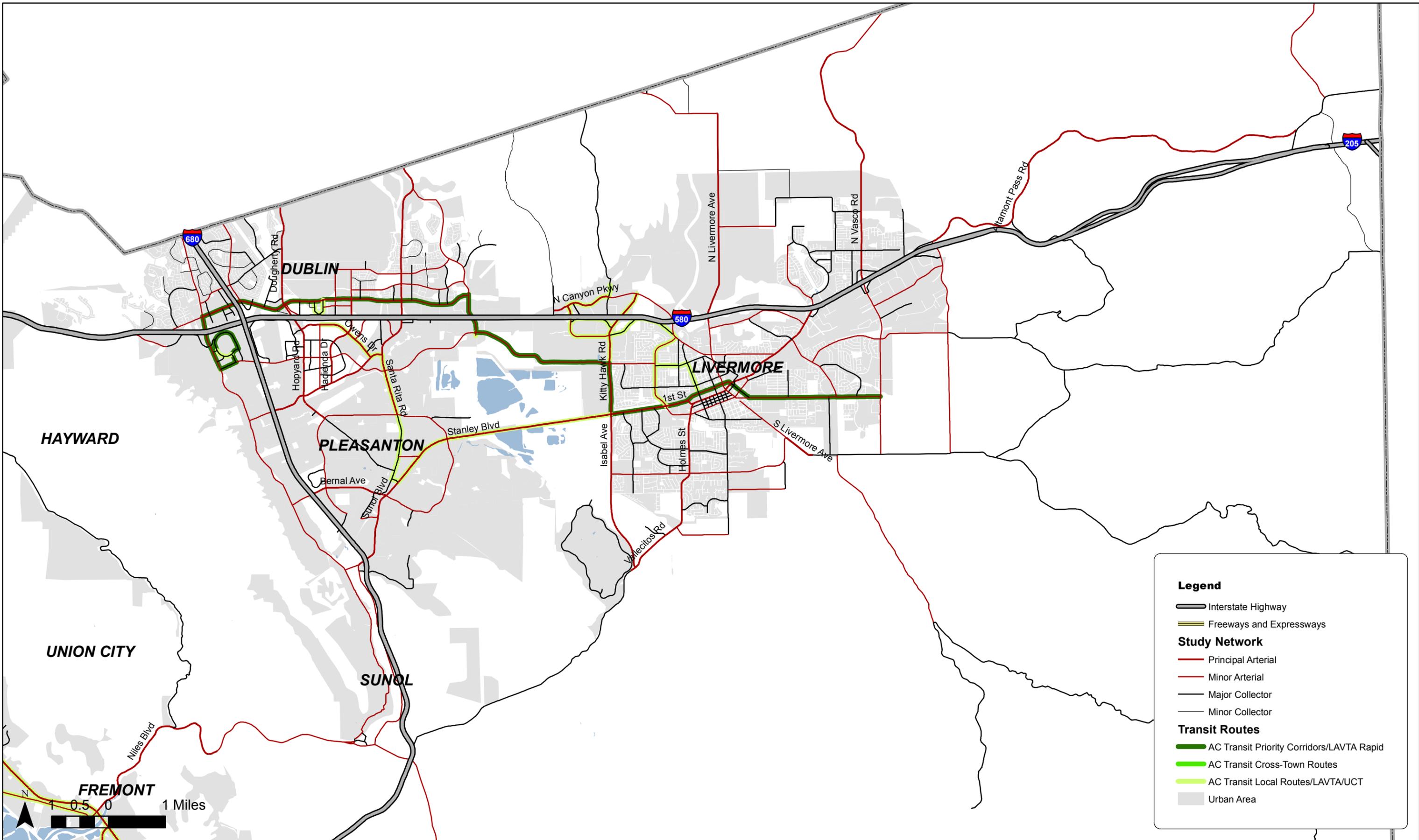
APPENDIX D: Updated Draft Transit Emphasis Maps



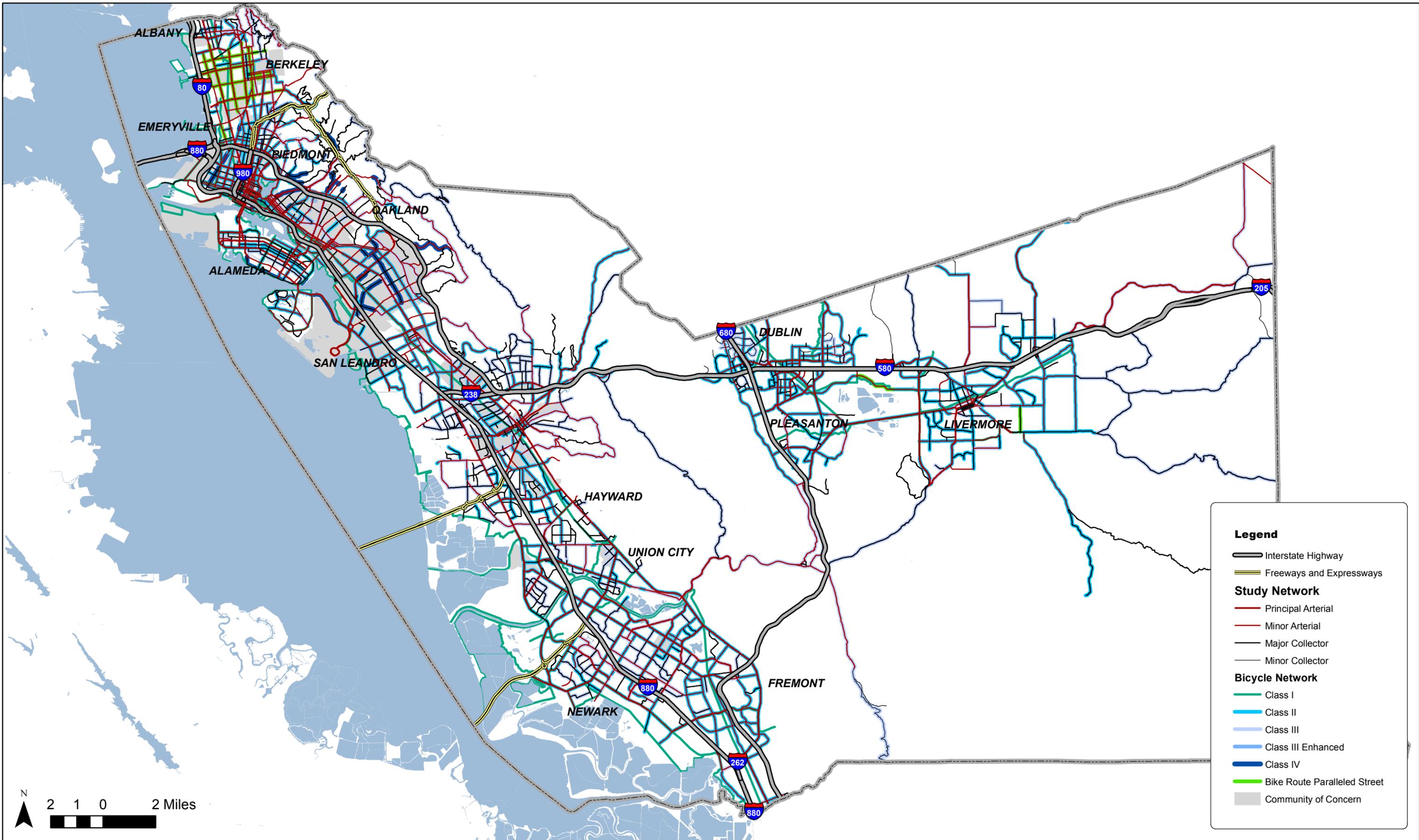


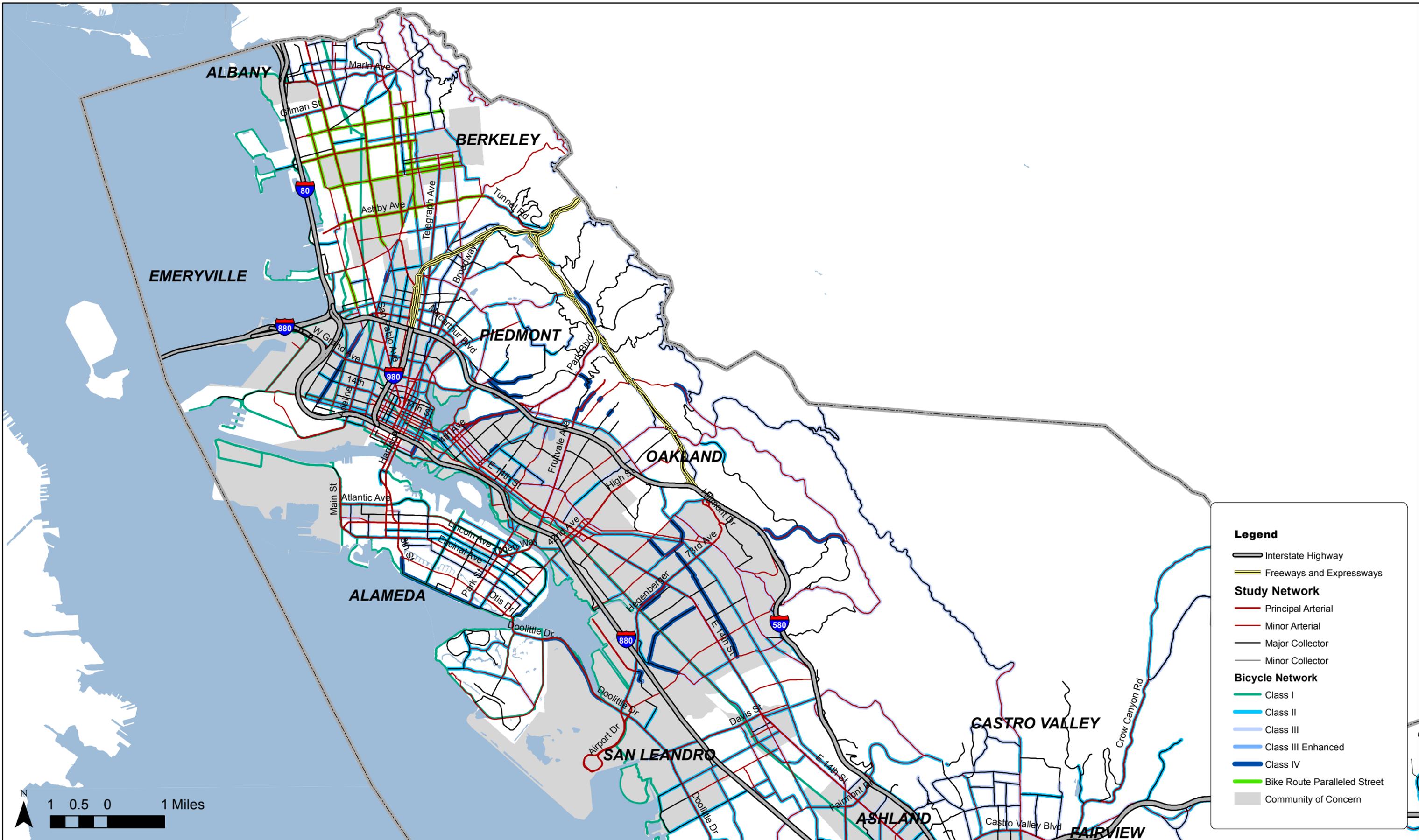






APPENDIX E: Updated Draft Bicycle Emphasis Maps





Legend

- Interstate Highway
- Freeways and Expressways
- Study Network**
- Principal Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- Bicycle Network**
- Class I
- Class II
- Class III
- Class III Enhanced
- Class IV
- Bike Route Paralleled Street
- Community of Concern



