APPENDIX A

COMMUNITY ENGAGEMENT SUMMARY: COMMUNITY ENGAGEMENT PLAN

Date: February 14th, 2020
Project: Dublin Bicycle and Pedestrian Master Plan
To: Sai Midididdi, Project Manager
From: Corinne Winter (Winter Consulting) through Mike Alston (Kittelson)

FINAL Community Engagement Plan

Introduction

The Community Engagement Plan (CEP) for the Dublin Bicycle and Pedestrian Master Plan Update (the Plan) establishes a framework for soliciting meaningful information and insights to inform decision making. Through the strategies outlined in the CEP, and in partnership with agency staff and community members, the Project Team will engage appropriate stakeholders to better understand walking and bicycling issues and opportunities within Dublin. This input will inform the development of bicycle and pedestrian projects, policies, and programs for the Plan update. The CEP includes the following sections:

1. Guiding Principles
2. Engagement Process
    a. Stakeholder Identification
    b. Engagement Strategy & Activities
    c. Documentation and Transition of Stakeholder Relationships

Appendices
1. Potential TAC Members
2. Potential Pop-Up Locations
3. Organizations

1. Guiding Principles

The strategies outlined in this CEP are guided by four principles:

- **Build on ongoing planning efforts:** The City of Dublin (City) has past experience working with community stakeholders. This CEP will build off of the City's prior and ongoing engagement efforts.

- **Coordinate outreach efforts:** In order to take full advantage of stakeholder input, the Project Team will fully coordinate various outreach activities with the project's technical tasks.

- **Build relationships with community-based organizations:** The Project Team will develop strategies to build and maintain strong relationships with Dublin and surrounding area community-based organizations (CBOs), and will identify opportunities to partner with community stakeholders on outreach implementation.

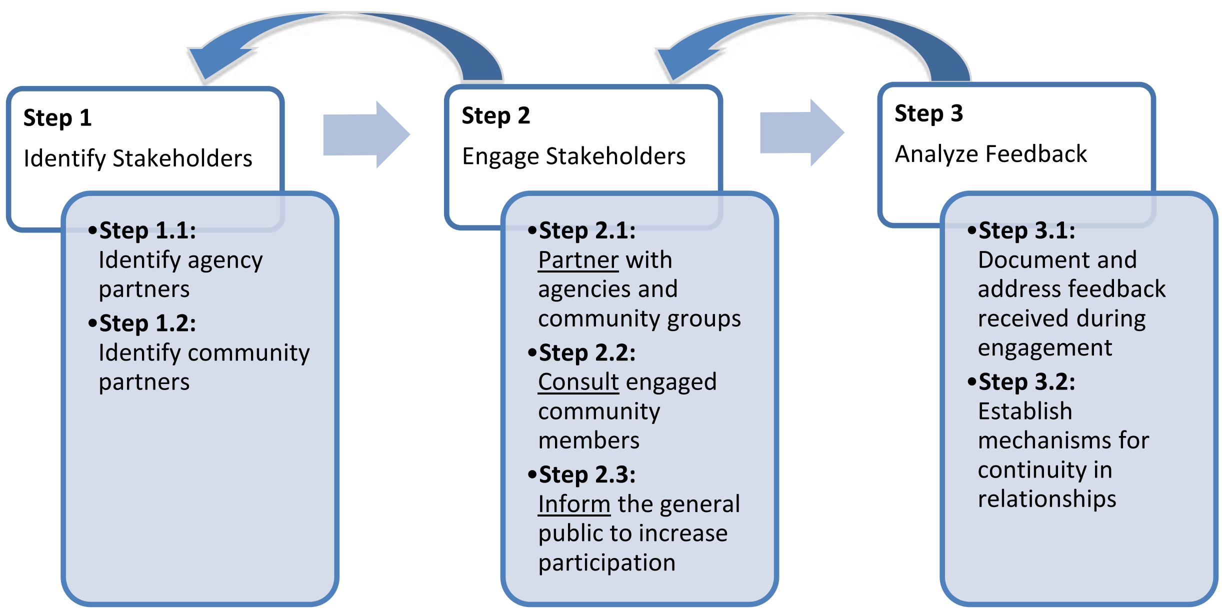
- **Engage stakeholders effectively and equitably**: The Project Team will work to ensure participation from a wide range of community members, including individuals from disadvantaged communities, of different ethnicities, and other community members who are traditionally underrepresented in outreach and engagement, including people with limited mobility. On-demand interpretation will be made available for all engagement activities to enable successful communication with all of Dublin's diverse residents.

2. Engagement Process

Community engagement for the Plan will include the following steps, as illustrated in **Figure 1**:

- Identify stakeholders
- Engage stakeholders
- Analyze feedback

Figure 1: Stakeholder Engagement Process



2.1 Stakeholder Identification

The Project Team will identify stakeholders that may have an interest in shaping the outcomes of the Plan, including those that aren't yet aware the Plan is underway. These stakeholders generally fall into one of two categories:

- **Agency Partners:** Agencies responsible for project implementation, whether direct or indirect (e.g., agency departments, elected leaders)
- **Community Partners:** Community members who may be affected by or interested in changes to bicycle and pedestrian infrastructure, policies, and/or programs in Dublin

Agency Partners
Stakeholders include City of Dublin staff in Planning, Public Works, Parks, Community Services, and Dublin Police Services; Alameda County Fire Department; Dublin Unified School District; and elected/appointed representatives and other institutions (e.g., Kaiser Hospital), which influence transportation policy and project implementation.

Community Partners
The City's residents, businesses, bike shops (e.g., Dublin Cyclery), and groups such as Bike East Bay, Walk the Trail, and the Chamber of Commerce, will be interested in and impacted by the implementation of projects and policies defined in the Plan. Therefore, these community partners are an important group of stakeholders.

2.2 Engagement Strategy & Activities

This section describes:

- The committees that will interface with the Project Team
- The activities that will be designed when consulting appropriate stakeholders at major decision-making points
- The communication plan used to keep the public informed and to increase participation in the activities described

Governing Groups and Committees

The Project Team will form a Technical Advisory Committee (TAC) to provide key guidance. The Alameda CTC Bicycle and Pedestrian Advisory Committee (BPAC) serves as the Dublin's BPAC and will also provide important input.

1. **Technical Advisory Committee** (TAC)
    - **Members:** See **Appendix 1** for public agency representatives from various departments in Dublin
    - **Role:** The TAC will be consulted at five key project milestones and will be responsible for shaping the direction and outcomes of the Plan. Prior to TAC meetings, the Project Team will prepare meeting materials, and support the Project Manager in correspondence with TAC members. During TAC meetings, the Project Team will share relevant Plan information, review findings, discuss concerns and tradeoffs, and seek the TAC's guidance on Plan recommendations.
    - **Frequency:** See **Table 1** for a tentative meeting schedule, topics, and outcomes.
2. **Alameda CTC Bicycle and Pedestrian Advisory Committee** (BPAC)
    - **Members:** Current BPAC members
    - **Role:** Solicit input from the Alameda CTC Bicycle and Pedestrian Advisory Committee to provide additional guidance and support for the draft Plan.
    - **Frequency:** Introduce the Plan at the BPAC's April 30 meeting and then update BPAC throughout the Plan process as appropriate.

Table 1: TAC Meeting Topics and Target Outcomes		
Anticipated Date	**Topics**	**Target Outcomes**
Meeting #1 March 2020 (Phase 1)	▪ Introduce the Plan process ▪ Share the Community Engagement Plan ▪ Solicit input on the project vision	▪ Establish collective understanding of the Plan and planning process ▪ Obtain feedback on Community Engagement Plan and upcoming stakeholder engagement ▪ Obtain input on project vision
Meeting #2 May 2020 (Phase I)	▪ Review and discuss preliminary existing conditions ▪ Update on community outreach ▪ Review draft vision and goals	▪ Obtain feedback on draft existing conditions findings ▪ Obtain feedback on draft vision and goals
Meeting #3 Fall 2020 (Phase 2)	▪ Review preliminary findings from needs analysis ▪ Update on community outreach	▪ Share findings from needs assessment ▪ Solicit input on recommendations for policy, program, and infrastructure elements
Meeting #4 Winter 2021	▪ Draft prioritization approach and plan recommendations	▪ Obtain feedback on draft prioritization approach and Plan recommendations

(Phase 2)		
Meeting #5 Spring 2021 (Phase 3)	▪ Present draft Plan for review and comment	▪ Obtain feedback on draft Plan

Community Engagement Activities

In addition to the ongoing partnerships described above, community engagement for the Plan includes activities to solicit input from the Dublin community on walking and biking, shown in **Table 2.** At key points in the technical work, the Consultant Team will summarize the feedback received from these engagement activities to incorporate into findings and recommendations. A wide range of community stakeholders will be consulted in the development of these activities to help:

- Identify potential gaps in the Project Team's understanding of existing conditions
- Obtain feedback on feasible alternatives from a broad spectrum of current and potential pedestrians and bicyclists
- Cultivate community support for future implementation

Table 2: Outreach Activities During Each Plan Phase		
Phase	**Activity**	**Purpose and Target Outcomes**
Phase I: Project Launch (Feb – Oct 2020)	One (1) workshop; City's bi-annual transportation community workshop	▪ Inform the public about the Plan and gather broad community feedback ▪ Establish collective understanding of the planning process; Obtain feedback on project vision
	Two (2) pop-up events; potential locations are listed in Appendix 2	▪ Inform the public about the Plan and gather broad community feedback ▪ Assess qualitative priorities in various neighborhoods ▪ Meet residents at local events or meetings, and also advertise the events to the broader community
	Two (2) public meetings (e.g. City Council or Commissions)	▪ Provide support to City staff and answer stakeholders' questions
	Distribute flyers/ postcards/business cards to various community locations	▪ Spread information and interest in the Plan via Dublin's community facilities, library, trailheads, and through other City locations/programs ▪ Advertise interactive online map and other ways to provide input
	Website and online map	▪ Will be updated at key project milestones and will provide information about the Plan development and events ▪ Online map will give the public the opportunity to identify desired improvements, gaps, and key destinations in the existing bicycle and pedestrian network
	Inform elected officials	▪ Inform the City Council that the Plan is kicking off and invite them to sign up for future project emails, if interested
Phase 2: Review of Draft Bicycle and Pedestrian Improvements (Nov 2020 through Apr 2021)	Two (2) pop-up events; potential locations are listed in Appendix 2	▪ Inform the public about the Plan and gather broad community feedback on draft Plan elements ▪ Assess qualitative priorities in various neighborhoods ▪ Meet residents at local events or meetings, and also advertise the event to the broader community
	One (1) Walking Tour	▪ Investigate existing conditions with Bike East Bay, Walk the Trail, and other community stakeholders ▪ Gather specific input on pedestrian and bicycle facilities, network gaps, and infrastructure needs
	Two (2) public meetings (e.g. City Council or Commissions)	▪ Provide support to City staff and answer stakeholders' questions
	Website and online map and PUBLIC SURVEY	▪ Project website will be updated at key project milestones and will provide information about the Plan development and events ▪ Online map will give the public the opportunity to review the proposed network/improvements and provide input
Phase 3: Draft and Final Plan	One (1) workshop; City's bi-annual Transportation Community Workshop	▪ Gather broad community feedback ▪ Assess qualitative priorities across the City ▪ Obtain feedback on draft Plan elements
	Two (2) public meetings (e.g. City Council or Commissions)	▪ Provide support to City staff and answer stakeholders' questions
	Website	▪ Project website will be updated at key project milestones and will provide information about the Plan development and events

Plan Communications

Plan communication tools are summarized in **Table 3** and rely on electronic communication channels (i.e., City of Dublin, City PIO (Public Information Officer), and partner websites; social media accounts; stakeholder email lists; and Dublin Library and facilities). Content will be published concurrently with Plan milestones to keep the public up-to-date on the Plan's status, help identify additional stakeholders, and increase participation in the outreach activities described in **Table 2.**

The Consultant Team will also work with local community and business organizations to expand the reach of the Plan's communication channels. **Appendix 3** offers a preliminary list of stakeholder organizations.

Table 3: Plan Communication Tools

Activity	Purpose	Occurrence	Target Outcomes
Flyer/ Postcard/ Business Card	Share Plan information with the public during Phase I	Develop an initial flyer at outset of Plan; distribute on two separate dates	▪ Spread information and build interest in the Plan via Dublin's facilities; Library, trailhead message boards, and through other City locations (e.g., bike lockers at BART, bus shelters)
Website	Broadly share Plan materials and provide a platform for additional community participation	The website will be updated at key milestones	▪ Document outreach meetings ▪ Link to/embed the online map ▪ Allow the public to provide feedback on the Draft Plan
Social Media	Broadly share Plan materials and encourage additional community participation using the City's existing platforms	As appropriate throughout the Plan	▪ City to promote the Plan website, online map, in-person outreach events, and Plan milestones on existing City platforms
Plan email list	Keep interested parties informed about key milestones and outreach touch points	As appropriate throughout the Plan	▪ Keep interested parties updated on Plan status and highlight opportunities to share feedback ▪ Help market outreach meetings and other feedback opportunities ▪ Help increase interest and engagement in outreach activities
On-Demand Language Interpretation Service	A phone-based service that provides interpretation in 244 languages	As appropriate throughout the Plan	▪ Permits an increase in community stakeholders' participation in certain outreach activities described in **Table 2** ▪ Engage stakeholders effectively and equitably
Partner-Organization Outreach	Leverage partnerships with organizations interested in transportation to reach their constituencies	As appropriate throughout the Plan	▪ Keep organizations' constituents updated on Plan status and highlight opportunities to share feedback ▪ Help market outreach meetings and other feedback opportunities ▪ Help increase interest and thus improve engagement in outreach activities

Online Engagement

This section describes the approach for the Plan website, social media communications, and online map.

Plan Website

Online engagement tools will complement in-person outreach efforts. The Project Team will create a robust and customized online content management system (CMS) with significant capabilities and potential. This section describes the initial framework for the CMS tool, but further customization is possible throughout the span of the planning process depending on project needs.

All aspects of the online tool will be fully accessible (compliant with the most stringent Federal accessibility standards) and will be easily utilized from both computers and various mobile devices. Optional demographic surveys will allow the project team to assess who is interacting with the online engagement tools and use this information to make decisions regarding in-person engagement (i.e., geographies or demographics that aren't represented can be further emphasized).

Content for publication

The CMS tool will provide a central storehouse for all general project information that might be of interest to stakeholders, for example:

- Project scope and timeline
- Agendas, minutes, and presentations from relevant meetings
- Connections to/from other relevant project websites
- Upcoming outreach events

Content to encourage discourse

In addition to providing static information, the CMS tool will be leveraged at multiple points during the planning process to solicit feedback from stakeholders and to share sophisticated project information. These mechanisms will include interactive online survey maps.

Social media

Social media engagement seeks to increase conversation around the project, reach target demographics that are outside currently engaged demographics, and successfully solicit feedback at various project stages.

Mechanisms for advertising the online assets

Regardless of how robust they are, online engagement platforms are only as useful as the amount of traffic that they receive and who they are able to reach. Recognizing the importance of driving traffic to the web assets, the Project Team will develop multiple channels to advertise the project website and tools, including the City and partners' email distribution lists, social media, project collateral, and in-person outreach.

2.3 Documentation and Transition of Stakeholder Relationships

This aspect of the engagement process focuses on documenting the outreach efforts as well as ensuring continuity between planning and implementation.

The Consultant Team will establish mechanisms for continuity in stakeholder relationships by providing the stakeholder database to the City and making all online assets made available to City for future use. The Team will indicate if follow-up with specific demographics or individuals may be recommended.

Documentation will include activity summaries for each of the three outreach phases as well as a summary outreach report. The Consultant Team will transfer all engagement materials and files to the City for future use or reference. All outreach efforts will be documented and summarized in a summary outreach report, which will be folded into the final Dublin Bicycle and Pedestrian Master Plan.

Appendix 1: Potential TAC Members

Contact	Email	Designation	Agency/Department	Confirmed
Kristie Wheeler	Kristie.Wheeler@dublin.ca.gov	Assistant Community Development Director	Planning	Yes
Bridget Amaya	Bridget.Amaya@dublin.ca.gov	Assistant Parks & Community Services Director	Parks & Community Service	Yes
Chris Stevens	stevenschris@dublinusd.org	Chief Facilities Operations Officer; Office 925-828-2551 ext. 8061, Cell 925-557-0109	Dublin Unified School District	Verbal ok/No email confirmation yet
Kevin Monaghan	Kevin.Monaghan@dublin.ca.gov	Traffic Sergeant	Dublin Police Department	Yes
Darrell Jones	Darrell.Jones@dublin.ca.gov	Deputy Fire Marshall	Dublin Fire Department	Yes
Lisa Bobadilla	lbobadilla@sanramon.ca.gov	Division Manager, Transportation Division, Public Works	City of San Ramon	Yes
Cedric Novenario	cnovenario@cityofpleasantonca.gov	Senior Traffic Engineer	City of Pleasanton	Yes
Julie Chiu	jchiu@cityoflivermore.net	Associate Civil Engineer	City of Livermore	Yes-Include both
Andy Ross	aaross@cityoflivermore.net	Assistant Planner	City of Livermore	Yes-Include both
Hazel Wetherford	Hazel.Wetherford@dublin.ca.gov	Economic Development Director	City Manager's Office	Yes
John Stefanski	John.Stefanski@dublin.ca.gov	Assistant to the City Manager	City Manager's Office	Yes
Christopher Marks	CMarks@alamedactc.org	Associate Transportation Planner	Alameda CTC	Yes
Sergio Ruiz	sergio.ruiz@dot.ca.gov	Branch Chief for Active Transportation	Caltrans	Yes
Jake Freedman	Jake.Freedman@dot.ca.gov	East Alameda County liaison	Caltrans	Yes
Mariana Parreiras	mparrei@bart.gov	Project Manager, BART Planning, Development & Construction, 510.464.6169	BART	Emailed the contact- Not confirmed yet
Cyrus Sheik	csheik@lavta.org		LAVTA	Yes

Appendix 2: Potential Pop-Up Locations

Event	Date	Phase	Location
Shamrock 5k Fun Run & Walk	Sunday, March 15, at 8:30 a.m.	Phase 1	Dublin
Saint Patrick's Day Festival	Saturday, March 14 & Sunday, March 15	Phase 1	100 Civic Plaza, Dublin, CA
Bike East Bay – Family Cycling Workshops	Saturday, March 28, 2020 |10 a.m. – 1 p.m.	Phase 1	2100 E Cantara Drive
Dublin Farmers' Market	Thursdays, beginning April 2, 4:00 p.m. – 8:00 p.m. Thursday, May 28 – Bike to Market Day	Phase 1 or 2	Emerald Glen Community Park, Dublin, CA
Dublin Pride Volunteer Day	Saturday, April 25 8 a.m. -1 p.m.	Phase 1	Emerald Glen Park, Gleason Dr., Dublin

Cinderella Ride 2020	Saturday, March 28, 2020	Phase 1	Las Positas College – Livermore, CA
Dublin Pride Week Workshops	Saturday April 25 - May 3	Phase 1	Various locations throughout Dublin
Bike Commuting 101	Thursday, April 30	Phase 1	100 Civic Plaza, Dublin, CA
Bike to Work Day	Thursday, May 14, 2020	Phase 1	East and West Dublin BART, Dublin, CA
Community Bike Ride	May 16, 2020	Phase 1	11-mile ride between City of Pleasanton and City of Dublin
Spring Eggstravaganza	Saturday, April 11, 2020 | 8:30 a.m. – 1:00 p.m.	Phase 1	4201 Central Parkway
Picnic Flix	Fri, June 12 | Fri, July 31| Fri, Aug 21	Phase 1	4201 Central Parkway
Family Campout	June 20-21, 3:00 p.m. – 10:00 a.m. July 11-12, 3:00 p.m. – 10:00 a.m. August 8-9, 3:00 p.m. – 10:00 a.m.	Phase 1	Emerald Glen Park Alamo Creek Park Schaefer Ranch Park
Dublin Heritage Park and Museums	Music Jams & Hands-On History Day	Phase 1	6600 Donlon Way, Dublin, CA
Splatter	September 12	Phase 1	Emerald Glen Park, 4201 Central Parkway, Dublin, CA
Walk and Roll to School	First week of October, planning meetings with schools in Sept. Could promote plan @ meeting and ask site leads to distribute info or host workshop @ school	Phase 2	
Homecoming Parade	TBD	Phase 2	Dublin High School
Dublin Senior Center Info. Fair	October 3, 2020	Phase 2	
The Wave	Swim lessons, swim meets, etc.	Phase 2	
Dublin Library	Tabling at entrance during peak use	Phase 2	

Appendix 3: Stakeholder Organizations

Organization	Website	Number & Email
WHEELS	https://www.wheelsbus.com/	925-828-0231 info@lavta.org
Dial-a-Ride	https://www.wheelsbus.com/	925-455-7510 info@lavta.org
Bike East Bay	https://bikeeastbay.org/	kristi@bikeeastbay.org
The Trail Group		
Valley Spokesmen Bicycle Club	https://www.valleyspokesmen.org	925-828-5299 webmaster@valleyspokesmen.org
Indians in Dublin, Ca	Facebook Link	
Asian Pacific Islander American Public Affairs	https://www.apapa.org	916-928-9988 info@apapa.org
Integrity in Action	Dublin-integrity-in-action.org	info@dublinintegrityinaction.org
Chamber of Commerce	www.dublinchamberofcommerce.org	925-828-6200, Inge Houston, CEO/President, ceo@dublinchamberofcommerce.org
Innovation Tri-Valley		Lynn Naylor, CEO, lnaylor@innovationtrivalley.org
Dublin Senior Foundation		925-833-1866
Dublin Community Foundation	http://www.dublinfoundation.org/	614-889-2001

New Life Church	www.newlifeinfo.com	925-355-9200
Muslim Community Center	https://mcceastbay.org/	925-485-1786 contact@mcceastbay.org
Valley Christian Center	www.comediscovervcc.org	925-560-6202
Blazing Fire Church	https://blazingfire.org/home	925-264-9161 info@blazingfire.org
Dublin Art Collective	Facebook.com/DublinArtCa	
Sri Panchamukha Hanuman Temple	https://panchamukhahanuman.org/	510-926-7638 pmhtemple@gmail.com
Dublin Fighting Irish	http://www.dublinfightingirish.org	510-714-1439 irishyouthfootball@yahoo.com
Tri-Valley Convention and Visitor's Bureau		925-846-8910
Tri-Valley YMCA		925-263-4444
Women's Club of Dublin/San Ramon	https://dsrwomensclub.org/	925-828-0231 dsrwcmail@gmail.com
Dublin Sister City Association	Facebook Link	925-899-4771
Dublin Partners in Education	www.dpie.org	925-828-2551 x8024
Dublin Lions Club		925-828-6636 steve6gd@yahoo.com
Girl Scouts	https://www.crossroadsgirlscouts.com/	800-447-4475 crossroadsgirlscouts@gmail.com
Boy Scouts of America	http://www.sfbac.org/about/ebscoutshop	925-785-4518 jalewis@bsamail.org
Dublin Historical Preservation Association	http://dhpa.org/	dhpaorg@gmail.com
Dublin 4-H	https://www.dublin4h.com/	925-462-4518 cnattu@gmail.com badami@gmail.com
Child Care Links	https://behively.org/	925-417-8733 hello@behively.org
BART		Kamala Parks, KParks2@bart.gov
Senior Support Programs of the Tri-Valley		
Alameda County Safe Routes to School	http://alamedacountysr2s.org/	info@alamedacountysr2s.org
Kaiser Permanente		Ronald Wetter, Community & Governmental Relations Manager, ronald.wetter@kp.org
Zeiss Meditec		Mark Boyd, Sr. Facilities Manager, mar.boyd@zeiss.com
Vagaro HQ		Kerry Melchoir, Director of Operations, kerrymelchior@vagaro.com
TriNet HQ		Jay Meyer, Director of Facilities, jay.meyer@trinet.com
Patelco Credit Union HQ		Cara Houck, Community and Corporate Social Responsibility Specialist, chouck@patelco.org
AEye HQ		Jennifer Deitsch, Communications Director
Ross Stores HQ		Lynn Mayate, Corporate HR, lynn.mayate@ros.com
Graybar		Kristian Reyes, Kristian.Reyes@grybar.com

Chabot Las Positas Community College District		Julia Dozier, District Executive Director, jdozier@clpccd.org
Dublin San Ramon Services District		Judy Zavadil, zavadil@dsrsd.com
Camp Parks		Brian Lucid, Analyst, brian.m.lucid.civ@mail.mil
Tri-Valley Career Center		Sarah Holtzclaw, Program Manager, sholtzclaw@clpccd.org
Federal Corrections Institute		
Alameda County (Courthouse, Office of Emergency Services, County Jail)		

APPENDIX A

COMMUNITY ENGAGEMENT SUMMARY: PROJECT FACTSHEET

DUBLIN
CALIFORNIA

BICYCLE AND PEDESTRIAN MASTER PLAN

Please fill out our Public Survey!

OUR VISION

The City of Dublin is a vibrant place where walking and biking are **safe, comfortable,** and **convenient** ways to travel and connect individuals, **inclusive of all ages and abilities,** to local and regional destinations.

GOALS

Enhance Safety Prioritize safety in design and implementation of walking and biking facilities.

Increase Walking and Biking Support biking and walking as attractive modes of transportation.

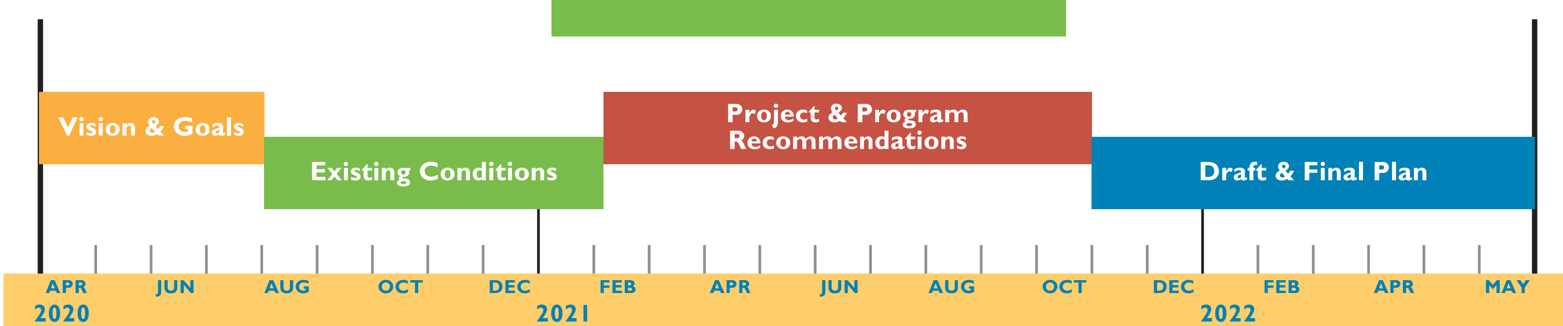
Improve Connectivity Develop a bicycle and pedestrian network that provides well-connected facilities for users of all ages and abilities.

Enhance Accessibility Utilize principles of universal design to make biking and walking a viable transportation option for all, including people with disabilities.

Prioritize Investments Maintain sufficient funding to provide for existing and future bicycle and pedestrian needs, including supporting programs and operation and maintenance. Leverage biking and walking projects to promote economic activity and social equity outcomes among people of all ages and abilities

GET INVOLVED

Go to www. dublinbikeped.org to learn more and provide input to inform the Bicycle and Pedestrian Master Plan.



City of Dublin
100 Civic Plaza, Dublin, CA 94568
(925) 833-6630 | (925) 833-6651 FAX
www.dublin.ca.gov

Email us at:
bikeandpedplan@dublin.ca.gov

APPENDIX A

COMMUNITY ENGAGEMENT SUMMARY: PUBLIC SURVEY

City of Dublin's Bicycle and Pedestrian Plan update

Transportation Survey

The City of Dublin is updating its Bicycle and Pedestrian Plan to further the Dublin's commitment to create a walk- and bike-friendly community. The Plan will include goals and recommendations to ensure that walking and biking in Dublin is safe, comfortable, and fun for all ages and abilities.

This survey is intended to better understand travel behavior of residents who walk and bike in Dublin. This data will be used to inform the program, policy, and project recommendations. This survey will take approximately 7 minutes to complete, and the information collected will be confidential and used solely to inform the City's Bicycle and Pedestrian Plan update.

To learn more about the City of Dublin's Bicycle and Pedestrian Plan update, please visit the project website: www.DublinBikePed.org.

The more survey responses we get, the better informed our Plan will be. *Please share this survey with your friends, colleagues, family, and neighbors!*

General Travel Habits

1. **Before the COVID-19 pandemic, how frequently did you use each of the following options to travel to work or school? Check the appropriate boxes.**

	Never	Less than once a month	1-3 days a month	At least once a week
Drive alone in personal car, truck, van, or motorcycle	❑	❑	❑	❑
Carpool with others (car or van)	❑	❑	❑	❑
Public transit (Bus, BART)	❑	❑	❑	❑
Paratransit	❑	❑	❑	❑
Employer-provided shuttle	❑	❑	❑	❑
Personal Bicycle	❑	❑	❑	❑
Bike share	❑	❑	❑	❑
Scooter share/personal scooter	❑	❑	❑	❑
Walk	❑	❑	❑	❑
Taxi (Includes Uber, Lyft etc.)	❑	❑	❑	❑
Use wheelchair/mobility aid	❑	❑	❑	❑
Combination of multiple travel modes (bike to a transit station, drive to a vanpool location, etc.)	❑	❑	❑	❑

2. **After the COVID-19 pandemic, how frequently will you use each of the following options to travel to work or school? Check the appropriate boxes.**

	Never	Less than once a month	1-3 days a month	At least once a week
Drive alone in personal car, truck, van, or motorcycle	❑	❑	❑	❑
Carpool with others (car or van)	❑	❑	❑	❑
Public transit (Bus, BART)	❑	❑	❑	❑
Paratransit	❑	❑	❑	❑
Employer-provided shuttle	❑	❑	❑	❑
Personal Bicycle	❑	❑	❑	❑
Bike share	❑	❑	❑	❑
Scooter share/personal scooter	❑	❑	❑	❑
Walk	❑	❑	❑	❑
Taxi (Includes Uber, Lyft etc.)	❑	❑	❑	❑
Use wheelchair/mobility aid	❑	❑	❑	❑
Combination of multiple travel modes (bike to a transit station, drive to a vanpool location, etc.)	❑	❑	❑	❑

3. **On Question 1, if you selected "Combination of multiple travel modes," what travel modes are involved in your trip? Check all that apply.**

❑ Personal vehicle (drive alone)
❑ Carpool / Vanpool
❑ Public Transit
❑ Paratransit
❑ Employer-provided shuttle
❑ Personal Bicycle
❑ Bike share
❑ Scooter share/personal scooter
❑ Walk
❑ Use a wheelchair/mobility aid
❑ Taxi (Includes Uber, Lyft, etc.)
❑ Other: ______________________

4. **If you most often drive alone to work, which of the following are the main reasons?**
Check all that apply.

- ❑ Don't usually drive alone to get to work
- ❑ Driving alone is quickest/most convenient option
- ❑ Privacy
- ❑ Safety
- ❑ Cost of other transportation options is prohibitive
- ❑ Irregular work schedule
- ❑ Need to make additional stops on the way to or from work, or in the middle of the day
- ❑ Work reasons/commitments
- ❑ Don't have access to or want to take a shower at work if I walk or bike
- ❑ Too hard to get to transit stop/station from home
- ❑ Too hard to get to transit stop/station from work
- ❑ Public transportation or paratransit are not available or convenient
- ❑ Sidewalks are not traversable while using a wheelchair or mobility aid
- ❑ The route I would use does not have curb ramps
- ❑ Tactile warning surfaces (such as yellow truncated domes) are either confusing or not present
- ❑ Weather
- ❑ Insufficient bike parking
- ❑ Other, please specify:

____

5. **Do you have school-aged children?**

- ❑ Yes
- ❑ No
- ❑ Prefer not to answer

6. **If you have children, how do your child(ren) typically travel to/from school? (Check all that apply.)**

- ❑ Walk
- ❑ Dropped off in a personal vehicle
- ❑ School bus
- ❑ Public transportation (bus/rail)
- ❑ Paratransit, wheelchair or mobility aid
- ❑ Bike
- ❑ Scooter
- ❑ Drive themselves alone or with siblings
- ❑ Other:

____

7. **If you have children, please indicate which, if any, of the following factors <u>discourage</u> your child(ren) from traveling to/from school by biking, using a scooter, walking or using a wheelchair/mobility aid. (Check all that apply.)**

- ❑ Takes too long / distance to school
- ❑ Inconvenient
- ❑ Not safe from traffic
- ❑ Not safe from crime
- ❑ It isn't "cool"/peer pressure
- ❑ Lack of bicycle facilities
- ❑ Lack of sidewalks
- ❑ Lack of curb ramps
- ❑ Tactile warning surfaces (such as yellow truncated domes) between sidewalk and street are either confusing or not present
- ❑ Sidewalks in poor condition (cracks, uneven surface, etc.) or obstacles on the sidewalk (light poles, trees, etc.)
- ❑ Insufficient bike parking
- ❑ Other:

____

Walking and Biking in Dublin

8. **How important are the following potential barriers when considering whether to bike, walk or travel using a wheelchair/mobility aid somewhere, like to work or to run errands?**

	Not important	Somewhat important	Very important
Cars go too fast and/or are too close to the sidewalk	❑	❑	❑
The existing sidewalks, bicycle facilities, and trails are not maintained properly	❑	❑	❑
Existing sidewalks, bicycle facilities and trails do not provide safe access for my wheelchair or mobility aid	❑	❑	❑
There isn't enough lighting in the areas where I would walk or bike	❑	❑	❑
Crossing the street feels dangerous	❑	❑	❑
It is inconvenient to get to close-by destinations (grocery stores, jobs, schools, parks, transit stations)	❑	❑	❑
There is not enough shade to keep me comfortable on the walk or bike/scooter ride	❑	❑	❑
Are we missing anything important? Please write in comment box			

9. **What is your favorite street to bike, walk or travel on using a wheelchair or mobility aid in Dublin, and why?**

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10. **What types of improvements would encourage you travel more in Dublin by biking, walking or by wheelchair/mobility aid?**
Select up to three.

- ❑ Better/more bicycle facilities
- ❑ Better/more sidewalks and trails
- ❑ Lower vehicle speeds and/or more traffic calming infrastructure (ex. Curb extensions, etc.)
- ❑ More pedestrian countdown signals and pedestrian hybrid beacons at intersections
- ❑ Improved street lighting
- ❑ More marked crosswalks at intersections and/or in the middle of the block
- ❑ Better maintenance of existing sidewalks, bicycle facilities, and paths
- ❑ Employer incentives to walk or bike to work
- ❑ Better sidewalk, bicycle facility, and trail connections to transit stops/stations
- ❑ More trees, shade, benches or other amenities along my route
- ❑ More curb ramps and audible pedestrian push buttons
- ❑ Additional short- and long-term secure bike parking for all types of bicycles
- ❑ Additional onboard bike parking on transit
- ❑ Other:

____

11. **Where should the City prioritize walking improvements first? Select up to three.**
    - ❑ Places where pedestrians are involved in traffic crashes
    - ❑ On routes connecting people to schools, libraries, and parks
    - ❑ On routes connecting people to transit stops
    - ❑ To serve people who rely on walking the most (such as those who have limited access to vehicles or transit)
    - ❑ Along and across busy streets
    - ❑ On streets connecting to businesses
    - ❑ In areas with the most people walking
    - ❑ Other:

12. **Where should the City prioritize biking improvements first? Select up to three.**
    - ❑ Places where bicyclists are involved in traffic crashes
    - ❑ On routes connecting people to schools, libraries, and parks
    - ❑ On routes connecting people to transit stops
    - ❑ To serve people who rely on biking the most (such as those who have limited access to vehicles or transit)
    - ❑ At trail intersections
    - ❑ Along and across busy streets
    - ❑ On streets connecting to businesses
    - ❑ In areas with the most people biking
    - ❑ Other

Is there anything else you'd like to tell us about biking, walking or using a wheelchair/mobility aid in Dublin?

About You

The following questions will help City staff ensure that people throughout Dublin and from different backgrounds are participating in this process. Remember that your responses to the survey questions are completely anonymous.

13. **What are the cross streets nearest to your home address? (Enter as you would in Google Maps…example response: "Dublin Boulevard and Regional Street, Dublin, CA")?**

14. **Your age**
    - ❑ 5-14 years old
    - ❑ 15-24 years old
    - ❑ 25-44 years old
    - ❑ 45-64 years old
    - ❑ 65+ years old
    - ❑ Prefer not to respond

15. **Other than yourself, are any members of your household: (Check all that apply.)**
    - ❑ Under age 18
    - ❑ Over age 65
    - ❑ Not applicable
    - ❑ Prefer not to respond

16. **What is your gender identity?**
    - ❑ Female
    - ❑ Male
    - ❑ Gender non-conforming (Please specify):
    - ❑ Prefer not to respond

17. **How do you identify your race/ethnicity? (Select all that apply.)**
    - ❑ White
    - ❑ Black or African American
    - ❑ American Indian or Alaska Native
    - ❑ Chinese
    - ❑ Filipino
    - ❑ Asian Indian
    - ❑ Vietnamese
    - ❑ Korean
    - ❑ Japanese
    - ❑ Other Asian
    - ❑ Native Hawaiian
    - ❑ Samoan
    - ❑ Chamorro
    - ❑ Other Pacific Islander
    - ❑ Other
    - ❑ Prefer not to respond

18. **Do you have a motor vehicle available for your use?**
    - ❑ Yes
    - ❑ No

Thank You!