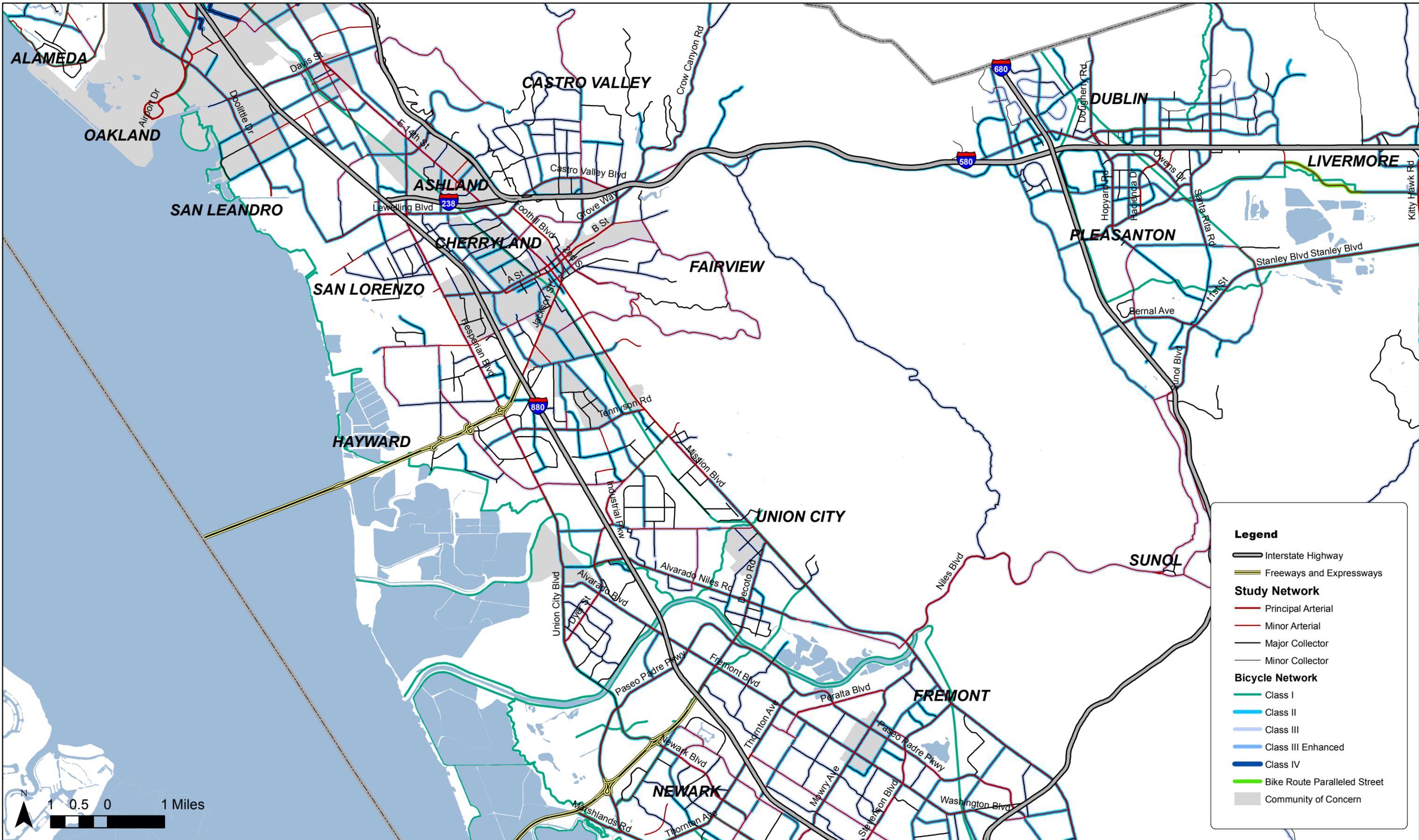
June 29, 2015

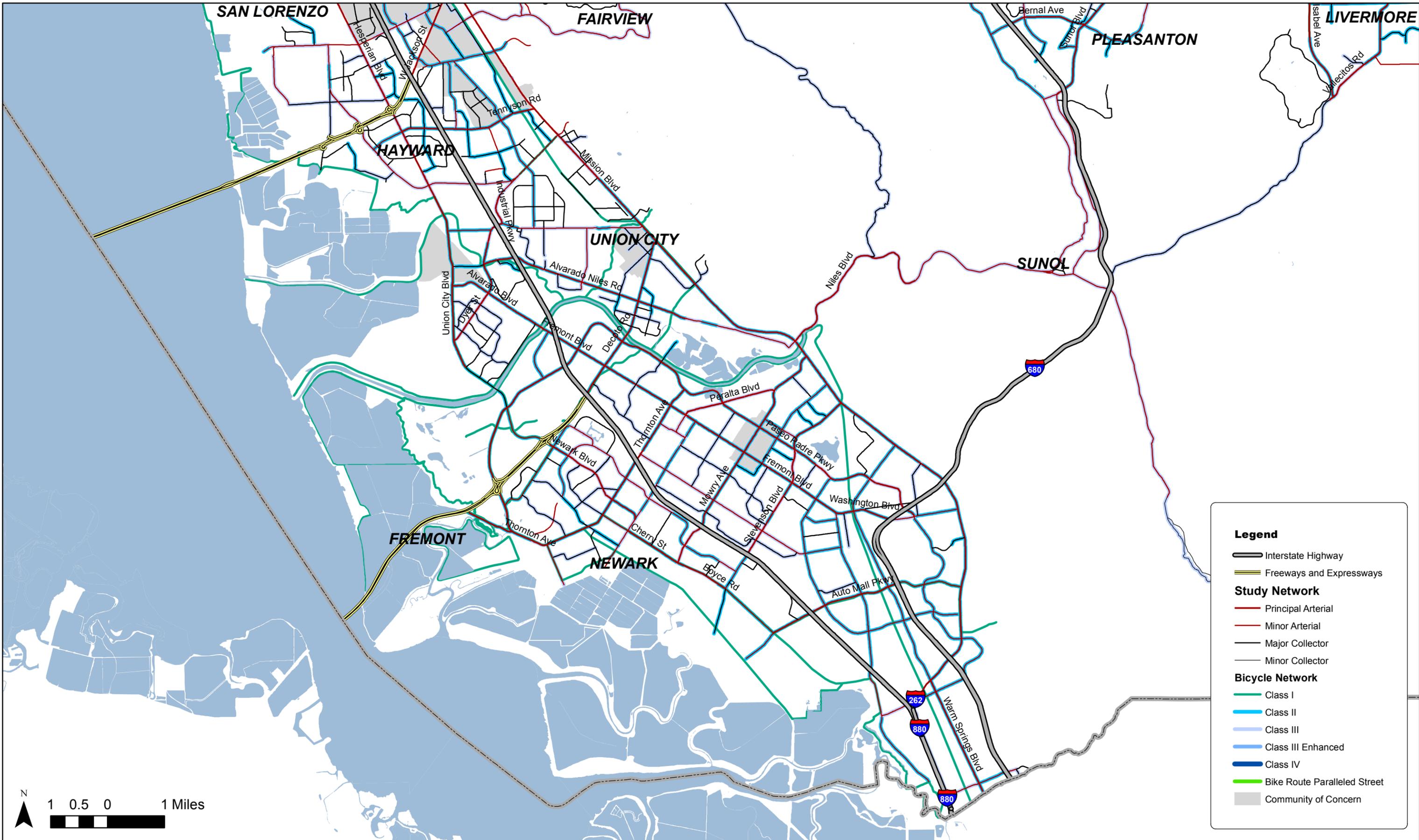
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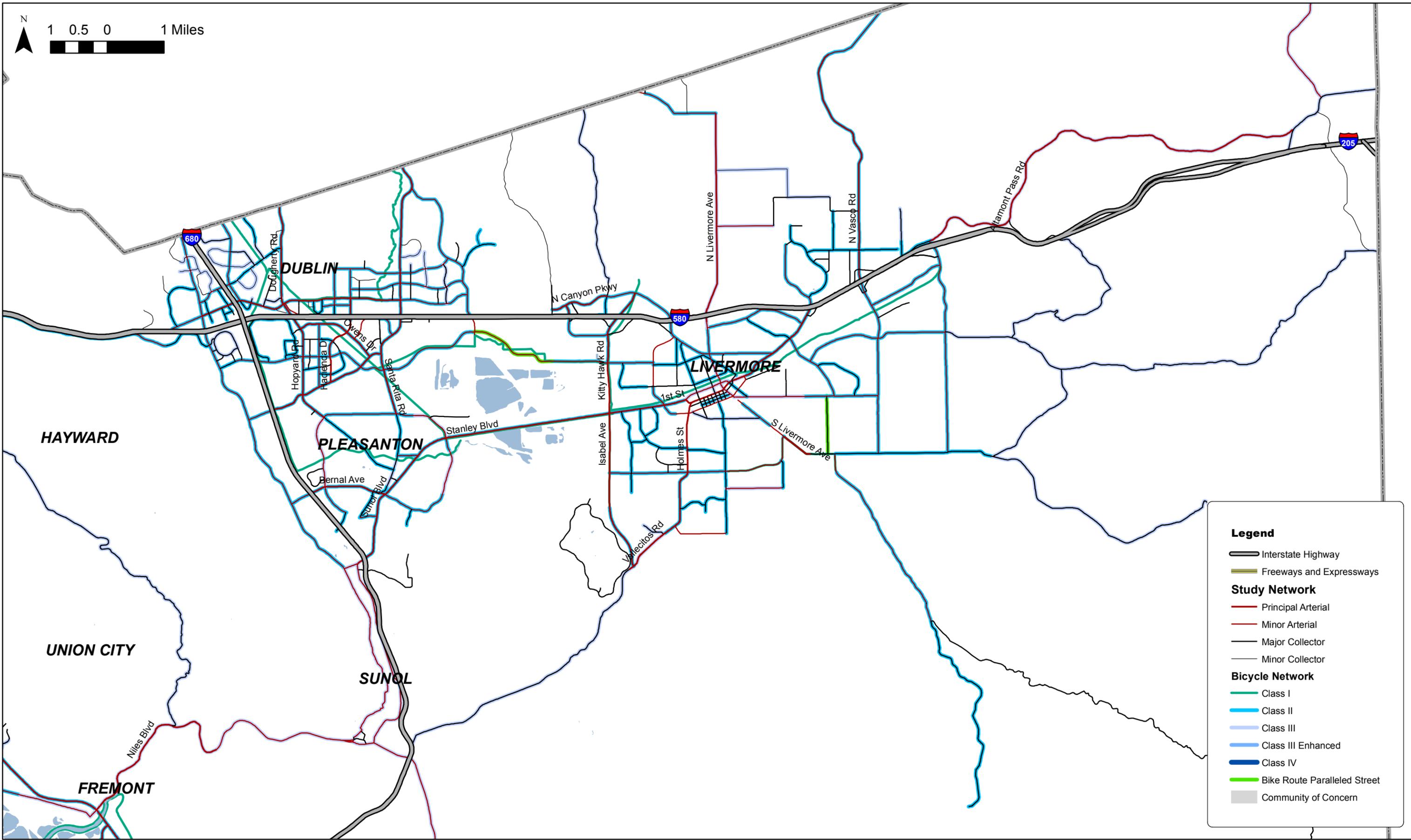
ACTC Multimodal Arterial Study Network