19. **Thank you for participating in this survey! The information you provided is an important part of developing the City of Dublin Bicycle and Pedestrian Plan Update.**

20. **Do you have suggestions about issues or improvements to specific locations in Dublin? If so, we encourage you to also submit comments using the project's online interactive map, accessible at www.DublinBikePed.org**

APPENDIX B

EXISTING CONDITIONS: PROGRAM & POLICY REVIEW

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MEMORANDUM

Dublin Bicycle and Pedestrian Plan

Inventory of Existing Programs and Policies

Date:	June 5, 2020	Project #: 24392
To:	Sai Midididdi, TE	
From:	Quinn Wallace; Erin Ferguson, PE, RSP; Amanda Leahy, AICP	
Subject:	Dublin Bicycle and Pedestrian Plan – Inventory of Existing Programs and Policies	

The City of Dublin (City) is updating the 2014 Dublin Bicycle and Pedestrian Master Plan (2014 Plan). The Dublin Bicycle and Pedestrian Master Plan Update (Plan) will serve as a comprehensive action plan for the City to provide improved bicycle and pedestrian facilities for its residents, employees, and visitors. As part of the baseline conditions and needs assessment, Kittelson & Associates, Inc. (Kittelson) is inventorying existing programs and policies related to walking and biking. This memorandum (memo) details this inventory and key themes from interviews conducted with representatives of seven City departments and the Dublin Unified School District. The memo is organized into the following sections:

- Document Review Summary
- Benchmarking Interviews Summary
- Programs Overview
- Key Needs and Recommendations
- Appendix: Interview Questionnaires

DOCUMENT REVIEW SUMMARY

This section summarizes current and draft policies and planning documents that are the most relevant to this Plan. Documents shown in

Table 1 were reviewed and summarized in this section with the intent to guide the active transportation goals, policies, and projects presented in this Plan. In addition to the documents identified in Table 1, the Plan will coordinate with upcoming efforts, including the Local Roadway Safety Plan and ADA Transition Plan. Following Table 1, each plan is described in greater detail and organized by scale chronologically.

Table 1: Relationship to Approved and Ongoing Plans

Plan	Bicycle Policies	Pedestrian Policies	Facility/ Network Maps	Design Guidelines	Design Concepts	Program Recommendations
State and Regional Plans						
California Green Building Code	●					
Countywide Active Transportation Plan (2019)	●	●				
Caltrans District 4 Bike Plan	●		●			
Local Plans						
Streetscape Master Plan (2009)				●		
Complete Streets Policy (City Council Resolution 199-12) (2012)	●	●				
Dublin Boulevard Bikeway Corridor and Connectivity Studies (2013)	●				●	
Pedestrian Safety Assessment (2014)						●
Bicycle and Pedestrian Master Plan (2014)	●	●	●	●	●	●
General Plan Land Use & Circulation (2014): Circulation & Scenic Highways Element	●	●				
General Plan Land Use & Circulation (2014): Schools, Public Lands, & Utilities Element	●	●				
Parks and Recreation Master Plan (2015)				●		

Plan		Bicycle Policies	Pedestrian Policies	Facility/ Network Maps	Design Guidelines	Design Concepts	Program Recommendations
Iron Horse Regional Trail Feasibility Study (2017)						●	
Traffic Safety Study Update (2018)						●	
Climate Action Plan (2020)		●	●				●
Downtown Streetscape Master Plan (2020)				●	●	●	
Local Road Safety Plan (in progress)				●	●	●	●
ADA Transition Plan (in progress)				●			●
Specific Plans	Dublin Crossing (2013)			●	●	●	
	Downtown (2014)				●	●	
	Dublin Village Historic Area (2014)			●			
	Eastern Dublin (2016)	●	●			●	

Source: Kittelson & Associates, Inc. 2020.

State and Regional Plans

State and regional plans pertinent to the Plan are summarized in this section. A summary of additional state and regional plans are included in the existing Bicycle and Pedestrian Master Plan.

California Green Building Standards Code

According to Chapter 8.76 of the City of Dublin's Municipal Code, bicycle parking and support facilities in both residential and non-residential development shall conform to the California Green Building Standards Code (CALGreen). The CALGreen Code includes both mandatory and voluntary measures.

For non-residential buildings, it is mandatory that both short-term and long-term bicycle parking is provided and secure. Generally, the number of long-term bicycle parking spaces must be at least 5% of the number of vehicle parking spaces. Schools have additional requirements so that both students and staff have access to sufficient bicycle parking.

Countywide Bicycle and Pedestrian Plans (2012)

The Alameda Countywide Bicycle and Pedestrian Plans established policies at the county level to augment regional and local bicycle and pedestrian plans, programs, and goals. Following a wave of legislative and regulatory changes intended to link transportation and land use planning (such as AB 32), the plans envisioned a transportation system that is multimodal, safe, accessible, affordable, and equitable, integrated, and more. In 2012, a total of $390 million (7% of total program funding) was dedicated to bicycle and pedestrian projects throughout the County. Two active transportation projects were identified in Dublin: the Alamo Canal Trail under I-580 and Gap Closure and Development of the Iron Horse Trail.

Countywide Active Transportation Plan (2019)

The 2019 Countywide Active Transportation Plan (CATP) combines updates of the Countywide Bicycle Plan and Countywide Pedestrian Plan. The CATP includes an analysis of low stress bike networks, identifies a countywide high injury pedestrian and bicycle network, evaluates major barriers to the bicycle and pedestrian network, and establishes a framework for prioritizing projects of countywide significance to inform decision-making around active transportation funding at Alameda County Transportation Commission. At the local level, the CATP provides resources to member agencies to help advance projects that provide complete, safe, and connected networks for biking and walking, including better connections to the regional transit network. Connectivity analysis presented in the CATP indicate that the East planning area, which includes the City of Dublin, generally has poor low-stress connectivity in the rural and outlying suburban areas, and the business park portions of Dublin and Pleasanton. Based on the high injury network analysis completed in the CATP, the combined bicycle and pedestrian high injury network mileage represents less than one percent of total countywide high injury network mileage. Within the East planning area, Dublin Boulevard from Arnold Drive to Hacienda Drive and Village Parkway from Davona Drive to Tamarack Drive experience the highest bicycle collision severity score and Dublin Boulevard was identified as the street with the most mileage on the pedestrian high injury network.

Caltrans District 4 Bike Plan

The Caltrans District 4 Bike Plan evaluates bicycle needs on and across the State transportation network and identifies priority bicycle projects. Projects are classified by prioritization categories of top tier, mid tier, and low tier. The following projects are recommended for Dublin:

- Top Tier Project:

   - Santa Rita Road and I-580: Interchange reconstruction (ramps only), Class IIB facility
- Mid Tier Project:
   - Tassajara Creek and I-580: New separated crossing
   - Alcosta Boulevard and I-680: Minor interchange improvements (signage and striping), Class II facility
- Low Tier Project:

Demarcus Boulevard and I-580: New separated crossingLocal Plans

Existing and draft plans with relevant plans, policies, and goals are described in this section of the non-infrastructure inventory.

Streetscape Master Plan (2009)

This Master Plan maximizes opportunities to craft an urban image unique to Dublin and to maintain existing amenities like street trees. Goals of the Streetscape Master Plan range from coordinating improvements and responsibilities for Dublin's streets to strengthening the streetscape design of Dublin Boulevard. In the context of active transportation, the Streetscape Master Plan is a particularly valuable resource for identifying and implementing street improvements that contribute to Dublin's image.

Complete Streets Policy (City Council Resolution 199-12) (2012)

The City of Dublin's Complete Streets Policy identifies complete streets planning as a critical contributor to:

- Increase walking, biking, and taking transit,
- Reduce vehicle miles traveled (VMT), and
- Meet greenhouse gas reduction goals.

Together, these targets are intended to result in public health benefits. The Policy emphasizes community engagement to remain sensitive to land use and context and coordination with nearby jurisdictions to connect infrastructure across city boundaries. The Policy names several improvements that should be considered to benefit all users of the street, including sidewalks, shared use paths, bike lanes and routes, accessible curb ramps, and more.

Dublin Boulevard Bikeway Corridor and Connectivity Studies (2013)

Two studies completed in 2013 that evaluated options for improving bicycling conditions on Dublin Boulevard, particularly in Downtown Dublin. A traffic analysis determined that removing a vehicle travel lane on Dublin Boulevard would delay transit service and worsen traffic during peak periods. Community members and local business owners expressed concern for this potential barrier to visiting Downtown Dublin via car. Ultimately, a shared-use path running alongside Dublin Boulevard and connecting to the Alamo Canal Trail became the long-term vision for bicycling. In the interim, sharrows (a Class III facility) were added to Dublin Boulevard between Dublin Court and Tassajara Road, and the City permitted riding bicycles on sidewalks to make riding a more comfortable experience for all bicyclists' skill levels.

Pedestrian Safety Assessment (2014)

The UC Berkeley Institute of Transportation Studies Technology Transfer Program prepared this Assessment for the City of Dublin in 2014. The authors compared different types of collisions that occurred in Dublin with other cities in California; they found that Dublin has a relatively high number of collisions involving pedestrians, particularly youth and elderly pedestrians, and collisions involving high vehicle speeds. Opportunity areas to improve walking conditions in Dublin include traffic calming programs, transportation demand management policies and programs, coordination with health agencies to promote walking and biking, and more. This Assessment also includes specific areas of Dublin where pedestrian conditions could significantly benefit from improvements, which will be reviewed in this Plan.

Bicycle and Pedestrian Master Plan (2014)

Adopted in 2014, Dublin's Bicycle and Pedestrian Master Plan (2014 Plan) established key goals and policies to maintain and improve biking and walking infrastructure. Goals and policies support the 2014 Plan's Vision for Dublin:

> The purpose of the City of Dublin Bicycle and Pedestrian Plan is to provide a policy and implementation framework for maintaining and improving bicycle and pedestrian infrastructure in the City. This Plan envisions a network of safe, comfortable, and attractive facilities that meet the needs of users of all ages and abilities and connect users with key destinations—schools, residential neighborhoods, parks, shopping areas, and job centers—within the City and in adjacent jurisdictions.

An inventory of the bicycle and pedestrian network and potential improvements to specific facilities are documented. Infrastructure projects at key locations are organized by priority into four tiers and are intended to actualize the proposed biking and walking network. Programming opportunities to attract biking and walking trips are also identified in the 2014 Plan. In addition to providing an inventory of potential funding sources for project implementation, the 2014 Plan includes bicycle and pedestrian design guidelines that apply national resources and best practices to project implementation in Dublin.

General Plan Land Use & Circulation: Circulation & Scenic Highways Element and Schools, Public Lands, & Utilities Element (2014)

The General Plan's Land Use & Circulation Elements focus on meeting the mobility needs of all roadway users by any mode and aligns with two key documents, the City of Dublin's Complete Streets Policy (City Council Resolution 199-12) and the Tri-Valley Transportation Plan (a regional plan). The Element promotes the use of local and regional trails and emphasize improving experiences walking and taking transit. The Elements name two areas, the Eastern Extended Planning Area and Downtown Dublin, where active transportation investments are a priority.

The Elements' Guiding Policies that are the most relevant to this Plan include:

5.3.1.A.3 Encourage improvements in the Enhanced Pedestrian Areas to improve the walkability of these areas.

5.5.1.A.1 Provide safe, continuous, comfortable and convenient bikeways throughout the City.

5.5.1.A.2 Improve and maintain bikeways and pedestrian facilities and support facilities in conformance with the recommendations in the Dublin Bicycle and Pedestrian Master Plan.

5.5.1.A.3 Enhance the multi-modal circulation network to better accommodate alternative transportation choices including BART, bus, bicycle, and pedestrian transportation.

5.5.1.A.4 Provide comfortable, safe, and convenient walking routes throughout the City and, in particular, to key destinations such as Downtown Dublin, the BART Stations, schools, parks, and commercial centers.

Parks and Recreation Master Plan (2015)

The Parks and Recreation Master Plan establishes goals, standards, guiding policies, and action programs to guide the City in the acquisition, development and management (operations and maintenance) of parks and recreation facilities. Goals and guiding policies and actions identified in the plan encourage creation of a continuous network of linear parks, paths, walks, and trails to enable travel by non-motorized modes. The standards and criteria for the City's parks and recreation facilities include requirements for bicycle parking, paving, and right-of-way width.

Iron Horse Regional Trail Feasibility Study (2017)

Based on a multimodal assessment and community outreach processes, this Feasibility Study arrives at several key preferred alternatives for the Iron Horse Regional Trail and its crossings on Dougherty Road, Dublin Boulevard, and the Dublin/Pleasanton BART station. A multi-use trail separating people walking and biking was preferred; a bicycle/pedestrian bridge was preferred for crossing Dublin Boulevard, while an at-grade crossing was preferred for Dougherty Road. Improvements near the BART station are intended to both enhance access to transit and improve experiences for trail users passing through the station area. Improvements to the Iron Horse Regional Trail contribute to this Plan by making use of the Trail easier and more convenient.

Traffic Safety Study Update (2018)

Collisions were studied in the 2018 Traffic Safety Study Update (Update) to evaluate safety performance on specific street sections and intersections. Overall, collisions had recently increased at the time of this Update, but there were also more people living and driving in Dublin, particularly East Dublin. Based on recent collision history, certain street sections and intersections merited improvements, such as continuous bicycle lanes at Central Avenue and Tassajara Road. The collision analysis included in this Plan supplements the findings and recommendations of the Update.

Climate Action Plan (2020)

The Climate Action Plan (CAP), Climate Action Plan 2030 and Beyond, establishes the City's vision for reducing greenhouse gas (GHG) emissions by 2045. The CAP names transportation as the largest source of emissions in Dublin and lays a plan for Dublin to become carbon neutral by 2045. Zero-emission vehicles and mode shift to biking, walking, and transit trips are key strategies to reduce Dublin's GHG emissions and meet citywide targets. The CAP sets measures to develop plans and programs around transportation demand management, transit-oriented development, parking management, and electric vehicle infrastructure planning to support mode shift and electrification of the Dublin's vehicle fleet. As stated in the CAP, a shift to alternative, active, shared, and electric mobility will provide safer routes between home, transit stops, and other community amenities, reduce greenhouse gas emissions, reduce traffic congestion, improve public health outcomes, and have economic benefits.

Downtown Streetscape Master Plan (2020)

The Downtown Streetscape Master Plan provides direction for public and private investment, specifically in regard to the development of the public realm and Downtown's identity. One of the plan's key goals is to develop pedestrian-oriented environments on Commercial Throughways and on Downtown Local Streets. On these roadways as well as on Crosstown Boulevards and Parkways, the plan also emphasizes providing safe and comfortable facilities and crossings for people walking and biking. Recommended improvements to Downtown are prioritized into four tiers that can be matched to project scale, budget, funding source, and other opportunities. Tier 1 and Tier 2 street and pedestrian enhancements are illustrated on Figure 3 and Figure 4 and include restriping/road diet evaluation, sidewalk expansion, intersection and mid-block crossing treatments, as well as art and wayfinding opportunities. Notable guidelines include expanding sidewalks to provide a minimum 12-foot sidewalk with minimum five- to six-foot clear throughway zone for walking.

Specific Plans

Four areas of Dublin have specific plans that outline guiding principles, policies, and design guidance related to active transportation: Dublin Crossing, Downtown, the Dublin Village Historic Area, and Eastern Dublin.

Dublin Crossing (2013)

This Specific Plan focuses on improving east-west connectivity in the Dublin Crossing, particularly between transit stops, destinations, and trails. A relevant guiding principle in this Specific Plan is to make it easier and more convenient for people to access and use the Iron Horse Regional Trail, the Dublin/Pleasanton BART station, and retail destinations without a car.

Downtown Specific Plan (2014)

Guiding principles pertinent to biking and walking in Downtown aim to create pedestrian-friendly streets, pedestrians, and bicyclists, enhance multimodal travel options, and cultivate pedestrian connections to retail destinations. Transit-oriented development and lighting should be scaled to people walking in Downtown. Pedestrian connectivity between buildings, parking, and sidewalks should be maintained throughout Downtown, and pedestrian amenities like street furniture are encouraged.

Dublin Village Historic Area (2014)

Placemaking, creating a positive experience for people walking, and attracting people to this area are key goals of this Specific Plan. Creating positive experiences for people walking includes providing more crosswalks and median refuges, calming vehicle traffic, adding pedestrian amenities or a plaza, and implementing pedestrian-scale lighting and wayfinding.

Eastern Dublin (2016)

A key goal in the Eastern Dublin Specific Plan is to reduce reliance on single-occupancy vehicles by planning the area's land uses to naturally promote walking, biking, taking transit, and ridesharing. Notably, development with a higher intensity is encouraged near transit corridors in Eastern Dublin. Relevant policies in this Specific Plan include:

- Providing sidewalks in the Town Center and Village Center
- Requiring development to balance pedestrian, bicycle, and automobile circulation
- Creating a north-south trail along Tassajara Creek and other streams
- Establishing a bike network that meets both travel needs and recreational opportunities
- Providing bicycle parking at key destinations

BENCHMARKING INTERVIEWS SUMMARY

Benchmarking interviews were conducted virtually with representatives of seven City departments and the Dublin Unified School District (DUSD) in April and May 2020. The purpose of the benchmarking interviews is to understand each relevant City department and DUSD's active transportation policies, programs, and needs that both support and can be supported by the Plan. Points of emphasis from the interviews will inform the Plan's recommendations and are described and summarized in this section.

Interviewees' complete responses can be found in the Appendix. Interviews were conducted with the following City departments and DUSD:

- Traffic
- Economic Development
- Community Development
- Fire
- Police
- Maintenance
- Parks and Community Services

Emphasis areas emerged as either a theme across multiple interviews or as single points of discussion that are particularly relevant to biking and walking in Dublin. Recommendations draw upon these emphasis areas within the framework of the City's existing policies and plans, as detailed in the previous section of this memo. Policy and program recommendations are intended to act as a starting point for the Plan, and they may be updated and refined as technical analyses and community engagement processes continue.

Emphasis areas, specific topics of each emphasis area, and draft recommendations (where applicable) are described in Table 2.

Table 2: Benchmarking Interview Themes

Emphasis Area	Topic	Recommendation
Desire for stronger policies	2014 Bicycle and Pedestrian Master Plan and Design Guidelines	Back the design guidelines with policy to require adherence to the Guidelines
		Consider approving the Plan in the form of a City resolution or ordinance
		Implement amendments to the Municipal Code to require priority design elements as part of development project implementation.
	Standard plans for new development	Update design standards to include bicycle and pedestrian-friendly standards, such as smaller driveway turning radii
	Unclear bicycle and pedestrian improvement processes	Craft a policy, or accompanying tool, that provides clear direction for bicycle/pedestrian project implementation
		Create a priority project list of identified improvements that can be applied to development projects as community benefits.
	Tension with General Plan policies	Consider modifying policies in the General Plan Circulation Element that facilitate auto-centric development or standards
	Vision Zero	Consider implementing a Vision Zero policy in Dublin

Emphasis Area	Topic	Recommendation
Unclear bicycle and pedestrian project implementation processes	Coordinating with proposed development projects	Establish clear development standards and implementation requirements for new development.
Coordination challenges in implementing bicycle and pedestrian improvements	Intersection treatments for bicyclists and pedestrians that impact vehicle operations	Establish guidance to assist decision makers in determining design solutions when tradeoffs are involved
	Filling gaps in the bicycle and pedestrian network with developers' improvements	Coordinate development review processes with the implementation plan for the proposed bicycle and pedestrian network
	City's plans concurrently in development	Incorporate bicycle and pedestrian improvements into the City's ongoing plans, such as the Downtown Streetscape Master Plan, to identify and secure various funding sources for bicycle/pedestrian projects
	Communication with developers and business owners	Consider implementing a transportation demand management program. Conduct a travel survey focused on walking, biking, and transportation demand management to Dublin's business community. Develop and continually update a spatial database of bicycle and pedestrian counts.
	Regional coordination	Consider coordinating bicycle and pedestrian improvement projects through regional channels, particularly in the Tri-Valley area, that already exist due to

Emphasis Area	Topic	Recommendation
		enforcement needs and economic development opportunities
Staffing needs	Coordinating and implementing bicycle and pedestrian projects	Hire at least one full time dedicated staff person (per 100,000 population) to meet the League of American Bicyclist's Bronze Standard
	School crossing guards and traffic enforcement near schools	Consider hiring more sworn or unsworn police officers to enforce road rules near schools
Emergency response vehicle needs	Vertical deflection in bicycle facilities	Design speed tables and Class IV bicycle facilities with the Fire Department for application in Downtown Dublin
	Speed management and traffic calming devices	Develop a pre-approved list of traffic calming devices with the Fire Department
Barriers to connectivity	Freeways	Continue to coordinate with the California Department of Transportation (Caltrans) to minimize negative effects of highways to people walking and biking
	Limited east-west connectivity through Downtown Dublin and between parks	
	Lacking pedestrian facilities on undeveloped parcels	Consider paving sidewalks at key locations to fill gaps in the pedestrian network
	Incomplete intersections and trail crossings	Establish design standards for trail crossings and for trails that run adjacent to roadways

Emphasis Area	Topic	Recommendation
		Consider implementing special accommodations (such as the East Dublin BART station and Iron Horse Trail connection) for bicyclists at trail crossings with the Fire Department's approval
Non-infrastructural barriers to biking and walking	High vehicle volumes and speeds	Consider traffic calming, bulb-outs, and narrowing vehicle travel lanes to reduce traffic stress to pedestrians and bicyclists
		Identify opportunities for paseos and shared-use paths in Downtown to separate vehicles from people walking and biking
	Lacking wayfinding for bicyclists and pedestrians	Include wayfinding standards and implementation considerations (such as cost and timeline) in the Plan
		Provide guidelines for consistent visual cues to people walking and biking in the Plan
	Safety concerns or discomfort while walking or biking	Coordinate projects to address safety needs at schools between DUSD, the City's Transportation Department, and Dublin Police
		Identify locations where lighting can be improved on Dublin's trails
		Implement transportation demand management programs, such as BART

Emphasis Area	Topic	Recommendation
		shuttles, that can supplement bicycle and pedestrian infrastructure
		Treat locations where people walking and biking have conflicted with vehicles entering or exiting driveways, such as at the Senior Center
Unclear maintenance protocols or responsibilities	Trail sweeping	Establish general bicycle and pedestrian facility maintenance policies and standards in the Plan
	Bicycle facility paint	Consider developing a maintenance plan for Dublin's bicycle facilities, including painting and sweeping needs
Challenges in implementing CALGreen standards	Requesting bike showers and lockers in new development	Provide direction in the Plan of how to implement CALGreen standards in the development process
Unknown bike parking and amenities demand and needs	Bike parking implementation and long-term use	Consider requiring bike parking analysis when parking studies are conducted in Dublin
		Consider focusing bike parking in areas where there is assumed bike demand, such as job centers, the BART stations, and technology-focused businesses
		Craft a policy or objective to establish an inventory of bicycle facilities, parking, and amenities throughout Dublin, including in

Emphasis Area	Topic	Recommendation
		parks, that can also be used for maintenance plans
		Include bike parking in the Plan's Design Guidelines
	Bike parking needs at parks and events	Install bike parking racks at parks that complies with the Draft Parks and Recreation Master Plan or where there is a demonstrated need, including at Stagecoach and at the Sports Grounds
		Require temporary wayfinding signage at events to notify attendees of bike valet
Differing speeds of people walking and biking on a single facility	E-bikes	Develop a policy and design standards in the Plan that address varying users' speeds on a single facility
	Multi-use trails in parks	

Source: Kittelson & Associates, Inc. 2020.

PROGRAMS OVERVIEW

In the benchmarking interviews, City and DUSD staff described how several City programs support biking and walking in Dublin. Programs are also described on the City's website and in the 2014 Bicycle and Pedestrian Master Plan. Programs support and aim to implement the City's policies and goals. The City's active transportation programs are described in Table 3.

Table 3: Active Transportation Programs

Program	Description	Managing Department
Bicycle and pedestrian counts	Bicycle and pedestrian counts are included in the City's turning movement counts. Bike counters collect data on the Iron Horse and Alamo Canal Trails. Bicycle and pedestrian count data are also provided to the City in environmental documents and traffic studies.	Traffic and Planning
Safe Routes to School (SRTS)[1]	SRTS aims to establish routes which maximize safety for travel to and from school sites, as well as to educate school administrators, parents, and children about vehicle, bike, and pedestrian safety.	DUSD with support from Alameda CTC, several City Departments, including Police, Planning, and Traffic
Adult school crossing guards[2]	Crossing guards help children safely cross the street at key locations on the way to school. Crossing guards may help parents more comfortably allow students to walk or bike to school while setting an example of how to safely cross the street.	DUSD, Police, and Traffic
Bike to Work Day[3]	Bike to Work Day is a City-sponsored activity that encourages commuters to bike to their place of work. The event includes energizer stations for refreshments and giveaways. Bike to Work Day is expected to be held on September 24, 2020.	Traffic and Environmental Programs

Notes:

1. Source: https://dublin.ca.gov/349/Safe-Routes-to-School
2. Source: http://guide.saferoutesinfo.org/crossing_guard/index.cfm
3. Source: https://dublin.ca.gov/954/National-Bike-Month-Activities

Additional program details and needs are provided below:

- A recommended action item from the 2014 Bicycle and Pedestrian Master Plan not yet implemented is a GIS database of bicycle and pedestrian counts by location. The database should be continually updated as the City receives and collects new count data.
- The City integrates SRTS into planning processes through the City's partnership with Alameda CTC's Safe Routes to Schools Program (SR2S) Program.[1] When development projects include a new school, the Planning Department and DUSD coordinate to evaluate connections to the school.
    - There is a need to designate a staff person at DUSD and the City who are responsible for coordinating and overseeing school connectivity. This staff responsibility would ensure that school access is sufficient from the planning stage all the way through to the operation of schools.
- The Transportation Department fields requests for crossing guards, and school principals determine crossing guard needs for their school. Dublin Police then hires the crossing guards and manage the program.
    - A coordination protocol may be needed between DUSD and the Transportation Department to jointly identify and cross-check crossing guard needs.

KEY NEEDS AND RECOMMENDATIONS

In compiling the non-infrastructure inventory described in this memo, several needs and recommendations became clears. These bicycle- and pedestrian-related needs and recommendations are described below:

- Vehicle speeds and volumes were identified in benchmarking interviews as challenges to walking and biking comfortably in Dublin. Additionally, the Pedestrian Safety Assessment (2014) recommends improve walking conditions using traffic calming programs, transportation demand management (TDM) policies and programs, and coordination with health agencies to promote walking and biking. TDM programs could be informed by surveys conducted with the business community and bicycle and pedestrian counts.
- Active transportation investments in East Dublin and Downtown Dublin are considered a priority in the General Plan Land Use & Circulation Element. Biking and walking needs in these geographic areas, gaps in the walking and biking network, and safety treatments near parks, senior centers, and schools should be considered in the Plan's prioritization framework. Additionally, a database of bicycle and pedestrian counts would guide investments.
- Guided by the Plan's updated Design Guidelines, trail crossings and complete intersections should be implemented through coordinated development processes and special accommodations for bicyclists and pedestrians that the Fire Department may provide. Notably,

[1] Alameda CTC administers the Alameda County SR2S Program, which also includes the International Walk and Roll to School Day as part of its programming.

crossing conditions on the Iron Horse Regional Trail can be improved at Dublin Boulevard, Dougherty Road, and the Dublin/Pleasanton BART station.
- Driveways were identified as a potential point of conflict for bicyclists and pedestrians, and radii should be modified to both enhance the safety of people walking and biking and accommodate emergency response vehicles. Additionally, road safety treatments are identified in the Plan's collision analysis.
- East-west connectivity, particularly through Downtown and to the City's parks, was emphasized as a need in benchmarking interviews. The Dublin Crossing Specific Plan (2013) also identifies this need, particularly between transit stops, destinations, and trails.
- Promoting and facilitating biking and walking to local destinations is a need in Dublin, according to benchmarking interviews, several specific plans, and the draft CAP (2020). A travel survey with the business community could provide additional insight as to how to make biking and walking an appealing option for more residents, commuters, and visitors.
- Improved coordination and clearer work processes to implement bicycle and pedestrian projects are needed to upgrade and expand the bicycle and pedestrian network, establish maintenance plans and ongoing infrastructure needs, and maximize both local and regional resources.

Next Steps

Upon receiving comments from the City, Kittelson will revise and finalize this non-infrastructure inventory, which will then be used as the basis for program and policy recommendations in the Plan. Kittelson will prepare cost estimates and an implementation plan for recommended policies and programs and will work with the City to identify which, if any, of the recommendations could be further developed within the Plan.

APPENDIX B

EXISTING CONDITIONS: DEMOGRAPHIC ANALYSIS

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MEMORANDUM

Date:	June 22, 2020	Project #: 24392
To:	Sai Midididdi, TE City of Dublin	
From:	Amanda Leahy, AICP, Mike Alston, RSP, Quinn Wallace, Erin Ferguson, PE, RSP	
Project:	Dublin Bicycle and Pedestrian Master Plan	
Subject:	Demographic Analysis	

The City of Dublin (City) is updating the 2014 Dublin Bicycle and Pedestrian Master Plan (Plan). The Plan will serve as a comprehensive action plan for the City to provide improved bicycle and pedestrian facilities for its residents, employees, and visitors. As part of the baseline conditions and needs assessment, Kittelson & Associates, Inc. (Kittelson) gathered and summarized demographic data. The findings of this demographic analysis will inform the Plan's bicycle and pedestrian demand analysis. After completing the baseline conditions and needs assessment, this analysis may be used in prioritizing the Plan's projects, identifying project and program recommendations, and developing an implementation plan.

This memorandum (memo) details the methodology, maps, tables, and charts produced to analyze Dublin's demographics. Charts, tables, and graphs provide additional context by comparing key Dublin demographics to the same statistics across Alameda County. The memo is organized into the following sections:

- Methodology
- Map Packages
    - Population – Race/Ethnicity and Age
    - Workers – Travel Modes and Times
    - Households – Income, Vehicles, and Health
- Comparison of City of Dublin to Alameda County
- Next Steps

Maps included in each of the map packages are as follows:

- Population – Race/Ethnicity and Age
    - Total Population of Block Groups
    - Total Population of Transportation Analysis Zones

- Minority Race/Ethnicity Population
- Population Under Age 18
- Population Ages 65 and Older

- Workers – Travel Modes and Times
  - Number of Workers per Block Group
  - Commuters by Public Transportation
  - Pedestrian Commuters
  - Commuters by Bicycle
  - Commuter Travel Times Greater than 30 Minutes
- Households – Income, Vehicles, and Health
  - Number of Households per Block Group
  - Number of Households per Transportation Analysis Zone
  - Household Income Under 25% of City Median Income
  - Household Income 25% - 50% of City Median Income
  - Household Income 50% - 100% of City Median Income
  - Household Income 100% + of City Median Income
  - Zero Car Households
  - CalEnviroScreen

METHODOLOGY

Data sets from the U.S. Census the California Communities Environmental Health Screening Tool (CalEnviroScreen) were used in this analysis. The CalEnviroScreen is generated by the California Office of Environmental Health Hazard Assessment (OEHHA) and maps disadvantaged areas statewide based on a number of indicators generated from socioeconomic and environmental health data. Those data include pollution exposure, environmental effect, sensitive population, and socioeconomic indicators. The CalEnviroScreen tool produces an overall score for each census tract and compares the results as percentiles across all of California. Communities within the top 25th percentile statewide are considered disadvantages communities under the California Department of Transportation (Caltrans) Active Transportation Program grant guidelines.

CalEnviroScreen data is summarized at the Census tract level, while all other Census data sets are summarized at the block group level (i.e., more granular). CalEnviroScreen indicators fall into four broad groups—exposures, environmental effects, sensitive populations, and socioeconomic factors. In Dublin, there are 10 tracts containing 19 block groups. Block groups are shown in the **Total Population of Block Groups, Number of Workers per Block Group,** and **Number of Households per Block Group** maps. Census data variables were grouped into categories that show the relevant demographic trends in Dublin. The block groups are described in more detail below.

Demographic data primarily came from the Census's American Community Survey (ACS) 2014-2018 5-Year Estimates. Variables from these data sets include:

- Age
- Race and ethnicity
- Household income
- Commute mode
- Commute time
- Vehicles per household

In addition to using data sets from the American Community Survey (ACS), data was obtained from the Census's Longitudinal Employer-Household Data (LEHD) dataset.[1] The analysis related to jobs was conducted on primary jobs, which includes the highest paying job per individual worker (one person per job). This includes both public and private sector jobs.

Census Block Group Data

Because block groups do not coincide with municipal boundaries, some judgment is required when determining which block groups to include in Dublin analysis for two reasons:

1. Block groups abutting the City boundaries but not fully contained within Dublin must either be included or excluded. Block group 4505022 on the western boundary and block groups 4507521 and 4507511 on the eastern boundary include substantial land area outside City boundaries, but all or most of the population in each case is within City boundaries (based on the distribution of development). Therefore, all three are included in analysis.
2. Block groups may include land and/or population which this plan will have no ability to impact. Two such block groups are block group 4501022, which exclusively includes the Santa Rita County Jail, and block group 4501021, which includes the Camp Parks US Army facility but also includes land developed separately (including the Dublin Crossing development). Camp Parks land is owned and planned by the federal government and is outside the City's planning jurisdiction. The area is generally excluded from the realm of this Plan.

Data for block group 4501022 will be excluded from analysis, given that the population's movements and mobility needs are limited to the jail site. Workers within this census block group are identified in the ACS based on their place of residence. A discussion of the populations contained within the 4501021 block group informs whether to retain its data in the analysis. A discussion of the population distribution is included in the next section.

Comparison to Travel Demand Model

As previously mentioned, this demographic analysis forms the basis for forthcoming demand analysis, prioritization, and project and program recommendations. The variables explored in this analysis will

[1] LEHD data is available online at http://onthemap.ces.census.gov/.

allow the City to spatially prioritize with sociodemographic factors. These demographic data are available from the ACS at the block group level—approximately 19 block groups wholly or partially within City limits. The City maintains a transportation model, which provides smaller units of analysis called transportation analysis zones (TAZs). By comparison, the city is comprised of 134 TAZs. TAZs provide a more granular unit of analysis but fewer demographic variables overall. The relevant data provided by the City model (including data representing 2017) include population and household totals (2017 estimated values) which can be compared to the ACS data.

Figure 1 presents a comparison between block group and TAZ population values. TAZ population is aggregated to the block group level for comparison; where TAZs intersect multiple block groups, they are aggregated to the block group that contains their centroid. The comparison shows the values to be generally within approximately 10 percent of one another, with some differences explained by the boundaries that are not coincident.

The comparison also shows that block group 4501021 (containing Camp Parks land) has a similar population estimate with the associated TAZs, although a majority of this block group's land is on Camp Parks land. The population accounted for in this block group primarily resides in the southern portion of the block group (outside the Camp Parks land), so the block group population is retained for this analysis. Going forward, the demand analysis and prioritization work using these data will account for the population being concentrated in the southern part of the of the block group.[2] The demographic information associated with this block group will be included and carried forward in future analysis.

Figure 1 also shows several TAZs with no population—in particular, the centrally located TAZ within block group 4501022. This block group contains the Santa Rita County Jail. ACS data report a population of 900, which exclusively includes inmates (counted as group quarters population).

[2] A closer inspection of available ACS data revealed that among the approximately 1,135 residents over age 16 in the block group, 18 are employed in the armed forces.

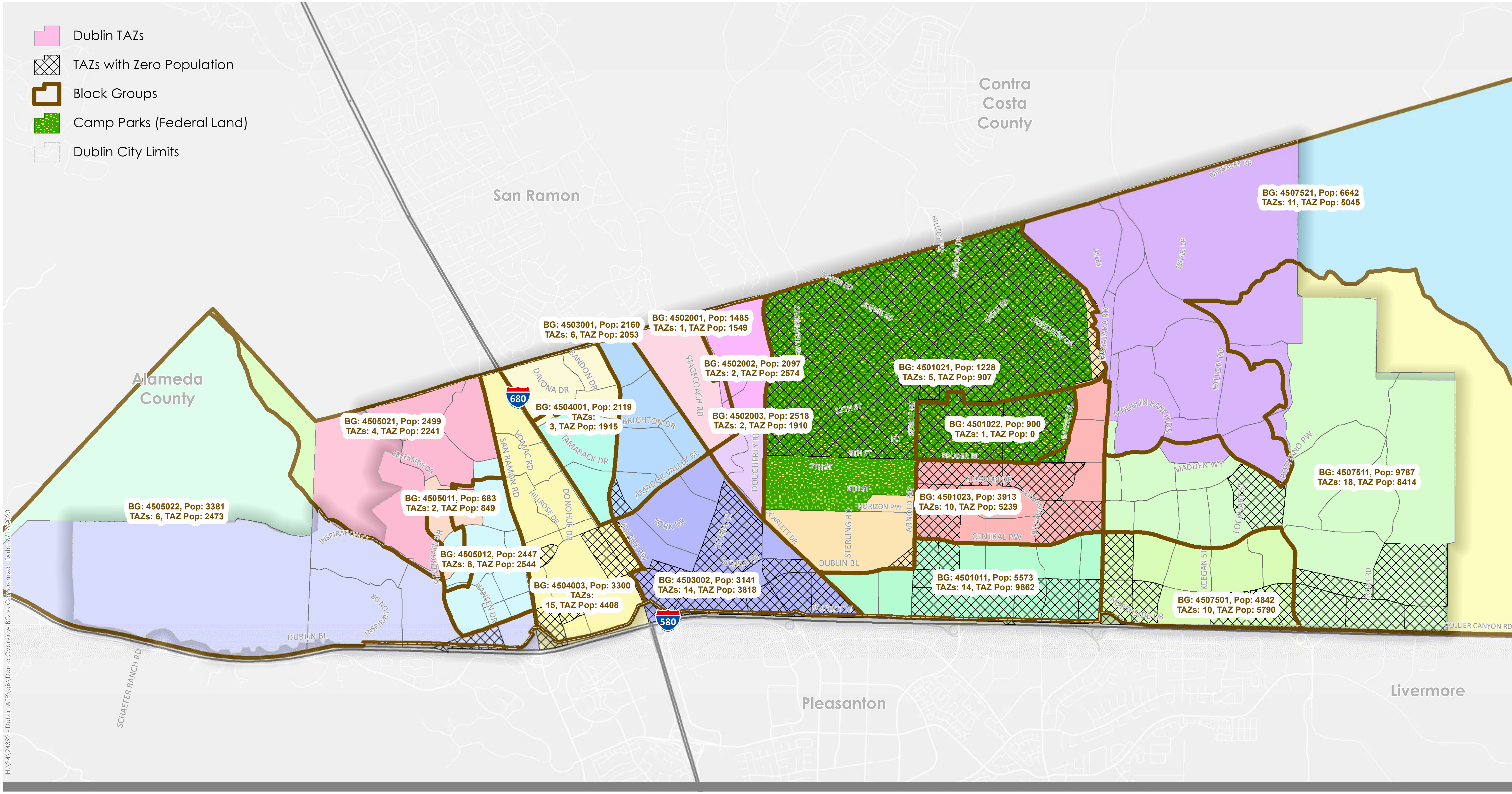


Figure 1

Census Block Groups versus City Model TAZs
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

MAP PACKAGES

Maps produced in this analysis spatially present demographic data in Dublin only. Graphs, charts, and tables in this memo provide additional context and comparisons to all of incorporated and unincorporated Alameda County.