Appendix E - Bicycle Emphasis
Page 51

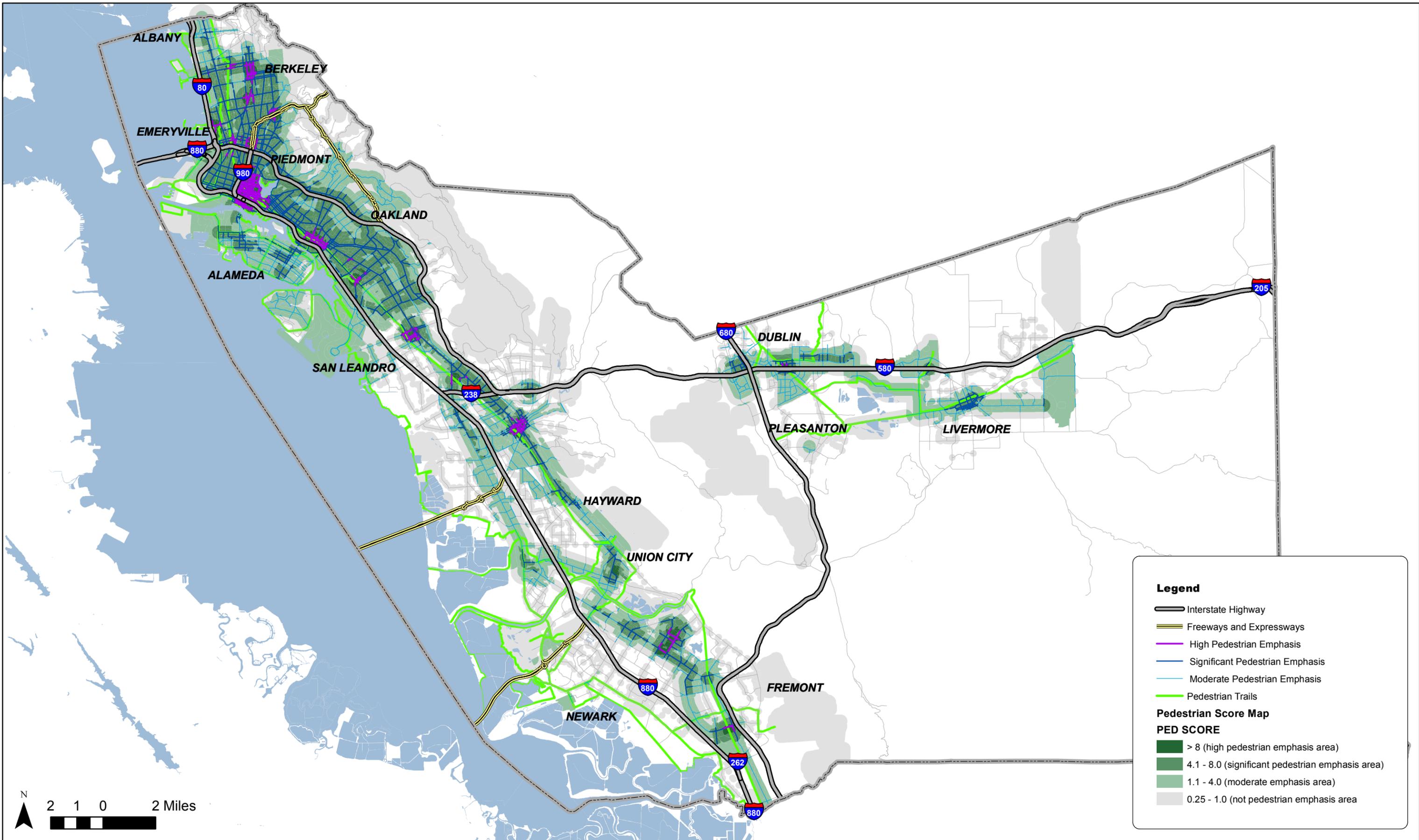
North County

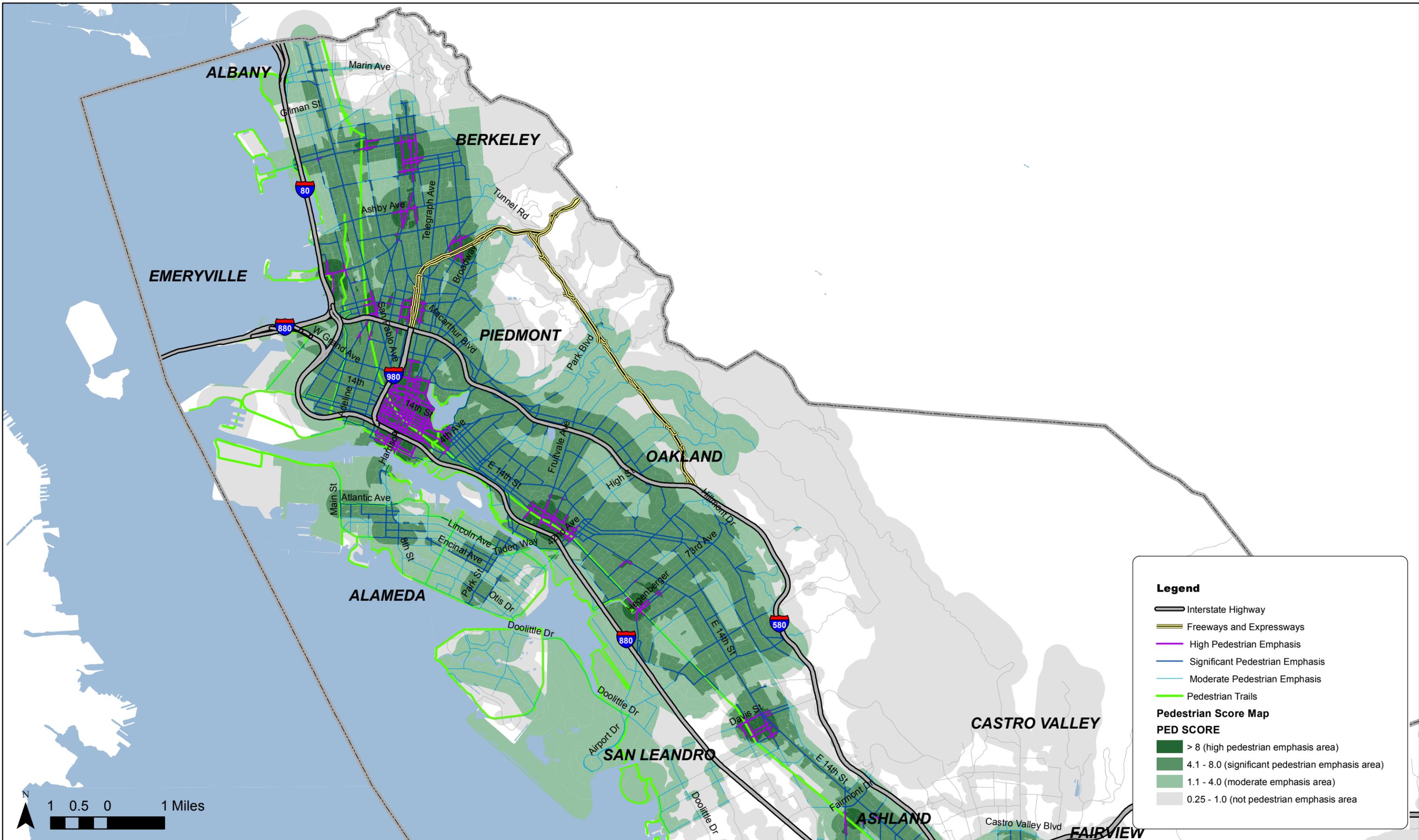


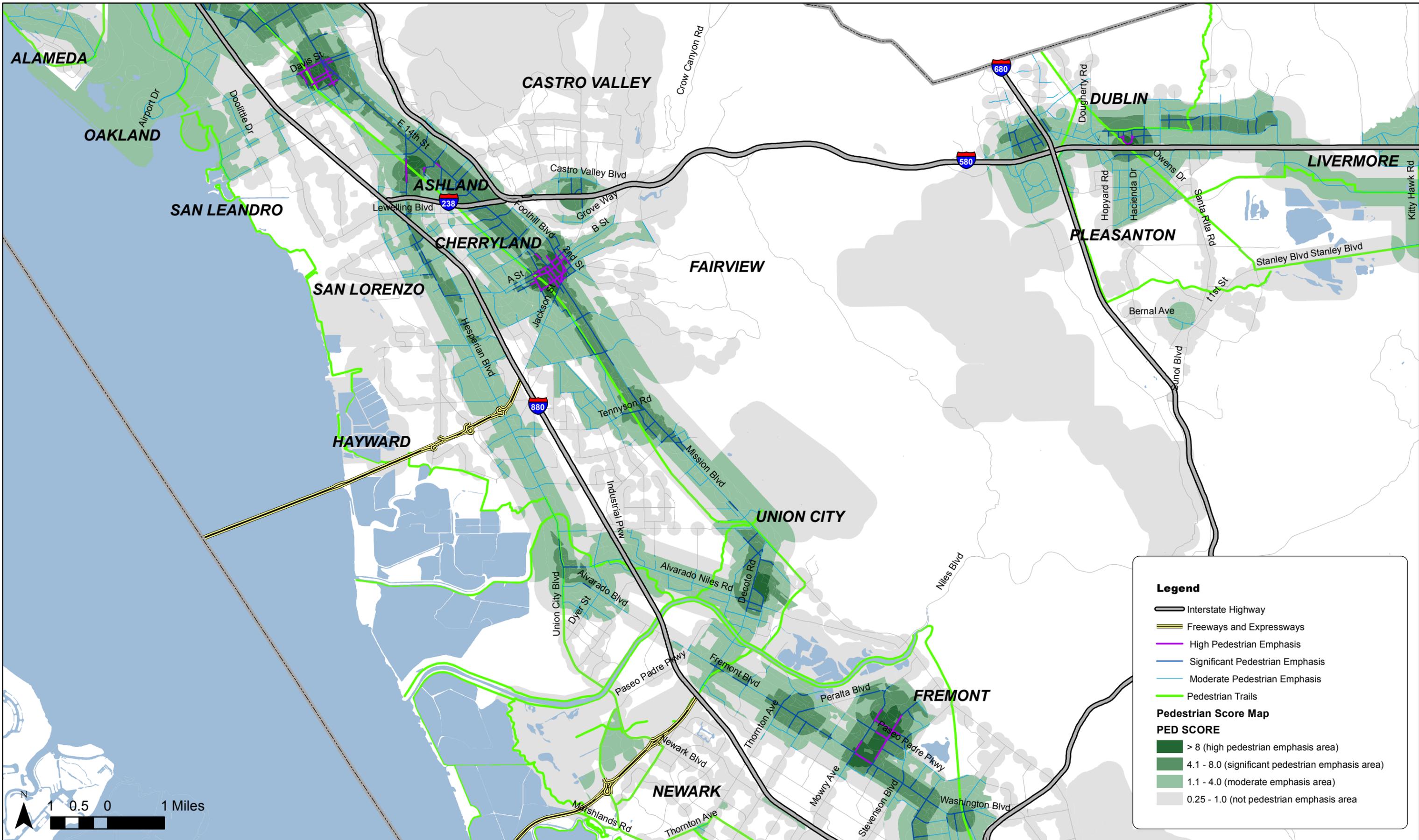




APPENDIX F: Updated Draft Pedestrian Emphasis Maps







June 29, 2015

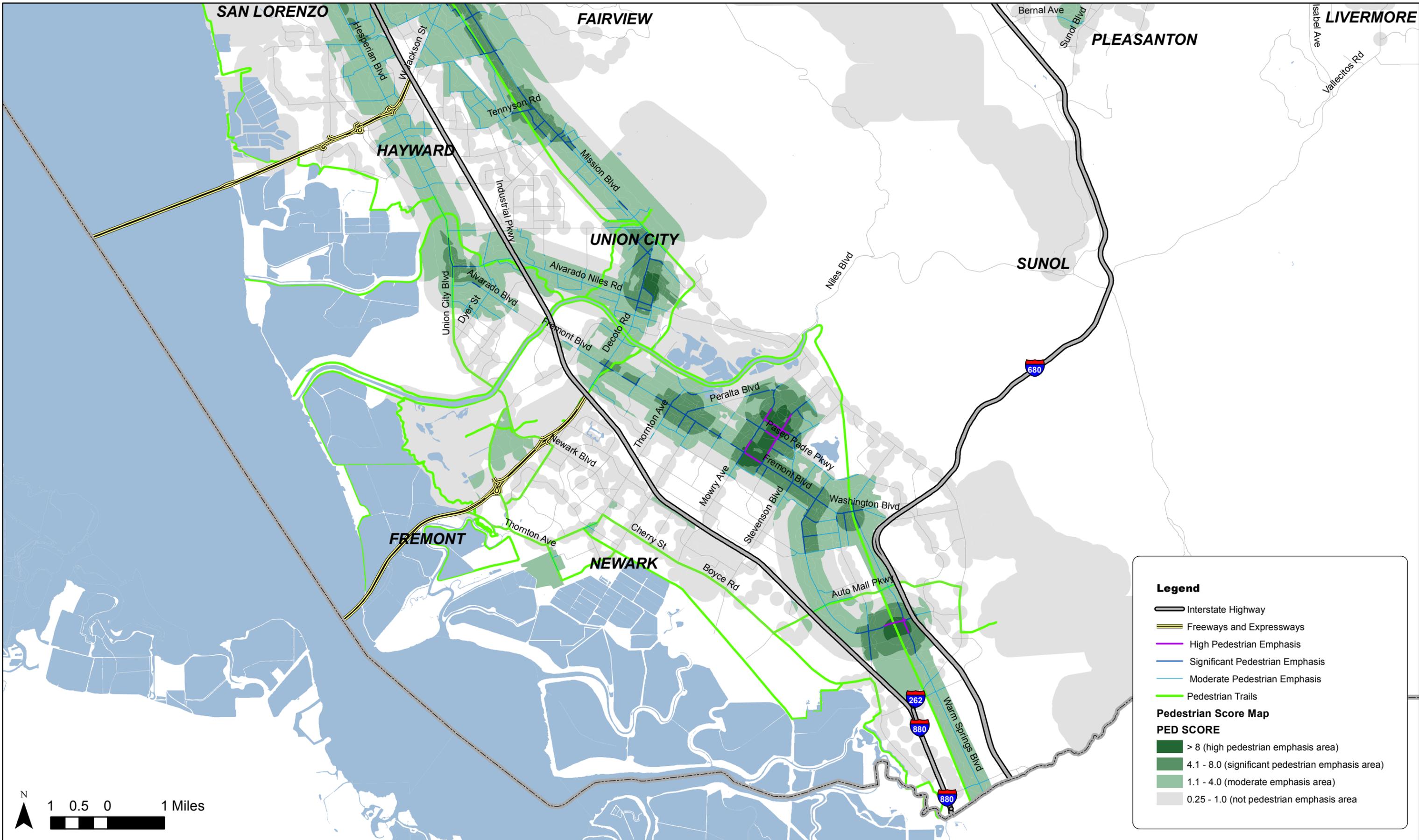
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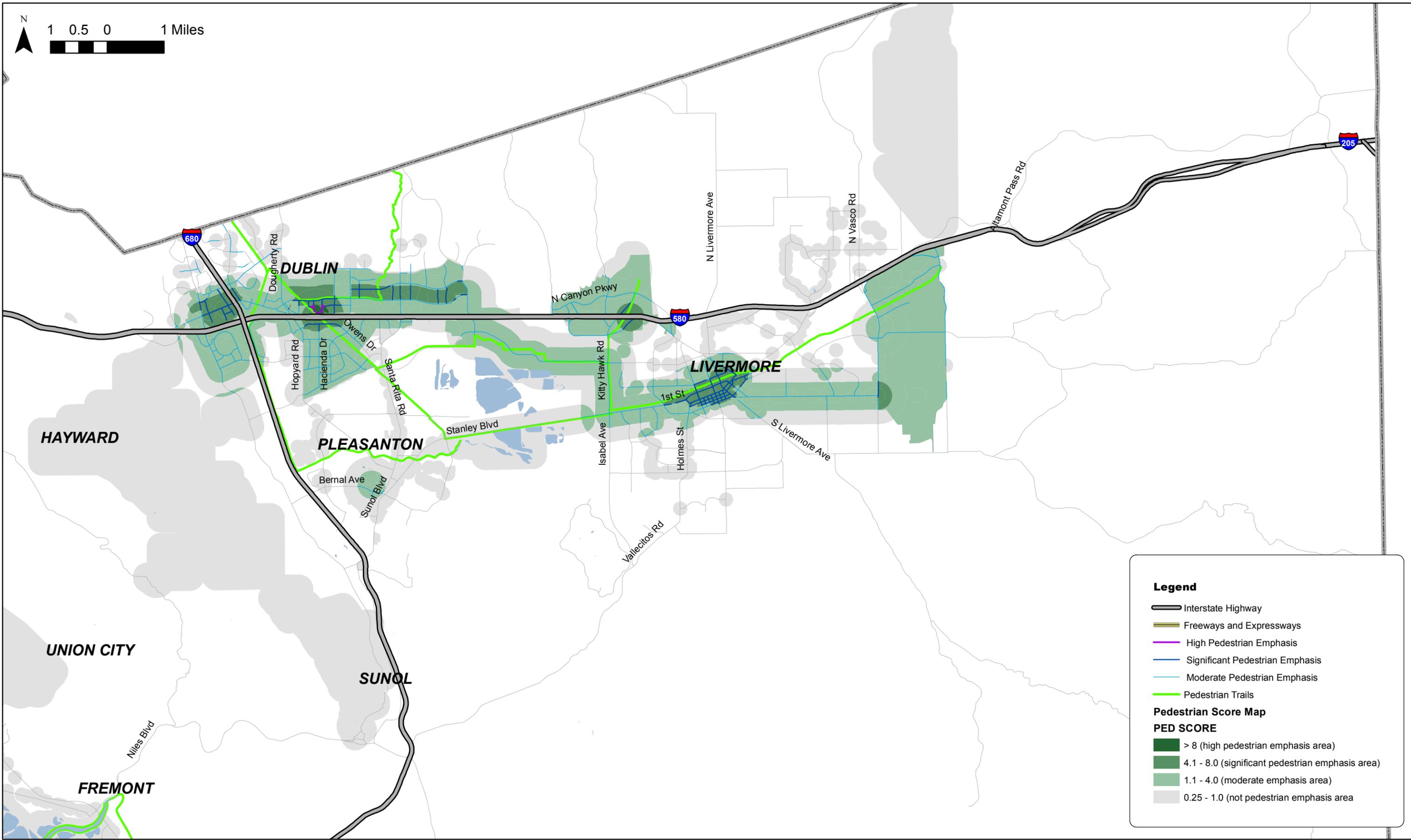
ACTC Multimodal Arterial Study Network

Appendix F - Pedestrian Emphasis

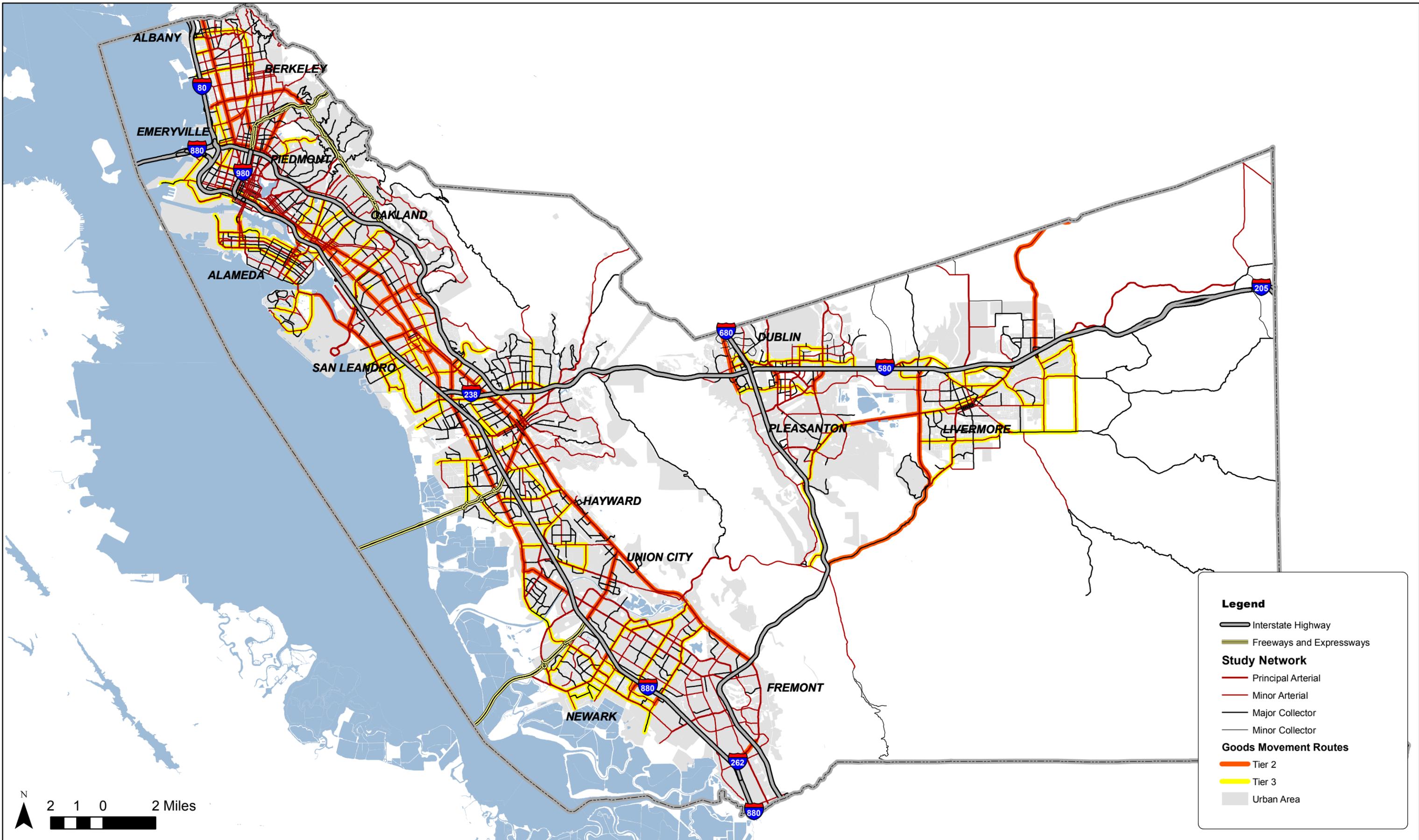
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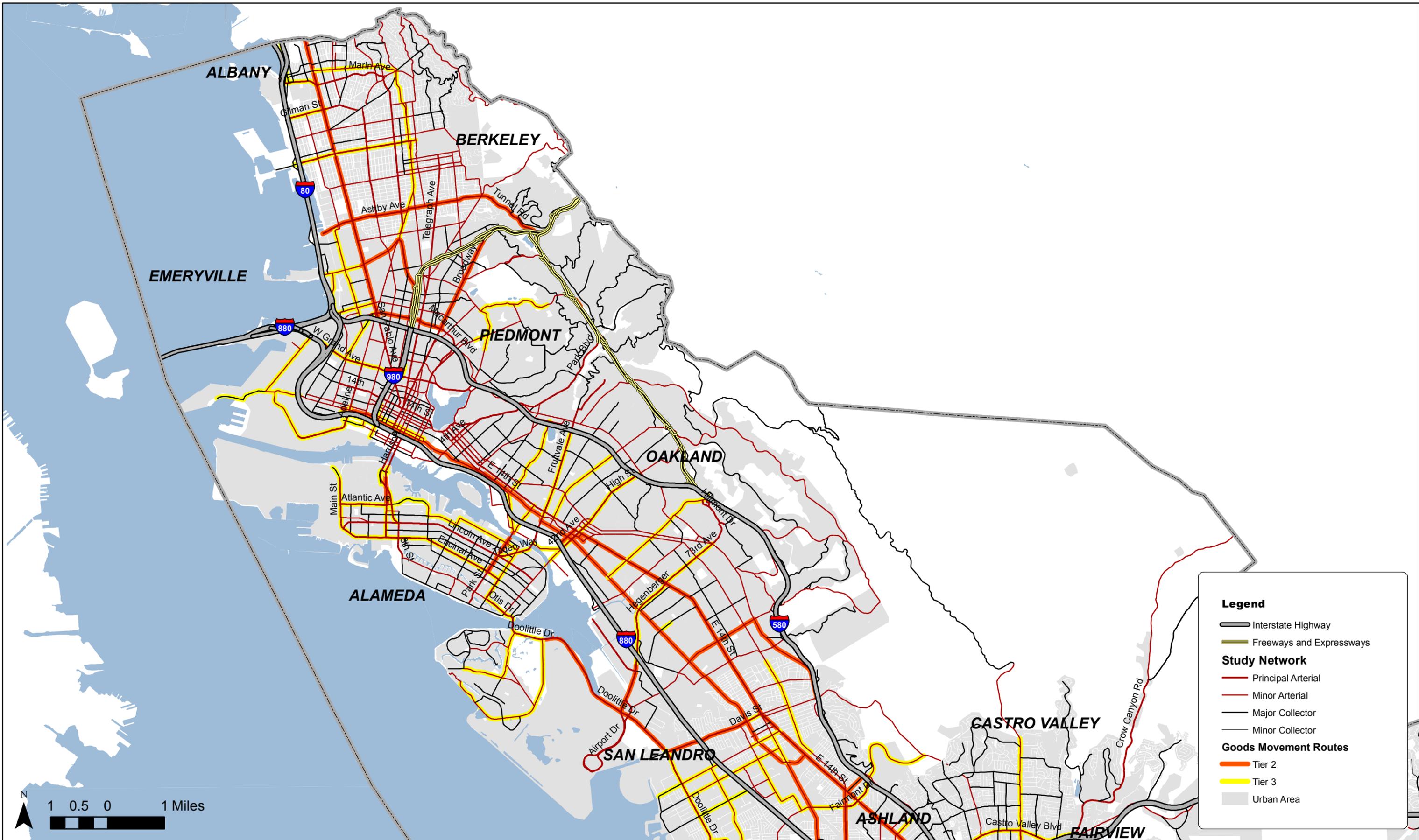
Central County