The maps are grouped into three packages:

- Population – Race/Ethnicity and Age
- Workers – Commute Modes and Times
- Households – Income, Vehicles, and Health

The group is shown first in each map series to provide an overview and is followed by maps analyzing unique variables. For example, the number of households per block group are shown first, followed by a map of household income grouping.

Population – Race/Ethnicity and Age

This map package shows proportions of racial and ethnic minorities and age groups by each block group's population. Maps in this package include the following:

- Total Population of Block Groups
- Total Population of Transportation Analysis Zones
- Minority Race/Ethnicity Population
- Population Under Age 18
- Population Ages 65 and Older

Race/Ethnicity

In this package, the **Minority Race/Ethnicity Population** map shows the percent of individuals who identify within a minority race or ethnicity. To form this category, the following Census demographics were grouped together:

- Black or African American Alone
- American Indian and Alaska Native Alone
- Asian Alone
- Native Hawaiian and Other Pacific Islander Alone
- Some Other Race Alone
- Two or More Races
- Hispanic or Latino

Individuals that are white alone (not Hispanic or Latino) are excluded from this category. The Census defines Asian individuals as "a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent." The ACS does provide subgroup estimates that better clarify the respondents who indicate *Asian alone* as their race; those estimates are only available at the City level.

Within Dublin, the 26,672 Asian residents are comprised of the following groups, in descending proportional order:[3]

- Asian Indian: 12,627 (47% of Asian alone residents)
- Chinese, excluding Taiwanese: 7,160 (27% of Asian alone residents)
- Filipino: 2,040 (8% of Asian alone residents)
- Vietnamese: 1,650 (6% of Asian alone residents)
- Korean: 1,139 (4% of Asian alone residents)
- Pakistani: 452 (2% of Asian alone residents)
- Japanese: 428 (2% of Asian alone residents)
- Taiwanese: 260 (1% of Asian alone residents)

Age

Three maps show three age groupings relative to block group populations:

- **Population Under 18** to show concentrations of where children live
- **Population Age 65 and Older** to show concentrations of where seniors live

Workers – Commute Modes and Times

This map package shows proportions of key commute modes, including commutes by bicycle, walking, and public transportation, by each block group's number of workers. Charts and tables provided in this section compare commute mode trends and findings using LEHD data. Maps in this package include the following:

- Number of Workers per Block Group
- Commuters by Public Transportation
- Pedestrian Commuters
- Commuters by Bicycle
- Commuter Travel Times Greater than 30 Minutes

[3] Other groups in Dublin comprising less than 1% of Asian residents include Bangladeshi, Bhutanese, Burmese, Cambodian, Hmong, Indonesian, Laotian, Malaysian, Mongolian, Nepalese, Okinawan, Sri Lankan, Thai, *other unspecified*, and *two or more*. Note that the 26,672 total is based on city-level data and varies slightly from the aggregated Census block group totals presented later in this memorandum.

Commute Modes

Three maps display commute modes that are central to the Plan, including **Commuters by Public Transportation, Pedestrian Commuters,** and **Commuters by Bicycle.** Due to significant differences between block groups and relatively low percentages, the count of each commuter type per block group is shown in a bubble in addition to the percentages.

Notably, one outlier is shown in the **Commuters by Bicycle** map: one block group has 44 bicycle commuters, amounting to over 20% of its 166 workers. The high proportion of bicycle commuters in this block group may be attributable to the Army Base located in this block group.

On the **Commuters by Public Transportation** map, high proportions of transit commuters can be found not only near the Dublin/Pleasanton BART station, but also where the Alamo Canal Trail and Iron Horse Trail converge. The Iron Horse Trail connects directly to the BART station and is about a 1-mile bicycle ride. Other densities of transit commuters are likely attributable to the number of workers in the block group, such as near the Martin Canyon Creek Trail.

Commute Times

A single map, **Commuter Travel Times Greater than 30 Minutes**, shows the overall high proportions of commuters by block group with commutes over 30 minutes. On this map, commute mode is not considered, so a 30-minute walking or biking commute is classified the same as a 30-minute driving commute. This map may contextualize commute mode choices also displayed in this map package.

Dublin Workers and Commuters

For purposes of the discussion that follows, the following terms are used:

- **Workers living in Dublin:** This term is used to define jobholders who live in Dublin. They may work in Dublin or elsewhere.
- **People working in Dublin:** This term is used to define people who work in Dublin. They may live in Dublin or elsewhere.

Based on the most recent LEHD data available (2017), the net inflow and outflow of Dublin workers is the following:

- 16,042 people commute into Dublin for work and live elsewhere (these are people working in Dublin)
- 23,161 people live in Dublin and commute elsewhere to work (these are workers living in Dublin)

1,484 people live and work in Dublin (these are in both categories above)

Figure 2 presents this relationship visually.

Figure 2: Workers by Residence and Job Location

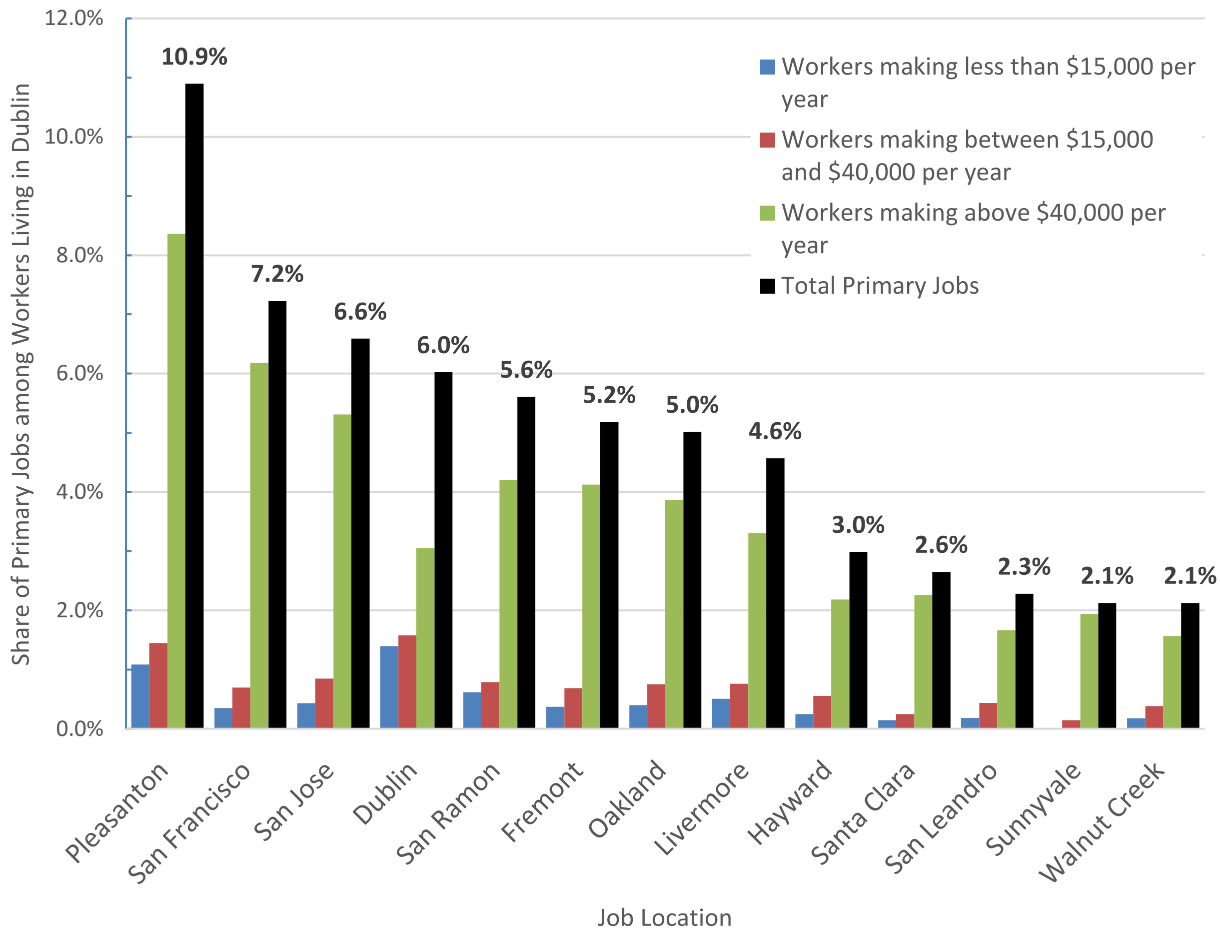
Source: Longitudinal Employer-Household Dynamics (LEHD), 2017.

Work Destinations

Figure 3 shows that the top job locations of workers living in Dublin range from cities in Silicon Valley to neighboring jurisdictions, such as Pleasanton and San Ramon. San Francisco is the second most common job location after Pleasanton for workers living in Dublin. The home and work location provided by LEHD data are sorted into the three income groups presented.

Variation in job location exists by income; Dublin is the fourth highest job location overall, behind Pleasanton, San Francisco, and San Jose. Notably, the relative share of residents working in Dublin is lower among those who make above $40,000 per year compared to other locations.

Figure 3: Top 10 Job Locations Among Workers Living in Dublin, by Income Level



Source: Longitudinal Employer-Household Dynamics (LEHD), 2017.

Commute Distances

As highlighted in Figure 3, approximately 6% of workers living in Dublin work in Dublin as well. As shown in Table 1, of the 24,645 workers living in Dublin, 71% work more than 10 miles from home. Compared to the share of total workers, a higher share of the lowest income workers work within ten miles (39% compared to 29%).

Table 1: Commute Destinations Among Workers Living in Dublin (Primary Jobs)

Distance from Home to Work	Workers, by Income Level (Percent of Column)			
	Workers making less than $15,000 per year	Workers making between $15,000 and $40,000 per year	Workers making above $40,000 per year	All Workers
< 10 miles	982 (39%)	1,245 (30%)	4,815 (27%)	7,042 (29%)
10 to 24 miles	776 (31%)	1,489 (36%)	8,248 (46%)	10,513 (43%)
25 to 50 miles	366 (15%)	697 (17%)	3,604 (20%)	4,667 (19%)
>50 miles	370 (15%)	703 (17%)	1,350 (7%)	2,423 (10%)
Total	**2,494**	**4,134**	**18,017**	**24,645**

Source: Longitudinal Employer-Household Dynamics (LEHD), 2017.

Table 2 provides the distance to home for people working in Dublin.

Table 2: Commute Origins Among People Working in Dublin (Primary Jobs)

Distance from Home to Work	Workers, by Income Level (Percent of Column)			
	Workers making less than $15,000 per year	Workers making between $15,000 and $40,000 per year	Workers making above $40,000 per year	All Workers
< 10 miles	1,004 (28%)	1,355 (26%)	2,657 (31%)	5,016 (29%)
10 to 24 miles	1,087 (30%)	1,813 (34%)	2,830 (33%)	5,730 (33%)
25 to 50 miles	721 (20%)	1,090 (21%)	1,648 (19%)	3,459 (20%)
>50 miles	835 (23%)	1,043 (20%)	1,443 (17%)	3,321 (19%)
Total	3,647	5,301	8,578	17,526

Source: Longitudinal Employer-Household Dynamics (LEHD), 2017.

The plurality of people who commute to Dublin from elsewhere travel 10 to 24 miles into work (approximately 33%). As shown in Table 2, the distances traveled leaving Dublin for work are generally higher than the distances traveled into Dublin for work.

Households – Income, Vehicles, and Health

This map package shows proportions of key household metrics by each block group's number of households. Maps in this package include:

- Number of Households per Block Group
- Household Income Under 25% of City Median Income
- Household Income 25% - 50% of City Median Income
- Household Income 50% - 100% of City Median Income
- Household Income 100% + of City Median Income
- Zero Car Households
- CalEnviroScreen

Income

The city's median income is used as the basis for comparing household incomes in Dublin. The city's median household income is $146,208.[4] The closest Census income level to Dublin's median household income is $150,000. Four household income groups were created to identify any concentrations of household incomes and any differences in access to key land uses by household incomes. The income groupings used on the maps are described below:

- **Household Income Under 25% of City Median Income** shows households with incomes between $0 and $35,000.
- **Household Income 25% - 50% of City Median Income** shows households with incomes between $35,000 and $75,000.
- **Household Income 50% - 100% of City Median Income** shows households with incomes between $75,000 and $150,000.
- **Household Income 100%+ of City Median Income** shows households with incomes at and above $150,000.

On the **Household Income Under 25% of City Median Income** map, a concentration of households earning less than $35,000 per year may be attributable to the Army Base located in this block group. This concentration also correlates with the number of bicycle and transit commuters in this block group, as shown in the **Commuters by Bicycle** and **Commuters by Public Transportation** maps.

[4] Source: City of Dublin Demographics. Retrieved from: https://www.dublin.ca.gov/1811/Demographics

Another concentration shown in the **Household Income 25% - 50% of City Median Income** map is located adjacent to the Martin Canyon Creek Trail. Notably, this block group also has a high proportion of transit commuters, as shown in the **Commuters by Public Transportation** map. This indicates an area of Dublin where income level and commute mode appear to be linked.

Similarly, high income level concentrations shown in the **Household Income 100%+ of City Median Income** map are linked to longer commute times. As shown in the **Commuter Travel Times Greater than 30 Minutes** map, high proportions of workers commuting more than 30 minutes in eastern block groups of Dublin are located where high proportions of households earn above the median income.

Vehicles

Dublin's households with zero vehicles are spatialized in the **Zero Car Households** map. This map is shown to indicate where individuals may rely on biking, walking, and riding public transportation as their primary modes of travel.

Health

As shown on the **CalEnviroScreen** map, Dublin's scores indicate that the city is minimally, if at all, disadvantaged from a perspective of health and environment compared to other California communities.

Comparison of City of Dublin to Alameda County and East County Planning Area

For consistency with the data presented at the block group level, Dublin is represented by an aggregation of constituent tracts, as shown in the **Total Population of Block Groups, Number of Workers per Block Group,** and **Number of Households per Block Group** maps. This aggregation may include some people and households not within city limits. However, a comparison of the aggregated Census block totals compared to the Dublin City geography shows the population totals to be within 2 percent of one another.

Generally, people of color, particularly Black/African American and Hispanic or Latino groups, are among communities that have been historically disadvantaged in access to transportation services and infrastructure. In comparing racial and ethnicity statistics with Alameda County, this demographic analysis has not found that this trend is prevalent in Dublin. Like Alameda County, Dublin has an approximately 40%-60% split of Non-White Combined populations and white alone populations. Significant differences between Alameda County and Dublin are in the Black/African American Alone and Asian Alone populations. Indian (12,627) and Chinese Except Taiwanese (7,160) groups make up the majority of Dublin's Asian Alone (26,888) populations.

Table 3: Comparison of Population Variables, Dublin and Alameda County, 2014-2018

Variable	Dublin	Alameda County
Total Population	**59,275**	**1,643,700**
Race		
White Alone	25,172 (42%)	681,725 (41%)
Non-White Combined	34,103 (58%)	961,975 (59%)
Black/African American Alone	1,769 (3%)	177,135 (11%)
American Indian and Alaska Native Alone	269 (<1%)	10,712 (1%0
Asian Alone	26,831 (45%)	486,434 (30%)
Native Hawaiian and Other Pacific Islander Alone	217 (<1%)	13,768 (1%)
Some or Other Alone	1,294 (2%)	169,771 (10%)
2+ Races	3,723 (6%)	104,155 (6%)
Age		
Population Under 5 Years Old	4,486 (8%)	97,506 (6%)
Population 5-14 Years Old	9,462 (16%)	192,220 (12%)
Population 15-24 Years Old	4,738 (8%)	197,570 (12%)
Population 25-44 Years Old	20,698 (35%)	516,424 (31%)
Population 45-64 Years old	14,699 (25%)	424,063 (26%)
Population 65+ Years Old	5,192 (9%)	215,917 (13%)

Source: American Community Survey (ACS) 2014-2018 5-Year Estimates.

For transportation-focused data, Dublin characteristics are compared to the East County Planning Area as well, as it represents a more similar comparison to the City than the County overall.[5] Dublin has 8% more commuters who drive alone to work compared to Alameda County as a whole, as also shown by the lower percentages of commuters who bike, walk, or take transit to work. The commute mode in Dublin is more aligned with mode share of commuter in the East Planning Area of the County. In Dublin, 4% fewer commuters drive alone relative to the East Planning Area, and the 4% more commuters take transit.

[5] The East County Planning area includes Dublin, Pleasanton, Livermore, and unincorporated county area east of Hayward and Fremont. More information and the areas can be found in the Countywide Active Transportation Plan at https://www.alamedactc.org/planning/countywide-bicycle-and-pedestrian-plans/.

Table 4: Comparison of Worker Variables, Dublin and Alameda County, 2014-2018

Variable	Dublin	Alameda County – East Planning Area	Alameda County
Total Workers Age 16+	**29,874**	**118,263**	**767,292**
Commute Mode			
Car/Truck/Van – Drove Alone	20,544 (69%)	86,523 (73%)	471,802 (61%)
Car/Truck/Van – Carpooled	2,829 (9%)	9,923 (8%)	75,493 (10%)
Public Transit (including Taxicab)	4,004 (13%)	10,136 (9%)	115,383 (15%)
Motorcycle	35 (<1%)	343 (<1%)	2,994 (<1%)
Bicycle	116 (<1%)	987 (1%)	15,132 (2%)
Walked	343 (1%)	1,890 (2%)	28,513 (4%)
Other Means	136 (<1%)	712 (1%)	8,603 (1%)
Worked at Home	1,902 (6%)	7,749 (7%)	48,111 (6%)
Commute Time, not working from home			
Travel Time < 30 minutes	12,362 (44%)	55,270 (50%)	339,680 (47%)
Travel Time ≥ 30 minutes	15,610 (56%)	55,244 (50%)	379,501 (53%)

Source: American Community Survey (ACS) 2014-2018 5-Year Estimates.

When compared with Alameda County, Dublin has a lower proportion of households without vehicles. The percentage of households, 3% is similar to that in the East Planning Area of Alameda County, 4%.

Table 5: Comparison of Zero-Vehicle Households, Dublin and Alameda County, 2014-2018

Variable	Dublin	Alameda County – East Planning Area	Alameda County
Total Households	19,950	81,152	572,870
Vehicle Access			
Zero-Car Households	665 (3%)	3,051 (4%)	54,816 (10%)

Source: American Community Survey (ACS) 2014-2018 5-Year Estimates.

When compared with Alameda County, Dublin has relatively high proportions of English-proficient households (that are not English only) and Spanish-speaking households with limited English proficiency. Additionally, Dublin's proportion of zero-car households is 7% lower than Alameda County's proportion of zero-car households.

Table 6: Comparison of Household Variables, Dublin and Alameda County, 2014-2018

Variable	Dublin	Alameda County
Total Households	19,950	572,870
Home Language		
English Only	10,051 (50%)	314,017 (55%)
Other Language (English-proficient) Household	8,297 (42%)	205,763 (36%)
Limited English Proficiency Household	1,602 (8%)	53,090 (9%)
Spanish	*195 (8%)*	*16,454 (3%)*
Other Indo-European Language	*207 (1%)*	*4,453 (1%)*
Asian/Pacific Islander	*1,124 (6%)*	*30,082 (5%)*
Other Language	*76 (<1%)*	*2,101 (<1%)*

Source: American Community Survey (ACS) 2014-2018 5-Year Estimates.

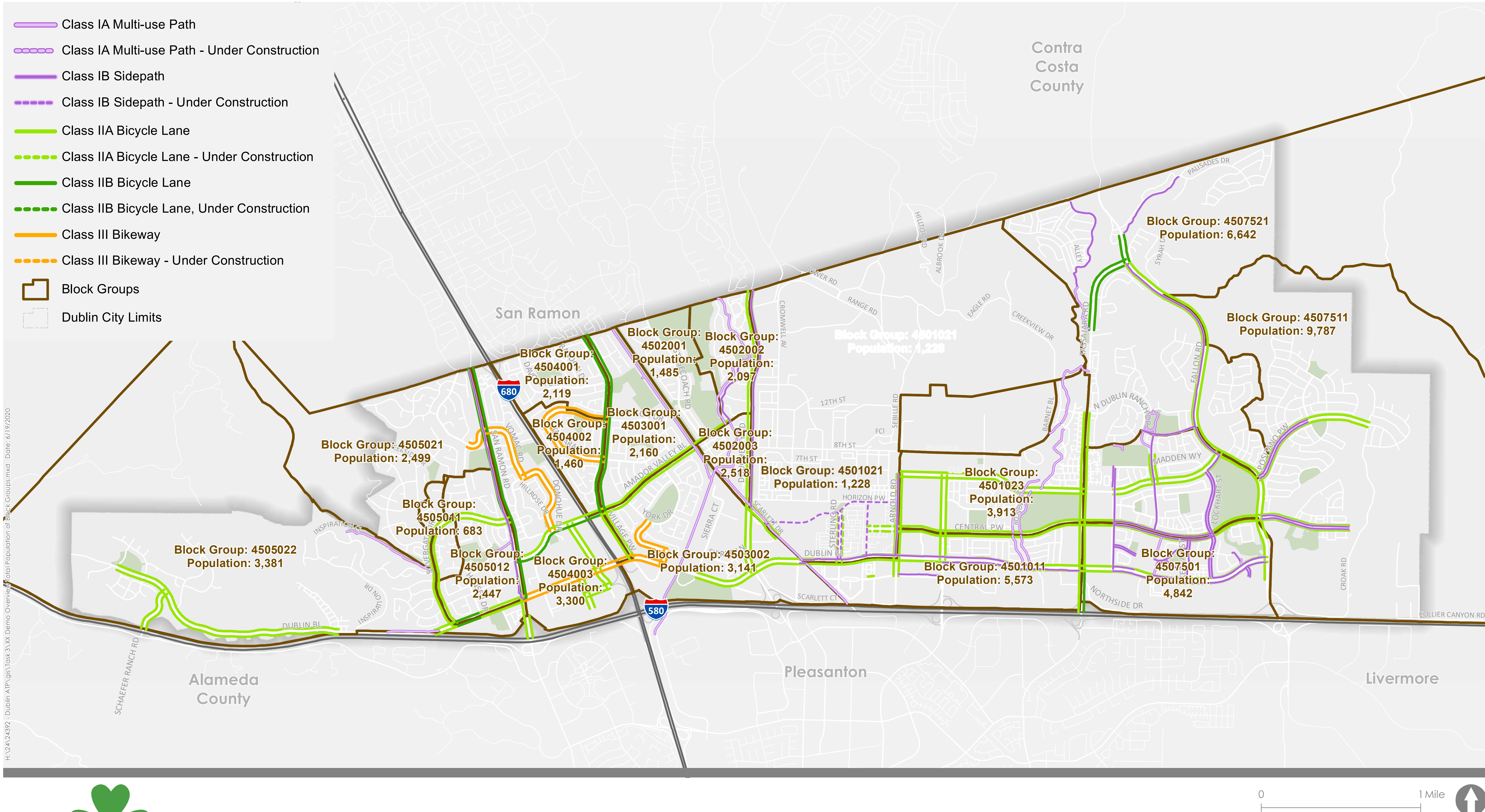
SUMMARY AND NEXT STEPS

Key takeaways of this demographic analysis are described below:

- Land uses and accessible bicycle and pedestrian facilities likely influence the number of commuters who choose to bike, walk, or take transit, such as the high proportion of bicycle commuters in the Army Base's block group.
- Correlations are present in Dublin between commuters' travel times and household incomes. High-income households and commuters with travel times longer than 30 minutes are concentrated in the city's eastern block groups. Additionally, high proportions of jobs paying over $40,000 per year are located in San Francisco and San Jose, which likely require commute times longer than 30 minutes. While Pleasanton has the highest proportion of total primary job locations and locations where workers making above $40,000 per year, Dublin has one of the lowest proportions of job locations where workers make above $40,000 per year.
- Commuting distances for residents who leave Dublin for work are generally higher than the distances that workers travel into Dublin for work. Mode switch may be more feasible for people commuting to Dublin for work than vice versa.
- Several key demographic differences, including zero-car households and multi-lingual households, exist between Dublin and Alameda County. These differences may signify why people bike and walk in Dublin and how they access information regarding active transportation infrastructure and services.

The findings of this demographic analysis will inform the demand analysis, which will also be completed as part of the Plan's baseline conditions and needs assessment. The demand analysis will use the age data to develop walking and biking typologies among the Dublin population. After completing the baseline conditions and needs assessment, this analysis may be used in prioritizing the Plan's projects, identifying project and program recommendations, and developing an implementation plan. For project prioritization specifically, the data presented here provide an opportunity for the City to prioritize subgroups of its population based on indicators of relative transportation burden (e.g., presence zero-car households).

MAP PACKAGE
POPULATION – RACE/ETHNICITY AND AGE



Total Population of Block Groups
Dublin, California

DUBLIN
CALIFORNIA

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Population by TAZ
Dublin, California

DUBLIN
CALIFORNIA

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Minority Race/Ethnicity Population
Dublin, California

DUBLIN CALIFORNIA

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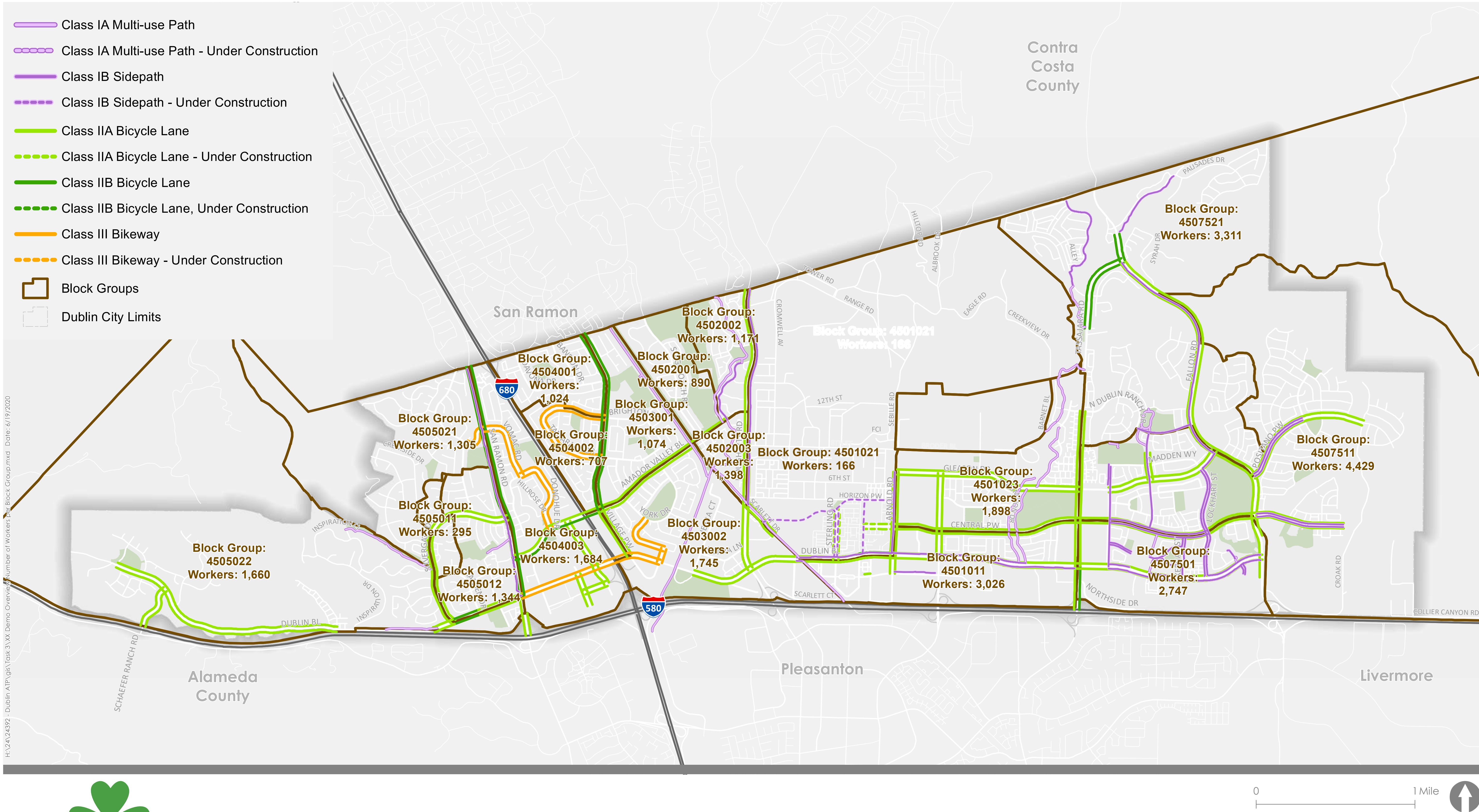
Population Under Age 18
Dublin, California

DUBLIN
CALIFORNIA

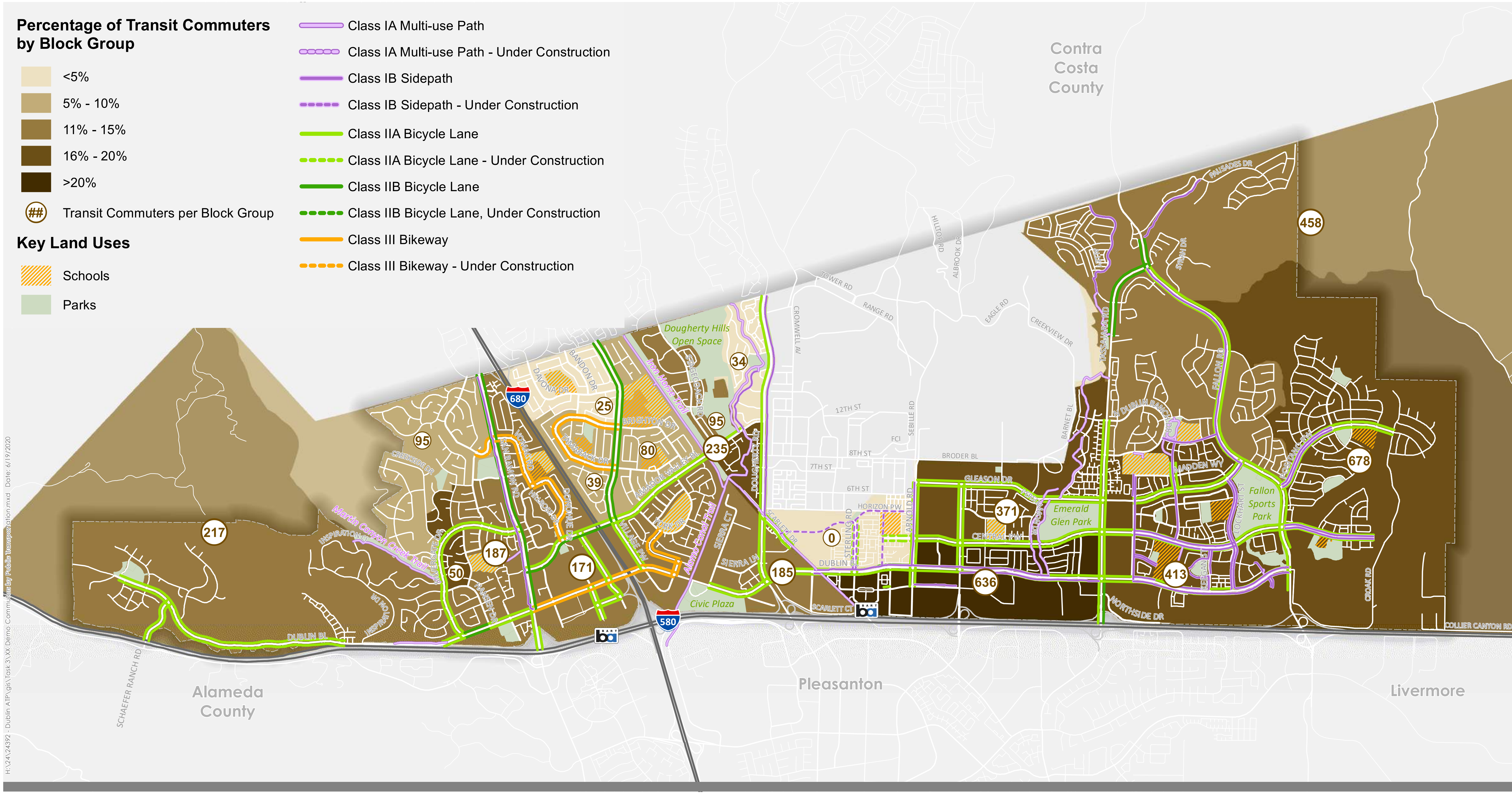
KITTELSON & ASSOCIATES

Population Ages 65 and Older
Dublin, California

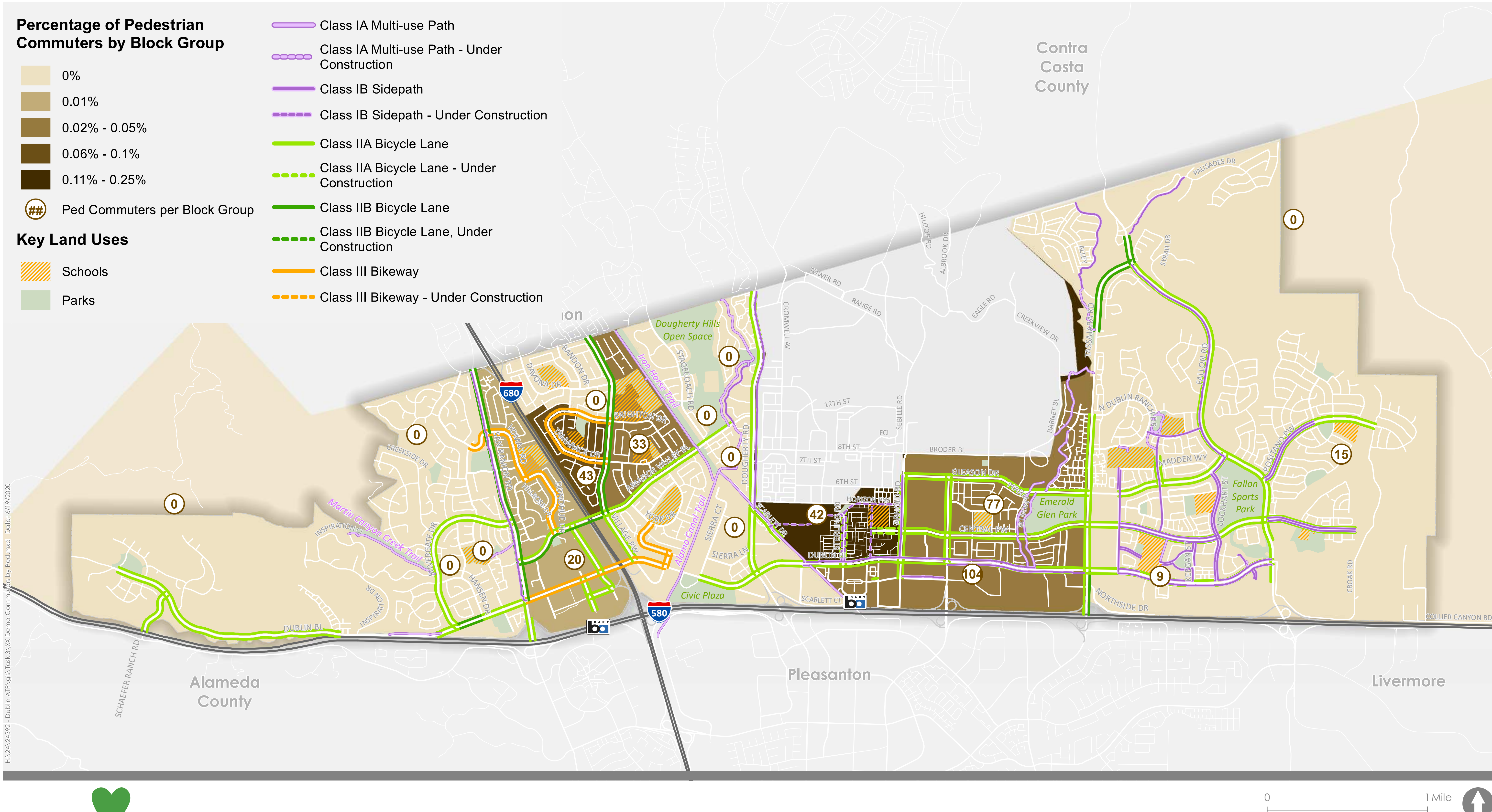
MAP PACKAGE
WORKERS – COMMUTE MODES AND TIMES



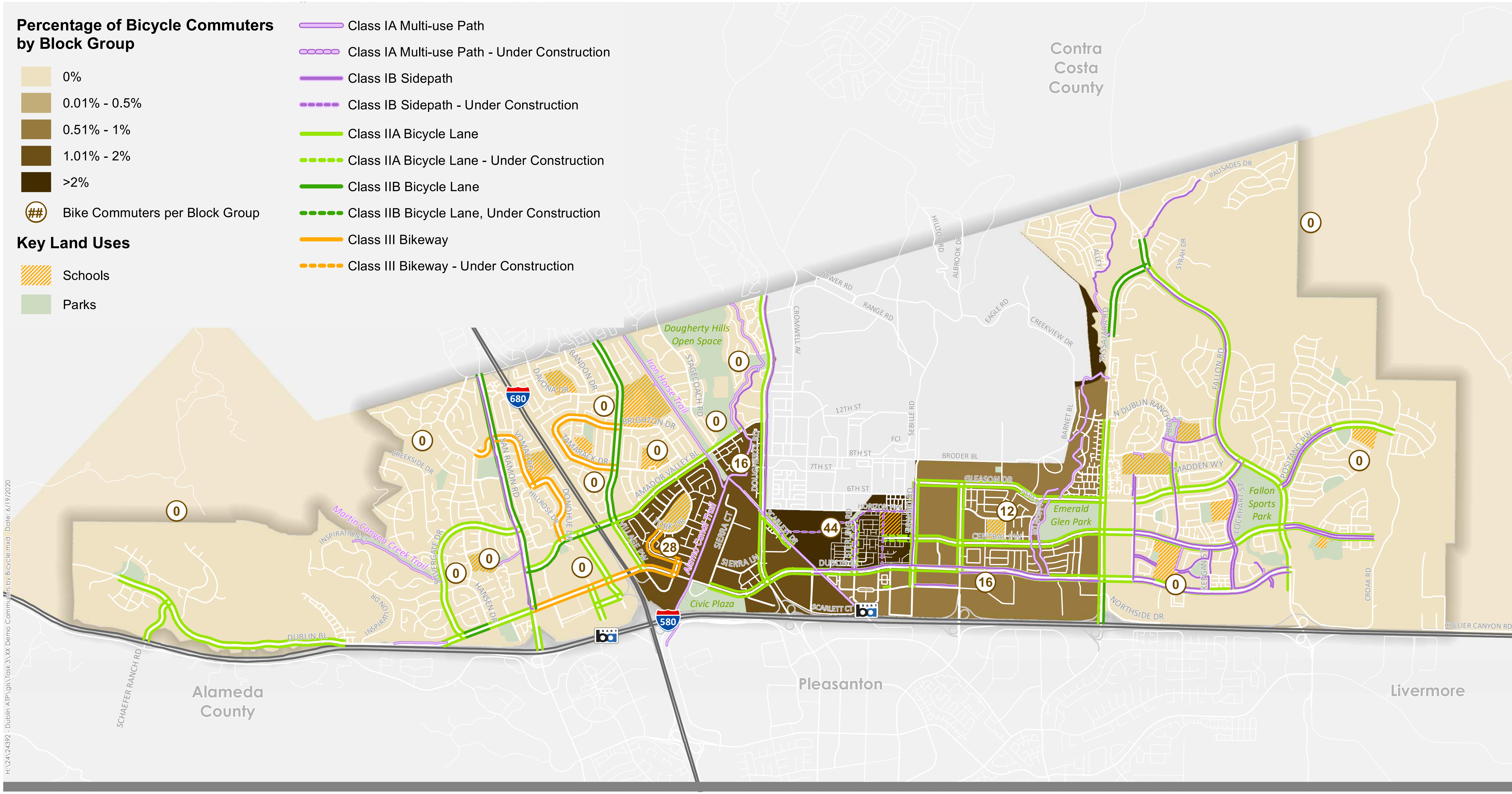
Number of Workers per Block Group
Dublin, California



Commuters by Public Transportation
Dublin, California



Pedestrian Commuters
Dublin, California



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Commuters by Bicycle
Dublin, California

DUBLIN CALIFORNIA

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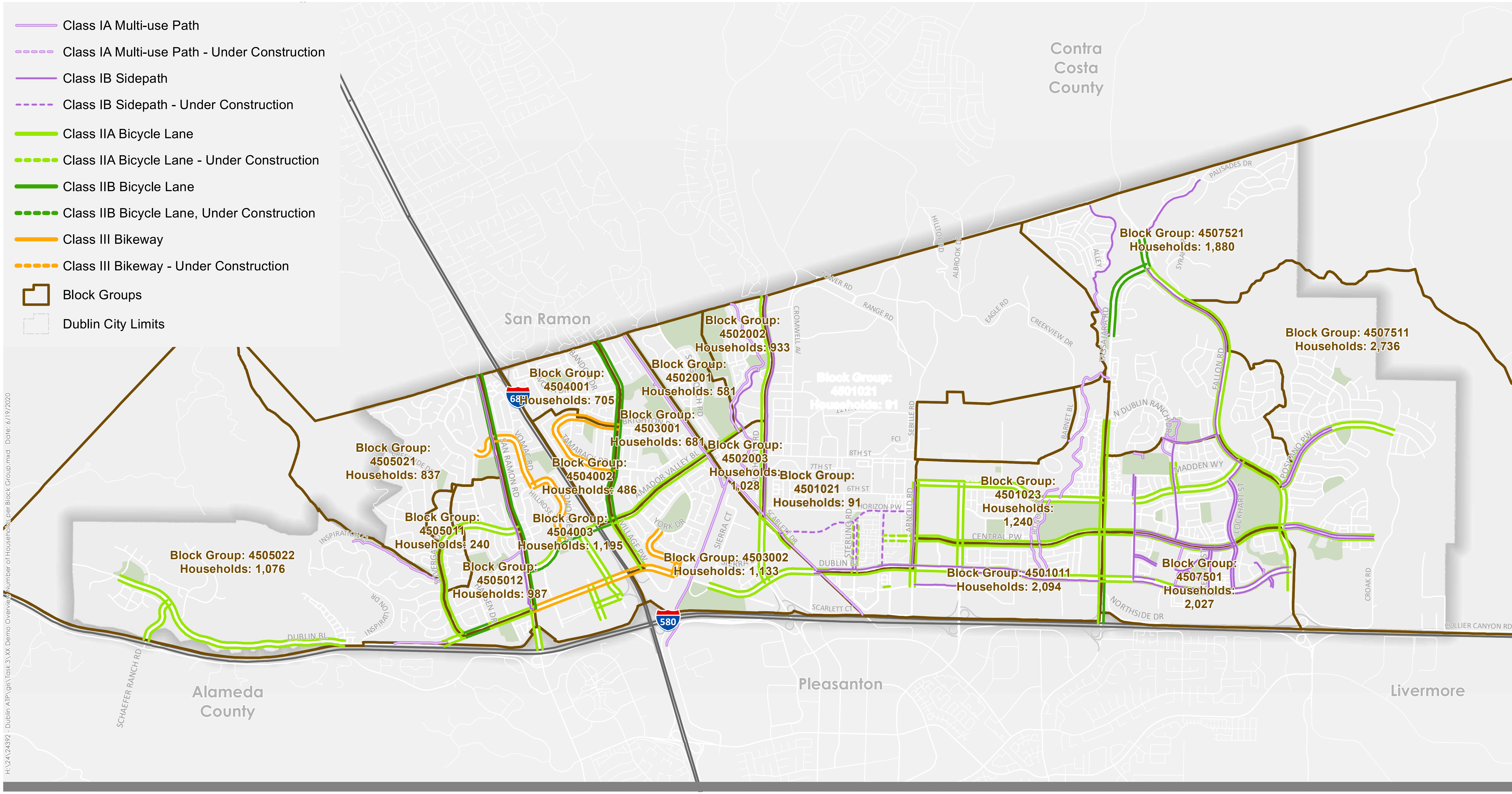
Commuter Travel Times Greater than 30 Minutes
Dublin, California

MAP PACKAGE
HOUSEHOLDS – INCOME, VEHICLES, AND HEALTH



0 1 Mile

DUBLIN CALIFORNIA

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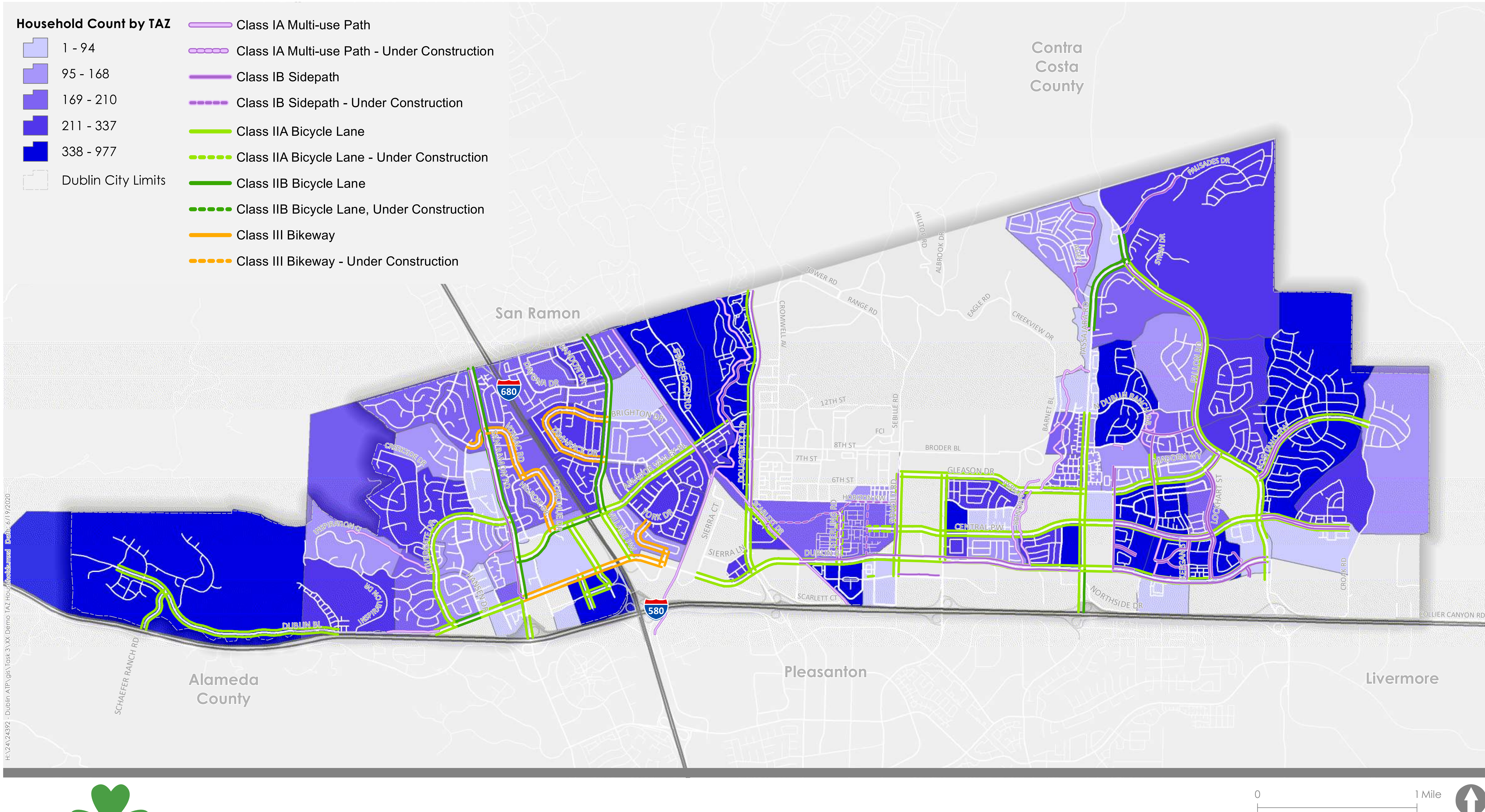
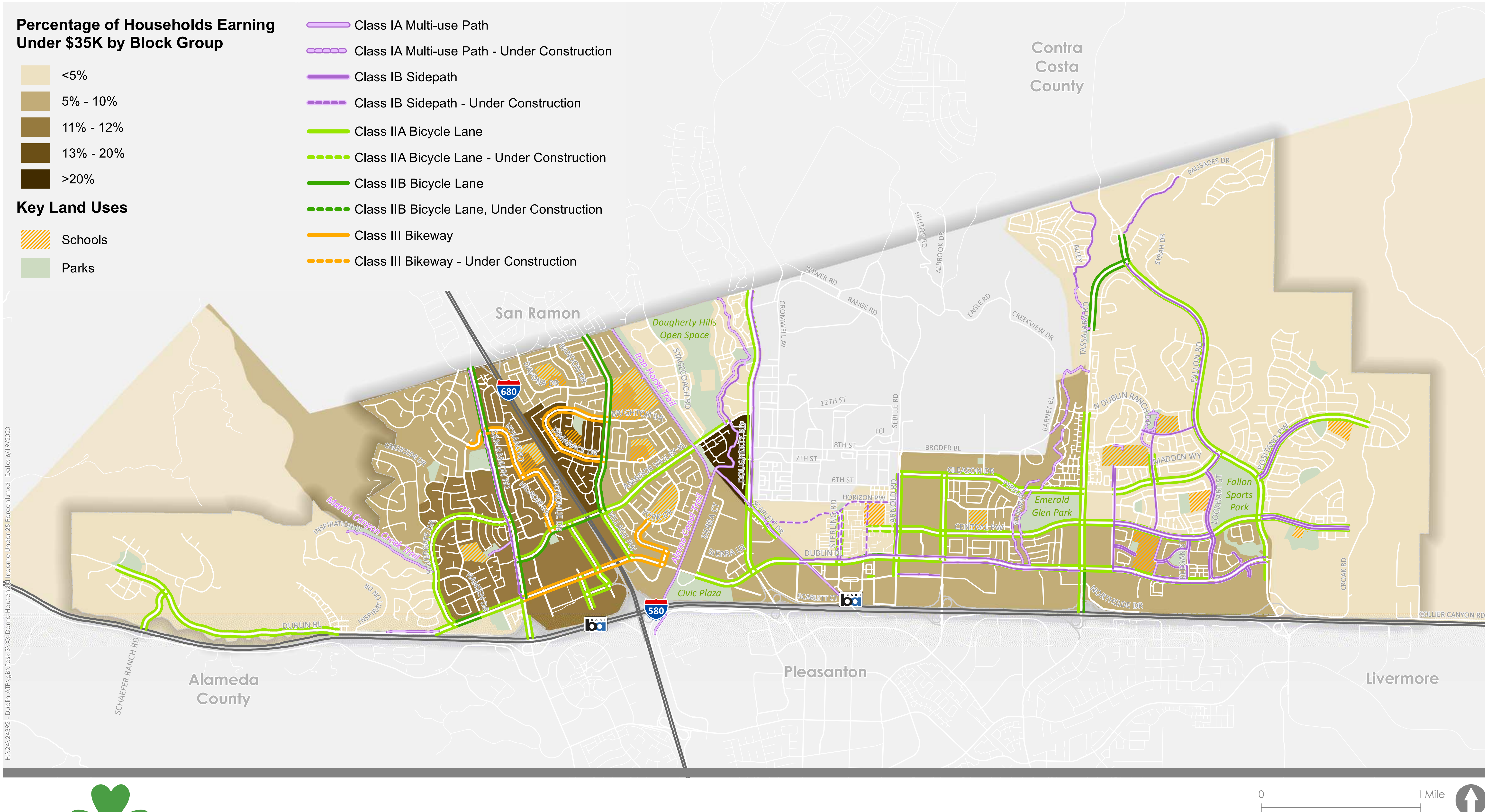
Number of Households per Block Group
Dublin, California



Households by TAZ
Dublin, California



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Household Income Under 25% of City Median Income
Dublin, California

DUBLIN
CALIFORNIA

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Household Income 25% - 50% of City Median Income
Dublin, California

Household Income 50% - 100% of City Median Income
Dublin, California

DUBLIN CALIFORNIA

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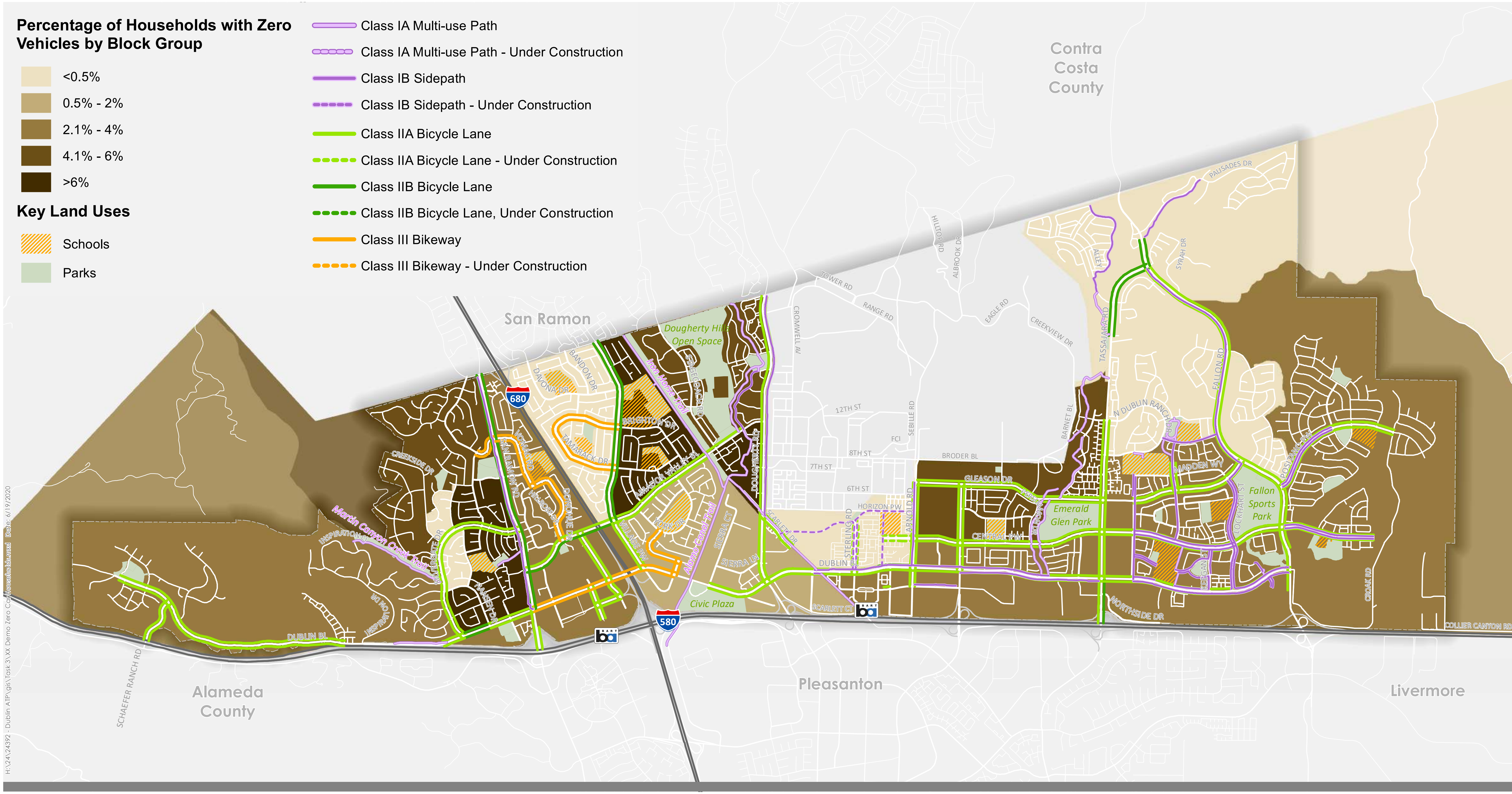
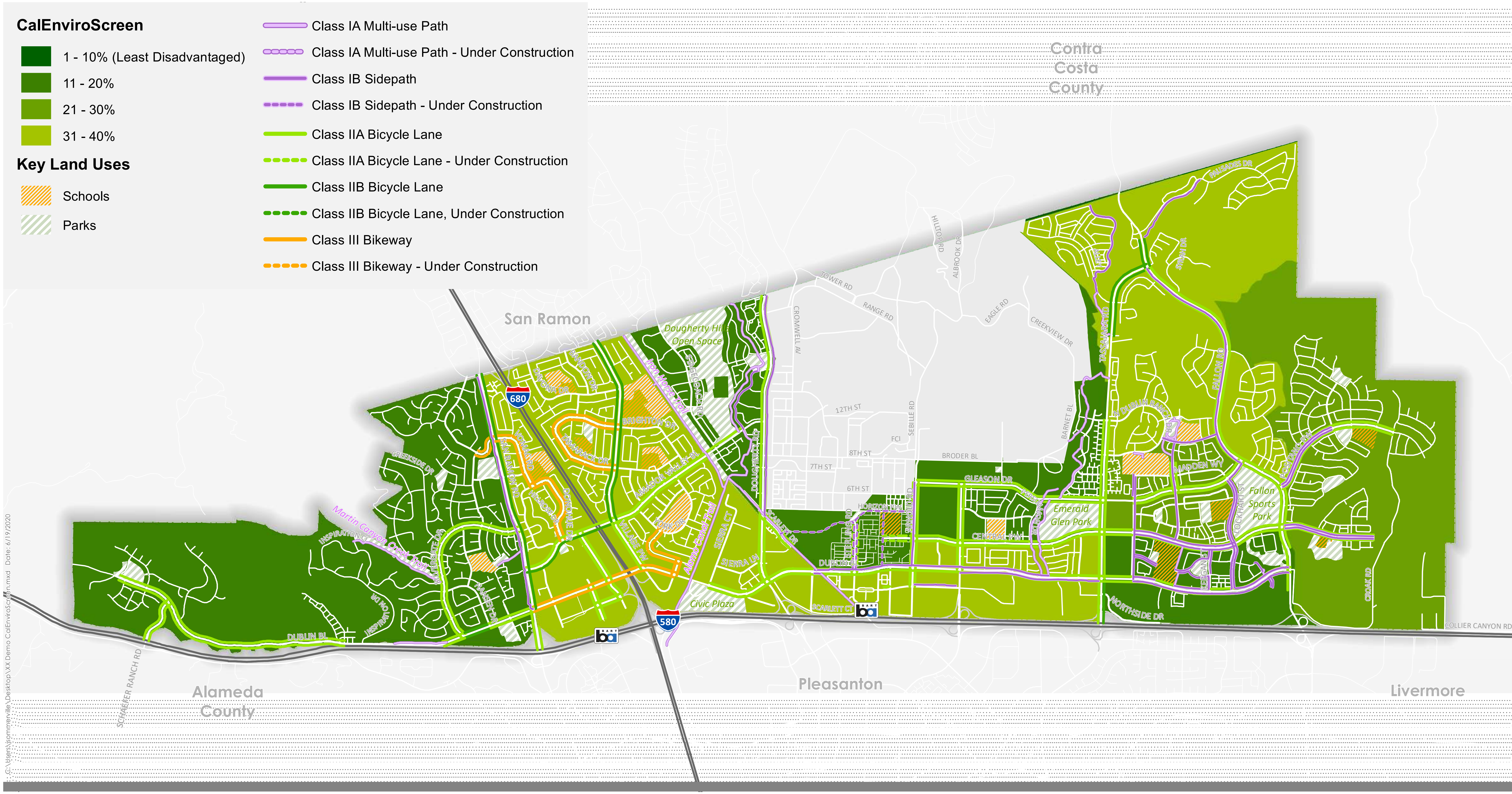
Household Income 100%+ of City Median Income
Dublin, California



Zero Car Households
Dublin, California



CalEnviroScreen
Dublin, California

APPENDIX B

EXISTING CONDITIONS: COLLISION ANALYSIS & HIGH INJURY NETWORK

KITTELSON & ASSOCIATES

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MEMORANDUM

Date:	June 22, 2020	Project #: 24392
To:	Sai Midididdi, TE City of Dublin	
From:	Amanda Leahy, AICP; Mike Alston, RSP; Michael Sahimi, AICP; Erin Ferguson, PE, RSP	
Project:	Dublin Bicycle and Pedestrian Master Plan	
Subject:	Task 3.3.2 Safety Analysis – Trends and High Injury Network Mapping	

Kittelson & Associates, Inc. (Kittelson) is assisting the City of Dublin (City) to update the Dublin Bicycle and Pedestrian Master Plan (Plan). This memorandum documents the methodology used for identifying the City's draft high injury network (HIN) as part of Task 3.3.2 - Safety Analysis. It is organized into the following sections:

- Data Sources
- Scope of Analysis and Approach to Analysis
- Citywide Collision Trends
- High Injury Network Maps

This analysis is intended to identify exclusively collision history and trends. The results of this analysis will serve as an input to the forthcoming prioritization framework (Task 4.1) and network recommendations (Task 4.2). Related information, like the presence of schools or vulnerable populations, will be layered alongside this quantitative analysis in the prioritization work.

DATA SOURCES

Kittelson obtained the six most recent years of reported collision data involving bicyclists and pedestrians from the City's CrossRoads collision database, representing 2014 through 2019. Kittelson checked collision totals against the University of California, Berkeley, Transportation Injury Mapping System (TIMS) database and ensured that collisions were not double-counted based on collision locations, dates, and other attributes. Kittelson also used a County of Alameda centerline file to develop the roadway network used for analysis. This network was previously reviewed by the City to confirm roadways and functional classification designations.

SCOPE OF ANALYSIS AND APPROACH TO ANALYSIS

Collisions

The analysis included pedestrian and bicycle collisions of all severity levels, in descending order of severity: fatal, severe injury, other visible injury, complaint of pain injury, and property damage only (PDO). A collision is classified based on the most severe outcome among any parties involved in the collision.

Collisions were geocoded to the subject intersections or the relevant locations along roadways based on the information provided in the collision database. Collisions within 250 feet of an intersection were spatially located to the relevant intersection, and collisions listed as occurring greater than 250 feet from an intersection (as measured from the center of the intersection) were manually moved to the distance listed from the intersection.

Street Network

The analysis evaluated collisions that occurred on public streets within the City, excluding freeway mainlines (e.g., Interstates 580 and 680) but included ramp terminal intersections of freeways.

Analysis Steps

The following steps describe the basic analysis approach to identifying the HIN.

1. Establish the HIN database (collisions and roadway network) as described above.
2. Evaluate the frequency and severity of reported collisions using Equivalent Property Damage Only (EPDO, also known as collision severity score) screening and sliding window methodology from the *Highway Safety Manual* with severity weighting consistent with the Alameda CTC Countywide Active Transportation Plan (specifics of this methodology described below).
3. Select approximately the top 10 percent of roadways based on collision severity scores to be included in the HIN.
4. Where applicable, extend gaps between portions of the identified HIN provided the roadway characteristics are uniform.

Steps 2 through 4 were conducted separately for pedestrian and bicycle collisions.

Collision Severity Score

Kittelson used an equivalent property damage only (EPDO) performance measure, also known as a collision severity score, which assigns weighting factors to collisions by severity relative to property damage only (PDO) collisions. For this analysis, the following weights were assigned in concurrence with Alameda CTC:

- **Fatal and severe injury collisions:** 10 equivalent PDOs
- **Visual injury or complaint of pain (moderate and minor injury) collisions:** 5 equivalent PDOs
- **PDO collisions:** 1 equivalent PDO

The weighting factors intentionally weigh fatal and severe injuries equally to recognize that the difference between a severe injury collision versus a fatal collision are often more of a function of the individuals involved than the circumstances of the collision.

The collision severity score is calculated by multiplying each collision severity total by its associated weight and summing the results, using the following formula:

*Collision Severity Score = Fatal weight * # of fatal collisions + severe injury weight*
** # of severe injury collisions + other visible injury weight * # of other visible injury collisions*
*+ complaint of pain injury weight * # of complaint of pain injury weight collisions + PDO collisions*

The collision severity score is annualized by dividing the score by the number of years (six) of collision data used in the analysis.

Resulting Network

Kittelson performed a network screening to calculate the collision severity score for half-mile sliding window segments throughout the City.

Sliding Window Methodology

As part of geocoding the collision data, Kittelson implemented a Python script in ArcGIS. This script segmented the street network into one-half (1/2) of a mile segments, incrementing the segments by one-tenth (1/10) of a mile. The collision severity score was calculated per increment of each segment as the script "slides" along each street in the network. It includes intersections as part of the analysis. By evaluating individual road increments multiple times, the sliding window methodology minimizes inaccurate collision reporting locations and identifies the windows with the highest collision severity scores. This methodology helps to identify portions of roadways with the greatest potential for safety improvements. Kittelson aggregated the results, based on their collision severity scores and via visual inspection of the results, into continuous corridors that make up the draft HIN. This is consistent with the methodology for the analysis conducted as part of the Alameda CTC Countywide Active Transportation Plan.

COLLISION TRENDS

Alongside the spatial analysis to identify pedestrian and bicycle high injury networks, available variables in the collision data were analyzed to identify any citywide trends. Pedestrian and bicycle collisions were analyzed separately for any trends based on the following characteristics:

- Temporal characteristics (time of day, day of week, seasonal, year over year)
- Lighting conditions
- Location characteristics (intersection versus segment collisions)
- Primary collision factors cited by reporting officers
- Age and gender of people walking and biking involved in collisions

Among those categories, key findings that could support further Plan update work are included below. Note that collisions involving people walking or biking are random and sparse; the relative size of each dataset—68 bicycle collisions and 81 pedestrian collisions over six years—limits the ability to find statistically valid trends. Nonetheless, the following trends may be indicative of conditions within the City.

Location

Table 1 and Table 2 present pedestrian and bicycle collisions based on location and severity. As with the spatial analysis, intersection collisions are defined as those reported to have occurred within a 250-foot intersection influence area; all others are considered segment collisions. A majority of both pedestrian and bicycle collisions occurred at intersections, where there are more conflicts with motor vehicle traffic than at other locations along roadways.

Table 1: Pedestrian Collisions by Location and Severity

Location	Fatal/Severe Injury Collisions	Other Collisions	Total Reported Collisions	Share of Total Reported
Intersection	11	63	74	91%
Segment	1	6	7	9%
Total Reported	**12**	**69**	**81**	**100%**

Source: City of Dublin; Kittelson, 2020.

Table 2: Bicycle Collisions by Location and Severity

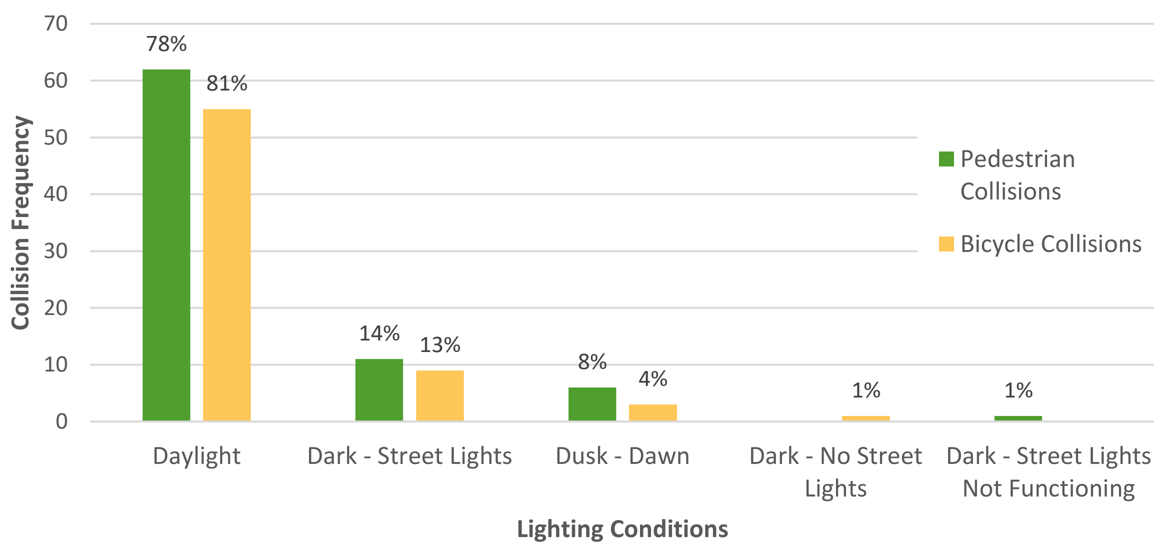
Location	Fatal/Severe Injury Collisions	Other Collisions	Total Reported Collisions	Share of Total Reported
Intersection	2	50	52	76%
Segment	1	15	16	24%
Total Reported	**3**	**65**	**68**	**100%**

Source: City of Dublin; Kittelson, 2020.

Lighting

Figure 1 presents pedestrian and bicycle collisions by lighting conditions. The majority of such collisions occurred in daylight conditions. All reported bicycle fatal and severe injury collisions occurred in daylight conditions. In dark conditions, collisions primarily occurred under street lights.

Figure 1: Pedestrian and Bicycle Collisions by Lighting Conditions



Source: City of Dublin; Kittelson, 2020.

Primary Collision Factors

Primary collision factors (PCFs) are aggregated and provided in the data based on the section of the California Vehicle Code the reporting officer records. Among bicycle collisions, the following primary collision factors were the most frequently cited:

- **Automobile right of way violation (26% of collisions):** a reported PCF that indicates one of several California Vehicle Violation codes regarding a failure to yield right-of-way to oncoming traffic. This PCF may be an action on the part of the bicyclist or the motorist involved.
- **Improper turning (16% of collisions):** a reported PCF that indicates a motorist committed a hazardous violation while turning.
- **Other hazardous movement (12% of collisions):** This is an aggregated violation category that can indicate a hazardous movement on the part of the bicyclist or the motorist involved.

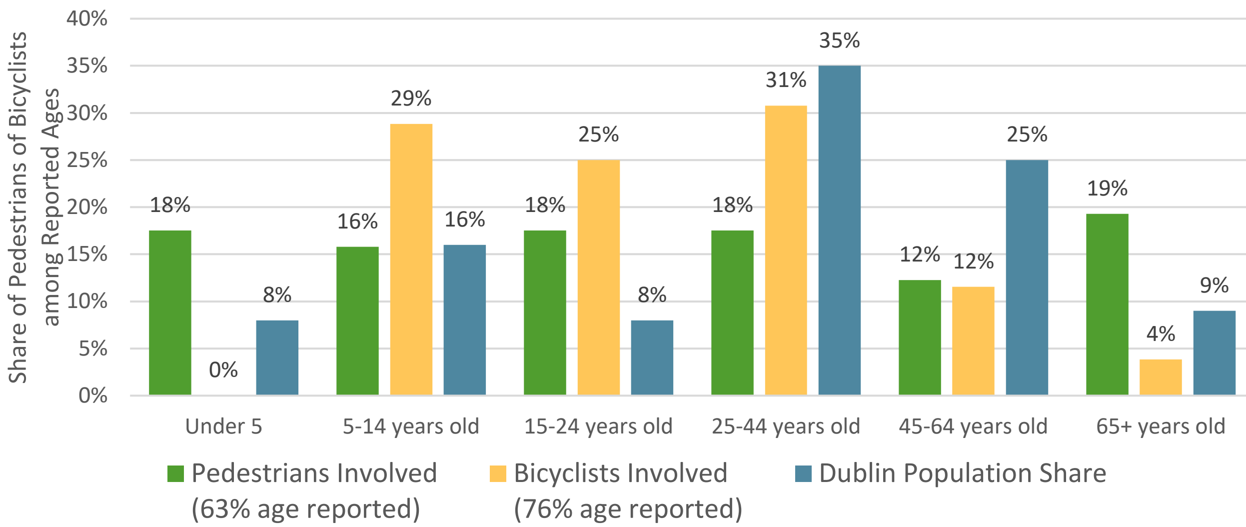
Among pedestrian collisions, the following PCFs were most frequently cited:

- **Pedestrian right-of-way violation (27% of collisions):** a reported PCF that indicates a driver violated a pedestrian's right-of-way.
- **Other improper driving (20% of collisions):** a PCF that represents an aggregation of motorist violations.
- **Automobile right-of-way violation (14% of collisions):** a reported PCF that indicates one of several California Vehicle Violation codes regarding a failure to yield right-of-way to oncoming traffic. This PCF would be an action on the part of the pedestrian or the motorist involved.
- **Pedestrian violation (6% of collisions):** a reported PCF that indicates a pedestrian was determined to have violated the laws regarding right-of-way.

Age and Gender of Parties Involved

Figure 2 presents the ages of people walking or biking involved in collisions compared to the share of the City's population. Note that age data was available for 76% of pedestrians and for 63% of bicyclists involved in collisions. The comparison reveals that people between 15 to 24 years old appear overrepresented in bicycle and pedestrian collisions. They represent 25% and 18% of pedestrians and bicyclists involved in collisions, compared to eight percent of the City's population. Similarly, people between 45 and 64 years old are underrepresented among pedestrian and bicyclist collisions (12 percent each) relative to their share of Dublin's population (25 percent).

Figure 2: Age of Parties Involved in Collisions



Source: City of Dublin; Kittelson, 2020.