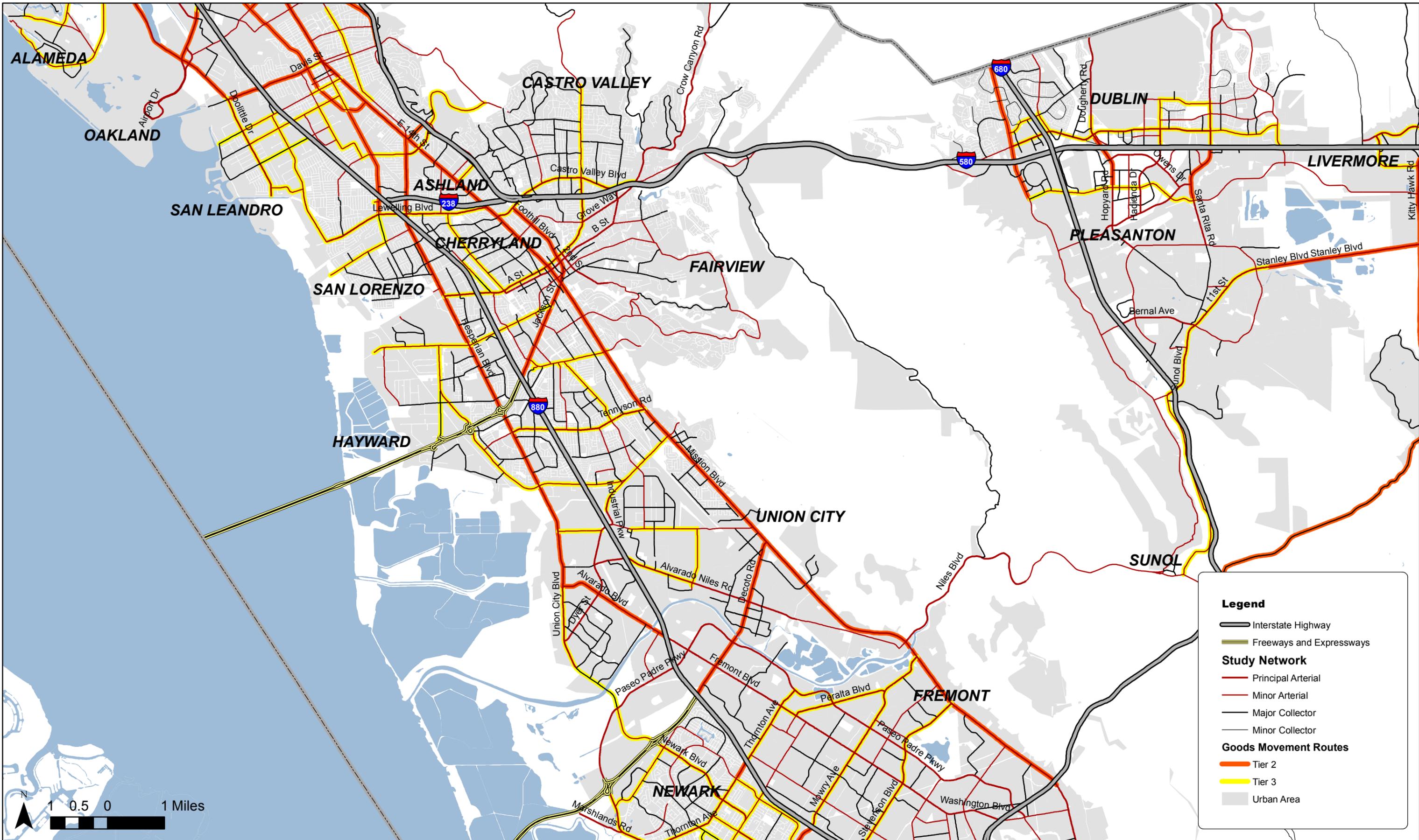


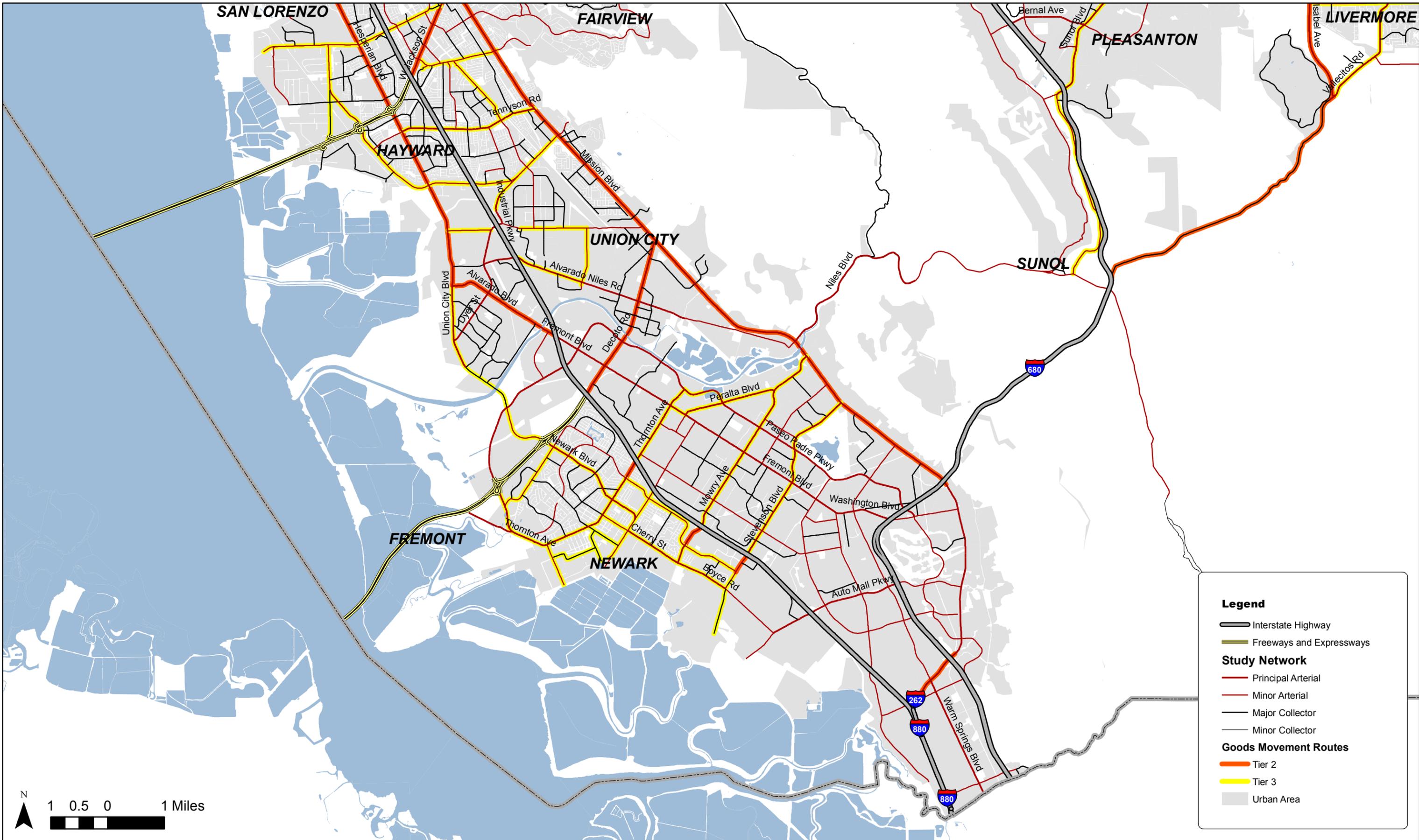


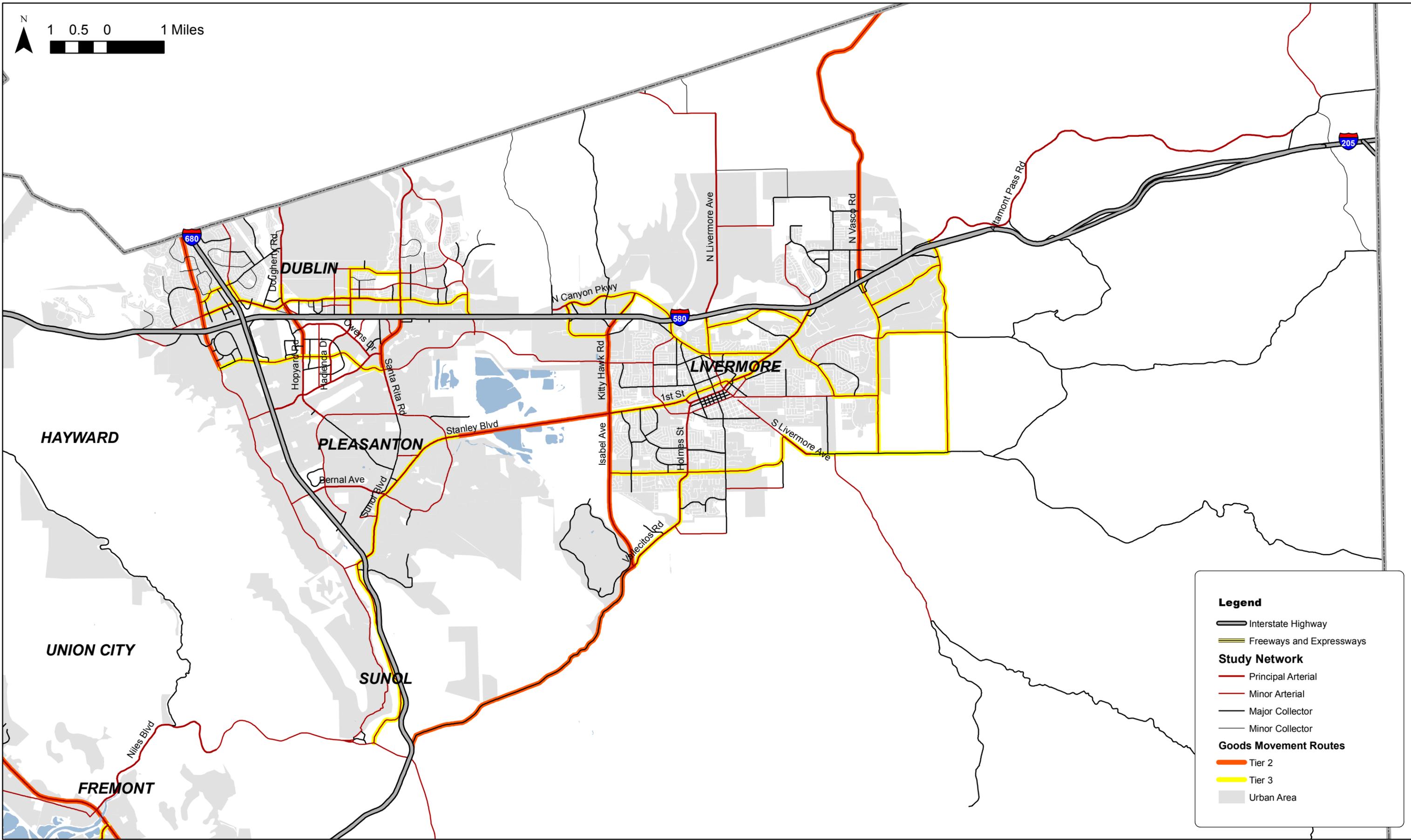
APPENDIX G: Updated Draft Goods Movement Network Maps











Legend

- Interstate Highway
- Freeways and Expressways
- Study Network**
- Principal Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- Goods Movement Routes**
- Tier 2
- Tier 3
- Urban Area

APPENDIX H: Updated Draft Street Typology with Layered Modal Emphasis Maps

(will be posted prior to the meeting)

APPENDIX I: Updated Draft Modal Priority Maps

(will be posted prior to the meeting)

APPENDIX J: Summary of Stakeholder Comments on Draft Arterial Street Typology and Modal Priority Framework Methodology and Responses

Appendix J - Countywide Multimodal Arterial Plan - Summary of Stakeholder Comments and Responses on Typology and Modal Priority Methodology

	Stakeholder	Category	Methodology Approach Comments	Comment Response
Methodology and Approach Comments				
1	Berkeley	Land Use	Land Use and PDAs - The City of Berkeley PDAs are generally confined to parcels fronting major corridors along San Pablo, University, Adeline, Shattuck and South Side/Telegraph. The exceptions are the Downtown and Southside areas which include a larger geography. Simply using the PDA's to reflect land use does not reflect adjacent streets, which support several modes of transportation for these avenues – these should be considered part of the corridor.	The PDA land use designation has two effects on street typology. First, it defines land use context condition fronting onto streets that are part of the Study Network, this is not affected by the depth of the PDA and does not require a change in methodology. Second, PDAs affect Pedestrian Emphasis scoring and project team is proposing that commercial mixed use zoning designations be given a higher Pedestrian Emphasis score and include an 1/8 mile buffer around those zones. This method was applied to similar zoning designations Countywide.
2	Berkeley	Pedestrian	Pedestrian Performance Measures - The City of Berkeley recommends that Population and Employment Density from US Census data be included as part of the typology or performance measures in classifying pedestrian and transit impact areas.	Density is already represented by proximity to transit, employment opportunity areas and activity centers in the pedestrian score. Adding any additional layers will intensify complexity for the Multimodal Arterial Plan, which is a countywide plan. Further adding higher Pedestrian Emphasis score for commercial mixed use zoning designations discussed earlier and including an 1/8 mile buffer around those zones will enhance the sensitivity of the Pedestrian Performance Measures to population and employment density. This method was applied to similar zoning designations Countywide to achieve a result that is similar to the method described in Berkeley's comment.
3	Berkeley	Bike	<p>Bicycle Performance Measures - Class I bikeways that are not associated with an arterial roadway are not included. However, they serve as bicycle and pedestrian arterials providing regional connectivity between Alameda and Contra Costa County cities.</p> <p>As defined, the arterial corridors do not include the “arterial” bikeway network within Berkeley, i.e. our Bicycle Boulevards. This could be resolved in two ways:</p> <ul style="list-style-type: none"> • ACTC should consider adding a proximity buffer along arterials to capture arterial corridor-serving bikeways such as parallel bike blvds. • The arterial bikeway evaluation should include major bikeway intersections; in Berkeley these are critical bikeway improvements along arterials where bike blvds cross them; in other cities they will be “protected intersections” where arterial Class IV Cycle tracks cross other arterials. <p>According to City of Berkeley’s recent Bicycle Plan update public survey, the current bikeway hierarchy listing is incorrect when attempting to address the needs of people riding bikes. The current hierarchy is:</p> <ul style="list-style-type: none"> o Class I pathway o Class IV cycle tracks o Class II bike lanes o Class III enhanced bicycle boulevard o Class III bike route <p>According to our bike plan update survey, Berkeley residents identified the following preferred hierarchy in serving their needs:</p> <ul style="list-style-type: none"> o Class IV cycle tracks o Class I pathway o Class III enhanced bicycle boulevard o Class II bike lanes o Class III bike route 	Although most Class I facilities do not travel within the arterial right-of-way, Class I facilities are accounted for in the bike emphasis overlay map. The GIS Cross-Sectional tool will consider Class I facilities, in addition to bike boulevards and parallel bike facilities that are not on the Study Network, in the needs assessment. These non Study Network facilities will be included in the maps as markers and the GIS Cross Sectional Tool will consider parallel bike facilities within a certain buffer from a Study Network segment, this consideration will be made in the needs assessment evaluation, which will therefore influence recommended improvements. The bikeway designations and hierarchy included in the Draft Typology and Modal Priority memos will now include the addition of the enhanced Class II and class III bicycle facility designation. In view of the recent legislative mandate (AB 1193 signed into law in September 2014) that added an additional class and provided emphasis for the protected bike lanes, enhanced class II and enhanced class III bicycle facilities that provide more protection for bicyclists over the other classes were also added to the highest emphasis for bicycles and to have the same priority as Class I and IV. Therefore, in regards to the modal priority approach, enhanced Class II and Class III bike facilities were given the same priority as Class I and Class IV facilities.

Appendix J - Countywide Multimodal Arterial Plan - Summary of Stakeholder Comments and Responses on Typology and Modal Priority Methodology

	Stakeholder	Category	Methodology Approach Comments	Comment Response
4	Oakland	Modal Priority	Does it make sense to rank modes 1-5 on every street? In many cases there are likely to be shared priorities that are of equal weight	The approach for identifying recommended improvements pivots off of the modal priority list. It is requested that all jurisdictions inform the modal priority list, which generally ranks modes in in order of highest priority to lowest priority. We acknowledge that some Study Network segments may have equal priorities for multiple modes, however we do request each jurisdiction identify the modal priority from a 1 through 5 ranking by mode. This approach allows the GIS Cross-Sectional tool to evaluate the needs assessment and recommended improvements at a Countywide level based on the modal priority list. However, the modal priority list methodology does not automatically preclude identifying improvements for lower priority modes. The primary priority mode will be given highest preference when assessing needs and potential improvements. Secondary, tertiary, quaternary, and quinary modes will be given preference only if right-of-way is available to accommodate additional modal improvements; and will consider if parallel facilities are present or can be provided to address the bicycling mode. Therefore, if two modes have equal priorities, we request that each jurisdiction continue to identify the single top modal priority; given the needs assessment approach, it's likely that improvements will also be identified for the second modal priority and potentially for other lower priority modes.
5	Oakland	Modal Priority	Pedestrians should be the highest priority in Oakland neighborhood commercial districts. These include (but aren't limited to): Piedmont, College, Grand, Lakeshore, parts of MacArthur, Telegraph, International.	The consultant team coordinated with City of Oakland staff to identify the preferred modal priority list for specific roadway segments within Oakland neighborhood commercial districts. These changes were made to the modal priority maps.
6	Oakland	Modal Priority	Almost no streets have bicycles as the first or second priority. This is a problem, particularly on bicycle boulevards (which were only included in the plan because they are bicycle priorities!) as well as local transit streets or residential streets (eg, West, Adeline)	City of Oakland provided a detailed bikeway network for the city. this GIS map layer will be incorporated into the Countywide Arterial Plan mapping work, which will influence bicycle priority throughout the City of Oakland. Bicycle boulevards are generally on streets that are not part of the Study Network, however, bike facilities not part of the Study Network will be incorporated into the bike emphasis maps as markers. The GIS Cross Sectional Tool will consider parallel bike facilities not on the Study Network but that are within a certain buffer from a Study Network segment, this consideration will be made in the needs assessment evaluation, which will therefore influence recommended improvements.
7	Oakland	Modal Priority	There doesn't seem to be much consideration for network connectivity. Some streets (eg, 14th Ave switch from pedestrian to transit to bicycle priority within a few blocks).	The consultant team coordinated with City of Oakland staff to identify the preferred modal priority list for specific roadway segments within Oakland. These changes were made to the modal priority maps. Network connectivity checks will be made later in the Arterial Plan development process, when evaluating recommended improvements by mode. During the network connectivity evaluation, we will provide greater consideration for continuous modal networks within each jurisdiction, the goal is to identify recommended improvements that help provide a Complete Streets network for the five major travel modes.
8	Oakland	Modal Priority	The designation of a street as a Class II bike lane should not always mean a lower priority. In many cases, Class II bicycle facilities are critical network components (many are part of the Countywide Bicycle Plan for instance)	The consultant team coordinated with City of Oakland staff to identify the preferred modal priority list for specific roadway segments within Oakland neighborhood commercial districts. These changes were made to the modal priority maps.