Additionally, reported gender was available for 78 percent of bicyclists involved in collisions and for 59 percent of pedestrians involved. The available data show that males represent approximately 60 percent of pedestrians involved in collisions and 83 percent of bicyclists involved in collisions.

DELIVERABLES FROM THE ANALYSIS

The results from HIN and collision analysis are provided in the following attachments:

- **Figure 3: Pedestrian Collisions**
- **Figure 4: Pedestrian Network Screening Results**
- **Figure 5: Pedestrian High Injury Network**
- **Figure 6: Bicycle Collisions**
- **Figure 7: Bicycle Network Screening Results**
- **Figure 8: Bicycle High Injury Network**
- **Figure 9: Collision Statistics Infographic**

HIGH INJURY NETWORK CHARACTERISTICS

Draft High Injury Network Extents

Table 3 provides the extents of each draft high injury network.

Table 3: Draft High Injury Network Roadways

Pedestrian Draft High Injury Network		**Bicycle Draft High Injury Network**	
Roadway	*Extents*	*Roadway*	*Extents*
Amador Valley Boulevard	I-680 to Burton St	Amador Valley Boulevard	San Ramon Rd to Penn Dr
Arnold Drive	I-580 to Dublin Blvd	Dublin Boulevard	Silvergate Dr to Myrtle Dr
Bent Tree Drive	Fallon Dr to Sugar Hill Terr	Village Parkway	Dublin Blvd to City Limits (N)
Burton Street	Amador Valley Blvd to Tamarack Dr		
Dublin Boulevard	Hansen Dr to Grafton St		
Hacienda Drive	I-580 to Dublin Blvd		
Regional Street	Southern extents to Amador Valley Blvd		
Tamarack Drive	Canterbury Ln to Brighton Dr		
Tassajara Road	Dublin Blvd to Gleason Dr		
Village Parkway	Dublin Blvd to Davona Dr		
Total Mileage: 8.4 miles		**Total Mileage: 6.7 miles**	

Source: City of Dublin; Kittelson, 2020.

Draft High Injury Network Characteristics

Sixty-two percent of the pedestrian collisions occurred on the 8.4 miles of roadway that make up the pedestrian HIN. Sixty-two percent of the bicycle collisions occurred on the 6.7 miles of roadway that make up the bicycle HIN.

General road characteristics of the draft pedestrian HIN include the following:

- Approximately 40 percent of the pedestrian HIN has a speed limit of 35 miles per hour; 32 percent of the HIN mileage consists of roads with speed limit of 40 or 45 miles per hour, and the remainder of the HIN has a speed limit of 25 or 30 miles per hour..
- Approximately 55 percent of the pedestrian HIN consists of roads classified as arterial roads, with the remainder being collector or residential streets.
- Approximately 47 percent of the HIN has five or six vehicular through lanes. Another 24 percent includes four vehicular through lanes, and the remainder of the HIN has two or three lanes.

General road characteristics of the draft bicycle HIN include the following:

- Approximately 78 percent of the bicycle HIN mileage consists of roads with speed limit of 35 or 45 miles per hour, with the remainder of the HIN having speeds limits of 30 miles per hour.
- The bicycle HIN is approximately evenly divided between arterial and collector roadways—54 and 46 percent, respectively.
- Approximately 88 percent of the HIN has four or more vehicular through lanes.

NEXT STEPS

The pedestrian and bicycle HIN will be carried forward as inputs to the network prioritization (Task 4.1) as part of the next task, which will include other input elements upon consultation with the City not quantified here—for example, proximity to schools or demographic information. The descriptive statistics and HIN characteristics described will also be carried forward into subsequent Plan update work, including possible documentation for infrastructure design guidelines and network recommendations (Task 4.2).

Figure 3

Pedestrian Collisions (2014 - 2019)
Dublin, California

DUBLIN CALIFORNIA

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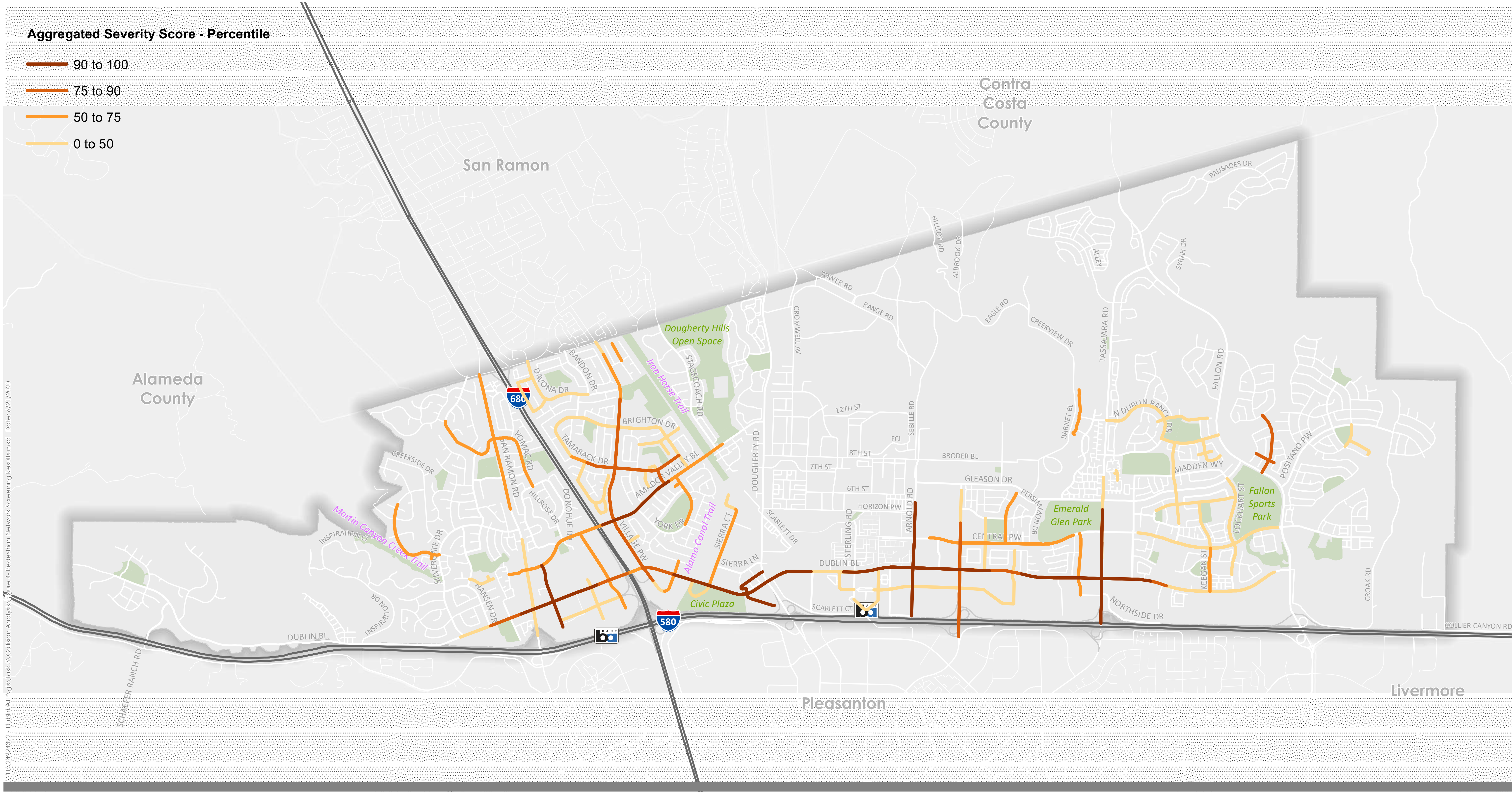


0 1 Mile

Figure 4

DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

Pedestrian Network Screening Results
Dublin, California

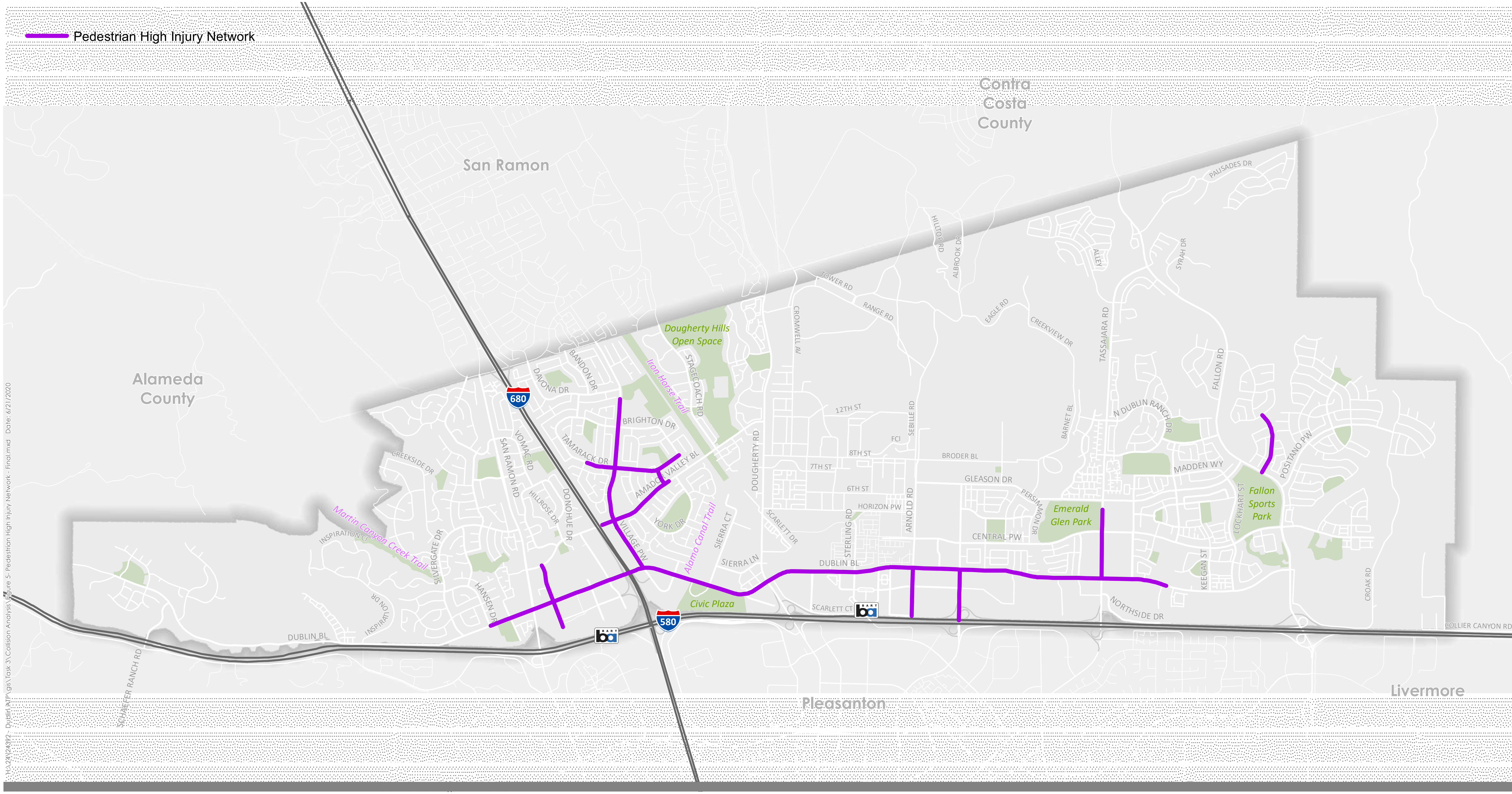


Figure 5

Pedestrian High Injury Network
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

Figure 6

Bicycle Collisions (2014 - 2019)
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

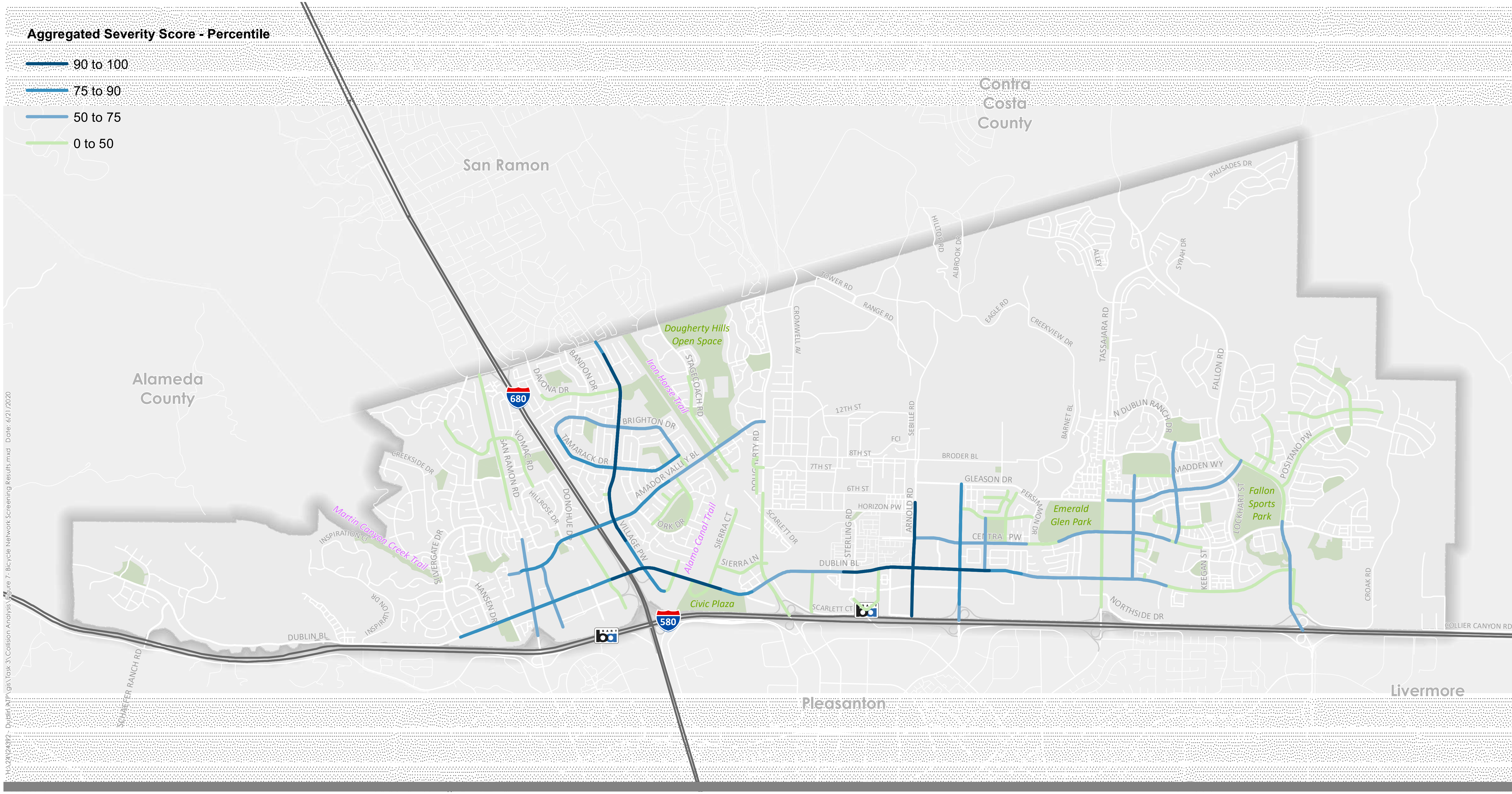


Figure 7

Bicycle Network Screening Results
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

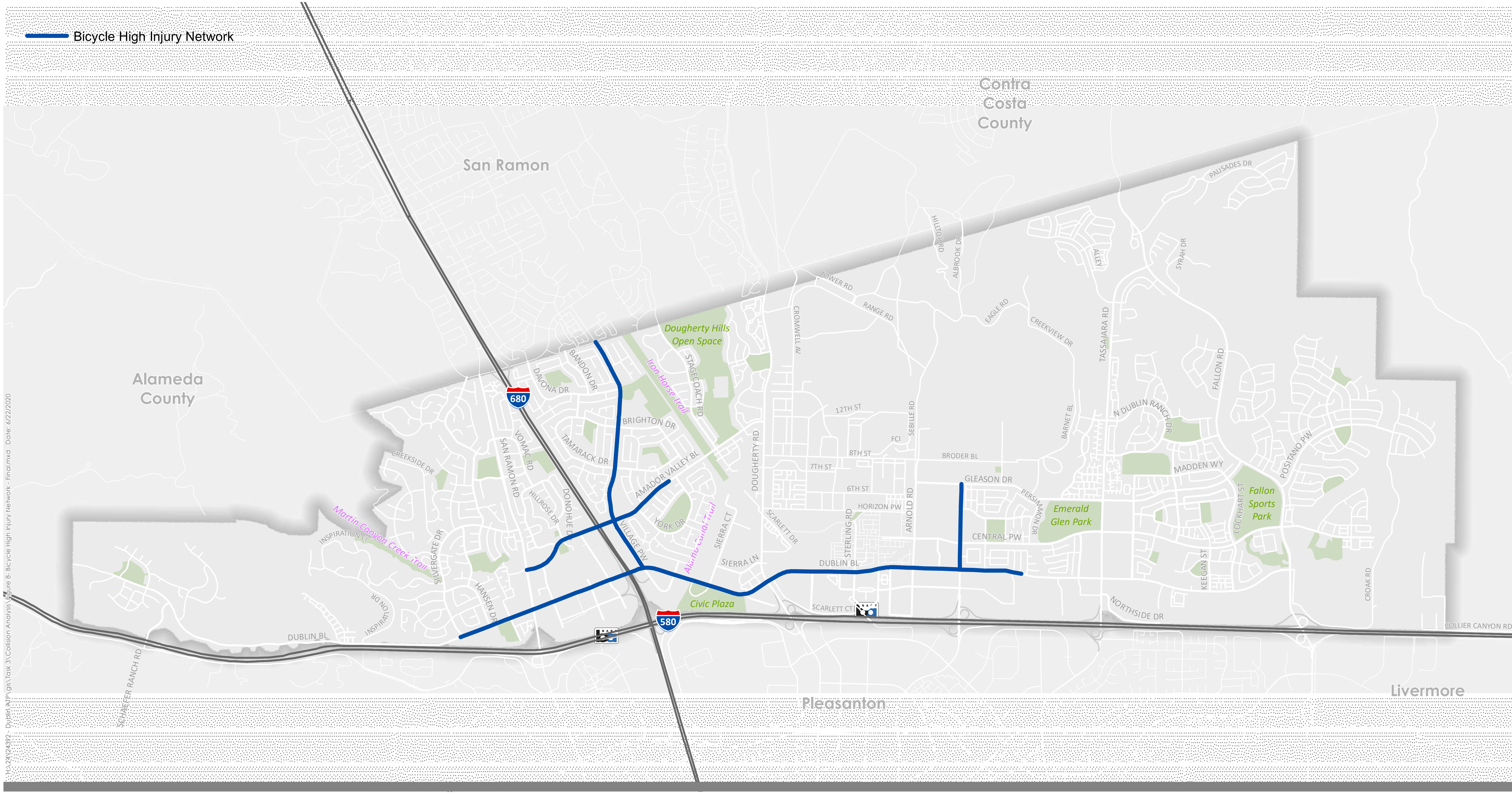


Figure 8

Bicycle High Injury Network
Dublin, California

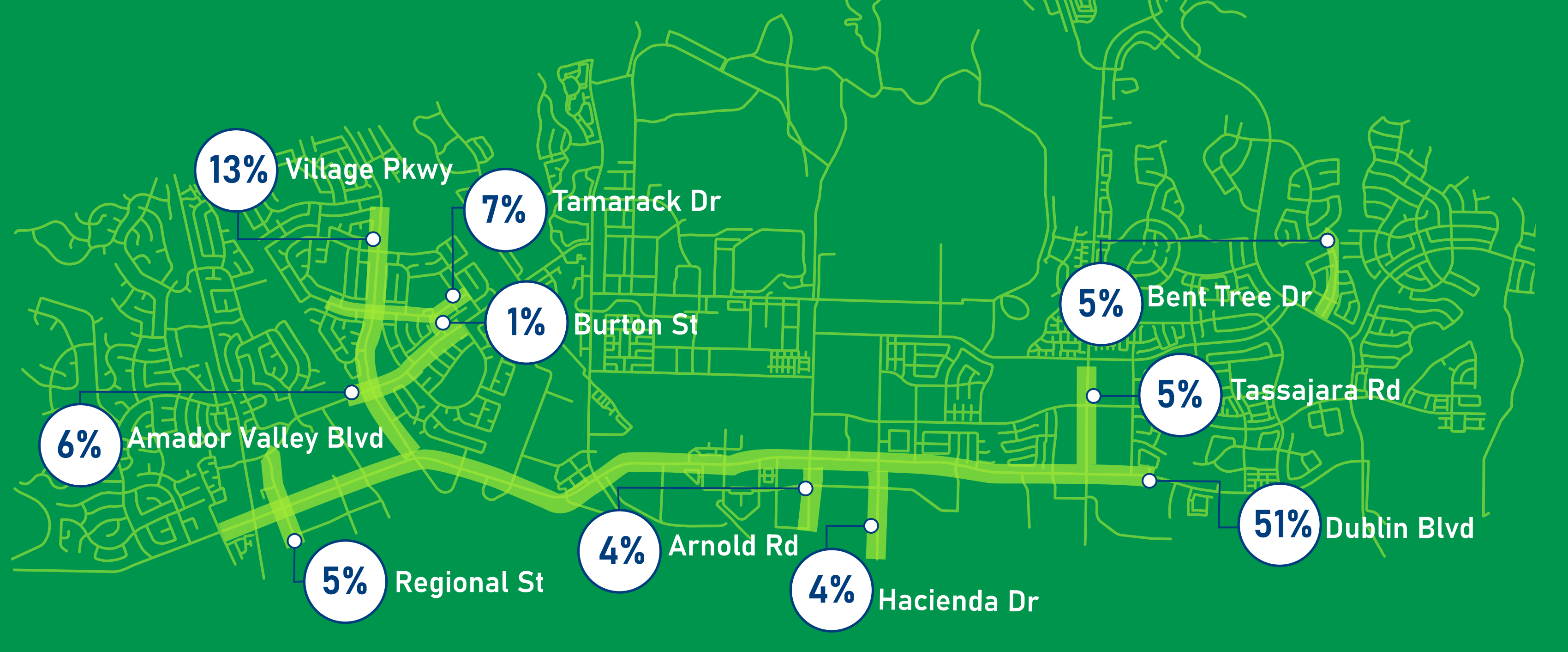
76% of bike collisions occur at an intersection

THE TOP **2** CITED PRIMARY COLLISION FACTORS FOR BIKE COLLISIONS ARE:

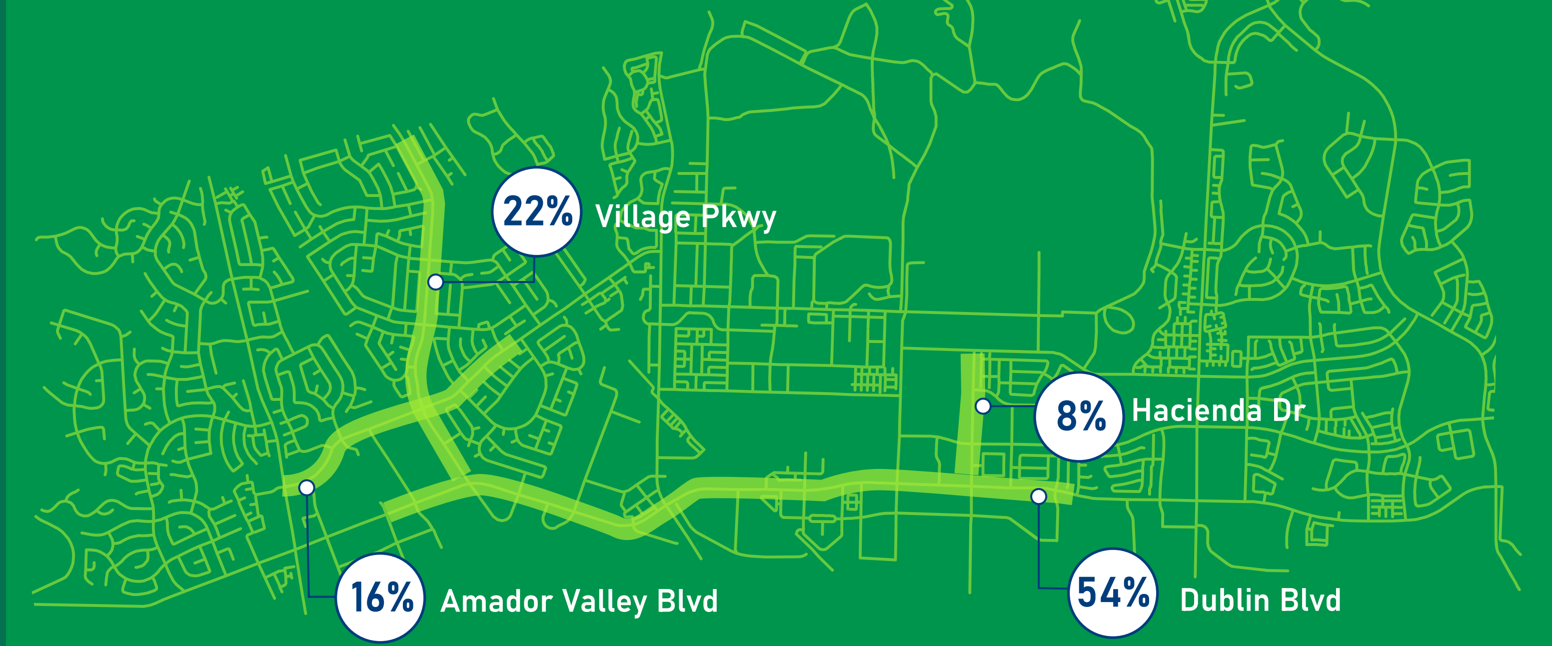
26% Automobile Right of Way Violation
(Failure to yield right-of-way to conflicting traffic)

16% Improper Turning

Pedestrian High Injury Network



Bicycle High Injury Network



4% of bike collisions resulted in a fatality or severe injury

91% of pedestrian collisions occur at an intersection

14% of pedestrian collisions are hit and run collisions

15% of pedestrian collisions resulted in a fatality or severe injury

Attachment A: Network Screening Results

FID	Street	Fatal Crashes	Severe Injury Crashes	Moderate Injury Crashes	Minor Injury Crashes	PDO Crashes	Total Crashes	Segment Length	Annualized EqPDO Score	Rank	Percentile	Percentile Group
623	DUBLIN BL	0	2	2	1	0	5	0.5	5.833333333	1	0.994444444	90_100
663	DUBLIN BL	1	0	3	1	0	5	0.5	5	2	0.988888889	90_100
1335	REGIONAL ST	0	1	3	0	3	7	0.402237	4.666666667	3	0.983333333	90_100
469	DUBLIN BL	0	0	4	1	1	6	0.5	4.333333333	4	0.977777778	90_100
491	DUBLIN BL	0	0	4	1	1	6	0.5	4.333333333	5	0.972222222	90_100
573	DUBLIN BL	0	0	4	1	1	6	0.5	4.333333333	6	0.966666667	90_100
710	DUBLIN BL	0	0	4	1	1	6	0.5	4.333333333	7	0.961111111	90_100
349	DUBLIN BL	1	0	2	1	0	4	0.5	4.166666667	8	0.955555556	90_100
386	DUBLIN BL	0	2	1	0	0	3	0.5	4.166666667	9	0.95	90_100
449	DUBLIN BL	0	2	1	0	0	3	0.5	4.166666667	10	0.944444444	90_100
718	DUBLIN BL	0	1	2	0	1	4	0.5	3.5	11	0.938888889	90_100
94	ARNOLD RD	1	0	1	1	1	4	0.5	3.5	12	0.933333333	90_100
202	ARNOLD RD	1	0	1	1	1	4	0.5	3.5	13	0.927777778	90_100
282	ARNOLD RD	1	0	1	1	1	4	0.5	3.5	14	0.922222222	90_100
147	AMADOR VALLEY BL	0	0	2	2	0	4	0.5	3.333333333	15	0.916666667	90_100
501	DUBLIN BL	1	0	1	1	0	3	0.5	3.333333333	16	0.911111111	90_100
672	DUBLIN BL	1	0	1	1	0	3	0.5	3.333333333	17	0.905555556	90_100
690	DUBLIN BL	1	0	1	1	0	3	0.5	3.333333333	18	0.9	90_100
1031	TASSAJARA RD	0	0	2	2	0	4	0.5	3.333333333	19	0.894444444	90_100
1164	TASSAJARA RD	0	0	2	2	0	4	0.5	3.333333333	20	0.888888889	90_100
1256	TASSAJARA RD	0	0	2	2	0	4	0.5	3.333333333	21	0.883333333	90_100
399	DUBLIN CT	0	2	0	0	0	2	0.1944855	3.333333333	22	0.877777778	90_100
583	DUBLIN BL	0	2	0	0	0	2	0.5	3.333333333	23	0.872222222	90_100
724	DUBLIN BL	0	2	0	0	0	2	0.5	3.333333333	24	0.866666667	90_100
1143	TRALEE VILLAGE DR	0	2	0	0	0	2	0.2343014	3.333333333	25	0.861111111	90_100
641	DUBLIN BL	0	0	2	1	2	5	0.5	2.833333333	26	0.855555556	75_90
339	HACIENDA DR	1	0	1	0	1	3	0.5	2.666666667	27	0.85	75_90
477	DUBLIN BL	0	0	2	1	1	4	0.5	2.666666667	28	0.844444444	75_90
485	DUBLIN BL	0	1	1	0	1	3	0.5	2.666666667	29	0.838888889	75_90
493	HACIENDA DR	1	0	1	0	1	3	0.5	2.666666667	30	0.833333333	75_90
522	DUBLIN BL	0	0	2	1	1	4	0.5	2.666666667	31	0.827777778	75_90
537	DUBLIN BL	0	0	2	1	1	4	0.5	2.666666667	32	0.822222222	75_90
586	DUBLIN BL	0	1	1	0	1	3	0.5	2.666666667	33	0.816666667	75_90
594	HACIENDA DR	1	0	1	0	1	3	0.5	2.666666667	34	0.811111111	75_90
631	DUBLIN BL	0	1	1	0	1	3	0.5	2.666666667	35	0.805555556	75_90
683	DUBLIN BL	0	1	1	0	1	3	0.5	2.666666667	36	0.8	75_90
1485	VILLAGE PW	0	0	1	2	1	4	0.5	2.666666667	37	0.794444444	75_90
97	BENT TREE DR	0	1	1	0	0	2	0.3832796	2.5	38	0.788888889	75_90
126	BURTON ST	0	0	1	2	0	3	0.0990718	2.5	39	0.783333333	75_90
740	DUBLIN BL	0	0	2	1	0	3	0.5	2.5	40	0.777777778	75_90
750	DUBLIN BL	0	0	2	1	0	3	0.5	2.5	41	0.772222222	75_90
1033	TWIN EAGLES LN	0	1	1	0	0	2	0.12372	2.5	42	0.766666667	75_90
1095	TAMARACK DR	0	0	2	1	0	3	0.5	2.5	43	0.761111111	75_90
1232	TAMARACK DR	0	0	2	1	0	3	0.5	2.5	44	0.755555556	75_90
1364	VILLAGE PW	0	0	2	1	0	3	0.5	2.5	45	0.75	75_90
1386	VILLAGE PW	0	0	3	0	0	3	0.5	2.5	46	0.744444444	75_90
1393	VILLAGE PW	0	0	1	2	0	3	0.5	2.5	47	0.738888889	75_90
1398	VILLAGE PW	0	0	1	2	0	3	0.5	2.5	48	0.733333333	75_90
1407	VILLAGE PW	0	0	2	1	0	3	0.5	2.5	49	0.727777778	75_90
133	AMADOR PLAZA RD	0	1	0	0	1	2	0.5	1.833333333	50	0.722222222	50_75
680	GLYNNIS ROSE DR	0	0	2	0	1	3	0.3829053	1.833333333	51	0.716666667	50_75
74	AMADOR VALLEY BL	0	0	1	1	1	3	0.5	1.833333333	52	0.711111111	50_75
158	AMADOR VALLEY BL	0	0	1	1	1	3	0.5	1.833333333	53	0.705555556	50_75
227	AMADOR VALLEY BL	0	0	1	1	1	3	0.5	1.833333333	54	0.7	50_75
275	AMADOR VALLEY BL	0	0	1	1	1	3	0.5	1.833333333	55	0.694444444	50_75
324	AMADOR VALLEY BL	0	0	1	1	1	3	0.5	1.833333333	56	0.688888889	50_75
333	DUBLIN BL	0	0	1	1	1	3	0.5	1.833333333	57	0.683333333	50_75
365	DUBLIN BL	0	0	1	1	1	3	0.5	1.833333333	58	0.677777778	50_75
649	DUBLIN BL	0	0	1	1	1	3	0.5	1.833333333	59	0.672222222	50_75
972	KEEGAN ST	0	0	1	1	1	3	0.2691345	1.833333333	60	0.666666667	50_75
53	CENTRAL PW	0	0	1	1	0	2	0.5	1.666666667	61	0.661111111	50_75
79	AMADOR VALLEY BL	0	0	1	1	0	2	0.5	1.666666667	62	0.655555556	50_75
86	CENTRAL PW	0	0	1	1	0	2	0.5	1.666666667	63	0.65	50_75
110	AMADOR VALLEY BL	0	0	1	1	0	2	0.5	1.666666667	64	0.644444444	50_75
129	AMADOR VALLEY BL	0	0	1	1	0	2	0.5	1.666666667	65	0.638888889	50_75
166	AMADOR VALLEY BL	0	0	1	1	0	2	0.5	1.666666667	66	0.633333333	50_75
174	AMADOR PLAZA RD	0	1	0	0	0	1	0.5	1.666666667	67	0.627777778	50_75
193	AMADOR VALLEY BL	0	0	1	1	0	2	0.5	1.666666667	68	0.622222222	50_75
204	CENTRAL PW	0	0	1	1	0	2	0.5	1.666666667	69	0.616666667	50_75
241	ASPEN ST	0	0	1	1	0	2	0.3253174	1.666666667	70	0.611111111	50_75
278	AMADOR VALLEY BL	0	0	1	1	0	2	0.5	1.666666667	71	0.605555556	50_75
284	CENTRAL PW	0	0	1	1	0	2	0.5	1.666666667	72	0.6	50_75
330	CENTRAL PW	0	0	1	1	0	2	0.5	1.666666667	73	0.594444444	50_75
413	DUBLIN BL	0	0	2	0	0	2	0.5	1.666666667	74	0.588888889	50_75
433	CLARK AV	0	0	1	1	0	2	0.2139419	1.666666667	75	0.583333333	50_75
818	LOCUST PL N	0	1	0	0	0	1	0.1212688	1.666666667	76	0.577777778	50_75
907	HILLBROOK PL	1	0	0	0	0	1	0.2892606	1.666666667	77	0.572222222	50_75
1029	SAN RAMON RD	0	1	0	0	0	1	0.5	1.666666667	78	0.566666667	50_75
1072	ROLLING HILLS DR	0	1	0	0	0	1	0.5	1.666666667	79	0.561111111	50_75
1081	SAN RAMON RD	0	1	0	0	0	1	0.5	1.666666667	80	0.555555556	50_75

FID	Street	Fatal Crashes	Severe Injury Crashes	Moderate Injury Crashes	Minor Injury Crashes	PDO Crashes	Total Crashes	Segment Length	Annualized EqPDO Score	Rank	Percentile	Percentile Group
1167	TYNE CT	0	1	0	0	0	1	0.03766	1.666666667	81	0.55	50_75
1186	SAN RAMON RD	0	1	0	0	0	1	0.5	1.666666667	82	0.544444444	50_75
1266	ROLLING HILLS DR	0	1	0	0	0	1	0.5	1.666666667	83	0.538888889	50_75
1300	TAMARACK DR	0	0	2	0	0	2	0.5	1.666666667	84	0.533333333	50_75
1312	PENN DR	0	1	0	0	0	1	0.3329521	1.666666667	85	0.527777778	50_75
1320	SAN RAMON RD	0	1	0	0	0	1	0.5	1.666666667	86	0.522222222	50_75
1344	SIERRA CT	0	0	1	1	0	2	0.5	1.666666667	87	0.516666667	50_75
1355	SAN RAMON RD	0	1	0	0	0	1	0.5	1.666666667	88	0.511111111	50_75
1363	VOMAC RD	0	1	0	0	0	1	0.4393404	1.666666667	89	0.505555556	50_75
1426	W VOMAC RD	0	1	0	0	0	1	0.456675	1.666666667	90	0.5	50_75
1465	VILLAGE PW	0	0	2	0	0	2	0.5	1.666666667	91	0.494444444	50_75
1467	WINDING TRAIL LN	0	1	0	0	0	1	0.027529	1.666666667	92	0.488888889	50_75
1471	VILLAGE PW	0	0	2	0	0	2	0.5	1.666666667	93	0.483333333	50_75
1479	VILLAGE PW	0	0	2	0	0	2	0.5	1.666666667	94	0.477777778	50_75
1493	VILLAGE PW	0	0	2	0	0	2	0.5	1.666666667	95	0.472222222	50_75
52	BRIGHTON DR	0	0	1	0	1	2	0.5	1	96	0.466666667	0_50
58	CENTRAL PW	0	0	1	0	1	2	0.5	1	97	0.461111111	0_50
105	ANTONE WY	0	0	0	1	1	2	0.3626265	1	98	0.455555556	0_50
124	CENTRAL PW	0	0	1	0	1	2	0.5	1	99	0.45	0_50
128	CENTRAL PW	0	0	1	0	1	2	0.5	1	100	0.444444444	0_50
186	BRIGHTON DR	0	0	1	0	1	2	0.5	1	101	0.438888889	0_50
192	CENTRAL PW	0	0	1	0	1	2	0.5	1	102	0.433333333	0_50
251	BRIGHTON DR	0	0	1	0	1	2	0.5	1	103	0.427777778	0_50
317	BRIGHTON DR	0	0	1	0	1	2	0.5	1	104	0.422222222	0_50
323	CENTRAL PW	0	0	1	0	1	2	0.5	1	105	0.416666667	0_50
401	HACIENDA DR	0	0	1	0	1	2	0.5	1	106	0.411111111	0_50
428	GRAFTON ST	0	0	0	1	1	2	0.5	1	107	0.405555556	0_50
429	DUBLIN BL	0	0	0	1	1	2	0.5	1	108	0.4	0_50
538	DUBLIN BL	0	0	1	0	1	2	0.5	1	109	0.394444444	0_50
892	MYRTLE DR	0	0	0	1	1	2	0.1348713	1	110	0.388888889	0_50
986	LEE THOMPSON ST	0	0	1	0	1	2	0.2958484	1	111	0.383333333	0_50
1024	SAINT PATRICK WY	0	0	1	0	1	2	0.3965917	1	112	0.377777778	0_50
1156	TOYOTA DR	0	0	0	1	1	2	0.1965035	1	113	0.372222222	0_50
1451	VILLAGE PW	0	0	0	1	1	2	0.5	1	114	0.366666667	0_50
68	AMANDA ST	0	0	1	0	0	1	0.1037903	0.833333333	115	0.361111111	0_50
80	CANTERBURY LN	0	0	0	1	0	1	0.5	0.833333333	116	0.355555556	0_50
98	CAMPBELL GREEN	0	0	0	1	0	1	0.0255053	0.833333333	117	0.35	0_50
167	CHARLTON CT	0	0	1	0	0	1	0.0127258	0.833333333	118	0.344444444	0_50
194	CAMPBELL LN	0	0	1	0	0	1	0.1909359	0.833333333	119	0.338888889	0_50
249	BRIGHTON DR	0	0	1	0	0	1	0.5	0.833333333	120	0.333333333	0_50
257	BRIGHTON DR	0	0	1	0	0	1	0.5	0.833333333	121	0.327777778	0_50
306	CANTERBURY LN	0	0	0	1	0	1	0.5	0.833333333	122	0.322222222	0_50
341	DUBLIN BL	0	0	0	1	0	1	0.5	0.833333333	123	0.316666667	0_50
346	HARTLAND LN	0	0	0	1	0	1	0.0431559	0.833333333	124	0.311111111	0_50
357	DAVONA DR	0	0	0	1	0	1	0.5	0.833333333	125	0.305555556	0_50
376	E CANTARA DR	0	0	0	1	0	1	0.1453459	0.833333333	126	0.3	0_50
380	DUBLIN BL	0	0	1	0	0	1	0.5	0.833333333	127	0.294444444	0_50
421	DUBLIN BL	0	0	0	1	0	1	0.5	0.833333333	128	0.288888889	0_50
426	CIVIC PZ	0	0	1	0	0	1	0.2322135	0.833333333	129	0.283333333	0_50
435	DUBLIN BL	0	0	1	0	0	1	0.5	0.833333333	130	0.277777778	0_50
447	DAVONA DR	0	0	0	1	0	1	0.5	0.833333333	131	0.272222222	0_50
474	DUBLIN BL	0	0	1	0	0	1	0.5	0.833333333	132	0.266666667	0_50
514	DUBLIN BL	0	0	0	1	0	1	0.5	0.833333333	133	0.261111111	0_50
547	HARTLAND CT	0	0	0	1	0	1	0.0415387	0.833333333	134	0.255555556	0_50
568	DUBLIN BL	0	0	1	0	0	1	0.5	0.833333333	135	0.25	0_50
588	DUBLIN BL	0	0	1	0	0	1	0.5	0.833333333	136	0.244444444	0_50
603	DUBLIN BL	0	0	1	0	0	1	0.5	0.833333333	137	0.238888889	0_50
614	HACIENDA DR	0	0	1	0	0	1	0.5	0.833333333	138	0.233333333	0_50
616	DUBLIN BL	0	0	0	1	0	1	0.5	0.833333333	139	0.227777778	0_50
617	FOXCROFT WY	0	0	1	0	0	1	0.061691	0.833333333	140	0.222222222	0_50
657	DUBLIN BL	0	0	0	1	0	1	0.5	0.833333333	141	0.216666667	0_50
705	DUBLIN BL	0	0	1	0	0	1	0.5	0.833333333	142	0.211111111	0_50
734	DUBLIN BL	0	0	1	0	0	1	0.5	0.833333333	143	0.205555556	0_50
737	GOLDEN GATE DR	0	0	1	0	0	1	0.2084345	0.833333333	144	0.2	0_50
738	GROVELAND LN	0	0	1	0	0	1	0.0417226	0.833333333	145	0.194444444	0_50
779	LOCKHART ST	0	0	0	1	0	1	0.5	0.833333333	146	0.188888889	0_50
792	OAK BLUFF LN	0	0	1	0	0	1	0.2777243	0.833333333	147	0.183333333	0_50
805	N SPAGO DR	0	0	0	1	0	1	0.1618169	0.833333333	148	0.177777778	0_50
820	N DUBLIN RANCH DR	0	0	1	0	0	1	0.5	0.833333333	149	0.172222222	0_50
845	HIBERNIA DR	0	0	1	0	0	1	0.3222054	0.833333333	150	0.166666667	0_50
853	LEWIS AV	0	0	0	1	0	1	0.0782577	0.833333333	151	0.161111111	0_50
887	LOCKHART ST	0	0	0	1	0	1	0.5	0.833333333	152	0.155555556	0_50
913	N DUBLIN RANCH DR	0	0	1	0	0	1	0.5	0.833333333	153	0.15	0_50
925	LOCKHART ST	0	0	0	1	0	1	0.5	0.833333333	154	0.144444444	0_50
957	IRONHORSE PW	0	0	0	1	0	1	0.3890455	0.833333333	155	0.138888889	0_50
1001	MARTINELLI WY	0	0	0	1	0	1	0.5	0.833333333	156	0.133333333	0_50
1094	SIERRA CT	0	0	0	1	0	1	0.5	0.833333333	157	0.127777778	0_50
1099	PALERMO WY	0	0	0	1	0	1	0.5	0.833333333	158	0.122222222	0_50
1117	S BRIDGEPOINTE LN	0	0	0	1	0	1	0.2159105	0.833333333	159	0.116666667	0_50
1135	TAMARACK DR	0	0	1	0	0	1	0.5	0.833333333	160	0.111111111	0_50

FID	Street	Fatal Crashes	Severe Injury Crashes	Moderate Injury Crashes	Minor Injury Crashes	PDO Crashes	Total Crashes	Segment Length	Annualized EqPDO Score	Rank	Percentile	Percentile Group
1136	TASSAJARA RD	0	0	0	1	0	1	0.5	0.833333333	161	0.105555556	0_50
1155	SAN RAMON RD	0	0	1	0	0	1	0.5	0.833333333	162	0.1	0_50
1192	SIERRA CT	0	0	0	1	0	1	0.5	0.833333333	163	0.094444444	0_50
1197	SAN RAMON RD	0	0	1	0	0	1	0.5	0.833333333	164	0.088888889	0_50
1218	TAMARACK DR	0	0	1	0	0	1	0.5	0.833333333	165	0.083333333	0_50
1260	TASSAJARA RD	0	0	0	1	0	1	0.5	0.833333333	166	0.077777778	0_50
1324	SUTTON LN	0	0	0	1	0	1	0.1856974	0.833333333	167	0.072222222	0_50
1422	VILLAGE PW	0	0	1	0	0	1	0.5	0.833333333	168	0.066666667	0_50
1446	VILLAGE PW	0	0	1	0	0	1	0.5	0.833333333	169	0.061111111	0_50
1457	UNNAMED	0	0	1	0	0	1	0.0515973	0.833333333	170	0.055555556	0_50
1484	WICKLOW LN	0	0	0	1	0	1	0.4141705	0.833333333	171	0.05	0_50
203	BRIGHTON DR	0	0	0	0	1	1	0.5	0.166666667	172	0.044444444	0_50
268	BROOKDALE CT	0	0	0	0	1	1	0.0938058	0.166666667	173	0.038888889	0_50
361	DUBLIN BL	0	0	0	0	1	1	0.5	0.166666667	174	0.033333333	0_50
572	HACIENDA CROSSING	0	0	0	0	1	1	0.3605973	0.166666667	175	0.027777778	0_50
888	MANSFIELD AV	0	0	0	0	1	1	0.2744785	0.166666667	176	0.022222222	0_50
1013	MARTINELLI WY	0	0	0	0	1	1	0.5	0.166666667	177	0.016666667	0_50
1205	SHADOW PL	0	0	0	0	1	1	0.0251716	0.166666667	178	0.011111111	0_50
1325	SHADOW DR	0	0	0	0	1	1	0.1588817	0.166666667	179	0.005555556	0_50
1487	UNNAMED	0	0	0	0	1	1	0.0811947	0.166666667	180	0	0_50

FID	Street	Fatal Crashes	Severe Injury Crashes	Moderate Injury Crashes	Minor Injury Crashes	PDO Crashes	Total Crashes	Segment Length	Crash Frequency (annual)	Annualized EqPDO Score	Rank	Percentile	Percentile Group
624	DUBLIN BL	1	1	2	2	0	6	0.5	1	6.666666667	1	0.994252874	90_100
1439	VILLAGE PW	0	1	4	1	1	7	0.5	1.166666667	6	2	0.988505747	90_100
454	DUBLIN BL	0	0	3	3	4	10	0.5	1.666666667	5.666666667	3	0.982758621	90_100
674	DUBLIN BL	0	0	3	3	3	9	0.5	1.5	5.5	4	0.977011494	90_100
461	DUBLIN BL	1	1	0	2	0	4	0.5	0.666666667	5	5	0.971264368	90_100
572	DUBLIN BL	1	1	0	2	0	4	0.5	0.666666667	5	6	0.965517241	90_100
1422	VILLAGE PW	0	1	4	0	0	5	0.5	0.833333333	5	7	0.959770115	90_100
1451	VILLAGE PW	0	1	4	0	0	5	0.5	0.833333333	5	8	0.954022989	90_100
1478	VILLAGE PW	0	1	4	0	0	5	0.5	0.833333333	5	9	0.948275862	90_100
355	DUBLIN BL	0	0	2	3	2	7	0.5	1.166666667	4.5	10	0.942528736	90_100
1360	VILLAGE PW	0	0	2	3	1	6	0.5	1	4.333333333	11	0.936781609	90_100
1455	VILLAGE PW	0	0	2	3	1	6	0.5	1	4.333333333	12	0.931034483	90_100
1463	VILLAGE PW	0	0	3	2	1	6	0.5	1	4.333333333	13	0.925287356	90_100
19	ARNOLD RD	1	1	0	1	0	3	0.5	0.5	4.166666667	14	0.91954023	90_100
40	ARNOLD RD	1	1	0	1	0	3	0.5	0.5	4.166666667	15	0.913793103	90_100
215	ARNOLD RD	1	1	0	1	0	3	0.5	0.5	4.166666667	16	0.908045977	90_100
543	DUBLIN BL	1	1	0	1	0	3	0.5	0.5	4.166666667	17	0.902298851	90_100
644	DUBLIN BL	1	1	0	1	0	3	0.5	0.5	4.166666667	18	0.896551724	90_100
559	DUBLIN BL	0	0	2	2	3	7	0.5	1.166666667	3.833333333	19	0.890804598	75_90
745	DUBLIN BL	0	0	2	2	3	7	0.5	1.166666667	3.833333333	20	0.885057471	75_90
1470	VILLAGE PW	0	0	2	2	2	6	0.5	1	3.666666667	21	0.879310345	75_90
1380	VILLAGE PW	0	1	2	0	0	3	0.5	0.5	3.333333333	22	0.873563218	75_90
89	AMADOR VALLEY BL	0	0	2	1	1	4	0.5	0.666666667	2.666666667	23	0.867816092	75_90
182	AMADOR VALLEY BL	0	0	2	1	1	4	0.5	0.666666667	2.666666667	24	0.862068966	75_90
1366	VILLAGE PW	0	0	1	2	1	4	0.5	0.666666667	2.666666667	25	0.856321839	75_90
54	AMADOR VALLEY BL	0	0	2	1	0	3	0.5	0.5	2.5	26	0.850574713	75_90
251	AMADOR VALLEY BL	0	0	2	1	0	3	0.5	0.5	2.5	27	0.844827586	75_90
363	DUBLIN BL	0	0	2	1	0	3	0.5	0.5	2.5	28	0.83908046	75_90
533	DUBLIN BL	0	0	2	1	0	3	0.5	0.5	2.5	29	0.833333333	75_90
1387	VILLAGE PW	0	0	1	2	0	3	0.5	0.5	2.5	30	0.827586207	75_90
507	DUBLIN BL	0	0	1	1	4	6	0.5	1	2.333333333	31	0.82183908	75_90
723	DUBLIN BL	0	0	1	1	4	6	0.5	1	2.333333333	32	0.816091954	75_90
1412	VILLAGE PW	0	0	1	1	2	4	0.5	0.666666667	2	33	0.810344828	75_90
440	HACIENDA DR	0	0	2	0	1	3	0.5	0.5	1.833333333	34	0.804597701	75_90
524	DUBLIN BL	0	0	0	2	1	3	0.5	0.5	1.833333333	35	0.798850575	75_90
550	HACIENDA DR	0	0	2	0	1	3	0.5	0.5	1.833333333	36	0.793103448	75_90
555	DUBLIN BL	0	0	0	2	1	3	0.5	0.5	1.833333333	37	0.787356322	75_90
592	DUBLIN BL	0	0	0	2	1	3	0.5	0.5	1.833333333	38	0.781609195	75_90
602	HACIENDA DR	0	0	2	0	1	3	0.5	0.5	1.833333333	39	0.775862069	75_90
610	DUBLIN BL	0	0	0	2	1	3	0.5	0.5	1.833333333	40	0.770114943	75_90
639	HACIENDA DR	0	0	2	0	1	3	0.5	0.5	1.833333333	41	0.764367816	75_90
683	DUBLIN BL	0	0	0	2	1	3	0.5	0.5	1.833333333	42	0.75862069	75_90
136	AMADOR VALLEY BL	0	0	1	1	1	3	0.5	0.5	1.833333333	43	0.752873563	75_90
224	AMADOR VALLEY BL	0	0	1	1	1	3	0.5	0.5	1.833333333	44	0.747126437	75_90
331	AMADOR VALLEY BL	0	0	1	1	1	3	0.5	0.5	1.833333333	45	0.74137931	75_90
1075	TAMARACK DR	0	0	1	1	1	3	0.5	0.5	1.833333333	46	0.735632184	75_90
1090	TAMARACK DR	0	0	1	1	1	3	0.5	0.5	1.833333333	47	0.729885057	75_90
1097	TAMARACK DR	0	0	1	1	1	3	0.5	0.5	1.833333333	48	0.724137931	75_90
1113	TAMARACK DR	0	0	1	1	1	3	0.5	0.5	1.833333333	49	0.718390805	75_90
1235	TAMARACK DR	0	0	1	1	1	3	0.5	0.5	1.833333333	50	0.712643678	75_90
2	BRIGHTON DR	0	0	2	0	0	2	0.5	0.333333333	1.666666667	51	0.706896552	50_75
41	AMADOR VALLEY BL	0	0	1	1	0	2	0.5	0.333333333	1.666666667	52	0.701149425	50_75
44	BRIGHTON DR	0	0	2	0	0	2	0.5	0.333333333	1.666666667	53	0.695402299	50_75
58	BRIGHTON DR	0	0	2	0	0	2	0.5	0.333333333	1.666666667	54	0.689655172	50_75
72	BRIGHTON DR	0	0	2	0	0	2	0.5	0.333333333	1.666666667	55	0.683908046	50_75
97	CENTRAL PW	0	0	1	1	0	2	0.5	0.333333333	1.666666667	56	0.67816092	50_75
189	CENTRAL PW	0	0	1	1	0	2	0.5	0.333333333	1.666666667	57	0.672413793	50_75
217	BRIGHTON DR	0	0	2	0	0	2	0.5	0.333333333	1.666666667	58	0.666666667	50_75
292	BRIGHTON DR	0	0	2	0	0	2	0.5	0.333333333	1.666666667	59	0.66091954	50_75
329	CENTRAL PW	0	0	1	1	0	2	0.5	0.333333333	1.666666667	60	0.655172414	50_75
346	FALLON RD	0	0	1	1	0	2	0.5	0.333333333	1.666666667	61	0.649425287	50_75
424	DUBLIN BL	0	0	2	0	0	2	0.5	0.333333333	1.666666667	62	0.643678161	50_75
464	DUBLIN BL	0	0	2	0	0	2	0.5	0.333333333	1.666666667	63	0.637931034	50_75
598	FALLON RD	0	0	1	1	0	2	0.5	0.333333333	1.666666667	64	0.632183908	50_75
754	FALLON RD	0	0	1	1	0	2	0.5	0.333333333	1.666666667	65	0.626436782	50_75
782	HIBERNIA DR	0	0	2	0	0	2	0.3222054	0.333333333	1.666666667	66	0.620689655	50_75
1287	REGIONAL ST	0	0	1	1	0	2	0.402237	0.333333333	1.666666667	67	0.614942529	50_75
1445	VILLAGE PW	0	0	1	1	0	2	0.5	0.333333333	1.666666667	68	0.609195402	50_75
731	DUBLIN BL	0	0	1	0	3	4	0.5	0.666666667	1.333333333	69	0.603448276	50_75
133	AMADOR VALLEY BL	0	0	1	0	2	3	0.5	0.5	1.166666667	70	0.597701149	50_75
194	AMADOR VALLEY BL	0	0	1	0	2	3	0.5	0.5	1.166666667	71	0.591954023	50_75
235	AMADOR VALLEY BL	0	0	1	0	2	3	0.5	0.5	1.166666667	72	0.586206897	50_75
334	GRAFTON ST	0	0	0	1	2	3	0.5	0.5	1.166666667	73	0.58045977	50_75
446	DUBLIN BL	0	0	0	1	2	3	0.5	0.5	1.166666667	74	0.574712644	50_75
613	DUBLIN BL	0	0	0	1	2	3	0.5	0.5	1.166666667	75	0.568965517	50_75
43	BRANNIGAN ST	0	0	0	1	1	2	0.5	0.333333333	1	76	0.563218391	50_75
80	CENTRAL PW	0	0	1	0	1	2	0.5	0.333333333	1	77	0.557471264	50_75
111	CENTRAL PW	0	0	1	0	1	2	0.5	0.333333333	1	78	0.551724138	50_75
156	BRANNIGAN ST	0	0	0	1	1	2	0.5	0.333333333	1	79	0.545977011	50_75
237	BRANNIGAN ST	0	0	0	1	1	2	0.5	0.333333333	1	80	0.540229885	50_75

FID	Street	Fatal Crashes	Severe Injury Crashes	Moderate Injury Crashes	Minor Injury Crashes	PDO Crashes	Total Crashes	Segment Length	Crash Frequency (annual)	Annualized EqPDO Score	Rank	Percentile	Percentile Group
264	CENTRAL PW	0	0	1	0	1	2	0.5	0.333333333	1	81	0.534482759	50_75
311	AMADOR VALLEY BL	0	0	1	0	1	2	0.5	0.333333333	1	82	0.528735632	50_75
328	AMADOR VALLEY BL	0	0	1	0	1	2	0.5	0.333333333	1	83	0.522988506	50_75
337	GLEASON DR	0	0	0	1	1	2	0.5	0.333333333	1	84	0.517241379	50_75
383	GLEASON DR	0	0	0	1	1	2	0.5	0.333333333	1	85	0.511494253	50_75
410	DUBLIN BL	0	0	0	1	1	2	0.5	0.333333333	1	86	0.505747126	50_75
416	HACIENDA DR	0	0	1	0	1	2	0.5	0.333333333	1	87	0.5	50_75
451	GLEASON DR	0	0	0	1	1	2	0.5	0.333333333	1	88	0.494252874	50_75
480	DUBLIN BL	0	0	0	1	1	2	0.5	0.333333333	1	89	0.488505747	50_75
482	GRAFTON ST	0	0	0	1	1	2	0.5	0.333333333	1	90	0.482758621	50_75
509	GLEASON DR	0	0	0	1	1	2	0.5	0.333333333	1	91	0.477011494	50_75
513	DUBLIN BL	0	0	0	1	1	2	0.5	0.333333333	1	92	0.471264368	50_75
539	GRAFTON ST	0	0	0	1	1	2	0.5	0.333333333	1	93	0.465517241	50_75
553	GLEASON DR	0	0	0	1	1	2	0.5	0.333333333	1	94	0.459770115	50_75
585	DUBLIN BL	0	0	0	1	1	2	0.5	0.333333333	1	95	0.454022989	50_75
650	DUBLIN BL	0	0	0	1	1	2	0.5	0.333333333	1	96	0.448275862	50_75
1039	SAN RAMON RD	0	0	0	1	1	2	0.5	0.333333333	1	97	0.442528736	50_75
1189	SAN RAMON RD	0	0	0	1	1	2	0.5	0.333333333	1	98	0.436781609	50_75
49	CENTRAL PW	0	0	0	1	0	1	0.5	0.166666667	0.833333333	99	0.431034483	0_50
50	ASPEN ST	0	0	1	0	0	1	0.3253174	0.166666667	0.833333333	100	0.425287356	0_50
105	ASTERWOOD DR	0	0	1	0	0	1	0.2313162	0.166666667	0.833333333	101	0.41954023	0_50
117	AMADOR VALLEY BL	0	0	1	0	0	1	0.5	0.166666667	0.833333333	102	0.413793103	0_50
225	CENTRAL PW	0	0	1	0	0	1	0.5	0.166666667	0.833333333	103	0.408045977	0_50
267	BENT TREE DR	0	0	1	0	0	1	0.3832796	0.166666667	0.833333333	104	0.402298851	0_50
291	CENTRAL PW	0	0	0	1	0	1	0.5	0.166666667	0.833333333	105	0.396551724	0_50
304	CENTRAL PW	0	0	1	0	0	1	0.5	0.166666667	0.833333333	106	0.390804598	0_50
336	HASTINGS WY	0	0	0	1	0	1	0.0315332	0.166666667	0.833333333	107	0.385057471	0_50
360	DUBLIN BL	0	0	0	1	0	1	0.5	0.166666667	0.833333333	108	0.379310345	0_50
397	FALLON RD	0	0	0	1	0	1	0.5	0.166666667	0.833333333	109	0.373563218	0_50
435	FALLON RD	0	0	1	0	0	1	0.5	0.166666667	0.833333333	110	0.367816092	0_50
436	FORINO DR	0	0	0	1	0	1	0.5	0.166666667	0.833333333	111	0.362068966	0_50
473	DUBLIN BL	0	0	0	1	0	1	0.5	0.166666667	0.833333333	112	0.356321839	0_50
519	FALLON RD	0	0	0	1	0	1	0.5	0.166666667	0.833333333	113	0.350574713	0_50
536	FORINO DR	0	0	0	1	0	1	0.5	0.166666667	0.833333333	114	0.344827586	0_50
563	FALLON RD	0	0	0	1	0	1	0.5	0.166666667	0.833333333	115	0.33908046	0_50
618	CROAK RD	0	0	1	0	0	1	0.330384	0.166666667	0.833333333	116	0.333333333	0_50
627	FALLON RD	0	0	0	1	0	1	0.5	0.166666667	0.833333333	117	0.327586207	0_50
649	FALLON RD	0	0	0	1	0	1	0.5	0.166666667	0.833333333	118	0.32183908	0_50
682	CLARK AV	0	0	0	1	0	1	0.2139419	0.166666667	0.833333333	119	0.316091954	0_50
710	DUBLIN BL	0	0	0	1	0	1	0.5	0.166666667	0.833333333	120	0.310344828	0_50
730	DUBLIN BL	0	0	1	0	0	1	0.5	0.166666667	0.833333333	121	0.304597701	0_50
740	DAVONA DR	0	0	1	0	0	1	0.5	0.166666667	0.833333333	122	0.298850575	0_50
879	IRONHORSE PW	0	0	1	0	0	1	0.3890455	0.166666667	0.833333333	123	0.293103448	0_50
1047	TASSAJARA RD	0	0	1	0	0	1	0.5	0.166666667	0.833333333	124	0.287356322	0_50
1053	SAN RAMON RD	0	0	1	0	0	1	0.5	0.166666667	0.833333333	125	0.281609195	0_50
1086	TASSAJARA RD	0	0	1	0	0	1	0.5	0.166666667	0.833333333	126	0.275862069	0_50
1103	TASSAJARA RD	0	0	1	0	0	1	0.5	0.166666667	0.833333333	127	0.270114943	0_50
1122	POSITANO PW	0	0	0	1	0	1	0.5	0.166666667	0.833333333	128	0.264367816	0_50
1125	SAN RAMON RD	0	0	1	0	0	1	0.5	0.166666667	0.833333333	129	0.25862069	0_50
1152	SUMMER GLEN DR	0	0	1	0	0	1	0.4586498	0.166666667	0.833333333	130	0.252873563	0_50
1219	REDWOOD AV	0	0	1	0	0	1	0.1709642	0.166666667	0.833333333	131	0.247126437	0_50
1253	SAN RAMON RD	0	0	1	0	0	1	0.5	0.166666667	0.833333333	132	0.24137931	0_50
1254	TASSAJARA RD	0	0	1	0	0	1	0.5	0.166666667	0.833333333	133	0.235632184	0_50
1276	TWIN EAGLES LN	0	0	1	0	0	1	0.12372	0.166666667	0.833333333	134	0.229885057	0_50
1296	SAN RAMON RD	0	0	1	0	0	1	0.5	0.166666667	0.833333333	135	0.224137931	0_50
1307	SCARLETT DR	0	0	0	1	0	1	0.2489757	0.166666667	0.833333333	136	0.218390805	0_50
1323	SAN RAMON RD	0	0	1	0	0	1	0.5	0.166666667	0.833333333	137	0.212643678	0_50
1354	TASSAJARA RD	0	0	1	0	0	1	0.5	0.166666667	0.833333333	138	0.206896552	0_50
1372	VOMAC RD	0	0	1	0	0	1	0.4393404	0.166666667	0.833333333	139	0.201149425	0_50
1397	VALENTANO DR	0	0	0	1	0	1	0.5	0.166666667	0.833333333	140	0.195402299	0_50
1497	W VOMAC RD	0	0	1	0	0	1	0.456675	0.166666667	0.833333333	141	0.189655172	0_50
1498	VALENTANO DR	0	0	0	1	0	1	0.5	0.166666667	0.833333333	142	0.183908046	0_50
231	AMADOR PLAZA RD	0	0	0	0	3	3	0.5	0.5	0.5	143	0.17816092	0_50
606	DUBLIN BL	0	0	0	0	3	3	0.5	0.5	0.5	144	0.172413793	0_50
101	AMADOR PLAZA RD	0	0	0	0	2	2	0.5	0.333333333	0.333333333	145	0.166666667	0_50
341	DUBLIN BL	0	0	0	0	2	2	0.5	0.333333333	0.333333333	146	0.16091954	0_50
396	DOUGHERTY RD	0	0	0	0	2	2	0.5	0.333333333	0.333333333	147	0.155172414	0_50
406	DUBLIN BL	0	0	0	0	2	2	0.5	0.333333333	0.333333333	148	0.149425287	0_50
411	DOUGHERTY RD	0	0	0	0	2	2	0.5	0.333333333	0.333333333	149	0.143678161	0_50
444	DUBLIN BL	0	0	0	0	2	2	0.5	0.333333333	0.333333333	150	0.137931034	0_50
694	DUBLIN BL	0	0	0	0	2	2	0.5	0.333333333	0.333333333	151	0.132183908	0_50
750	DOUGHERTY RD	0	0	0	0	2	2	0.5	0.333333333	0.333333333	152	0.126436782	0_50
1012	LANCASTER RD	0	0	0	0	2	2	0.2953148	0.333333333	0.333333333	153	0.120689655	0_50
257	BRIGHTON DR	0	0	0	0	1	1	0.5	0.166666667	0.166666667	154	0.114942529	0_50
283	AMADOR VALLEY BL	0	0	0	0	1	1	0.5	0.166666667	0.166666667	155	0.109195402	0_50
295	CAPOTERRA WY	0	0	0	0	1	1	0.3317445	0.166666667	0.166666667	156	0.103448276	0_50
393	DUBLIN BL	0	0	0	0	1	1	0.5	0.166666667	0.166666667	157	0.097701149	0_50
455	DOUGHERTY RD	0	0	0	0	1	1	0.5	0.166666667	0.166666667	158	0.091954023	0_50
462	CLARINBRIDGE CI	0	0	0	0	1	1	0.0359862	0.166666667	0.166666667	159	0.086206897	0_50
548	DUBLIN BL	0	0	0	0	1	1	0.5	0.166666667	0.166666667	160	0.08045977	0_50

FID	Street	Fatal Crashes	Severe Injury Crashes	Moderate Injury Crashes	Minor Injury Crashes	PDO Crashes	Total Crashes	Segment Length	Crash Frequency (annual)	Annualized EqPDO Score	Rank	Percentile	Percentile Group
637	CIVIC PZ	0	0	0	0	1	1	0.2322135	0.166666667	0.166666667	161	0.074712644	0_50
668	DUBLIN BL	0	0	0	0	1	1	0.5	0.166666667	0.166666667	162	0.068965517	0_50
736	DUBLIN BL	0	0	0	0	1	1	0.5	0.166666667	0.166666667	163	0.063218391	0_50
849	KOHNEN WY	0	0	0	0	1	1	0.2406822	0.166666667	0.166666667	164	0.057471264	0_50
995	MARIPOSA CI	0	0	0	0	1	1	0.1274	0.166666667	0.166666667	165	0.051724138	0_50
1026	SIERRA CT	0	0	0	0	1	1	0.5	0.166666667	0.166666667	166	0.045977011	0_50
1182	PENN DR	0	0	0	0	1	1	0.3329521	0.166666667	0.166666667	167	0.040229885	0_50
1200	STAGECOACH RD	0	0	0	0	1	1	0.5	0.166666667	0.166666667	168	0.034482759	0_50
1282	STAGECOACH RD	0	0	0	0	1	1	0.5	0.166666667	0.166666667	169	0.028735632	0_50
1290	SIERRA LN	0	0	0	0	1	1	0.3366714	0.166666667	0.166666667	170	0.022988506	0_50
1341	S MARIPOSA LN	0	0	0	0	1	1	0.159664	0.166666667	0.166666667	171	0.017241379	0_50
1347	STAGECOACH RD	0	0	0	0	1	1	0.5	0.166666667	0.166666667	172	0.011494253	0_50
1362	WHITWORTH DR	0	0	0	0	1	1	0.2065178	0.166666667	0.166666667	173	0.005747126	0_50
1490	UTICA CT	0	0	0	0	1	1	0.0663647	0.166666667	0.166666667	174	0	0_50

Attachment B: Collision Database

City-provided database

Involved With	Bicycle

Count of Report No	Column Labels						
Row Labels	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**Grand Total**
Fatal/Sev	1		2				3
Other	16	12	9	11	8	9	65
Grand Total	17	12	11	11	8	9	68

Involved With	Pedestrian

Count of Report No	Column Labels						
Row Labels	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**Grand Total**
Fatal/Sev	4	1	2	2	2	1	12
Other	8	12	8	11	16	14	69
Grand Total	12	13	10	13	18	15	81

TIMS Download

BICYCLE_ACCIDENT	Y

Count of CASE_ID	Column Labels						
Row Labels	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**Grand Total**
Fatal/Sev	1		2				3
Other	9	11	9	12	8	10	59
Grand Total	10	11	11	12	8	10	62

PEDESTRIAN_ACCIDENT	Y

Count of CASE_ID	Column Labels						
Row Labels	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**Grand Total**
Fatal/Sev	3	1	1	2	1		8
Other	7	7	6	10	8	6	44
Grand Total	10	8	7	12	9	6	52