Appendix J - Countywide Multimodal Arterial Plan - Summary of Stakeholder Comments and Responses on Typology and Modal Priority Methodology

	Stakeholder	Category	Methodology Approach Comments	Comment Response
9	Oakland	Base Street Type	It does not appear that freeway access to downtown Oakland results in any streets with an auto priority. This seems like a potential issue given the importance of these streets for getting people in/out of downtown	City of Oakland staff provided suggested revisions to base street types and modal priorities to be consistent with the ongoing Oakland Complete Streets project. Consultant team revised the maps as necessary based on suggested revisions by Oakland staff.
10	Oakland	Modal Priority	Some of the high priority truck routes don't seem to correspond with areas where we would typically encourage or expect high truck volumes (eg, West MacArthur, Upper Broadway, 7th St in downtown)	Goods movement/truck priority is based on the three tier Goods Movement network developed by the Countywide Goods Movement Plan consulting team. We verified with city staff the goods movement network and make changes as necessary within Oakland.
11	Oakland	Base Street Type	Generally, I know that it is a huge task to develop a single system for the entire county but several of these issues are fairly substantial so I hope that we can address them	We are in the process of addressing these issues.
12	Oakland	Modal Priority	Modal Priority Memo Table 1 - Pedestrians (not transit) should have highest priority in the land use types listed on the left-most columns.	Several cities have commented that they have pedestrian-oriented main streets or commercial districts that were not emphasized to the degree that they would expect or desire, and adjustments to the Pedestrian Emphasis overlay have been made to correct for these comments. Pedestrian emphasis scoring method was changed to provide an evaluation within an eighth-mile buffer around the areas zoned for commercial main street use. This was done to reflect the higher levels of pedestrian activity in areas around main streets both from patrons parking adjacent to the main street and from local residents and employees walking to the services on the main streets. The changes made to the pedestrian emphasis layer resulted in greater pedestrian priority in the vicinity of main streets or commercial districts. In addition, City of Oakland staff coordinated with consultant team to specify preferred modal priorities along study segments within Oakland, this work was done as part of the ongoing Oakland Complete Streets project.
13	Oakland	Modal Priority	Modal Priority Memo Table 1 - Why are bicycles/pedestrians lower priority for land uses in middle column? Why are pedestrians the lowest priority in mixed-use or commercial areas?	Bicycles and pedestrians are given higher priority within PDA place types (column 1 of Table 2) than the SCS land use types (column 2 of Table 2) because the PDA place types represent more urbanized commercial/residential/employment districts with higher priority given to non-auto modes; the SCS land use types in column 2 of Table 2 are more typical of suburban areas with higher priority given to auto modes over pedestrian/bicycle modes. Based on comments received on the pedestrian emphasis overlay, the pedestrian emphasis scoring method was changed to provide an evaluation within an eighth-mile buffer around the areas zoned for commercial main street use. This was done to reflect the higher levels of pedestrian activity in areas around main streets both from patrons parking adjacent to the main street and from local residents and employees walking to the services on the main streets. The changes made to the pedestrian emphasis layer resulted in greater pedestrian priority in the vicinity of main streets or commercial districts. In addition, City of Oakland staff coordinated with consultant team to specify preferred modal priorities along Study Network segments within Oakland as part of the ongoing Citywide Complete Streets Plan development.

Appendix J - Countywide Multimodal Arterial Plan - Summary of Stakeholder Comments and Responses on Typology and Modal Priority Methodology

	Stakeholder	Category	Methodology Approach Comments	Comment Response
14	Oakland	Modal Priority	<p>Modal Priority Memo Table 2 - Practically, bicycle almost never have the highest priority in Oakland, even on bicycle boulevards.</p> <p>At a minimum, Class 3B routes should get the same priority as Class I/IV.</p> <p>Also, bicycle routes on non-commercial streets should generally give bicycles a higher priority than pedestrians (eg, West)</p>	<p>City of Oakland staff provided an updated bike network map that was incorporated into the bike emphasis maps for the Arterial Plan development; the updated bike network includes many more bike facilities within Oakland not previously assumed in the draft maps, and therefore results in higher bike priority along some Study Network segments. In addition, the consultant team incorporated the enhanced Class II and enhanced Class III facilities in the bike emphasis maps, the modal priority methodology was also updated to give the same priority consideration for enhanced Class II/III facilities as Class I/IV facilities. Non Study Network facilities such as some Class 3B routes, are included in the maps as markers and the GIS Cross Sectional Tool will consider parallel bike facilities within a certain buffer from a Study Network segment, this consideration will be made in the needs assessment evaluation, which will therefore influence recommended improvements. Therefore, changes that were made within Oakland and the modal priority methodology do result in higher bicycle priority for several segments. No other changes were made to pedestrian modal priority methodology, bicycles are generally given higher priority than pedestrians on non-commercial streets such as the land uses in Column 2 of Table 2. In addition, City of Oakland staff coordinated with consultant team to specify preferred modal priorities along Study Network segments within Oakland as part of the ongoing Citywide Complete Streets Plan development.</p>
15	Alameda County	General	<p>Could the CTC clarify the Complete Streets Plan requirements moving forward? I know that one of the outcomes of the MMAP project is to produce a tool jurisdictions can use when developing their own typology and modal priorities for a CS Plan. By BOS Resolution, Alameda County has demonstrated (and will be self-certifying) that our general plans satisfy the CS compliance requirement. Will we still be required to develop a CS Plan for our Circulation Elements, or is it optional?</p>	<p>It is the intent that MMAP outcome could be used for any Complete Street work that a jurisdiction undertakes. In that context, MMAP outcome is only a resource and will provide a countywide context too. At this moment it is unclear if the County would be required to develop a separate Complete Streets Plan given the development of the Countywide Multimodal Arterial Plan.</p>
16	Alameda County	Modal Priority	<p>GIS Review: We found that the degree of roadway segmentation for Modal Priorities is overly detailed for some roads. Please consider either lengthening segments, or suggest a modification to the jurisdiction for their concurrence. We made comments on a few of the roads by two or more segments, but in general it was not necessary.</p>	<p>After all modal network and modal priority maps are updated, the project team will update the study segment lengths to be longer, as appropriate given potential context and modal priority changes. The process to update the study segment lengths is still under development and will be determined at a later date.</p>
17	Alameda County	Base Street Type	<p>GIS Review: We ran into several examples of how the Base Street Typology of a given roadway could actually meet more than one category. E14th Street/Mission Blvd. is one example. Although typologies are based on ADTs and other traffic data, we found it can present an incomplete representation of the various functions of a particular roadway. (Throughway vs. Community Connector)</p>	<p>Based on comments received regarding base street types along E. 14th Street/International Boulevard, the base street type will be revised to County Connector along the study segments within unincorporated Alameda County, San Leandro and Oakland, with the possible exception of the segment in the Fruitvale District.</p>
18	Alameda County	General	<p>GIS Review: We need to better understand the outcome for jurisdictions when choosing particular street typologies and modal priorities. How will this info be used by the CTC in future decisions on funding project applications? How important is it to choose one typology or modal priority over another for future project opportunities? See #1 in Performance Objectives Review.</p>	<p>The Arterial Plan is not a programming document. The typology/modal priority, improvement needs and prioritization of improvements identified from the Plan are expected to inform the Alameda CTC's CTP and the local jurisdictions work related to Complete Streets or other relevant work.</p>

Appendix J - Countywide Multimodal Arterial Plan - Summary of Stakeholder Comments and Responses on Typology and Modal Priority Methodology

	Stakeholder	Category	Methodology Approach Comments	Comment Response
19	Alameda County	General	Objectives: Page 5 of 16: #7- "...For Study network segments with multiple priorities, preference for recommended improvements will be given to the TOP IDENTIFIED MODAL PRIORITY...additional improvements will be identified for other lower priority modes WHEREVER POSSIBLE.." However, we may be applying for funding for a lower priority mode because of approved streetscape plans, agency priorities, or other reasons. How would this work?	As explained in our response to the previous comment, the Arterial Plan is not a Programming document, and that this process is only for identifying improvements based on whether segments are addressing the need of top identified modal priority. However, the project team will meet with each jurisdiction and transit operator (in Fall of 2015 or Winter of 2016) to review these identified improvements, and they will have the opportunity to state whether other improvement needs for other modes are identified by the local jurisdiction that is missing from the list.
20	Dublin	Bike	In reviewing the bike network, it seems that it would require a lot of comments as the Countywide Bike Plan data is not detailed as compared to our City bike plan. I like to suggest that we provide the GIS shape files from our bike plan to you that could be added to the network. Please let me know if this is doable.	City of Dublin provided the consultant team a GIS map layer with the City's bike network. CD+A incorporated the City's GIS layer into the Countywide Arterial Plan mapping.
21	Bike East Bay	Bike	We feel it is appropriate to start with bikeways designated in adopted plans for your modal analysis. These bikeways will of course need to be updated as bike plans are updated and also as active transportation plans and complete streets plans are updated. However, we don't feel your priority analysis should look to these plans for the type of bikeway to be prioritized or accommodation. All of these plans were written before protected bike lanes were allowed in California. As a result, none of them include a single protected bike lane. Rather, your focus should be on designing into each roadway the type of bike access that is appropriate given the roadway conditions, land use context and expected demand for bicycling. This means that you should not survey local cities for their stop-gap proposed protected bikeway networks as part of this process. Planning for a network of protected bikeways has been part of an appropriate public process in each city.	Bike East Bay is suggesting a different approach for identifying Bike Modal Priority. The suggestion is to focus on designing the streets for bikes by looking at the type of bike access that is appropriate given the roadway conditions, land use context and expected demand for bicycling. However, the Multimodal Arterial Plan must be consistent with an adopted documents and policies prepared by the jurisdictions. The Multimodal Arterial Plan when updated will reflect the modal priority changes identified in any adopted Plans by the jurisdictions.

Appendix J - Countywide Multimodal Arterial Plan - Summary of Stakeholder Comments and Responses on Typology and Modal Priority Methodology

	Stakeholder	Category	Methodology Approach Comments	Comment Response
22	Bike East Bay	Bike	In your modal analysis, conduct your priority analysis for autos, trucks, and transit, and then for streets that are also bikeways, simply design the bikeway that is appropriate for that street, given roadway conditions, land use context, and expected demand. Don't change priorities based on the type of bikeway called for in outdated plans. The most important advantage to this approach over the approach of having a city planner from each jurisdiction draw you a map of protected bike lanes, is that there will be a more uniform and consistent approach to designing bikeways, something that is needed in Alameda County. This approach also avoids the problem a City A designating a Class II bikeway to its city line, while City B designates the same street with the same conditions a Class IV. The experience and design needs to be consistent, and that is where the Alameda CTC is needed. This is in fact what you are already doing for goods movement, transit access and congestion management, ensuring that the transportation system is well-designed across multiple jurisdictions. Our proposed approach also acknowledges a reality that planning for long distance trips is not what bicycling is all about. It's about planning for around town trips and shorter trips to transit. Cities should choose the bike routes, but the experience should be consistent, and that is a good role for the Alameda CTC, particularly when it comes to allocating monies as part of voter-approved complete street policies.	See the above comment on the methodology. Project team will ensure the consistency and continuity of bike facility classification along networks across jurisdictions at a later part of the Multimodal Arterial Plan.
23	Bike East Bay	Bike	I also want to reiterate our goals and concerns about this Multimodal Plan. First, the planning process and the final Plan once adopted needs to acknowledge that there is much we don't know about neighborhood desires for better bicycling and for that matter better multimodal streets. After this Plan is adopted, much neighborhood outreach will be needed to find the right project for each neighborhood, using of course the goals this Plan sets out to improve transit, goods movement, bicycling and walking.	The goal of the Multimodal Arterial Plan is to conduct an information based needs assessment based on modal priorities identified through land use, modal overlays, and street typology. That said, Alameda CTC acknowledges that it is the jurisdiction's role to conduct outreach and to continue to bring to our attention any modal priorities, needs, or desired improvements not reflected in the final Multimodal Arterial Plan to potentially reflect it in future update
24	Bike East Bay	Bike	Secondly, the redesign of major arterial streets, particularly those within PDA's and in commercial areas, are an exercise in how to give drivers better options for leaving their car keys at home, and choosing for some of their trips walking, bicycling and transit, and even driving to transit. This Plan needs to be smart about how arterial streets are redesigned to lower single-occupant private vehicles, to make more room for transit improvements, walking improvements, local truck access and bicycling improvements. And by being smart, this Plan will help Alameda County start to prioritize which projects best help us redesign our streets so that people have choices.	The Plan will identify the multimodal needs of the county's major arterial network, which is occurring for the first time. As you are aware, this is happening by also looking at the Land Use including PDAs. The Plan by identifying appropriate modal improvements in coordination with the modal priority will support all modes and travel choices.

Appendix J - Countywide Multimodal Arterial Plan - Summary of Stakeholder Comments and Responses on Typology and Modal Priority Methodology

	Stakeholder	Category	Methodology Approach Comments	Comment Response
25	Bike East Bay	Bike	Finally, since you will be hearing this again from Bike East Bay, another important goal is to rebuild walkable, bikeable neighborhoods served by high-quality transit. There has for far too long been an emphasis on moving more people during commute hours, and that has to change. Your focus, and our focus as advocates, is to improve 'everyday trips' so that people can get around their neighborhoods and communities without driving for every trip. This in turn, will help revitalize where we live in Alameda County, encouraging people to shop locally, support local businesses, walk and bike to school, etc.	This Plan deeply supports Transit, and does so by making the major transit corridors identified by the operators and Alameda CTC's Transit Plan as the roads with Transit Priority so that needed transit supportive improvements are identified. Again, this is the first time this effort is occurring more so at the county level network, and is expected to be the foundation for better supporting transit and other modes across the county on the arterials.
Other General and Mapping Comments				
1	Albany	Land Use	We are updating our GP and I am afraid I sent you the GIS layers of our existing plan, which do not reflect the location of the middle school. It is located on Brighton avenue between the Ohlone Greenway and Spokane.	This mapping change was made.
2	Berkeley	General	Per our conversation today the City of Berkeley is starting up a comprehensive look at its projects to begin prioritizing improvements, and apply a Complete Streets lens to our analysis. ACTC's MMAP process seems to have the most up-to-date information for many layers, such as transit, bikeway, etc. We'd like to use these layers for our analysis. With your permission we can work directly with your consultants to access the GIS information. Please confirm that this is ok or let me know if you have any questions.	City of Berkeley has Alameda CTC's permission to use the GIS mapping layers prepared for the Countywide Multimodal Arterial Plan.
3	Alameda County	General	Although Planning Area meetings were conducted last month, we found the complexity and level of detailed information in the three memos required a tremendous amount of staff time to understand and review adequately. It seemed various sections of the memos could be shortened and more concise, and would recommend this for future memos if at all possible. Thank-you!	The project team acknowledge that many of the approaches presented in this project are complex and will try to present future memos concisely.
4	Alameda County	General	We understand meetings will be held with each jurisdiction individually in the Fall for a final review and concurrence. It is also our understanding that due to the extensive comments received, this phase may only be delayed by one month, to July, instead of June for Commission approval. Could you clarify if what is being asked of the Commission in June or July is approval of all this work (MMAP review and performance objectives), or more an update on the process thus far and informational?	The project team plans to bring the updated typology, modal priority, and performance objectives with our response to comments from jurisdictions and non-agency stakeholders to a July Plan TAC meeting. At that meeting, jurisdiction staff will have an opportunity to review how their comments have been addressed and provide any final feedback. The project team plans to bring the final typology, modal priority, and performance objectives to ACTAC, PPLC and the Commission for approval in September.
5	Oakland	Bike	We provided a file of potential Class IV bikeways to CD+A, but it does not appear that this made it's way into the analysis. We would like to include this if possible.	CD+A has received the City of Oakland bike network GIS map and has incorporated that map into the Countywide Arterial Plan mapping.
6	Dublin	Base Street Type	We have significant comments on the maps and I can see as the result of these comments, several layers will be updated and then would require additional review. For example, I may have found an error on the street designation as County Connector and changed it to Throughway. This in turn would change the typology of other layers which would trigger another review. It seems that this Friday deadline is not adequate to complete all the review that is needed.	Comment noted, jurisdictions will have an opportunity to review the revised modal network maps and modal priority lists in July.

Appendix J - Countywide Multimodal Arterial Plan - Summary of Stakeholder Comments and Responses on Typology and Modal Priority Methodology

	Stakeholder	Category	Methodology Approach Comments	Comment Response
7	Livermore	Bike	The City of Livermore has GIS information for our Bikeways system that we'd like added to the Arterial Plan maps. Lorraine Purcell is the City's GIS contact and can get you the GIS data for existing and proposed bike lanes, multi-use trails, and bike routes.	City of Livermore provided the consultant team a GIS map layer with the City's bike network. CD+A incorporated the City's GIS layer into the Countywide Arterial Plan mapping.

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MEMORANDUM

Date: July 7, 2015
To: Saravana Suthanthira, Alameda CTC
From: Francisco Martin and Matthew Ridgway, Fehr & Peers
Subject: **Alameda Countywide Multimodal Arterial Plan – Draft Performance Measure Objectives Comments and Responses**

OK14-0023

The Alameda Countywide Multimodal Arterial Plan's performance measures are derived from the Plan's vision and goals. The performance measures will be utilized to evaluate existing and future year multimodal transportation conditions across the County for the Plan's Study Network, which is a broader countywide street network that represents all arterial and collector streets throughout the County using Caltrans' California Road System (CRS) classification. Performance measures were approved by the Alameda CTC Commission on February 26, 2015.

The draft performance objectives, or thresholds for the performance measures, were developed as a subsequent step after performance measures were approved. The performance objectives will be applied to existing and future year conditions to identify Study Network needs and provide guidance in identifying short-term (year 2020) and long-term (year 2040) improvements to adequately address those needs. Performance measures in combination with the performance objectives will ensure that the proposed short-term and long-term improvements meet the Plan's vision and goals.

The draft performance objectives were presented to ACTAC at the April 9, 2015 meeting and at each of the Planning Area meetings that took place during the week of April 20, 2015. The memo titled *Alameda Countywide Multimodal Arterial Plan – Draft Performance Measure Objectives* (April 1, 2015) was also submitted to stakeholders for review and is provided in **Appendix 1**. The



revised performance objectives summarized in this memo presents the updated performance objectives to be brought to the ACTAC and Commission for approval in September 2015.

COMMENTS AND RESPONSES ON DRAFT PERFORMANCE OBJECTIVES

Appendix 2 presents a summary of stakeholder comments received on the draft performance objectives and the consultant team's responses. The section below summarizes the key changes to draft performance objectives.

UPDATED PERFORMANCE OBJECTIVES

All stakeholders had an opportunity to review and refine the draft performance objectives during the April 9, 2015 ACTAC meeting and during the second set of Planning Area meetings held the week of April 20, 2015. Comments were received from transit agencies on transit related performance objectives (congested speed, transit travel speed, and transit reliability). Comments were also received on truck route accommodation index related to on-street parking. The following performance measures or objectives were revised based on comments received on the draft memo presented in **Appendix 1**:

- 1.1A – Congested Speed objective was adjusted to not apply to transit priority corridors since a transit speed (measure 1.2A) objective is also applied to transit priority corridors.
- 1.2A Transit Travel Speed objective was increased to be greater than 75% of the auto congested speed (measure 1.1A) based on requested changes from AC Transit.
- 1.2B Transit Reliability objective was increased to be greater than a 0.7 PM peak hour-to-non-peak hour transit speed ratio based on requested changes from AC Transit.
- 1.5 Truck Route Accommodation Index evaluation methodology was adjusted to exclude the consideration of on-street parking based on feedback received from stakeholders. The revised methodology applies a three-point scoring system that corresponds to the following rating:
 - 1 point = Poor
 - 2 point = Good
 - 3 point = Very Good

The performance objective of achieving a Very Good rating along truck priority corridors was not changed.

The redline changes to proposed draft performance objectives are summarized in **Table 1**.



**TABLE 1
 MULTIMODAL ARTERIAL PLAN PERFORMANCE OBJECTIVES**

Performance Measure	Application	Modal Objectives ¹				
		Autos	Transit	Pedestrian	Bicycle	Trucks
1.1A – Congested Speed	Facility-Specific Measure, Existing and Future Conditions	Greater than 40% of Posted Speed Limit	Greater than 40% of Posted Speed Limit*	*	*	Greater than 40% of Posted Speed Limit
1.1B – Reliability	Facility-Specific Measure, Existing and Future Conditions	Reliable	*	*	*	Reliable
1.2A – Transit Travel Speed	Facility-Specific Measure, Existing and Future Conditions	*	Greater than 75 50% of the Auto Congested Speed (Measure 1.1A)	*	*	*
1.2B – Transit Reliability	Facility-Specific Measure, Existing and Future Conditions	*	Greater than 0.70 0.4 (PM peak hour-to-non-peak hour transit speed ratio)	*	*	*
1.2C – Transit Infrastructure Index	Facility-Specific Measure, Existing and Future Conditions	*	Good or Very Good	*	*	*
1.3 – Pedestrian Comfort Index	Facility-Specific Measure, Existing and Future Conditions	**	Fair, Good or Very Good	Good or Very Good	*	*
1.4 – Bicycle Comfort Index	Facility-Specific Measure, Existing and Future Conditions	**	*	*	Good or Very Good	*



**TABLE 1
 MULTIMODAL ARTERIAL PLAN PERFORMANCE OBJECTIVES**

Performance Measure	Application	Modal Objectives ¹				
		Autos	Transit	Pedestrian	Bicycle	Trucks
1.5 – Truck Route Accommodation Index	Facility-Specific Measure, Existing and Future Conditions	*	*	*	*	Very Good
1.7 – Pavement Condition Index	Facility-Specific Measure, Existing Conditions	Good or Very Good	Good or Very Good	Good or Very Good	Good or Very Good	Good or Very Good

Notes:

1. The asterisk (*) indicates that a performance objective is not applicable for that specific modal priority. Although a performance objective does not apply, it does not imply that the needs assessment will neglect recommended improvements that can better measure performance results and thus enhance the built environment for modes without applicable performance objectives.
2. The double asterisk (**) indicates that that a performance objective is not applicable for that specific modal priority. In addition, sidewalk width reduction or bicycle facility removal will not be considered along auto priority Study Network segments even to meet the set thresholds.

Source: Fehr & Peers, 2015.

Attachments

Appendix 1 – Alameda Countywide Multimodal Arterial Plan – Draft Performance Measure Objectives

Appendix 2 – Summary of Stakeholder Comments on Draft Performance Objectives

APPENDIX 1

Alameda Countywide Multimodal Arterial Plan – Draft Performance Measure Objectives

MEMORANDUM

Date: April 1, 2015
To: Saravana Suthanthira, Alameda CTC
From: Francisco Martin and Matthew Ridgway, Fehr & Peers
Subject: **Alameda Countywide Multimodal Arterial Plan – Draft Performance Measure Objectives**

OK14-0023

The Alameda Countywide Multimodal Arterial Plan’s performance measures are derived from the Plan’s vision and goals. The performance measures will be utilized to evaluate existing and future year multimodal transportation conditions across the County for the Plan’s Study Network¹, which is a broader countywide street network that represents all arterial and collector streets throughout the County using Caltrans’ California Road System (CRS) classification. Performance measures were approved by the Alameda CTC Commission on February 26, 2015. The list of approved performance measures is summarized in the **Appendix A** for reference.

The draft performance objectives, or thresholds for the performance measures, were developed as a subsequent step after performance measures were approved. The performance objectives will be applied to existing and future year conditions to identify Study Network needs and provide guidance in identifying short-term (year 2020) and long-term (year 2040) improvements to adequately address those needs. Performance measures in combination with the performance objectives will ensure that the proposed short-term and long-term improvements meet the Plan’s vision and goals. This memo summarizes the Multimodal Arterial Plan’s performance measure planning framework and presents the draft performance objectives. The draft performance

¹ The Study Network consists of the arterials and collectors that are part of the California Road System classification that was sent to all Alameda County jurisdictions for review and to support data collection in December 2014.



objectives will be presented to ACTAC at the April 9, 2015 meeting and at each of the Planning Area meetings planned for the week of April 20, 2015. A brief summary of the role and utility of various Plan development components is provided in **Table 1**, additional information for each of the components is also provided in the proceeding section.

TABLE 1
ROLE AND UTILITY OF MULTIMODAL ARTERIAL PLAN COMPONENTS

Plan Development Components	Utility	Approval Status
Vision and Goals	The vision lays out the strategic direction for the Plan; goals describe the desired outcome of the Plan.	Approved by Commission on February 26, 2015
Performance Measures	<p>Performance measures assess the existing and future year transportation conditions of the Study Network against the identified goals. These performance measures include three types of measures: Performance Measures; Performance Indicators; and Network Connectivity Checks.</p> <ul style="list-style-type: none"> • <i>Performance Measures</i> – Measures that directly assess the built environment and planning level operations at the facility-specific scale, and thus provide the direct assessment of a roadway facility on Study Network multimodal gaps and needs. • <i>Performance Indicators</i> –These are area-wide performance measures and are generally applied after preferred short- and long-term improvements are identified for the Arterial Network to evaluate and to ensure that the preferred improvements achieve the Plan’s vision and goals. • <i>Network Connectivity Checks</i> - Network connectivity checks are performed as a mapping exercise that evaluates the transit infrastructure, pedestrian comfort, bicycle comfort and truck route accommodation measures for consistency across the respective modal networks. 	Approved by Commission on February 26, 2015
Performance Objectives	These are thresholds identified for the performance measures that directly assess the built environment and planning level operations at the facility-specific scale. Performance objectives are applied to the performance measure assessment of existing and future year transportation conditions to determine Study Network gaps, deficiencies and needs. Performance objectives vary depending on the modal priority along a Study Network segment.	Pending Commission Approval – May/June 2015
Typologies	Typologies classify the Study Network roads based on their transportation and access functions, and land use characteristics of the roads. They help identify the modal priorities along each Study Network segment. In addition, typologies inform the Arterial Network ¹ selection criteria.	Pending Commission Approval – June 2015

1. The Arterial Network is the subset of the Study Network representing *arterials of countywide significance*.



PERFORMANCE MEASURES AND PLANNING FRAMEWORK

Figure 1 presents a streamlined flow chart of the Multimodal Arterial Plan planning framework and illustrates how performance measures in combination with performance objectives will be used to identify short and long-term improvements. The process is also described below and distinguishes between the progress made until now and upcoming tasks.

TASKS COMPLETED OR IN PROGRESS

1. Performance Measures are derived from the Plan's goals, which are in turn derived from the Plan's vision. The Plan's vision, goals and performance measures were approved by the Commission on February 26, 2015.
2. In late 2014, the project team identified the "Study Network;" this network includes available parallel facilities of other modes (e.g. bike and truck routes). The Study Network will support data collection, assessment of existing and future conditions, and typology development.
3. In February of 2015, the ACTAC and the Commission reviewed the draft criteria to identify Arterials of Countywide Significance (Arterial Network). No changes were requested; therefore, using this set of criteria, the Arterial Network will be developed in April and presented to the ACTAC and Commission for approval in May. The Arterial Network will be used to develop the list of preferred improvements. Arterial Network selection criteria are summarized in a memo titled Alameda Countywide Multimodal Arterial Plan – Draft Criteria for Selecting Arterials of Countywide Significance (January 21, 2015).
4. Roadway typologies² will be developed for the Study Network. Typologies will be descriptive of a roadway's transportation function, land use context, and modal emphasis. Modal priority for transit and trucks will be coordinated with the Countywide Transit and Goods Movement Plans that are currently underway. Modal priorities will be vetted and confirmed during the Planning Area meetings in April.
5. Modal priorities will inform the performance objectives by segment/corridor as different modal priorities can potentially result in different performance objectives. Draft performance objectives are described in the following section of this memo.

² The roadway typology framework is described in a separate memo titled "Alameda CTC Countywide MMAP: Draft Arterial Street Typology Framework Concepts," and will also be presented to ACTAC and at the Planning Area meetings in April.

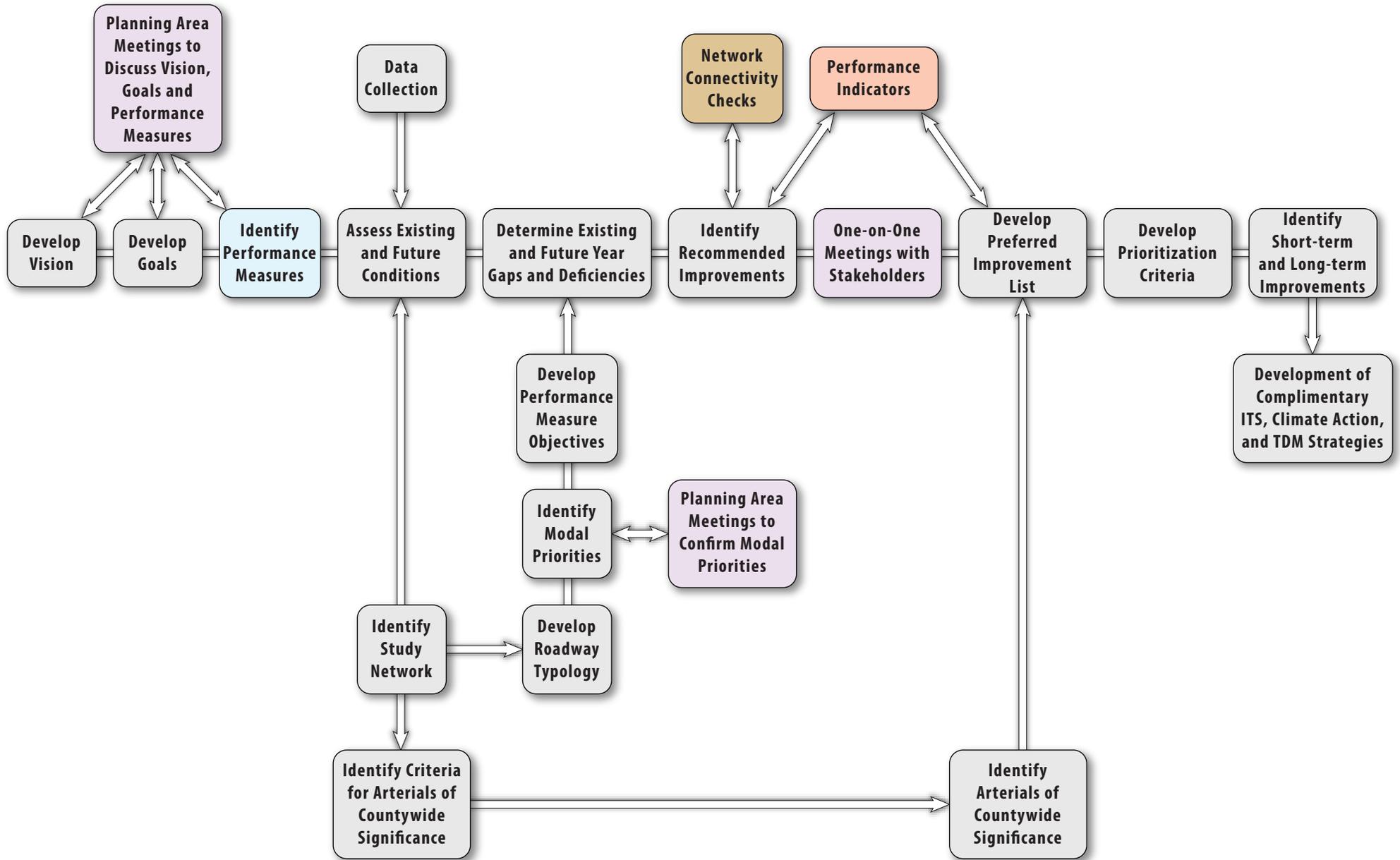


Figure 1





UPCOMING TASKS

6. The performance objectives will be applied to the performance measure assessment of existing and future year transportation conditions to determine network gaps, deficiencies and needs.
7. Recommended multi-modal transportation improvements will be identified to adequately address short (2020) and long-term (2040) Study Network multimodal needs. Network connectivity checks will be conducted for each mode at this stage to ensure that identified recommended improvements provide an adequate and supportive network for all modes; connectivity checks will be performed as a mapping exercise that evaluates the transit infrastructure, pedestrian comfort, bicycle comfort and truck route accommodation measures for consistency across the respective modal networks. For Study Network segments with multiple modal priorities, preference for recommended improvements will be given to the top identified modal priority; additional improvements will be identified for other lower priority modes wherever possible.
8. The Consultant team will meet with each Alameda County jurisdiction and transit operators individually to review the recommended set of multi-modal transportation improvements; each jurisdiction will have the opportunity to review and refine the set of recommended improvements, which will lead to identifying the preferred set of improvements for the Arterials Network. Since the Arterial Network is the subset of the Study Network, the recommended improvements identified for the Arterial Network will be considered as the preferred set of improvements for the Arterial Network.
9. After preferred improvements are identified, the project team will utilize the following area-wide performance indicators to ensure that the list of identified preferred improvements achieves these various elements of the Plan's vision and goals and the results of these indicators will revise the list of preferred improvements as necessary:
 - a. Equity: The benefit to Communities of Concern performance indicator ensures that recommended improvements are equitable throughout the County.
 - b. Property value index: The property value index ensures that recommended improvements support a strong economy.
 - c. Demand for active transportation: The demand for active transportation performance indicator will identify the potential mode shift to active transportation modes.



- d. VMT per capita and GHG per capita performance indicators: The VMT and GHG per capita indicators will help ensure that recommended improvements have a positive impact on emissions throughout the County.
10. Prioritization criteria³ will be developed in coordination with stakeholders to prioritize the list of preferred short and long-term improvements to be included in the Final Multimodal Arterial Plan.
11. The project team will develop a set of ITS, climate action, and TDM strategies that are complimentary to the list of preferred short and long-term improvements.

As shown in **Figure 1** and described above, performance measures and objectives play a critical role in developing the Plan and identifying the preferred set of short and long-term improvements.

APPROVED PERFORMANCE MEASURES

The approved performance measures to be utilized as part of the Alameda Countywide Multimodal Arterial Plan development are listed in the **Appendix A**. Performance measures will be applied to assess existing and/or future year transportation conditions. These measures also include area-wide performance indicators (non-auto mode share, benefit to Communities of Concern, demand for active transportation, VMT and GHG per capita). These indicators by themselves do not evaluate existing or future conditions to identify gaps or deficiencies, but provide an evaluation of the network or facility for a comparative assessment of the proposed improvements against the Plan's vision and goals. Therefore, these area-wide indicators will be generally applied after preferred short- and long-term improvements are identified for the Arterial Network to evaluate and to ensure that the preferred improvements achieve the Plan's vision and goals. Similarly, facility-specific performance indicators such as operating cost effectiveness, implementation challenge score and property value index will be applied after short- and long-term improvements are identified.

The performance measures table in the **Appendix A** also lists the goal that each measure or indicator addresses, if the measure is a facility-specific or area-wide application, and whether the measure or indicator applies to either existing conditions, future year conditions or both. Arterial

³ Short and long-term improvement prioritization criteria will be developed and presented to stakeholders later in the Plan development process. All stakeholders will have an opportunity to review and provide feedback on the prioritization criteria before the criteria are finalized.



corridor performance measure results will be derived from the study segment results along the corridor; for example, automobile congested speed at the corridor level will be estimated by calculating the average (weighted by volume) congested speed from all the individual study segments that are within the corridor limits.

PROPOSED PERFORMANCE OBJECTIVES

As previously mentioned, modal priorities will inform the performance objectives as different modal priorities can potentially result in different objectives to determine if an arterial study segment is performing adequately to suit the multimodal needs. A particular objective identified for a performance measure related to a mode is the minimum threshold that needs to be met for that measure if that particular mode has the priority on that arterial segment. For example, the Bicycle Comfort Index identifies four different ratings, ranging from Level of Traffic Stress 1 (LTS1) to LTS4 (LTS1 representing "Very Good" comfort level for cyclists). If a Study Network segment is identified as having a bicycle modal priority, the performance measure objective would be to achieve an LTS1 (Very Good) or LTS2 (Good) rating. If the segment is not identified as having a bicycle modal priority, a Bicycle Comfort Index performance objective does not apply and therefore it's assumed that any rating - LTS1, LTS2, LTS3 or LTS4 - is adequate for that specific segment.