Report No	Collision date	Collision Ti	Day	Location	Distance	Direction	Lighting	Weather	Collision Type	Involved With	PCF	Hit and Ru	Injury Deg	severity	Injured	Killed	Year	InjuredNum	KilledNumb
D14-00306	2014-01-29	08:33	Wednesda	TAMARACK DR - BURTON ST	100'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Auto R/W Violation	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2014	1	0
D14-00318	2014-01-30	16:36	Thursday	AMADOR VALLEY BL - BURTON ST	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Auto R/W Violation	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2014	1	0
D14-00769	2014-03-13	12:17	Thursday	TOYOTA DR - DUBLIN BL	6'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Unknown	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2014	1	0
D14-00980	2014-04-02	13:33	Wednesda	DUBLIN BL - DUBLIN CT	242'	Direction:	Daylight	Cloudy	Vehicle - Pedestrian	Pedestrian	Auto R/W Violation	Hit & Run:	Severe Inju	2	# Inj: 1	# Killed: 0	2014	1	0
D14-01226	2014-04-23	10:06	Wednesda	TASSAJARA RD - DUBLIN BL	14'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Auto R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2014	1	0
D14-02675	2014-09-15	07:58	Monday	VILLAGE PW - BRIGHTON DR	3'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2014	1	0
D14-02703	2014-09-17	09:54	Wednesda	LOCUST PL N - WINEBERRY WY	336'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Severe Inju	2	# Inj: 0	# Killed: 0	2014	0	0
D14-02791	2014-09-26	10:42	Friday	BENT TREE DR - TWIN EAGLES LN	10'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Auto R/W Violation	Hit & Run:	Severe Inju	2	# Inj: 1	# Killed: 0	2014	1	0
D14-02824	2014-09-29	15:38	Monday	VILLAGE PW - LEWIS AV	50'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Improper Turning	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2014	1	0
D14-02883	2014-10-04	00:10	Saturday	ARNOLD RD - DUBLIN BL	0'	Direction:	Dark - Street Lights	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2014	1	0
D14-03027	2014-10-17	11:37	Friday	AMADOR VALLEY BL - REGIONAL ST	348'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Auto R/W Violation	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2014	1	0
D14-03410	2014-11-22	21:09	Saturday	DUBLIN BL - REGIONAL ST	0'	Direction:	Dark - Street Lights	Cloudy	Vehicle - Pedestrian	Pedestrian	Auto R/W Violation	Hit & Run:	Severe Inju	2	# Inj: 2	# Killed: 0	2014	2	0
D1500341	2015-02-04	18:20	Wednesda	SAN RAMON RD - VOMAC RD	0'	Direction:	Dark - Street Lights	Clear	Vehicle - Pedestrian	Pedestrian	Unknown	Hit & Run:	Severe Inju	2	# Inj: 1	# Killed: 0	2015	1	0
D1500799	2015-03-20	08:44	Friday	TAMARACK DR - AMANDA ST	83'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Unknown	Hit & Run:	Other Visib	3	# Inj: 2	# Killed: 0	2015	2	0
D1500864	2015-03-25	14:51	Wednesda	VILLAGE PW - BRIGHTON DR	660'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Auto R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2015	1	0
D1501259	2015-05-02	14:00	Saturday	BRIDGEPOINTE LN - HARTLAND LN	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Unknown	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2015	1	0
D1501579	2015-06-05	11:41	Friday	SAN RAMON RD - DUBLIN BL	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Auto R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2015	1	0
D1501650	2015-06-12	15:50	Friday	VILLAGE PW - DUBLIN BL	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Property D	0	# Inj: 0	# Killed: 0	2015	0	0
D1501739	2015-06-21	19:42	Sunday	DUBLIN BL - GLYNNIS ROSE DR	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Property D	0	# Inj: 0	# Killed: 0	2015	0	0
D1501807	2015-06-29	08:50	Monday	DUBLIN RANCH DR - OAK BLUFF LN	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2015	1	0
D1502220	2015-08-07	09:16	Friday	CHARLTON CT - FOXCROFT WY	46'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Unknown	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2015	1	0
D1502301	2015-08-15	13:04	Saturday	REGIONAL ST - AMADOR VALLEY BL	13'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2015	1	0
D1502700	2015-09-23	08:25	Wednesda	VILLAGE PW - AMADOR VALLEY BL	229'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Auto R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2015	1	0
D1502752	2015-09-27	11:37	Sunday	REGIONAL ST - SAINT PATRICK WY	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Other Improper Driving	Hit & Run:	Property D	0	# Inj: 0	# Killed: 0	2015	0	0
D1503346	2015-11-22	15:46	Sunday	VILLAGE PW - TAMARACK DR	30'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2015	1	0
D1601088	2016-04-19	13:31	Tuesday	DUBLIN BL - CLARK AV	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2016	1	0
D1601144	2016-04-25	22:59	Monday	DUBLIN BL - ARNOLD RD	0'	Direction:	Dark - Street Lights	Clear	Vehicle - Pedestrian	Pedestrian	Not Stated	Hit & Run:	Fatal	1	# Inj: 1	# Killed: 1	2016	1	1
D1601267	2016-05-08	01:04	Sunday	PENN DR - TYNE CT	0'	Direction:	Dark - Street Lights Not F	Cloudy	Vehicle - Pedestrian	Pedestrian	Not Stated	Hit & Run:	Severe Inju	2	# Inj: 2	# Killed: 0	2016	2	0
D1601647	2016-06-13	12:29	Monday	DUBLIN BL - SIERRA CT	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2016	1	0
D1601861	2016-07-01	23:31	Friday	ARNOLD RD - DUBLIN BL	0'	Direction:	Dark - Street Lights	Clear	Vehicle - Pedestrian	Pedestrian	Not Stated	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2016	1	0
D1601956	2016-07-13	10:10	Wednesda	DUBLIN BL - REGIONAL ST	26'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Property D	0	# Inj: 0	# Killed: 0	2016	0	0
D1602786	2016-09-21	14:07	Wednesda	CANTARA DR - SPAGO DR (N)	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Unknown	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2016	1	0
D1602817	2016-09-24	17:24	Saturday	HACIENDA CROSSING - HACIENDA DR	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Unknown	Hit & Run:	Property D	0	# Inj: 0	# Killed: 0	2016	0	0
D1603327	2016-11-06	17:00	Sunday	DUBLIN BL - TASSAJARA RD	12'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2016	1	0
D1603835	2016-12-16	17:50	Friday	AMADOR PLAZA RD - AMADOR VALLEY BL	0'	Direction:	Dusk - Dawn	Clear	Vehicle - Pedestrian	Pedestrian	Unknown	Hit & Run:	Property D	0	# Inj: 0	# Killed: 0	2016	0	0
D1700553	2017-02-17	15:49	Friday	SHADOW DR - SHADOW PL	150'	Direction:	Daylight	Raining	Vehicle - Pedestrian	Pedestrian	Unsafe Starting or Backing	Hit & Run:	Property D	0	# Inj: 0	# Killed: 0	2017	0	0
D1701856	2017-06-13	09:06	Tuesday	HACIENDA DR - DUBLIN BL	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Improper Passing	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2017	1	0
D1702023	2017-06-28	12:13	Wednesda	CAMPBELL LN - DUBLIN BL	12'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2017	1	0
D1702661	2017-08-19	16:19	Saturday	SUTTON LN - CANTERBURY LN (E)	102'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Auto R/W Violation	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2017	1	0
D1702791	2017-08-30	18:58	Wednesda	ROLLING HILLS DR - WINDING TRAIL LN	0'	Direction:	Dusk - Dawn	Clear	Vehicle - Pedestrian	Pedestrian	Unsafe Speed	Hit & Run:	Severe Inju	2	# Inj: 2	# Killed: 0	2017	2	0
D1702823	2017-09-02	18:39	Saturday	VILLAGE PW - AMADOR VALLEY BL	0'	Direction:	Dusk - Dawn	Clear	Vehicle - Pedestrian	Pedestrian	Pedestrian Violation	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2017	1	0
D1702941	2017-09-12	08:03	Tuesday	CENTRAL PW - ASPEN ST	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Unsafe Speed	Hit & Run:	Other Visib	3	# Inj: 2	# Killed: 0	2017	2	0
D1703065	2017-09-20	19:55	Wednesda	IN PARKING LOT OF 4100 GRAFTON - NULL	0'	Direction:	Dark - Street Lights	Clear	Vehicle - Pedestrian	Pedestrian	Other Improper Driving	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2017	1	0
D1703166	2017-09-28	17:58	Thursday	ANTONE WY - GRAFTON ST	11'	Direction:	Dusk - Dawn	Clear	Vehicle - Pedestrian	Pedestrian	Unsafe Speed	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2017	1	0
D1703403	2017-10-18	09:32	Wednesda	CENTRAL PW - ASPEN ST	13'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Pedestrian Violation	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2017	1	0
D1703793	2017-11-21	13:40	Tuesday	DUBLIN BL - GOLDEN GATE DR	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2017	1	0
D1703974	2017-12-04	15:50	Monday	BRIGHTON DR - CALLAN ST	342'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Unsafe Starting or Backing	Hit & Run:	Property D	0	# Inj: 0	# Killed: 0	2017	0	0
KAI1	2017-12-20	20:40		HACIENDA & 580, DUBLIN, CA	86'	Direction: North			Vehicle - Pedestrian	Pedestrian	Pedestrian Violatoin		Fatal	1	# Inj: 0	# Killed: 1	2017	0	1
D1800044	2018-01-05	06:11	Friday	TWIN EAGLES LN - BENT TREE DR	9'	Direction:	Dark - Street Lights	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2018	1	0
D1800114	2018-01-10	12:15	Wednesda	HILLBROOK PL - NULL	0'	Direction:	Daylight	Cloudy	Vehicle - Pedestrian	Pedestrian	Other Improper Driving	Hit & Run:	Fatal	1	# Inj: 0	# Killed: 1	2018	0	1
D1800168	2018-01-12	16:56	Friday	DUBLIN BL - GLYNNIS ROSE DR	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Other Visib	3	# Inj: 2	# Killed: 0	2018	2	0
D1800901	2018-03-05	08:18	Monday	PALERMO WY - LOCKHART ST	8'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Other Hazardous Movement	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2018	1	0
D1800993	2018-03-10	17:34	Saturday	5200 DUBLIN BLVD-PARKING LOT - NULL	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Other Improper Driving	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2018	1	0
D1801748	2018-05-09	14:35	Wednesda	CENTRAL PW - LEE THOMPSON ST	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Traffic Signals and Signs	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2018	1	0
D1802496	2018-07-10	12:47	Tuesday	DUBLIN BL - CLARK AV	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2018	1	0
D1802655	2018-07-21	17:36	Saturday	BROOKDALE CT - MANSFIELD AV	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Other Improper Driving	Hit & Run:	Property D	0	# Inj: 0	# Killed: 0	2018	0	0
D1802760	2018-07-29	13:19	Sunday	LAZY DOG P/LOT - NULL	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Other Improper Driving	Hit & Run:	Property D	0	# Inj: 0	# Killed: 0	2018	0	0
D1802763	2018-07-29	14:02	Sunday	PANDA EXPRESS P/LOT - NULL	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Unknown	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2018	1	0
D1802975	2018-08-15	11:59	Wednesda	REGIONAL ST - SAINT PATRICK WY	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Other Improper Driving	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2018	1	0
D1803146	2018-08-27	17:14	Monday	TASSAJARA RD - DUBLIN BL	708'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Not Stated	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2018	1	0
D1803168	2018-08-29	14:13	Wednesda	ARNOLD RD - MARTINELLI WY	250'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Unsafe Starting or Backing	Hit & Run:	Property D	0	# Inj: 0	# Killed: 0	2018	0	0
D1803740	2018-10-11	08:00	Thursday	ANTONE WY - GRAFTON ST	11'	Direction:	Dusk - Dawn	Clear	Vehicle - Pedestrian	Pedestrian	Other Hazardous Movement	Hit & Run:	Property D	0	# Inj: 0	# Killed: 0	2018	0	0
D1803965	2018-10-31	08:44	Wednesda	DUBLIN BL - DUBLIN CT	0'	Direction:	Dusk - Dawn	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Severe Inju	2	# Inj: 1	# Killed: 0	2018	1	0
D1803967	2018-10-31	08:52	Wednesda	DUBLIN BL - GLYNNIS ROSE DR	0'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Other Improper Driving	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2018	1	0
D1804307	2018-11-29	15:12	Thursday	DAVONA DR - WICKLOW LN (N)	446'	Direction:	Daylight	Cloudy	Vehicle - Pedestrian	Pedestrian	Pedestrian Violation	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2018	1	0
D1804497	2018-12-13	15:28	Thursday	AMADOR VALLEY BL - BURTON ST	10'	Direction:	Daylight	Clear	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2018	1	0
D1900808	2019-03-02	18:34	Saturday	HIBERNIA DR - DUBLIN BL	243'	Direction:	Dark - Street Lights	Raining	Vehicle - Pedestrian	Pedestrian	Ped R/W Violation	Hit & Run:	Other Visib	3	# Inj: 1	# Killed: 0	2019	1	0
D1900852	2019-03-05	23:16	Tuesday	SIERRA CT - PRIVATE PROPERTY	0'	Direction:	Dark - Street Lights	Cloudy	Rear-End	Pedestrian	Other Improper Driving	Hit & Run:	Complaint	4	# Inj: 1	# Killed: 0	2019	1	0

Report No	Collision date	Collision Time	Day	Location	Distance	Direction	Lighting	Weather	Collision Type	Involved With	PCF	Hit and Run	Injury Degree	severity	Injured	Killed	Year	Street1	Street2	Address	InjuredNumber	KilledNumber
D14-00229	2014-01-22	18:21	Wednesday	DUBLIN BL - DOUGHERTY RD	0'	Direction: Not Stated	Daylight	Clear	Other	Bicycle	Other	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2014	DUBLIN BL	DOUGHER	DUBLIN BL	0	0
D14-00842	2014-03-17	10:15	Monday	DUBLIN BL - TASSAJARA RD	365'	Direction: West	Dark - Street Lights	Clear	Other	Bicycle	Unknown	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2014	DUBLIN BL	TASSAJAR	DUBLIN BL	0	0
D14-01146	2014-04-16	15:35	Wednesday	HACIENDA DR - CENTRAL PW	464'	Direction: North	Daylight	Clear	Other	Bicycle	Unsafe Spe	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2014	HACIENDA	CENTRAL I	HACIENDA	1	0
D14-01364	2014-05-08	10:30	Thursday	DUBLIN BL - SIERRA CT	201'	Direction: East	Daylight	Cloudy	Other	Bicycle	Improper T	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2014	DUBLIN BL	SIERRA CT	DUBLIN BL	0	0
D14-01373	2014-05-08	19:00	Thursday	DUBLIN BL - CLARINBRIDGE CI	0'	Direction: Not Stated	Daylight	Clear	Other	Bicycle	Improper T	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2014	DUBLIN BL	CLARINBR	DUBLIN BL	0	0
D14-01900	2014-06-25	15:08	Wednesday	DUBLIN BL - SCARLETT DR	0'	Direction: West	Daylight	Clear	Broadside	Bicycle	Unknown	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2014	DUBLIN BL	SCARLETT	DUBLIN BL	1	0
D14-02193	2014-07-23	19:24	Wednesday	DUBLIN BL - SAN RAMON RD	10'	Direction: West	Daylight	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2014	DUBLIN BL	SAN RAM	DUBLIN BL	0	0
D14-02228	2014-07-26	16:56	Saturday	DUBLIN BL - HIBERNIA DR	16'	Direction: East	Daylight	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2014	DUBLIN BL	HIBERNIA	DUBLIN BL	1	0
D14-02255	2014-07-30	06:51	Wednesday	DUBLIN BL - ARNOLD RD	0'	Direction: Not Stated	Daylight	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Fatal	1	# Inj: 0	# Killed: 1	2014	DUBLIN BL	ARNOLD R	DUBLIN BL	0	1
D14-02634	2014-09-10	17:26	Wednesday	DUBLIN BL - SAN RAMON RD	100'	Direction: West	Daylight	Clear	Other	Bicycle	Unsafe Sta	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2014	DUBLIN BL	SAN RAM	DUBLIN BL	1	0
D14-02645	2014-09-11	15:23	Thursday	LANCASTER RD - UTICA CT	40'	Direction: East	Daylight	Clear	Other	Bicycle	Other	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2014	LANCASTE	UTICA CT	LANCASTE	0	0
D14-02674	2014-09-15	07:23	Monday	VILLAGE PW - BRIGHTON DR	464'	Direction: North	Daylight	Clear	Other	Bicycle	Improper T	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2014	VILLAGE P	BRIGHTON	VILLAGE P	1	0
D14-02867	2014-10-03	08:23	Friday	BRIGHTON DR - AMADOR VALLEY BL	11'	Direction: North	Daylight	Cloudy	Other	Bicycle	Improper T	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2014	BRIGHTON	AMADOR	BRIGHTON	0	0
D14-03065	2014-10-21	07:25	Tuesday	DUBLIN BL - VILLAGE PW	0'	Direction: Not Stated	Daylight	Clear	Other	Bicycle	Unknown	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2014	DUBLIN BL	VILLAGE P	DUBLIN BL	0	0
D14-03230	2014-11-07	08:07	Friday	BENT TREE DR - TWIN EAGLES LN	7'	Direction: West	Daylight	Clear	Other	Bicycle	Improper T	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2014	BENT TREE	TWIN EAG	BENT TREE	1	0
D14-03634	2014-12-16	17:19	Tuesday	AMADOR PLAZA RD - AMADOR VALLEY BL	0'	Direction: Not Stated	Dark - Street Lights	Raining	Other	Bicycle	Auto R/W	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2014	AMADOR F	AMADOR	AMADOR F	0	0
D14-03679	2014-12-20	11:01	Saturday	DUBLIN BL - CLARK AV	256'	Direction: East	Daylight	Cloudy	Other	Bicycle	Auto R/W	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2014	DUBLIN BL	CLARK AV	DUBLIN BL	1	0
D1500727	2015-03-13	16:47	Friday	BRANNIGAN ST - WHITWORTH DR	125'	Direction: South	Daylight	Clear	Other	Bicycle	Improper F	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2015	BRANNIGA	WHITWOF	BRANNIGA	0	0
D1500839	2015-03-23	12:14	Monday	VILLAGE PW - TAMARACK DR	16'	Direction: South	Daylight	Clear	Other	Bicycle	Other Haza	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2015	VILLAGE P	TAMARAC	VILLAGE P	1	0
D1500979	2015-04-06	06:48	Monday	DUBLIN BL - HIBERNIA DR	10'	Direction: West	Daylight	Clear	Other	Bicycle	Improper T	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2015	DUBLIN BL	HIBERNIA	DUBLIN BL	1	0
D1501144	2015-04-23	12:02	Thursday	SIERRA LN - DOUGHERTY RD	2'	Direction: West	Daylight	Clear	Other	Bicycle	Not Stated	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2015	SIERRA LN	DOUGHER	SIERRA LN	0	0
D1501277	2015-05-07	11:23	Thursday	CENTRAL PW - BRANNIGAN ST	13'	Direction: East	Daylight	Cloudy	Other	Bicycle	Traffic Sigr	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2015	CENTRAL P	BRANNIGA	CENTRAL P	1	0
D1502206	2015-08-05	16:54	Wednesday	REGIONAL ST - AMADOR VALLEY BL	0'	Direction: South	Daylight	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2015	REGIONAL	AMADOR	REGIONAL	1	0
D1502258	2015-08-11	12:29	Tuesday	ARNOLD RD - DUBLIN BL	10'	Direction: North	Daylight	Clear	Other	Bicycle	Not Stated	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2015	ARNOLD RI	DUBLIN BI	ARNOLD RI	1	0
D1502360	2015-08-21	19:12	Friday	CENTRAL PW - TASSAJARA RD	0'	Direction: Not Stated	Daylight	Clear	Other	Bicycle	Unsafe Sta	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2015	CENTRAL P	TASSAJAR	CENTRAL P	1	0
D1502467	2015-08-31	15:59	Monday	VILLAGE PW - BRIGHTON DR	0'	Direction: North	Daylight	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Other Visible Injury	3	# Inj: 2	# Killed: 0	2015	VILLAGE P	BRIGHTON	VILLAGE P	2	0
D1502478	2015-09-01	11:07	Tuesday	DUBLIN BL - AMADOR PLAZA RD	226'	Direction: East	Daylight	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2015	DUBLIN BL	AMADOR	DUBLIN BL	0	0
D1502560	2015-09-09	07:57	Wednesday	GRAFTON ST - GLEASON DR	0'	Direction: Not Stated	Daylight	Clear	Broadside	Bicycle	Other Haza	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2015	GRAFTON	GLEASON	GRAFTON	1	0
D1503570	2015-12-14	15:10	Monday	GRAFTON ST - CAPOTERRA WY	0'	Direction: Not Stated	Daylight	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2015	GRAFTON	CAPOTERF	GRAFTON	0	0
D1600257	2016-01-27	08:28	Wednesday	KOHNEN WY - SHELTON ST	255'	Direction: West	Daylight	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2016	KOHNEN W	SHELTON	KOHNEN W	0	0
D1600466	2016-02-17	07:51	Wednesday	VILLAGE PW - BRIGHTON DR	667'	Direction: North	Daylight	Cloudy	Broadside	Bicycle	Ped R/W V	Hit & Run:	Severe Injury	2	# Inj: 1	# Killed: 0	2016	VILLAGE P	BRIGHTON	VILLAGE P	1	0
D1600987	2016-04-09	15:07	Saturday	ARNOLD RD - DUBLIN BL	0'	Direction: Not Stated	Daylight	Cloudy	Broadside	Bicycle	Other Haza	Hit & Run:	Severe Injury	2	# Inj: 1	# Killed: 0	2016	ARNOLD RI	DUBLIN BI	ARNOLD RI	1	0
D1601081	2016-04-18	17:54	Monday	VILLAGE PW - DUBLIN BL	181'	Direction: North	Daylight	Clear	Other	Bicycle	Other Haza	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2016	VILLAGE P	DUBLIN BI	VILLAGE P	1	0
D1601453	2016-05-27	08:06	Friday	DUBLIN BL - CLARK AV	413'	Direction: East	Daylight	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2016	DUBLIN BL	CLARK AV	DUBLIN BL	1	0
D1602413	2016-08-23	19:48	Tuesday	CENTRAL PW - HACIENDA DR	0'	Direction: Not Stated	Dusk - Dawn	Clear	Other	Bicycle	Other Haza	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2016	CENTRAL P	HACIENDA	CENTRAL P	0	0
D1602435	2016-08-25	20:55	Thursday	CENTRAL PW - HACIENDA DR	0'	Direction: Not Stated	Dark - Street Lights	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2016	CENTRAL P	HACIENDA	CENTRAL P	1	0
D1602575	2016-09-07	13:18	Wednesday	HASTINGS WY - VILLAGE PW	5'	Direction: West	Daylight	Clear	Other	Bicycle	Not Stated	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2016	HASTINGS	VILLAGE P	HASTINGS	1	0
D1603410	2016-11-14	17:54	Monday	DUBLIN BL - FALLON RD	0'	Direction: Not Stated	Dusk - Dawn	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2016	DUBLIN BL	FALLON RI	DUBLIN BL	1	0
D1603859	2016-12-18	18:56	Sunday	AMADOR VALLEY BL - VILLAGE PW	262'	Direction: East	Dark - No Street Lights	Clear	Other	Bicycle	Unsafe Lar	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2016	AMADOR	VILLAGE P	AMADOR	1	0
D1603961	2016-12-27	11:35	Tuesday	MARIPOSA CI - MARIPOSA LN (N)	16'	Direction: West	Daylight	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2016	MARIPOSA	MARIPOSA	MARIPOSA	0	0
D1701223	2017-04-14	07:24	Friday	PENN DR - LANCASTER RD	87'	Direction: North	Daylight	Clear	Other	Bicycle	Improper T	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2017	PENN DR	LANCASTE	PENN DR &	0	0
D1701352	2017-04-27	07:31	Thursday	STAGECOACH RD - AMADOR VALLEY BL	11'	Direction: South	Daylight	Clear	Other	Bicycle	Not Stated	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2017	STAGECOA	AMADOR	STAGECOA	0	0
D1701386	2017-04-29	10:58	Saturday	DUBLIN BL - SIERRA CT	775'	Direction: East	Daylight	Clear	Other	Bicycle	Improper T	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2017	DUBLIN BL	SIERRA CT	DUBLIN BL	0	0
D1701587	2017-05-19	08:52	Friday	VILLAGE PW - BRIGHTON DR	200'	Direction: North	Daylight	Clear	Rear-End	Bicycle	Brakes	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2017	VILLAGE P	BRIGHTON	VILLAGE P	1	0
D1701708	2017-05-30	16:20	Tuesday	VILLAGE PW - DAVONA DR	0'	Direction: Not Stated	Daylight	Clear	Broadside	Bicycle	Not Stated	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2017	VILLAGE P	DAVONA I	VILLAGE P	1	0
D1701872	2017-06-14	10:04	Wednesday	DUBLIN BL - GLYNNIS ROSE DR	257'	Direction: East	Daylight	Clear	Other	Bicycle	Not Stated	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2017	DUBLIN BL	GLYNNIS F	DUBLIN BL	1	0
D1701951	2017-06-22	09:11	Thursday	DUBLIN BL - SIERRA CT	520'	Direction: West	Daylight	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2017	DUBLIN BL	SIERRA CT	DUBLIN BL	1	0
D1702185	2017-07-11	18:17	Tuesday	CLARK AV - DUBLIN BL	0'	Direction: Not Stated	Daylight	Clear	Other	Bicycle	Not Stated	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2017	CLARK AV	DUBLIN BI	CLARK AV	1	0
D1703245	2017-10-05	08:30	Thursday	ASPEN ST - SUMMER GLEN DR	5'	Direction: South	Daylight	Clear	Other	Bicycle	Unsafe Spe	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2017	ASPEN ST	SUMMER	ASPEN ST &	1	0
D1704003	2017-12-06	15:31	Wednesday	AMADOR VALLEY BL - VILLAGE PW	115'	Direction: East	Dusk - Dawn	Clear	Other	Bicycle	Other Haza	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2017	AMADOR	VILLAGE P	AMADOR	1	0
D1704208	2017-12-21	09:58	Thursday	DUBLIN BL - CLARK AV	560'	Direction: East	Daylight	Clear	Other	Bicycle	Auto R/W	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2017	DUBLIN BL	CLARK AV	DUBLIN BL	0	0
D1800712	2018-02-19	07:44	Monday	AMADOR VALLEY BL - REGIONAL ST	18'	Direction: West	Daylight	Clear	Other	Bicycle	Other Haza	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2018	AMADOR	REGIONAL	AMADOR	1	0
D1801394	2018-04-11	21:30	Wednesday	DUBLIN BL - AMADOR PLAZA RD	26'	Direction: East	Dark - Street Lights	Raining	Other	Bicycle	Traffic Sigr	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2018	DUBLIN BL	AMADOR	DUBLIN BL	0	0
D1801564	2018-04-25	15:34	Wednesday	VILLAGE PW - DUBLIN BL	193'	Direction: North	Daylight	Clear	Head-On	Bicycle	Not Stated	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2018	VILLAGE P	DUBLIN BI	VILLAGE P	0	0
D1802458	2018-07-06	21:54	Friday	DUBLIN BL - SAN RAMON RD	363'	Direction: West	Dark - Street Lights	Clear	Rear-End	Bicycle	Improper T	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2018	DUBLIN BL	SAN RAM	DUBLIN BL	1	0
D1802730	2018-07-27	16:44	Friday	DUBLIN BL - HACIENDA DR	303'	Direction: West	Daylight	Clear	Sideswipe	Bicycle	Improper T	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2018	DUBLIN BL	HACIENDA	DUBLIN BL	1	0
D1803532	2018-09-26	15:19	Wednesday	VOMAC RD - SAN RAMON RD	2'	Direction: Not Stated	Daylight	Clear	Broadside	Bicycle	Auto R/W	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2018	VOMAC RD	SAN RAM	VOMAC RD	1	0
D1803553	2018-09-28	08:01	Friday	GLEASON DR - GRAFTON ST	7'	Direction: East	Daylight	Clear	Broadside	Bicycle	Traffic Sigr	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2018	GLEASON I	GRAFTON	GLEASON I	0	0
D1804463	2018-12-11	08:19	Tuesday	VALENTANO DR - FORINO DR	6'	Direction: East	Daylight	Clear	Broadside	Bicycle	Traffic Sigr	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2018	VALENTAN	FORINO D	VALENTAN	1	0
D1900667	2019-02-20	13:13	Wednesday	VILLAGE PW - TAMARACK DR	0'	Direction: Not Stated	Daylight	Cloudy	Broadside	Bicycle	Other Haza	Hit & Run:	Property Damage Only	0	# Inj: 0	# Killed: 0	2019	VILLAGE P	TAMARAC	VILLAGE P	0	0
D1901126	2019-03-24	12:16	Sunday	AMADOR VALLEY BL - VILLAGE PW	212'	Direction: West	Daylight	Clear	Broadside	Bicycle	Improper T	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2019	AMADOR	VILLAGE P	AMADOR	1	0
D1901652	2019-05-04	18:13	Saturday	VILLAGE PW - TAMARACK DR	0'	Direction: Not Stated	Daylight	Clear	Other	Bicycle	Not Stated	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2019	VILLAGE P	TAMARAC	VILLAGE P	1	0
D1902063	2019-06-06	21:55	Thursday	ASTERWOOD DR - REDWOOD AV	0'	Direction: Not Stated	Dark - Street Lights	Clear	Broadside	Bicycle	Ped R/W V	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2019	ASTERWO	REDWOOI	ASTERWO	1	0
D1903850	2019-10-24	07:23	Thursday	IRONHORSE PW - DUBLIN BL	329'	Direction: South	Daylight	Clear	Broadside	Bicycle	Ped R/W V	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2019	IRONHORS	DUBLIN BI	IRONHORS	1	0
D1904425	2019-12-08	18:10	Sunday	FALLON RD - POSITANO PW	210'	Direction: South	Dark - Street Lights	Clear	Sideswipe	Bicycle	Unknown	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2019	FALLON RD	POSITANO	FALLON RD	1	0
D1904431	2019-12-09	08:17	Monday	AMADOR VALLEY BL - STAGECOACH RD	480'	Direction: West	Daylight	Fog	Sideswipe	Bicycle	Auto R/W	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2019	AMADOR	STAGECOA	AMADOR	1	0
D1904502	2019-12-13	18:11	Friday	DUBLIN BL - VILLAGE	0'	Direction: Not Stated	Dark - Street Lights	Raining	Broadside	Bicycle	Not Stated	Hit & Run:	Other Visible Injury	3	# Inj: 1	# Killed: 0	2019	DUBLIN BL	VILLAGE	DUBLIN BL	1	0
D1904624	2019-12-23	19:00	Monday	DUBLIN BL - FALLON GATEWAY	0'	Direction: Not Stated	Dark - Street Lights	Clear	Broadside	Bicycle	Not Stated	Hit & Run:	Complaint of Pain	4	# Inj: 1	# Killed: 0	2019	DUBLIN BL	FALLON G	DUBLIN BL	1	0