Table 2 presents the proposed performance objectives for performance measures that are facility-specific and apply to existing conditions. Performance measures for no objectives were developed are included in the next section of this memo. In order to have a comparable rating system, the scores were translated into an equivalent qualitative rating scale (e.g., very good, good, poor, etc.) for several performance measures. Performance objectives are identified for measures that directly assess the built environment and planning level operations at the facility-specific scale, and thus provide the direct assessment of a roadway facility on Study Network multimodal gaps and needs. The following are those measures, and are related to the "Multimodal" goal.

- 1.1A – Congested Speed
- 1.1B – Reliability
- 1.2A – Transit Travel Speed
- 1.2B – Transit Reliability
- 1.2C – Transit Infrastructure Index
- 1.3 – Pedestrian Comfort Index
- 1.4 – Bicycle Comfort Index
- 1.5 – Truck Route Accommodation Index
- 1.7 – Pavement Condition Index



**TABLE 2
 MULTIMODAL ARTERIAL PLAN PERFORMANCE OBJECTIVES**

Performance Measure	Application	Modal Objectives ¹				
		Autos	Transit	Pedestrian	Bicycle	Trucks
1.1A – Congested Speed	Facility-Specific Measure, Existing and Future Conditions	Greater than 40% of Posted Speed Limit	Greater than 40% of Posted Speed Limit	*	*	Greater than 40% of Posted Speed Limit
1.1B – Reliability	Facility-Specific Measure, Existing and Future Conditions	Reliable	*	*	*	Reliable
1.2A – Transit Travel Speed	Facility-Specific Measure, Existing and Future Conditions	*	Greater than 50% of the Auto Congested Speed (Measure 1.1A)	*	*	*
1.2B – Transit Reliability	Facility-Specific Measure, Existing and Future Conditions	*	Greater than 0.4 (PM peak hour-to-non-peak hour transit speed ratio)	*	*	*
1.2C – Transit Infrastructure Index	Facility-Specific Measure, Existing and Future Conditions	*	Good or Very Good	*	*	*
1.3 – Pedestrian Comfort Index	Facility-Specific Measure, Existing and Future Conditions	**	Fair, Good or Very Good	Good or Very Good	*	*
1.4 – Bicycle Comfort Index	Facility-Specific Measure, Existing and Future Conditions	**	*	*	Good or Very Good	*



TABLE 2
MULTIMODAL ARTERIAL PLAN PERFORMANCE OBJECTIVES

Performance Measure	Application	Modal Objectives ¹				
		Autos	Transit	Pedestrian	Bicycle	Trucks
1.5 – Truck Route Accommodation Index	Facility-Specific Measure, Existing and Future Conditions	*	*	*	*	Very Good
1.7 – Pavement Condition Index	Facility-Specific Measure, Existing Conditions	Good or Very Good	Good or Very Good	Good or Very Good	Good or Very Good	Good or Very Good

Notes:

1. The asterisk (*) indicates that a performance objective is not applicable for that specific modal priority. Although a performance objective does not apply, it does not imply that the needs assessment will neglect recommended improvements that can better measure performance results and thus enhance the built environment for modes without applicable performance objectives.
2. The double asterisk (**) indicates that that a performance objective is not applicable for that specific modal priority. In addition, sidewalk width reduction or bicycle facility removal will not be considered along auto priority Study Network segments even to meet the set thresholds.,

Source: Fehr & Peers, 2015.



EXCEPTIONS FOR IDENTIFYING PERFORMANCE OBJECTIVES

In addition to the facility-specific performance measures, there are a number of performance indicators that, as illustrated in **Figure 1**, will be used later in the project to assure that project vision and goals are met. ***Performance indicators by themselves do not evaluate existing or future conditions to identify a gap or deficiency, but provide a measurement of the network or facility for a comparative assessment of the proposed improvements against the existing conditions.*** Therefore, identifying objectives for indicators are not applicable and therefore not proposed. Similarly, performance objectives are not identified for the network connectivity measures, coordinated technology or collision rates. Network connectivity measure will be conducted as a mapping exercise that evaluates the transit infrastructure, pedestrian comfort, bicycle comfort and truck route accommodation measures for consistency across the respective modal networks. The coordinated technology measure provides an inventory of available and proposed ITS infrastructure along the Study Network, coordinated technology results will be used to inform ITS improvements and strategies recommended as part of the Plan. Collision rates provide a facility-specific assessment of exiting conditions and the results will potentially be used to prioritize short and long-term improvements later in the Plan development process. The following are the indicators and measures for which identifying objectives is not applicable:

- 1.6 – Enhanced Mobility
- 2.1 – Benefit to Communities of Concern
- 3.1 – Transit Connectivity
- 3.2 – Pedestrian Connectivity
- 3.3 – Bicycle Connectivity
- 3.4 – Network Connectivity
- 4.1 – Operating Cost Effectiveness
- 4.2 – Implementation Challenge Score
- 4.3 - Coordinated Technology
- 4.4 – Property Value Index
- 5.1 – Collision Rates
- 5.2 – Demand for Active Transportation

All stakeholders will have an opportunity to review and refine the performance objectives, in addition to the modal priorities along the Study Network. Jurisdictions will also be given the opportunity to coordinate with neighboring jurisdictions and transit agencies on modal priorities along multi-jurisdictional routes at the second set of Planning Area meetings during the week of April 20, 2015.



BASIS FOR PERFORMANCE OBJECTIVES

Jurisdictions within Alameda County generally do not have adopted performance objectives for the approved performance measures listed in **Table 2**. As a result, the consultant team based performance objectives on previous planning projects that utilized similar measures; if reference projects were not applicable the consultant team applied relevant research to identify appropriate objectives. The basis for each performance objective is described below.

1.1A – Automobile Congested Speed

Automobile congested travel speed will be estimated for Existing and Future Year PM Peak hour conditions. The *2014 Level of Service Monitoring Report* (Alameda CTC, November 2014) applies the HCM 2000 arterial LOS methodology to assess CMP-arterial segment LOS during the PM peak hour. The methodology's LOS thresholds are shown in **Table 3**. According to the methodology, an average speed that is generally greater than 40% of the typical free flow speed corresponds to LOS D or better conditions. Based on this assessment, the automobile congested speed performance objective is proposed to be greater than 40% of the posted speed limit. This objective applies to auto and truck priority corridors only.

1.1B – Automobile Reliability

The automobile reliability measure is based on the PM peak hour volume-to-capacity (V/C) assessment, which corresponds to the following measure ratings:

- Reliable (V/C between 0 – 0.8)
- Less Reliable (V/C between 0.8 – 1.0)
- Unreliable (V/C greater than 1.0)

The 1994 HCM provides V/C LOS methodology for arterials; later versions of the HCM provide arterial segment LOS methodologies based on travel speed and not V/C ratio. Based on Table 7-1 in the 1994 HCM, a V/C ratio of 0.79 or lower corresponds to LOS D or better conditions along an arterial with four or more travel lanes. Based on this assessment, the automobile reliability performance objective is proposed to be lower than a V/C ratio of 0.8, which generally corresponds to LOS D, which is identified to be of rating "Reliable". This objective applies to auto and truck priority corridors only.



**TABLE 3
 ARTERIAL LOS, HCM 2000**

Arterial Class	I	II	III	IV
Range of Free Flow Speed (mph)	55 to 45	45 to 35	35 to 30	35 to 25
Typical Free Flow Speed (mph)	50	40	35	30
Level of Service	Average Travel Speed (mph)			
A	>42	>35	>30	>25
B	>34-42	>28-35	>24-30	>19-25
C	>27-34	>22-28	>18-24	>13-19
D	>21-27	>17-22	>14-18	>9-13
E	>16-21	>13-17	>10-14	>7-9
F	≤16	≤13	≤10	≤7

Source: Exhibit 15-2, HCM 2000.

1.2A Transit Travel Speed

Transit travel speed will be estimated for Existing and Future Year PM Peak hour conditions utilizing data provided by transit agencies. The *Transit Capacity and Quality of Service Manual* (TCQSM, TRB, 3rd Edition, 2013) was reviewed for applicable performance objectives related to transit speed. No applicable performance objective was identified in the TCQSM. According to the *2013 Public Transportation Fact Book* (APTA, 2013), the national average speed for all roadway transit modes was about 14 mph in 2011. Given that the Bay Area region is generally considered to have some of the worst traffic congestion compared to other metropolitan regions in the country, it is reasonable to assume that the Bay Area transit speed is below the national average of 14 mph. According to the *2014 Level of Service Monitoring Report* (Alameda CTC, November 2014), the average vehicle travel speed along CMP Tier 1 arterial segments was roughly 20 mph network wide. Using available sources of transit and vehicle travel speed data, a performance objective that transit travel speed is at least 50% of the auto congested speed (measure 1.1A) was assumed to be adequate. This objective applies to transit priority corridors only.



1.2B Transit Reliability

The transit reliability metric is estimated by comparing PM peak hour transit travel speed to non-peak hour speed based on data provided by transit agencies. The *Transit Capacity and Quality of Service Manual* (TCQSM, TRB, 3rd Edition) was reviewed for applicable performance objectives related to transit reliability, which for this plan is defined as the PM peak hour-to-non-peak hour transit speed ratio. No applicable performance objective was identified in the TCQSM. Instead, the project team proposes a performance objective that transit reliability should be greater than a PM peak hour-to-non-peak hour transit speed ratio of 0.4. This objective is based on the objective for measure 1.1A – auto congested speed, which has an objective of congested PM peak hour automobile speed being greater than 40% of the posted speed limit. This objective applies to transit priority corridors only.

1.2C Transit Infrastructure Index

The transit infrastructure index score is based on the following factors: bus stop amenities, bus stop location, and bus stop design. The measure applies a 10-point scoring system that corresponds to the following rating:

- 0 – 5 points = Poor
- 6 – 7 points = Good
- 8 – 10 points = Very Good

The proposed transit infrastructure index objective is based on previous planning projects that utilized a similar measure. For example, Fehr & Peers is currently part of the team developing the *Ashland-Cherryland Business District Specific Plan* in unincorporated Alameda County. Fehr & Peers applied a similar multi-modal performance measure for the specific plan development in which the objective was to achieve a rating of “Good” or “Very Good” (at least 6 out of 10 on the scoring system) along the E. 14th Street/Mission Boulevard transit corridor. The same performance objective is proposed for the Multimodal Arterial Plan development for the transit priority corridors.

1.3 Pedestrian Comfort Index

The pedestrian comfort index score is based on factors such as sidewalk width, presence of buffer between sidewalk and roadway, average crosswalk spacing, roadway classification, and percent heavy vehicle traffic. The measure applies a 24-point scoring system that corresponds to the following rating:



- 0 – 7 points = Poor
- 8 – 14 points = Fair
- 15 – 20 points = Good
- 21 – 24 points = Very Good

The proposed pedestrian comfort index objective is based on previous planning projects that utilized a similar measure. As previously mentioned, Fehr & Peers is currently part of the consultant team developing the *Ashland-Cherryland Business District Specific Plan* in unincorporated Alameda County. Fehr & Peers applied a similar multi-modal performance measure for the specific plan development in which the objective was to achieve a rating of "Good" or "Very Good" (at least 15 out of 24 on the scoring system) along roadways within the plan area. The same performance objective is proposed for the Multimodal Arterial Plan development and applied to pedestrian priority segments only. A performance objective of "Fair", "Good" or "Very Good" (at least 8 out of 24 on the scoring system) rating is also proposed for transit priority corridors to achieve a minimum pedestrian design standard for transit patrons that walk to and from bus stops.

1.4 Bicycle Comfort Index

The bicycle comfort index is based on the Level of Traffic Stress (LTS) methodology (Mineta Transportation Institute, May 2012) that examines the characteristics of streets and how various aspects can cause stress on bicyclists and affect where they are likely to ride. LTS methodology classifies roadway segments into one of four levels of traffic stress, which are termed as LTS1 through LTS4. Groups of cyclists are categorized by how much stress they will tolerate in different environments:

- LTS1: most children can tolerate and feel safe while bicycling.
- LTS2: the mainstream adult population will tolerate and feel safe while bicycling.
- LTS3: cyclists who are considered "enthused and confident" but still prefer having their own dedicated space for riding will tolerate and feel safe while bicycling.
- LTS4: a level tolerated only by those characterized as "strong and fearless", which comprises just 0.5 percent of the population. The high-stress streets that LTS4 groups will ride are those with high speed limits, multiple travel lanes, limited or non-existent bike lanes and signage, and large distances to cross at intersections.



For simplicity, the LTS results correspond to the following rating:

- LTS1 = Very Good
- LTS2 = Good
- LTS3 = Fair
- LTS4 = Poor

The proposed bicycle comfort index objective is based on previous planning projects that utilized a similar measure. As previously mentioned, Fehr & Peers is currently part of the consultant team developing the *Ashland-Cherryland Business District Specific Plan* in unincorporated Alameda County. Fehr & Peers applied a similar multi-modal performance measure for the specific plan development in which the objective was to achieve a rating of "Good" or "Very Good" along roadways within the plan area. The "Good" or "Very Good" rating corresponds to an LTS2 or LTS1 score, respectively. A "Good" (LTS2) rating implies that the mainstream adult population can tolerate the design of the facility and feel safe while bicycling, a "Very Good" (LTS1) rating implies that most children can tolerate the design of the facility and feel safe while bicycling. The same performance objective is proposed for the Multimodal Arterial Plan development and applied to bicycle priority segments only.

1.5 Truck Route Accommodation Index

The truck route accommodation index score is based on curb lane width; additional consideration for on-street parking will be made only in urban contexts where many businesses are expected to load from the street. The measure applies a four-point scoring system that corresponds to the following rating scores:

- 0-1 point = Poor
- 2 points = Good
- 3 - 4 points = Very Good

One point is assigned if curb lane width is 10 feet or less, two points are assigned if the curb lane width is 11 feet, three points are assigned if the curb lane width is 12 feet or greater. One point is assigned for roadways in urban areas that provide on-street parking; a negative point is assigned if on-street parking is not provided. Performance measures similar to the truck route accommodation index have not been applied in other similar planning studies throughout the County; therefore relevant performance objectives are not available.



According to *A Policy on Geometric Design of Highways and Streets* (AASHTO, 2011), the recommended travel lane width ranges between 10 and 12 feet (not including curb, shoulder or on-street parking) for arterials in urban environments. The narrower the lane width, the higher the probability that trucks will off-track into adjacent lane or shoulder. Based on this logic, a curb lane width of 12 feet or greater is preferred for the majority of truck routes, which corresponds to a "Very Good" rating applying the truck route accommodation index. This objective applies to truck priority corridors only.

1.7 Pavement Condition Index

The pavement condition index (PCI) is used to describe the general condition of pavement on a 0 to 100 point scale. The Metropolitan Transportation Commission (MTC) maintains a PCI database for the Bay Area region and categorizes PCI using thresholds that were consolidated for use on the Multimodal Arterial Plan as described below:

- PCI 0 – 49 = Poor
- PCI 50 – 59 = At Risk
- PCI 60 – 79 = Good
- PCI 80 – 100 = Very Good

A PCI of 60 or higher is generally considered acceptable; therefore the proposed performance objective is to achieve a "Good" or "Very Good" rating along all Study Network segments regardless of the modal priority. The PCI performance objective also applies to pedestrian priority Study Network segments as the pavement condition provides a general indication of sidewalk conditions.

NEXT STEPS

The consultant team and Alameda CTC staff will present the draft performance objectives at the April 9, 2015 ACTAC meeting and at the second set of Planning Area meetings planned for the week of April 20, 2015 to seek input. Based upon comments received during this outreach, the objectives will be modified and brought to ACTAC and the Commission for approval in May 2015.

Attachments

Appendix A – Approved Multimodal Arterial Plan Performance Measures and Indicators

APPENDIX A

APPROVED MULTIMODAL ARTERIAL PLAN PERFORMANCE MEASURES AND INDICATORS¹

Goal	Category	Performance Measure	Evaluation Approach	Application	
1. Multimodal	1.1 – Auto	1.1A – Congested Speed	Based on average PM peak hour congested speed.	Facility-Specific Measure, Existing and Future Conditions	
		1.1B – Reliability	Based on PM peak hour volume-to-capacity ratio, categorized as: <ul style="list-style-type: none"> ▪ Reliable (V/C between 0 – 0.8) ▪ Less Reliable (V/C between 0.8 – 1.0) ▪ Unreliable (V/C greater than 1.0) 	Facility-Specific Measure, Existing and Future Conditions	
	1.2 – Transit	1.2A – Transit Travel Speed	Based on average PM peak hour transit travel speed provided by transit agencies that operate in the County.	Facility-Specific Measure, Existing and Future Conditions	
		1.2B – Transit Reliability	Based on average PM peak hour transit travel speed to non-peak hour travel speed ratio. Measure to be provided by transit agencies that operate in the County.	Facility-Specific Measure, Existing and Future Conditions	
		1.2C – Transit Infrastructure Index	Based on the following factors: <ul style="list-style-type: none"> ▪ Provided bus stop amenities ▪ Bus stop location ▪ Bus stop design The measure applies a 10-point scoring system that corresponds to the following rating: <ul style="list-style-type: none"> ▪ 0 – 5 points = Poor ▪ 6 – 7 points = Good ▪ 8 – 10 points = Very Good 		Facility-Specific Measure, Existing and Future Conditions

APPROVED MULTIMODAL ARTERIAL PLAN PERFORMANCE MEASURES AND INDICATORS¹

Goal	Category	Performance Measure	Evaluation Approach	Application
	1.3 – Pedestrian	1.3 – Pedestrian Comfort Index	<p>Based on the following factors:</p> <ul style="list-style-type: none"> ▪ Sidewalk width ▪ Presence of buffer between sidewalk and roadway ▪ Average crosswalk spacing ▪ Roadway classification, average daily vehicle volume, number of travel lanes and speed limit ▪ Percent heavy vehicle traffic <p>The measure applies a 24-point scoring system that corresponds to the following rating:</p> <ul style="list-style-type: none"> ▪ 0 – 7 points = Poor ▪ 8 – 14 points = Fair ▪ 15 – 20 points = Good ▪ 21 – 24 points = Very Good 	Facility-Specific Measure, Existing and Future Conditions
	1.4 – Bicycle	1.4 – Bicycle Comfort Index	<p>Application of the Level of Traffic Stress (LTS) methodology, which is based on the type of bicycle facility provided and separation from vehicle travel lanes. LTS methodology classifies roadway segments into one of four levels of traffic stress, which are termed as LTS1 through LTS4. Groups of cyclists are categorized by how much stress they will tolerate in different environments. For simplicity, the LTS results correspond to the following rating:</p> <ul style="list-style-type: none"> ▪ LTS4 = Poor ▪ LTS3 = Fair ▪ LTS2 = Good ▪ LTS1 = Very Good 	Facility-Specific Measure, Existing and Future Conditions

APPROVED MULTIMODAL ARTERIAL PLAN PERFORMANCE MEASURES AND INDICATORS¹

Goal	Category	Performance Measure	Evaluation Approach	Application
	1.5 – Trucks/ Goods Movement	1.5 – Truck Route Accommodation Index	<p>Based on curb-lane width. Additional consideration for on-street parking; on-street parking will be considered only in urban contexts where many businesses are expected to load from the street. The measure applies a four-point scoring system that corresponds to the following rating:</p> <ul style="list-style-type: none"> ▪ 0-1 point = Poor ▪ 2 points = Good ▪ 3-4 points = Very Good <p>One point is assigned if curb lane width is 10 feet or less, two points are assigned if the curb lane width is 11 feet, three points are assigned if the curb lane width is 12 feet or greater. One point is assigned for roadways in urban areas that provide on-street parking; a negative point is assigned if on-street parking is not provided.</p>	Facility-Specific Measure, Existing and Future Conditions
	1.6 – Enhanced Mobility	1.6 – Non-Auto Transportation Mode Share	Qualitative assessment of cross-sectional improvements on likelihood of changes to transit, pedestrian, and bicycle travel (proxy for person throughput).	Area-Wide Indicator, Existing, Future Conditions
	1.7 State of Good Repair	1.7 Pavement Condition Index (PCI)	<p>Based on the PCI data obtained from the MTC StreetSaver database. The PCI measure applies a 100-point scoring system that corresponds to the following rating:</p> <ul style="list-style-type: none"> ▪ PCI 0 – 49 = Poor ▪ PCI 50 – 59 = At Risk ▪ PCI 60 – 79 = Good ▪ PCI 80 – 100 = Very Good 	Facility-Specific Measure, Existing Conditions

APPROVED MULTIMODAL ARTERIAL PLAN PERFORMANCE MEASURES AND INDICATORS¹

Goal	Category	Performance Measure	Evaluation Approach	Application
2. Accessible and Equitable²	2.1 – Social Equity	2.1 – Benefit to Communities of Concern	After the preferred list of short and long-term improvements is identified, a ratio will be estimated by dividing the number of arterial miles of identified improvements within Communities of Concern (COC) by the number arterial miles of all identified improvements benefiting each jurisdiction. For Transit, number of population benefitted within COC versus overall population benefitted in the County will be used.	Area-Wide Indicator, Future Conditions
3. Connected Across the County and Region	3.1 – Transit	3.1 – Transit Connectivity	Connectivity measures will be assessed through a mapping exercise. The transit, pedestrian, bicycle and truck networks will be mapped to identify gaps or inconsistencies in the networks. The pedestrian and bicycle assessment will include consideration of relative comfort. The truck network connectivity assessment will be coordinated with the Countywide Goods Movement Plan consultant team to ensure that identified truck network gaps and deficiencies are adequately addressed.	Area-Wide Measure, Existing and Future Conditions
	3.2 – Pedestrian	3.2 – Pedestrian Connectivity		Area-Wide Measure, Existing and Future Conditions
	3.3 – Bicycle	3.3 – Bicycle Connectivity		Area-Wide Measure, Existing and Future Conditions
	3.4 – Trucks	3.4 – Network Connectivity		Area-Wide Measure, Existing and Future Conditions

APPROVED MULTIMODAL ARTERIAL PLAN PERFORMANCE MEASURES AND INDICATORS¹

Goal	Category	Performance Measure	Evaluation Approach	Application
4. Efficient Use of Resources	4.1 – Efficient Use of Operations Funding	4.1 – Operating Cost Effectiveness	<p>Based on the ratio of improvement costs to existing facility costs:</p> <ul style="list-style-type: none"> Develop unit operating costs for cross-sectional elements, including maintenance costs Estimate operating costs to maintain existing cross-section (O_E) Estimate operating costs to maintain preferred cross-sectional improvements (O_P) Operating Cost Effectiveness = O_P/O_E 	Facility-Specific Measure, Future Conditions
	4.2 – Implementation Challenge	4.2 – Implementation Challenge Score	<p>Based on a zero to four point scale, zero being most feasible and four being the least feasible based on the following variables:</p> <ul style="list-style-type: none"> Travel lane removal required (yes = 1 pt, no = 0 pts) Parking removal required (yes = 1 pt, no = 0 pts) Multi-jurisdiction coordination required (yes = 1 pt, no = 0 pts) Curb changes required (yes = 1 pt, no = 0 pts) 	Facility-Specific Indicator, Future Conditions
	4.3 ITS Infrastructure	4.3 Coordinated Technology	<p>Four-point scale (0 – 3) based on the level of ITS investment defined by built infrastructure. Consideration for coordination with adjacent jurisdictions and/or Caltrans, as applicable:</p> <ul style="list-style-type: none"> 0: no ITS infrastructure 1: basic investment ITS network 2: medium investment ITS network 3: high investment ITS network 	Facility-Specific Indicator, Existing and Future Conditions
	4.4 – Economic Benefits	4.4 – Property Value Index	Based on the change in residential and commercial property values influenced by transportation infrastructure improvements within the built environment.	Facility-Specific Indicator, Future Conditions

APPROVED MULTIMODAL ARTERIAL PLAN PERFORMANCE MEASURES AND INDICATORS¹

Goal	Category	Performance Measure	Evaluation Approach	Application
5. Safe, Healthy and Vibrant	5.1 – Safety	5.1 – Collision Rates	Collision rates based on the SWITRS database.	Facility-Specific Measure, Existing Conditions
	5.2 – Active Transportation Mode Share	5.2 – Demand for Active Transportation	Potential for mode shift (low, medium, high) based on demand for active transportation.	Area-Wide Indicator, Future Conditions
	5.3 – VMT	VMT per Capita	Based on VMT data from the Alameda CTC Travel Demand Model.	Area-wide Indicator, Existing and Future Conditions
	5.4 – GHG	GHG per Capita	Based on VMT data from the Alameda CTC Travel Demand Model.	Area-wide Indicator, Existing and Future Conditions

Notes:

1. More information is added to the Evaluation Approach to describe the scores. Performance measures are generally applied to assess existing and/or future year transportation conditions, performance indicators will generally be evaluated after preferred short and long-term improvements are identified to ensure that preferred improvements achieve the Plan’s vision and goals.
2. Accessibility is a component of the Transit Infrastructure Index, Pedestrian Comfort Index and Bicycle Comfort Index.

Source: *Alameda Countywide Multimodal Arterial Plan – Performance Measure and Evaluation Approach Memo*, Fehr & Peers, January 22, 2015.

APPENDIX 2

Summary of Stakeholder Comments on Draft Performance Objectives

Countywide Multimodal Arterial Plan - Performance Objectives Methodology Approach Comments Provided by Stakeholders

#	Stakeholder	Category	Methodology Approach Comments	Comment Response
1	Alameda County	Performance Objectives	Objectives: Page 7 of 16: the middle paragraph says that the objectives represent a minimum threshold if that particular mode has the priority on an arterial segment. What happens to the other modal priorities on that segment in terms of measuring its performance? Shouldn't all modes be meeting some degree of the objective	The modal priority list methodology does not automatically preclude measuring performance and identifying improvements for lower priority modes. The primary priority mode will be given highest preference when assessing needs and measuring performance measure objectives. If a segment is performing above the performance thresholds for a top priority, then the evaluation looks at the next modal priority and assesses its performance and identifies any necessary potential improvements.
2	Alameda County	Performance Objectives	Objectives: Page 8 of 16: Table 2, AND Page 12 of 16: Transit Travel Speed. Shouldn't the quantitative measure be based solely on the 2013 Public Transportation Fact Book and AC Transit data? Comparing our county's transit travel speed data to the auto congested speed isn't really an "apples to apples" meaningful correlation. An objective of "at least 50% of the auto congested speed", or roughly 10 mph, is actually 4 mph LESS than the APTA average transit speed of 14mph. Why would we set the bar lower, and why base it on auto congestion numbers??	Based on comments received from AC Transit staff, the transit speed objective was increased to be at least 75% of the auto congested speed during the PM peak hour. The suggested objective is based on AC Transit's average transit speed data along the major corridors.
3	Alameda County	Performance Objectives	Objectives: Page 13 of 16: Transit Reliability. Same comment on derivation of this Transit performance objective.	Based on comments received from AC Transit staff, the transit reliability objective was increased to be greater than a 0.7 PM peak hour-to-non-peak hour transit speed ratio. The suggested objective is based on AC Transit's average transit reliability data along the major corridors.
4	Alameda County	Performance Objectives	Objectives: Transit Travel Speed and Reliability: Are TPAs synonymous with PDAs? Are they different as used here?	Pages 12 and 13 of the performance objectives memo specified that transit speed and reliability performance objectives are only applicable to roadways that have been identified as having <u>transit priority</u> based on our typology evaluation. This is not to be confused with TPA (Transit Priority Areas) identified as a part of SB 743.
5	Alameda County	Performance Objectives	Objectives: Will the non-TPA/PDA corridors or roadways also be evaluated in a similar manner? Seems like they should for whatever modes operate on them; the memo says the objective applies to these major corridors ONLY.	The performance measure objectives are only applicable to certain modal priorities as indicated in Table 2 of the draft objectives memo. Each roadway's modal priorities would be determined in our typology evaluation. This method applies to all Study Network roadways.

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6	Alameda County	Performance Objectives	Objectives: Page 15 of 16: Truck Route Accommodation Index: Please clarify if this discussion means Truck on-street parking, or Car on-street parking? One point is assigned for roadways in urban areas that provide on-street parking; a negative point is assigned if on-street parking is not provided. Shouldn't this be reversed? On-street parking would seem a potential hindrance to truck travel. In addition, residential communities in unincorporated Alameda County have voiced opposition to allowing truck parking in their neighborhoods and a negative point should not apply. Seems like the parking consideration will penalize jurisdictions that don't want to provide on-street parking.	Several stakeholders stated concerns about incorporating on-street parking into the Truck Route Accommodation Index evaluation for urban areas. Specifically, stakeholders were concerned that the evaluation penalized street segments for not providing on-street parking which could potentially result in the GIS Cross-Sectional tool recommending the addition of parking for truck priority corridors, an improvement that is not preferred by several jurisdictions. To address these concerns, the Truck Route Accommodation Index methodology was revised to eliminate on-street parking in the evaluation for urban areas. The revised performance measure methodology applies a three-point scoring system that corresponds to the following rating: 1 point = Poor 2 points = Good 3 points = Very Good One point is assigned if curb lane width is less than 11 feet, two points are assigned if the curb lane width is between 11 and 12 feet, three points are assigned if the curb lane width is 12 feet or greater. The proposed performance objective of achieving a Very Good rating would still apply for truck priority corridors.
7	AC Transit	Performance Objectives	Transit Reliability - I suggest PM peak to non-peak speed ratio to be greater than 0.7, which is the average for major corridor routes.	Performance objective was updated so that the PM peak to non-peak speed ratio to be greater than 0.7.
8	AC Transit	Performance Objectives	Transit Speed - In order for transit to stay competitive against auto, I suggest "greater than 75% of auto speed".	Performance objective was updated so that the PM peak hour transit speed be greater than 75% of PM peak hour auto speed.
9	AC Transit	Performance Objectives	Why is the pedestrian comfort index (Measure 1.3) different for transit and pedestrian priority corridors?	Objective for transit priority corridors is lower to discourage over designing sidewalks and buffers along transit priority Study Network segments that travel through residential neighborhoods.
10	MTC	Performance Objectives	Performance Measure 1.1B (Reliability): It seems this objective is based on v/c ratios, but yet Table 3 (from the HCM) is based on speeds. Since most of the other objectives are based on speed, why wouldn't this objective be based on the same? Also, it would seem that obtaining INRIX speed data would be easier than obtaining volume data for the study arterials.	Travel speed data (from INRIX database) is being utilized to assess Study Network performance for vehicles under Measure 1.1.A. For reliability (Measure 1.1B), volume-to-capacity ratio methodology is used as it provides an assessment of roadway capacity that directly relates to this measure and also informs potential needs and recommended improvements.
11	MTC	Performance Objectives	Performance Measure 1.2B (Transit Reliability): The data source for this measure will be provided by the transit agencies, while the data source for Measure 1.1B (auto reliability) will either be based on v/c or speed. For those arterials that serve both auto and transit, how will you reconcile a situation where these two measures might contradict each other? For example: For an arterial serving both auto and transit, if the Auto Reliability is "unreliable", but the Transit Reliability is "reliable", this result may seem contradictory. If both modes are served by the same arterial, how can autos be significantly congested, but the transit buses using the same arterial be "uncongested"?	The project team has incorporated a method to address this conflict if it arises. Essentially, it will check for whether transit speed is higher than the vehicle speed on roadway segments. If transit speed is higher than the vehicle speed, then the vehicle speed will be adjusted upwards to be consistent with the transit speed. Exceptions will be the roads where transit has exclusive right of way.

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12	MTC	Performance Objectives	<p>Performance Measure 1.5 (Truck Route Accommodation Index):</p> <ul style="list-style-type: none"> - "Poor" is defined as 0-1 point. If there is no on-street parking, then wouldn't that be assigned 0, rather than a negative point? - "Very Good" is defined as 3-4 points. If the curb lane is 12 feet or greater, it gets assigned 3 points. Under what condition would it get 4 points? 	<p>Several stakeholders stated concerns about incorporating on-street parking into the Truck Route Accommodation Index evaluation for urban areas. Specifically, stakeholders were concerned that the evaluation penalized street segments for not providing on-street parking which could potentially result in the GIS Cross-Sectional tool recommending the addition of parking for truck priority corridors, an improvement that is not preferred by several jurisdictions. To address these concerns, the Truck Route Accommodation Index methodology was revised to eliminate on-street parking in the evaluation for urban areas. The revised performance measure methodology applies a three-point scoring system that corresponds to the following rating:</p> <p>1 point = Poor 2 points = Good 3 points = Very Good</p> <p>One point is assigned if curb lane width is less than 11 feet, two points are assigned if the curb lane width is between 11 and 12 feet, three points are assigned if the curb lane width is 12 feet or greater. The proposed performance objective of achieving a Very Good rating would still apply for truck priority corridors.</p>
13	Dublin	Performance Objectives	Can agency staff review more detail about the approved performance measures?	Yes, the performance measure memo describing each of the approved measures is available online on the Alameda CTC website as part of the February ACTAC/PPLC/Commission meeting agenda packet.
14	Dublin	Performance Objectives	Performance objective for measure 1.1A (congested speed) should not apply to street segments with transit priority since a transit speed (measure 1.2A) objective will be applied to transit priority segments.	Based on feedback received, objectives for Measure 1.1A (congested speed) will only apply to auto and truck priority corridors.
15	Dublin	Performance Objectives	Was a sensitivity analysis conducted for the performance objectives?	The draft performance objective summary memo in Appendix 1 of the response to comments memo describes the technical basis for deriving each of the proposed performance objectives.
16	San Leandro	Performance Objectives	San Leandro eliminated on-street parking in industrial areas and reallocated the space to the curb lane width to discourage trucks from parking on-street overnight or long-term. The City does not want to get penalized since trucks can still park illegally if needed.	<p>Several stakeholders stated concerns about incorporating on-street parking into the Truck Route Accommodation Index evaluation for urban areas. Specifically, stakeholders were concerned that the evaluation penalized street segments for not providing on-street parking which could potentially result in the GIS Cross-Sectional tool recommending the addition of parking for truck priority corridors, an improvement that is not preferred by several jurisdictions. To address these concerns, the Truck Route Accommodation Index methodology was revised to eliminate on-street parking in the evaluation for urban areas. The revised performance measure methodology applies a three-point scoring system that corresponds to the following rating:</p> <p>1 point = Poor 2 points = Good 3 points = Very Good</p> <p>One point is assigned if curb lane width is less than 11 feet, two points are assigned if the curb lane width is between 11 and 12 feet, three points are assigned if the curb lane width is 12 feet or greater. The proposed performance objective of achieving a Very Good rating would still apply for truck priority corridors.</p>

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17	San Leandro	Performance Objectives	Will performance measure and objectives be able to identify issues with at-grade rail crossings and recommend improvements for at-grade crossings?	The performance measures and objectives are not sensitive enough to identify issues with at-grade rail crossings, therefore the GIS Tool will not recommend improvements specific to at-grade rail crossings. However, during the one-on-one meetings scheduled for January 2016, jurisdictions will have the opportunity to include specific at-grade crossing improvements for consideration in the Arterial Plan development.

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