CASE_ID	ACCIDENT_YEAR	PROC_DATE	JURIS	COLLISION_DATE	COLLISION_TIME	OFFICER_ID	REPORTING_DISTRICT	DAY_OF_WEEK	CHP_SHIFT	POPULATION	CNTY_CITY_LOC	SPECIAL_COND	BEAT_TYPE	CHP_BEAT_TYPE	CITY_DIVISION_LAPD	CHP_BEAT_CLASS	BEAT_NUMBER	PRIMARY_RD	SECONDARY_RD	DISTANCE	DIRECTION	INTERSECTION	WEATHER_1	WEATHER_2	STATE_HWY_IND	CALTRANS_COUNTY	CALTRANS_DISTRICT	STATE_ROUTE	ROUTE_SUFFIX	POSTMILE_PREFIX	POSTMILE	LOCATION_TYPE	RAMP_INTERSECTION	SIDE_OF_HWY	TOW_AWAY	COLLISION_SEVERITY	NUMBER_KILLED	NUMBER_INJURED
6363339	2014	6/11/2014	100	1/30/2014	1636	203174	322	4	5	4	198	0	0	0		0		AMADOR VALLEY BL	BURTON ST	0		Y	A	-	N										N	4	0	1
6397006	2014	10/13/2015	100	1/29/2014	833	203240	304	3	5	4	198	0	0	0		0	NOVALU	TAMARACK DR	BURTON ST	100	W	N	A	-	N										N	4	0	1
6423660	2014	6/24/2014	100	3/20/2014	1712	1		4	5	4	198	0	0	0		0		BRODER BL	MADIGAN RD	750	W	N	A	-	N										N	4	0	1
6460407	2014	7/10/2014	100	4/2/2014	1333	202219	207	3	5	4	198	0	0	0		0		DUBLIN BL	AMADOR PLAZA RD	4	W	N	B	-	N										N	3	0	1
6475283	2014	7/24/2014	100	4/16/2014	1535	202219	406	3	5	4	198	0	0	0		0		HACIENDA DR	CENTRAL PKWY	464	N	N	A	-	N										N	3	0	1
6475287	2014	7/24/2014	100	4/23/2014	1006	100411	501	3	5	4	198	0	0	0		0		TASSAJARA RD	DUBLIN BL	14	N	N	A	-	N										N	3	0	1
6541933	2014	8/28/2014	100	7/26/2014	1656	202219	410	6	5	4	198	0	0	0		0		DUBLIN BL	HIBERNIA DR	16	E	N	A	-	N										N	3	0	1
6606255	2014	10/7/2014	100	7/30/2014	651	201242	408	3	5	4	198	0	0	0		0		DUBLIN BL	ARNOLD RD	0		Y	A	-	N										Y	1	1	0
6646294	2014	10/10/2014	100	9/17/2014	954	202219	325	3	5	4	198	0	0	0		0		LOCUST PL	WINEBERRY WY	336	N	N	A	-	N										N	2	0	1
6646298	2014	10/10/2014	100	9/15/2014	723	100411	301	1	5	4	198	0	0	0		0		VILLAGE PKWY	BRIGHTON DR	464	N	N	A	-	N										N	3	0	1
6669800	2014	11/7/2014	100	9/26/2014	1042	201242	507	5	5	4	198	0	0	0		0		BENT TREE DR	TWIN EAGLES LN	10	S	N	A	-	N										N	2	0	1
6679695	2014	1/28/2015	100	9/15/2014	758	203240	301	1	5	4	198	0	0	0		0	NO VAL	VILLAGE PW	BRIGHTON DR	3	N	N	A	-	N										N	3	0	1
6684186	2014	12/19/2014	100	10/16/2014	1531	202219	0	4	5	4	198	0	0	0		0		BRANNIGAN ST	GLEASON DR	8	N	N	A	-	N										N	3	0	1
6684190	2014	12/19/2014	100	10/17/2014	1137	201242	207	5	5	4	198	0	0	0		0		AMADOR VALLEY BL	REGIONAL ST	348	E	N	A	-	N										N	4	0	1
6684194	2014	12/19/2014	100	10/4/2014	10	202085	408	6	5	4	198	0	0	0		0		ARNOLD RD	DUBLIN BL	0		Y	A	-	N										N	4	0	1
6691789	2014	11/20/2014	100	9/11/2014	1523	202219	322	4	5	4	198	0	0	0		0		LANCASTER RD	UTICA CT	40	E	N	A	-	N										N	3	0	1
6713339	2014	1/9/2015	100	11/7/2014	807	203633	507	5	5	4	198	0	0	0		0		BENT TREE DR	TWIN EAGLES LN	7	W	N	A	-	N										N	3	0	1
6718683	2017	4/8/2019	100	12/20/2017	2040	224		3	5	4	198	0	0	0		0		HACIENDA DR	RT 580	86	N	N	A	-	Y	ALA	4	580	-	-	18.001	R	4	W	Y	1	1	0
6748044	2014	1/26/2015	100	11/22/2014	2109	203263	208	6	5	4	198	0	0	0		0	NOVALU	DUBLIN BL	REGIONAL ST	0		Y	B	-	N										N	2	0	2
6759034	2014	1/26/2015	100	11/26/2014	1049	201242	308	3	5	4	198	0	0	0		0		DARIAN CT	BRIGHTON DR	7	W	N	A	-	N										N	3	0	1
6776929	2014	2/12/2015	100	12/20/2014	1101	101974	0	6	5	4	198	0	0	0		0	NOVALU	DUBLIN BL	CLARK AV	256	E	N	B	-	N										N	3	0	1
6858267	2015	4/2/2015	100	2/4/2015	1820	202219	0	3	5	4	198	0	0	0		0		SAN RAMON RD	VOMAC RD	0		Y	A	-	N										N	2	0	1
6877336	2015	4/15/2015	100	3/25/2015	1451	201242	301	3	5	4	198	0	0	0		0		VILLAGE PW	BRIGHTON DR	660	N	N	A	-	N										N	4	0	1
6892456	2015	4/30/2015	100	3/13/2015	1647	203271	1	5	5	4	198	0	0	0		0		BRANNIGAN ST	WHITWORTH DR	125	S	N	A	-	N										N	3	0	1
6892458	2015	4/30/2015	100	3/23/2015	1214	100411	310	1	5	4	198	0	0	0		0		VILLAGE PKWY	TAMARACK DR	16	S	N	A	-	N										N	4	0	1
6895862	2015	5/22/2015	100	3/20/2015	844	202219	316	5	5	4	198	0	0	0		0		TAMARACK DR	AMANDA ST	83	E	N	A	-	N										N	4	0	2
6896523	2015	5/15/2015	100	4/6/2015	648	100411	410	1	5	4	198	0	0	0		0		DUBLIN BL	HIBERNIA DR	10	W	N	A	-	N										N	4	0	1
6896535	2015	5/15/2015	100	4/23/2015	1202	201242	411	4	5	4	198	0	0	0		0		SIERRA LN	DOUGHERTY RD	2	W	N	A	-	N										N	3	0	1
6926041	2015	6/1/2015	100	5/7/2015	1123	201242	504	4	5	4	198	0	0	0		0		CENTRAL PKWY	BRANNIGAN ST	13	E	N	B	-	N										N	3	0	1
6978936	2015	7/7/2015	100	6/5/2015	1141	201242	210	5	5	4	198	0	0	0		0		SAN RAMON RD	DUBLIN BL	0		Y	A	-	N										N	4	0	1
7002092	2015	7/22/2015	100	6/29/2015	850	202964	510	1	5	4	198	0	0	0		0		N DUBLIN RANCH DR	OAK BLUFF LN	0		Y	A	-	N										N	4	0	1
7038764	2015	9/3/2015	100	8/5/2015	1654	202219	207	3	5	4	198	0	0	0		0		REGIONAL ST	AMADOR VALLEY BL	0	S	-	A	-	N										N	3	0	1
7045238	2015	9/9/2015	100	8/15/2015	1304	206359	207	6	5	4	198	0	0	0		0		REGIONAL ST	AMADOR VALLEY BL	13	S	N	A	-	N										N	4	0	1
7047085	2015	9/19/2015	100	8/31/2015	1559	202219	301	1	5	4	198	0	0	0		0		VILLAGE PKWY	BRIGHTON DR	0	N	N	A	-	N										N	4	0	2
7057301	2015	11/13/2015	100	9/9/2015	757	100411	517	3	5	4	198	0	0	0		0		GRAFTON ST	GLEASON DR	0		Y	A	-	N										N	3	0	1
7064786	2015	9/22/2015	100	9/1/2015	1107	201242	207	2	5	4	198	0	0	0		0		DUBLIN BL	AMADOR PLAZA RD	226	E	N	A	-	N										N	3	0	1
7066429	2015	9/23/2015	100	8/21/2015	1912	201721	501	5	5	4	198	0	0	0		0		CENTRAL PKWY	TASSAJARA RD	0		Y	A	-	N										N	4	0	1
7123085	2015	12/2/2015	100	9/23/2015	825	100411	312	3	5	4	198	0	0	0		0		VILLAGE PW	AMADOR VALLEY BL	229	S	N	A	-	N										N	4	0	1
7132019	2015	12/9/2015	100	11/22/2015	1546	202964	310	7	5	4	198	0	0	0		0		VILLAGE PW	TAMARACK DR	30	E	N	A	-	N										N	4	0	1
7148992	2015	2/3/2016	100	12/14/2015	1510	202964	516	1	5	4	198	0	0	0		0		GRAFTON ST	CAPOTERRA WY	0		Y	A	-	N										N	3	0	1
7187881	2016	2/22/2016	100	1/27/2016	828	100411	515	3	5	4	198	0	0	0		0		KOHNEN WY	SHELTON ST	255	W	N	A	-	N										N	3	0	1
7199634	2016	9/25/2018	100	4/25/2016	2259	202219	408	1	5	4	198	0	0	0		0	NO VAL	DUBLIN BL	ARNOLD RD	0		Y	A	-	N										Y	1	1	1
7207981	2016	3/21/2016	100	2/17/2016	751	202219	301	3	5	4	198	0	0	0		0		VILLAGE PW	BRIGHTON DR	667	N	N	B	-	N										N	2	0	1
8000919	2016	3/30/2016	100	2/27/2016	1112	203271	207	6	5	4	198	0	0	0		0		AMADOR VALLEY BL	AMADOR PLAZA RD	223	E	N	A	-	N										N	4	0	1
8026971	2016	4/27/2016	100	4/19/2016	1331	202219	318	2	5	4	198	0	0	0		0		DUBLIN BL	CLARK AV	0		Y	A	-	N										N	4	0	1
8038919	2016	5/16/2016	100	4/9/2016	1507	202219	408	6	5	4	198	0	0	0		0		ARNOLD RD	DUBLIN BL	0		Y	A	-	N										Y	2	0	1
8040489	2016	5/19/2016	100	4/18/2016	1754	202964	312	1	5	4	198	0	0	0		0		VILLAGE PKWY	DUBLIN BL	181	N	N	A	-	N										N	3	0	1
8057436	2016	6/13/2016	100	5/27/2016	806	202219	320	5	5	4	198	0	0	0		0	NOVALU	DUBLIN BL	CLARK AV	413	E	N	A	-	N										N	3	0	1
8082082	2016	7/15/2016	100	6/29/2016	2051	202219	0	3	5	4	198	0	0	0		0		VOMAC RD	LANDALE AV	90	N	N	A	-	N										Y	4	0	1
8089931	2016	10/20/2016	100	8/25/2016	2055	201730	412	4	5	4	198	0	0	0		0		CENTRAL PKWY	HACIENDA DR	0		Y	A	-	N										N	4	0	1
8091427	2016	7/29/2016	100	7/13/2016	1010	202219	208	3	5	4	198	0	0	0		0		DUBLIN BL	REGIONAL ST	26	W	N	A	-	N										N	4	0	1
8092200	2016	8/3/2016	100	6/26/2016	948	201236	212	7	5	4	198	0	0	0		0		SAN RAMON RD	VOMAC RD	0		Y	A	-	N										N	3	0	1
8097043	2016	8/12/2016	100	7/1/2016	2331	201730	408	5	5	4	198	0	0	0		0		ARNOLD RD	DUBLIN BL	0		Y	A	-	N										N	4	0	1
8113234	2016	9/7/2016	100	8/13/2016	852	202219	207	6	5	4	198	0	0	0		0		AMADOR VALLEY BL	STARWARD DR	81	W	N	A	-	N										N	3	0	1
8148040	2016	10/18/2016	100	9/21/2016	1407	202219	0	3	5	4	198	0	0	0		0	NOVALU	E CANTANA DR	S SPAGE DR	0		N	A	-	N										N	3	0	1
8165468	2016	11/14/2016	100	11/6/2016	1700	203438	0	7	5	4	198	0	0	0		0	NO VAL	DUBLIN BL	TASSAJARA RD	12	W	N	A	-	N										N	4	0	1
8191866	2016	12/21/2016	100	11/14/2016	1754	202964	519	1	5	4	198	0	0	0		0		DUBLIN BL	FALLON RD	0		Y	A	-	N										N	4	0	1
8205673	2016	1/13/2017	100	12/18/2016	1856	202964	313	7	5	4	198	0	0	0		0		AMADOR VALLEY BL	VILLAGE PW	262	E	N	A	-	N										N	4	0	1
8316684	2017	3/6/2017	100	2/17/2017	1549	202219	203	5	5	4	198	0	0	0		0		SHADOW DR	SHADOW PL	150	W	N	C	-	N										N	4	0	1
8358065	2017	5/2/2017	100	4/14/2017	724	202219	0	5	5	4	198	0	0	0		0		PENN DR	LANCASTER RD	87	N	N	A	-	N										N	3	0	1
8363793	2017	5/18/2017	100	4/29/2017	1058	202219	321	6	5	4	198	0	0	0		0		DUBLIN BL	SIERRA CT	775	E	N	A	-	N										N	3	0	1
8363809	2017	5/18/2017	100	4/27/2017	731	202219	314	4	5	4	198	0	0	0		0		STAGECOACH RD	AMADOR VALLEY BL	11	S	N	A	-	N										N	3	0	1
8386199	2017	7/11/2017	100	5/31/2017	1900	206805	0	3	5	4	198	0	0	0		0		CENTRAL PKWY	TASSAJARA CREEK TRL	0		Y	A	-	N										N	3	0	1
8391055	2017	6/28/2017	100	5/30/2017	1620	203264	310	2	5	4	198	0	0	0		0		VILLAGE PKWY	DAVONA DR	0		Y	A	-	N										N	4	0	1
8391063	2017	6/28/2017	100	5/19/2017	852	203264	301	5	5	4	198	0	0	0		0		VILLAGE PW	BRIGHTON DR	200	N	N	A	-	N										N	4	0	1
8399630	2017	7/31/2017	100	6/14/2017	1004	202219	0	3	5	4	198	0	0	0		0		DUBLIN BL	GLYNNIS ROSE DR	257	E	N	A	-	N										N	3	0	1
8400056	2017	8/15/2017	100	6/13/2017	906	100411	412	2	5	4	198	0	0	0		0	NO VAL	HACIENDA DR	DUBLIN BL	0		Y	A	-	N										N	4	0	1
8402990	2017	7/12/2017	100	6/22/2017	911	206730	321	4	5	4	198	0	0	0		0		DUBLIN BL	SIERRA CT	520	W	N	A	-	N										N	4	0	1
8403328	2017	7/12/2017	100	6/28/2017	1213	202219	416	3	5	4	198	0	0	0		0		CAMPBELL LN	DUBLIN BL	12	S	N	A	-	N										N	4	0	1
8429817	2017	8/24/2017	100	7/11/2017	1817	207824	318	2	5	4	198	0	0	0		0		DUBLIN BL	CLARK AV	0		Y	A	-	N										N	3	0	1
8436902	2017	9/21/2017	100	9/2/2017	1839	206403	313	6	5	4	198	0	0	0		0		VILLAGE PKWY	AMADOR VALLEY BL	0		Y	A	-	N										N	3	0	1
8457978	2017	10/9/2017	100	9/12/2017	803	100411	413	2	5	4	198	0	0	0		0		CENTRAL PKWY	ASPEN ST	0		Y	A	-	N										N	3	0	2
8466761	2017	10/13/2017	100	8/30/2017	1858	202219	0	3	5	4	198	0	0	0		0		ROLLING HILLS DR	WINDING TRAIL LN	0		Y	A	-	N										Y	2	0	2
8469845	2017	11/9/2017	100	8/19/2017	1619	207824	330	6	5	4	198	0	0	0		0		SUTTON LA	CANTERBURY LN	102	S	N	A	-	N										N	3	0	1
8477284	2017	10/24/2017	100	10/5/2017	830	203264	400	4	5	4	198	0	0	0		0		ASPEN ST	SUMMER GLEN DR	5	S	N	A	-	N										N	4	0	1
8489136	2017	12/4/2017	100	10/18/2017	932	100411	413	3	5	4	198	0	0	0		0		CENTRAL PKWY	ASPEN ST	0	W	N	A	-	N										N	3	0	1
8494507	2017	11/27/2017	100	9/28/2017	1758	207353	511	4	5	4	198	0	0	0		0		ANTONE WY	GRAFTON ST	11	W	N	A	-	N										N	3	0	1
8508852	2017	12/12/2017	100	11/21/2017	1340	202219	208	2	5	4	198	0	0	0		0		DUBLIN BL	GOLDEN GATE DR	0		Y	A	-	N										N	4	0	1
8512807	2017	1/29/2018	100	12/6/2017	1531	202219	313	3	5	4	198	0	0	0		0		AMADOR VALLEY BL	VILLAGE PW	115	E	N	A	-	N										N	3	0	1
8538927	2017	1/30/2018	100	12/4/2017	1550	100411	301	1	5	4	198	0	0	0		0		BRIGHTON DR	CALLAN ST	342	E	N	A	-	N										N	4	0	1
8539371	2018	2/1/2018	100	1/5/2018	611	207519	507	5	5	4	198	0	0	0		0		TWIN EAGLES WAYS	BENT TREE DR	9	N	N	A	-	N										N	4	0	1
8540665	2017	1/27/2018	100	12/21/2017	958	100411	324	4	5	4	198	0	0	0		0		DUBLIN BL	CLARK AV	560	E	N	A	-	N										N	4	0	1
8542669	2018	2/5/2018	100	1/12/2018	1656	203253	414	5	5	4	198	0	0	0		0	NOVALU	DUBLIN BL	GLYNNIS ROSE DR	0		Y	A	-	N										N	3	0	2
8560839	2018	3/13/2018	100	2/10/2018	1247	202219	0	6	5	4	198	0	0	0		0	NOVALU	FALLON RD	DUBLIN BL	544	S	N	A	-	N										N	4	0	1
8584261	2018	3/29/2018	100	2/19/2018	744	103202	207	1	5	4	198	0	0	0		0		AMADOR VALLEY BL	REGIONAL ST	18	W	N	A	-	N										N	4	0	1
8584284	2018	4/5/2018	100	3/5/2018	818	400411	0	1	5	4	198	0	0	0		0		PALERMO WY	LOCKHART ST	8	W	N	A	-	N										N	3	0	1
8613829	2018	4/24/2018	100	4/3/2018	1653	203628	0	2	5	4	198	0	0	0		0	NO VAL	DUBLIN BL	GOLDEN GATE DR	498	W	N	A	-	N										N	3	0	1
8621657	2018	5/29/2018	100	4/25/2018	1534	203264	312	3	5	4	198	0	0	0		0		VILLAGE PW	DUBLIN BL	193	N	N	A	-	N										N	4	0	1
8625261	2018	5/30/2018	100	5/9/2018	1435	202219	0	3	5	4	198	0	0	0		0	NO VAL	CENTRAL PKWY	LEE THOMPSON WY	0		Y	A	-	N										N	4	0	1
8668416	2018	8/7/2018	100	7/10/2018	1247	100411	318	2	5	4	198	0	0	0		0	NO VAL	DUBLIN BL	CLARK AV	0		Y	A	-	N										N	3	0	1
8679053	2018	8/30/2018	100	7/27/2018	1644	202219	410	5	5	4	198	0	0	0		0		DUBLIN BL	HACIENDA DR	303	W	N	A	-	N										N	3	0	1
8690884	2018	9/25/2018	100	8/27/2018	1714	104423		1	5	4	198	0	0	0		0	NOVALE	TASSAJARA RD	DUBLIN BL	708	N	N	A	-	N										N	3	0	1
8719717	2018	10/23/2018	100	9/26/2018	1519	202219	212	3	5	4	198	0	0	0		0		W VOMAC RD	SAN RAMON RD	2	W	N	A	-	N										N	4	0	1
8733346	2018	12/4/2018	100	10/31/2018	844	202219	0	3	5	4	198	0	0	0		0		DUBLIN BL	DUBLIN CT	0		Y	A	-	N										N	2	0	1
8735999	2019	4/15/2019	100	3/2/2019	1834	207524	410	6	5	4	198	0	0	0		0		HIBERNIA DR	DUBLIN BL	243	S	N	C	-	N										N	4	0	1
8741775	2018	11/30/2018	100	11/15/2018	826	100411	0	4	5	4	198	0	0	0		0	NO VAL	GLEASON DR	FALLON RD	175	W	N	A	-	N										N	3	0	1
8753320	2018	1/28/2019	100	12/13/2018	1528	202219	322	4	5	4	198	0	0	0		0		AMADOR VALLEY BL	BURTON ST	10	W	N	A	-	N										N	4	0	1
8757540	2018	12/20/2018	100	11/29/2018	1512	100411	305	4	5	4	198	0	0	0		0		DAVONA DR	DAVONA LN	446	E	N	B	-	N										N	3	0	1
8763057	2018	12/27/2018	100	12/11/2018	819	201242	507	2	5	4	198	0	0	0		0		VALENTANO DR	URBINO ST	6	E	N	A	-	N										N	3	0	1
8810265	2019	3/18/2019	100	2/20/2019	1313	201242	320	3	5	4	198	0	0	0		0		VILLAGE PKWY	TAMARACK DR	0		Y	B	-	N										N	3	0	1
8831308	2019	4/4/2019	100	3/24/2019	1216	201242	221	7	5	4	198	0	0	0		0		AMADOR VALLEY BL	VILLAGE PW	212	W	N	A	-	N										N	4	0	1
8834345	2019	4/12/2019	100	3/27/2019	654	100411	416	3	5	4	198	0	0	0		0	NO VAL	DEMARCUS BL	DUBLIN BL	356	S	N	A	-	N										N	4	0	1
8870236	2019	6/5/2019	100	5/4/2019	1813	210672		6	5	4	198	0	0	0		0		VILLAGE PKWY	TAMARACK DR	0		Y	A	-	N										N	3	0	1
8888013	2019	7/16/2019	100	6/6/2019	2155	207525	0	4	5	4	198	0	0	0		0		ASTERWOOD DR	REDWOOD AV	0		Y	A	-	N										N	4	0	1
8950388	2019	11/7/2019	100	9/23/2019	646	100411	509	1	5	4	198	0	0	0		0		CENTRAL PKWY	LEE THOMPSON ST	0		Y	A	-	N										N	4	0	1
8951142	2019	11/6/2019	100	9/21/2019	1939	207519	410	6	5	4	198	0	0	0		0		DUBLIN BL	MYRTLE DR	39	W	N	A	-	N										N	3	0	1
8971125	2019	11/14/2019	100	10/24/2019	723	203264		4	5	4	198	0	0	0		0		IRON HORSE PKWY	DUBLIN BL	329	S	N	A	-	N										N	4	0	1
8991040	2019	1/15/2020	100	11/21/2019	926	203264	0	4	5	4	198	0	0	0		0		GOLDEN GATE DR	ST PATRICK DR	376	S	N	A	-	N										N	4	0	1
9010818	2019	2/15/2020	100	12/13/2019	1811	209766	320	5	5	4	198	0	0	0		0		DUBLIN BL	VILLAGE PKWY	0		Y	B	C	N										N	4	0	1
9010822	2019	2/15/2020	100	12/8/2019	1810	202964	502	7	5	4	198	0	0	0		0		FALLON RD	POSITANO PKWY	210	S	N	A	-	N										N	3	0	1
9010826	2019	2/15/2020	100	12/2/2019	1051	211122		1	5	4	198	0	0	0		0		IRON HORSE PKWY	MARTINELLI	71	S	N	C	-	N										N	3	0	1
9010867	2019	2/14/2020	100	12/9/2019	817	201242	0	1	5	4	198	0	0	0		0		AMADOR VALLEY BL	STAGECOACH RD	480	W	N	E	-	N										N	4	0	1
9028077	2019	2/5/2020	100	12/23/2019	1900	201998	0	1	5	4	198	0	0	0		0		DUBLIN BL	FALLON GATEWAY	0		Y	A	-	N										N	3	0	1

CASE_ID	ACCIDENT_YEAR	PROC_DATE	JURIS	COLLISION_DATE	COLLISION_TIME	PARTY_COUNT	PRIMARY_COLL_FACTOR	PCF_CODE_OF_VIOL	PCF_VIOL_CATEGORY	PCF_VIOLATION	PCF_VIOL_SUBSECTION	HIT_AND_RUN	TYPE_OF_COLLISION	MVIW	PED_ACTION	ROAD_SURFACE	ROAD_COND_1	ROAD_COND_2	LIGHTING	CONTROL_DEVICE	CHP_ROAD_TYPE	PEDESTRIAN_ACCIDENT	BICYCLE_ACCIDENT	MOTORCYCLE_ACCIDENT	TRUCK_ACCIDENT	NOT_PRIVATE_PROPERTY	ALCOHOL_INVOLVED	STWD_VEHTYPE_AT_FAULT	CHP_VEHTYPE_AT_FAULT	COUNT_SEVERE_INJ	COUNT_VISIBLE_INJ	COUNT_COMPLAINT_PAIN	COUNT_PED_KILLED	COUNT_PED_INJURED	COUNT_BICYCLIST_KILLED	COUNT_BICYCLIST_INJURED	COUNT_MC_KILLED	COUNT_MC_INJURED	PRIMARY_RAMP	SECONDARY_RAMP	LATITUDE	LONGITUDE	COUNTY	CITY	POINT_X	POINT_Y
6363339	2014	6/11/2014	100	1/30/2014	1636	2	A	-	10	21950	A	N	G	B	B	A	H	-	A	D	0	Y				Y		D	22	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.921	37.71352
6397006	2014	10/13/2015	100	1/29/2014	833	1	A	-	10	21952		M	G	B	A	A	H	-	A	A	0		Y			Y		L	4	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.923	37.71467
6423660	2014	6/24/2014	100	3/20/2014	1712	2	A	-	21	22106		N	G	B	F	A	H	-	A	D	0	Y				Y		D	22	0	0	1	0	1	0	0	0	0	-	-	37.7159	-121.806	ALAMEDA	DUBLIN	-121.886	37.71591
6460407	2014	7/10/2014	100	4/2/2014	1333	2	A	-	10	21952		N	G	B	F	A	H	-	A	D	0	Y				Y		A	1	0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.928	37.70488
6475283	2014	7/24/2014	100	4/16/2014	1535	2	A	-	12	22450	A	N	H	G	A	A	H	-	A	D	0		Y			Y		-		0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.888	37.70993
6475287	2014	7/24/2014	100	4/23/2014	1006	2	A	-	10	21950	A	N	G	B	B	A	H	-	A	A	0	Y				Y		A	7	0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.872	37.70579
6541933	2014	8/28/2014	100	7/26/2014	1656	2	A	-	12	21453	A	N	H	G	A	A	H	-	A	D	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.885	37.7063
6606255	2014	10/7/2014	100	7/30/2014	651	2	A	-	12	21453	A	N	H	G	A	A	H	-	A	A	0		Y			Y		L	4	0	0	0	0	0	1	0	0	0	-	-			ALAMEDA	DUBLIN	-121.893	37.70623
6646294	2014	10/10/2014	100	9/17/2014	954	2	A	-	11	21950	B	N	G	B	D	A	H	-	A	D	0	Y				Y		N	60	1	0	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.926	37.72436
6646298	2014	10/10/2014	100	9/15/2014	723	2	A	-	8	22107		N	H	G	A	A	H	-	A	D	0		Y			Y		A	8	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.71979
6669800	2014	11/7/2014	100	9/26/2014	1042	2	A	-	10	21950	A	N	G	B	B	A	H	-	A	A	0	Y				Y		A	1	1	0	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.853	37.71639
6679695	2014	1/28/2015	100	9/15/2014	758	2	A	-	10	21950	C	F	G	B	B	A	H	-	A	A	0	Y				Y		-		0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.71853
6684186	2014	12/19/2014	100	10/16/2014	1531	1	B	-	22			N	E	I	A	A	H	-	A	D	0		Y			Y		-	-	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.869	37.71264
6684190	2014	12/19/2014	100	10/17/2014	1137	2	A	-	9	21804	A	N	G	B	F	A	H	-	A	D	0	Y				Y		A	8	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.934	37.70671
6684194	2014	12/19/2014	100	10/4/2014	10	2	A	-	10	21950	A	N	G	B	B	A	H	-	C	A	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.893	37.70623
6691789	2014	11/20/2014	100	9/11/2014	1523	2	A	-	9	21804	A	N	H	G	A	A	H	-	A	D	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.92	37.71208
6713339	2014	1/9/2015	100	11/7/2014	807	2	A	-	8	22107		N	H	G	A	A	H	-	A	D	0		Y			Y		A	1	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.853	37.71639
6718683	2017	4/8/2019	100	12/20/2017	2040	2	A	-	11	21955		N	G	B	E	A	H	-	E	A	0	Y				Y		N	60	0	0	0	1	0	0	0	0	0	-	WF			ALAMEDA	DUBLIN	-121.873	37.7016
6748044	2014	1/26/2015	100	11/22/2014	2109	3	A	-	10	21950	A	N	G	B	B	A	H	-	C	A	0	Y				Y		A	1	1	0	1	0	2	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.934	37.70292
6759034	2014	1/26/2015	100	11/26/2014	1049	1	A	-	3	22350		N	E	I	A	A	H	-	A	D	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.922	37.71821
6776929	2014	2/12/2015	100	12/20/2014	1101	2	A	-	9	21804	A	N	H	G	A	A	H	-	A	A	0		Y			Y		D	22	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.919	37.70517
6858267	2015	4/2/2015	100	2/4/2015	1820	2	A	-	0	2818		N	G	B	E	A	G	-	C	A	0	Y				Y		A	1	1	0	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.941	37.71728
6877336	2015	4/15/2015	100	3/25/2015	1451	2	A	-	9	21804	A	N	G	B	F	A	H	-	A	D	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.72033
6892456	2015	4/30/2015	100	3/13/2015	1647	2	A	-	6	21750		N	H	G	A	A	H	-	A	D	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.869	37.70884
6892458	2015	4/30/2015	100	3/23/2015	1214	2	A	-	5	21202	A	N	H	G	A	A	H	-	A	A	0		Y			Y		L	4	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.71485
6895862	2015	5/22/2015	100	3/20/2015	844	3	D	-	0			N	G	B	F	A	H	-	A	D	0	Y				Y		-	-	0	0	2	0	2	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.923	37.71466
6896523	2015	5/15/2015	100	4/6/2015	648	2	A	-	8	22107		N	H	G	A	A	H	-	A	A	0		Y			Y		A	7	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.885	37.7063
6896535	2015	5/15/2015	100	4/23/2015	1202	2	A	-	5	21650	1	N	H	G	A	A	H	-	A	A	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.91	37.70654
6926041	2015	6/1/2015	100	5/7/2015	1123	2	A	-	12	21453	A	N	H	G	A	A	H	-	A	A	0		Y			Y		A	7	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.869	37.70978
6978936	2015	7/7/2015	100	6/5/2015	1141	2	A	-	9	21453	B	N	G	B	B	A	H	-	A	A	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.936	37.70206
7002092	2015	7/22/2015	100	6/29/2015	850	2	A	-	10	21950	A	N	G	B	B	A	H	-	A	D	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.865	37.71994
7038764	2015	9/3/2015	100	8/5/2015	1654	2	A	-	9	21804	A	N	H	G	A	A	H	-	A	D	0		Y			Y		A	1	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.935	37.7061
7045238	2015	9/9/2015	100	8/15/2015	1304	2	A	-	10	21950	A	N	G	B	B	A	H	-	A	A	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.935	37.70607
7047085	2015	9/19/2015	100	8/31/2015	1559	3	A	-	9	21804	A	M	H	G	A	A	H	-	A	D	0		Y			Y		A	1	0	0	2	0	0	0	2	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.71852
7057301	2015	11/13/2015	100	9/9/2015	757	2	A	-	17	21451	A	N	D	G	A	A	H	-	A	A	0		Y			Y		A	8	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.864	37.71365
7064786	2015	9/22/2015	100	9/1/2015	1107	2	A	-	9	21804	A	N	H	G	A	A	H	-	A	D	0		Y			Y		A	1	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.70511
7066429	2015	9/23/2015	100	8/21/2015	1912	2	A	-	21	22106	A	N	H	G	A	A	H	-	A	A	0		Y			Y		A	1	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.872	37.70981
7123085	2015	12/2/2015	100	9/23/2015	825	2	A	-	9	21804	A	N	G	B	F	A	H	-	A	D	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.70964
7132019	2015	12/9/2015	100	11/22/2015	1546	2	A	-	10	21950	A	N	G	B	B	A	H	-	A	A	0	Y				Y		A	8	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.71489
7148992	2015	2/3/2016	100	12/14/2015	1510	2	A	-	9	21804		N	H	G	A	A	H	-	A	D	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN		
7187881	2016	2/22/2016	100	1/27/2016	828	2	A	-	9	21804	A	N	H	G	A	A	H	-	A	D	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.867	37.71489
7199634	2016	9/25/2018	100	4/25/2016	2259	3	A	-	0	21456	1	N	G	B	B	A	H	-	C	A	0	Y				Y		N	60	1	0	0	1	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.893	37.70623
7207981	2016	3/21/2016	100	2/17/2016	751	2	A	-	10	21952		N	H	G	A	A	H	-	A	D	0		Y			Y		A	1	1	0	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.72035
8000919	2016	3/30/2016	100	2/27/2016	1112	2	A	-	8	21717		N	H	G	A	A	H	-	A	D	0		Y			Y		A	8	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.93	37.70927
8026971	2016	4/27/2016	100	4/19/2016	1331	2	A	-	10	21950	A	N	G	B	B	A	H	-	A	A	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.92	37.70537
8038919	2016	5/16/2016	100	4/9/2016	1507	2	A	-	17	21451	A	N	H	G	A	A	H	-	A	A	0		Y			Y		A	1	1	0	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.893	37.70623
8040489	2016	5/19/2016	100	4/18/2016	1754	2	A	-	9	21804	A	N	H	G	A	A	H	-	A	D	0		Y			Y		A	1	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.924	37.70644
8057436	2016	6/13/2016	100	5/27/2016	806	2	A	-	9	21801	A	N	H	G	A	A	H	-	A	D	0		Y			Y		A	1	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.919	37.70504
8082082	2016	7/15/2016	100	6/29/2016	2051	2	A	-	8	22107		F	E	I	F	A	H	-	D	D	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.936	37.71334
8089931	2016	10/20/2016	100	8/25/2016	2055	2	A	-	9	21453	B	N	H	G	A	A	H	-	C	A	0		Y			Y		A	1	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.888	37.70866
8091427	2016	7/29/2016	100	7/13/2016	1010	2	A	-	10	21950	A	N	G	B	B	A	H	-	A	A	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.934	37.7029
8092200	2016	8/3/2016	100	6/26/2016	948	2	A	-	0	23250		N	H	-	A	A	H	-	A	A	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.941	37.71728
8097043	2016	8/12/2016	100	7/1/2016	2331	2	A	-	0	21456	1	N	G	B	B	A	H	-	C	A	0	Y				Y		N	60	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.893	37.70623
8113234	2016	9/7/2016	100	8/13/2016	852	3	A	-	3	22350		N	C	C	A	A	H	-	A	A	0		Y			Y		A	1	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.934	37.70763
8148040	2016	10/18/2016	100	9/21/2016	1407	2	D	-	0			N	G	B	B	A	H	-	A	D	0	Y				Y		-	-	0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN		
8165468	2016	11/14/2016	100	11/6/2016	1700	2	A	-	10	21950	A	F	G	B	B	A	H	-	A	A	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.872	37.70575
8191866	2016	12/21/2016	100	11/14/2016	1754	2	A	-	9	21804	A	N	H	G	A	A	H	-	B	A	0		Y			Y		L	4	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.851	37.70677
8205673	2016	1/13/2017	100	12/18/2016	1856	2	A	-	7	21658	A	N	H	G	A	A	H	-	D	D	0		Y			Y	Y	L	4	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.926	37.71048
8316684	2017	3/6/2017	100	2/17/2017	1549	2	A	-	21	22106		N	G	B	E	B	H	-	A	D	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.941	37.70442
8358065	2017	5/2/2017	100	4/14/2017	724	2	A	-	8	22107		N	H	G	A	A	H	-	A	D	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.919	37.71333
8363793	2017	5/18/2017	100	4/29/2017	1058	2	A	-	8	22107		N	H	G	A	A	H	-	A	D	0		Y			Y		A	1	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.914	37.70381
8363809	2017	5/18/2017	100	4/27/2017	731	2	A	-	5	21650	1	N	H	G	A	A	H	-	A	A	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.916	37.71677
8386199	2017	7/11/2017	100	5/31/2017	1900	2	D	-	0			N	H	G	A	A	H	-	B	A	0		Y			Y		-	-	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN		
8391055	2017	6/28/2017	100	5/30/2017	1620	2	A	-	9	21453	C	N	H	G	A	A	H	-	A	A	0		Y			Y		L	4	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.72194
8391063	2017	6/28/2017	100	5/19/2017	852	2	A	-	3	22350		N	H	G	A	A	H	-	A	D	0		Y			Y		L	4	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.71907
8399630	2017	7/31/2017	100	6/14/2017	1004	2	A	-	5	21650	1	N	H	G	A	A	H	-	A	D	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.874	37.70574
8400056	2017	8/15/2017	100	6/13/2017	906	2	A	-	6	21951		F	G	B	B	A	H	-	A	A	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.888	37.70617
8402990	2017	7/12/2017	100	6/22/2017	911	2	A	-	9	21804	A	N	H	G	A	A	H	-	A	D	0		Y			Y		D	22	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.918	37.70484
8403328	2017	7/12/2017	100	6/28/2017	1213	3	A	-	10	21950	A	N	G	B	B	A	H	-	A	D	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.902	37.70576
8429817	2017	8/24/2017	100	7/11/2017	1817	2	A	-	9	21804	A	N	H	G	A	A	H	-	A	A	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.92	37.70537
8436902	2017	9/21/2017	100	9/2/2017	1839	2	A	-	11	21950	B	N	G	B	B	A	H	-	B	A	0	Y				Y		N	60	0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.71021
8457978	2017	10/9/2017	100	9/12/2017	803	3	A	-	3	22350		N	G	B	B	A	H	-	A	D	0	Y				Y		D	22	0	1	1	0	2	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.883	37.70865
8466761	2017	10/13/2017	100	8/30/2017	1858	3	A	-	3	22350		N	G	B	D	A	H	-	B	D	0	Y				Y		A	1	1	1	0	0	2	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.947	37.70687
8469845	2017	11/9/2017	100	8/19/2017	1619	2	A	-	9	21804	A	N	G	B	D	A	H	-	A	D	0	Y				Y		A	1	0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN		
8477284	2017	10/24/2017	100	10/5/2017	830	2	A	-	3	22350		N	H	G	A	A	H	-	A	A	0		Y			Y		A	7	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.883	37.71085
8489136	2017	12/4/2017	100	10/18/2017	932	2	A	-	11	21950	B	N	G	B	C	A	H	-	A	D	0	Y				Y		N	60	0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.883	37.70865
8494507	2017	11/27/2017	100	9/28/2017	1758	2	A	-	3	22350		N	G	B	B	A	H	-	B	D	0	Y				Y		A	8	0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.864	37.71789
8508852	2017	12/12/2017	100	11/21/2017	1340	2	A	-	10	21950	A	N	G	B	B	A	H	-	A	A	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.929	37.70425
8512807	2017	1/29/2018	100	12/6/2017	1531	2	A	-	5	21202	A	N	H	G	A	A	H	-	B	D	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.71033
8538927	2017	1/30/2018	100	12/4/2017	1550	2	A	-	21	22106		N	G	B	F	A	H	-	A	D	0	Y				Y		A	7	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.924	37.7184
8539371	2018	2/1/2018	100	1/5/2018	611	2	A	-	10	21950	A	N	G	B	B	A	H	-	C	D	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.853	37.71642
8540665	2017	1/27/2018	100	12/21/2017	958	2	A	-	9	21804	A	N	H	G	A	A	H	-	A	D	0		Y			Y	Y	A	7	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.918	37.70492
8542669	2018	2/5/2018	100	1/12/2018	1656	3	A	-	10	21950	A	N	G	B	B	A	H	-	A	A	0	Y				Y		A	1	0	1	1	0	2	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.875	37.70574
8560839	2018	3/13/2018	100	2/10/2018	1247	1	C	-	18			N	F	A	A	A	B	-	A	D	0		Y			Y		-	-	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.851	37.70528
8584261	2018	3/29/2018	100	2/19/2018	744	2	A	-	9	21804	A	N	H	G	A	A	H	-	A	A	0		Y			Y		A	1	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.935	37.70608
8584284	2018	4/5/2018	100	3/5/2018	818	2	A	-	-			N	G	B	B	A	H	-	A	D	0	Y				Y		A	7	0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.857	37.71305
8613829	2018	4/24/2018	100	4/3/2018	1653	1	B	-	22			N	E	I	A	A	H	-	A	D	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.931	37.70374
8621657	2018	5/29/2018	100	4/25/2018	1534	2	A	-	5	21650	1	N	H	G	A	A	H	-	A	D	0		Y			Y		L	4	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.924	37.70647
8625261	2018	5/30/2018	100	5/9/2018	1435	2	A	-	12	21453	A	F	G	B	B	A	H	-	A	A	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.86	37.70851
8668416	2018	8/7/2018	100	7/10/2018	1247	2	A	-	10	21950	A	N	G	B	B	A	H	-	A	A	0	Y				Y		A	1	0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.92	37.70537
8679053	2018	8/30/2018	100	7/27/2018	1644	2	A	-	8	22107		N	B	G	A	A	H	-	A	D	0		Y			Y		A	1	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.889	37.70618
8690884	2018	9/25/2018	100	8/27/2018	1714	2	A	-	11	21950	B	N	G	B	B	A	H	-	A	A	0	Y				Y		N	60	0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.872	37.7077
8719717	2018	10/23/2018	100	9/26/2018	1519	2	A	-	9	21453	B	N	D	G	A	A	H	-	A	A	0		Y			Y		A	1	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.941	37.71725
8733346	2018	12/4/2018	100	10/31/2018	844	2	A	-	10	21950	A	N	G	B	B	A	H	-	B	A	0	Y				Y		A	1	1	0	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.912	37.70372
8735999	2019	4/15/2019	100	3/2/2019	1834	2	A	-	10	21950	A	N	G	B	B	B	H	-	C	D	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.885	37.70563
8741775	2018	11/30/2018	100	11/15/2018	826	1	B	-	22			N	H	A	A	A	H	-	A	D	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.857	37.71582
8753320	2018	1/28/2019	100	12/13/2018	1528	2	A	-	10	21950	A	N	G	B	B	A	H	-	A	D	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.921	37.7135
8757540	2018	12/20/2018	100	11/29/2018	1512	2	A	-	11	21954	A	N	G	B	D	B	H	-	A	D	0	Y				Y		N	60	0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.937	37.72307
8763057	2018	12/27/2018	100	12/11/2018	819	2	A	-	12	22450	A	N	D	G	A	A	H	-	A	A	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.848	37.72421
8810265	2019	3/18/2019	100	2/20/2019	1313	2	A	-	5	21202	A	N	D	G	A	A	H	-	A	A	0		Y			Y		L	4	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.71489
8831308	2019	4/4/2019	100	3/24/2019	1216	2	A	-	8	22107		N	D	G	A	A	H	-	A	D	0		Y			Y		A	1	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.928	37.71001
8834345	2019	4/12/2019	100	3/27/2019	654	2	A	-	10	21952		N	D	J	F	A	H	-	A	D	0	Y				Y		A	1	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.9	37.70481
8870236	2019	6/5/2019	100	5/4/2019	1813	3	A	-	10	21950		N	H	G	B	A	H	-	A	A	0	Y	Y			Y		A	7	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.927	37.71489
8888013	2019	7/16/2019	100	6/6/2019	2155	2	A	-	10	21950	A	N	D	G	A	A	H	-	C	D	0		Y			Y		A	1	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.883	37.7127
8950388	2019	11/7/2019	100	9/23/2019	646	2	A	-	10	21950	A	N	G	B	B	A	H	-	A	A	0	Y				Y		A	8	0	0	1	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.86	37.70851
8951142	2019	11/6/2019	100	9/21/2019	1939	2	A	-	11	21955		N	G	B	D	A	H	-	C	A	0	Y				Y	Y	N	60	0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.882	37.70603
8971125	2019	11/14/2019	100	10/24/2019	723	2	A	-	10	21950	A	N	D	G	A	A	H	-	A	D	0		Y			Y		A	1	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.897	37.70541
8991040	2019	1/15/2020	100	11/21/2019	926	2	A	-	5	21651	B	N	D	C	A	A	H	-	A	D	0		Y			Y		L	4	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.928	37.70161
9010818	2019	2/15/2020	100	12/13/2019	1811	2	A	-	5	21650	1	N	D	G	A	B	H	-	C	A	0		Y			Y		L	4	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.924	37.70603
9010822	2019	2/15/2020	100	12/8/2019	1810	2	D	-	0			F	B	G	A	A	H	-	C	D	0		Y			Y		-	-	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.852	37.71346
9010826	2019	2/15/2020	100	12/2/2019	1051	2	D	-	0			F	G	B	B	B	H	-	A	D	0	Y				Y	Y	-	-	0	1	0	0	1	0	0	0	0	-	-			ALAMEDA	DUBLIN	-121.897	37.70403
9010867	2019	2/14/2020	100	12/9/2019	817	2	A	-	9	21801	A	N	B	G	A	A	H	-	A	D	0		Y			Y		A	1	0	0	1	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.917	37.71602
9028077	2019	2/5/2020	100	12/23/2019	1900	2	A	-	0	20001	A	N	D	G	A	A	H	-	C	A	0		Y			Y		A	1	0	1	0	0	0	0	1	0	0	-	-			ALAMEDA	DUBLIN	-121.851	37.70677

Attachment C: Descriptive Statistics Tables

Dublin Bike Collisions -- 2014-2019

Collisions by Year

Year	Count	Percent
2014	17	25%
2015	12	18%
2016	11	16%
2017	11	16%
2018	8	12%
2019	9	13%

Collisions by Day of Week

Day	Count	Percent
Monday	11	72%
Tuesday	9	
Wednesday	17	
Thursday	12	
Friday	11	28%
Saturday	5	
Sunday	3	

Collisions by Time of Day

Time	Count	Percent
6AM to 10AM	21	31%
10AM to 4PM	23	34%
4PM to 8PM	20	29%
8PM to 6AM	4	6%

Collisions by Severity

Severity	Count	Percent
Fatal	1	1%
Severe Injury	2	3%
Other Visible Injury	23	34%
Complaint of Pain	18	26%
Property Damage Only	24	35%

Collisions by Lighting and Severity

Lighting	Fatal	Severe Injury	Other Visible Injury	Complaint of Pain	Property Damage Only	Grand Total	**Share of Total**
Dark - No Street Lights			1			1	**1%**
Dark - Street Lights			3	3	3	9	**13%**
Daylight	1	2	18	14	20	55	**81%**
Dusk - Dawn			1	1	1	3	**4%**
Grand Total	1	2	23	18	24	68	**100%**

Hit and Run Collisions

Type	Count	Percent
Felony	3	4%
Misdemanor	0	
Not Hit and Run	65	96%

Intersection/Segment and Collision Severity

Injury Degree	Intersection	Segment	Grand Total
Fatal	1		1
Severe Injury	1	1	2
Other Visible Injury	16	7	23
Complaint of Pain	14	4	18
Property Damage Only	20	4	24
Grand Total	52	16	68
Share of Total	**76%**	**24%**	**100%**

Primary Collision Factor and Collision Severity

PCF	**Fatal**	**Severe Injury**	**Other Visible Injury**	**Complaint of Pain**	**Property Damage Only**	**Grand Total**	**Share of Total**
Auto R/W Violation	1		8	2	7	**18**	**26%**
Not Stated			2	6	3	**11**	**16%**
Improper Turning			4	2	5	**11**	**16%**
Other Hazardous Movement		1	2	3	2	**8**	**12%**
Unknown				2	2	**4**	**6%**
Traffic Signals and Signs				2	2	**4**	**6%**
Ped R/W Violation		1	2			**3**	**4%**
Unsafe Speed			2			**2**	**3%**
Unsafe Starting or Backing			1	1		**2**	**3%**
Other					2	**2**	**3%**
Unsafe Lane Change			1			**1**	**1%**
Brakes			1			**1**	**1%**
Improper Passing					1	**1**	**1%**
Grand Total	1	2	23	18	24	**68**	**100%**

Age and Severity

	Fatal	**Severe Injury**	**Other Visible Injury**	**Complaint of Pain Injury**	**Property Damage Only**	**Total**	**Share among Reported**	**Dublin Population Share**
Under 5	0	0	0	0	0	0	**0%**	**8%**
5-14 years old	0	1	5	3	6	15	**29%**	**16%**
15-24 years old	0	0	9	2	2	13	**25%**	**8%**
25-44 years old	1	0	6	6	3	16	**31%**	**35%**
45-64 years old	0	1	2	3	0	6	**12%**	**25%**
65+ years old	0	0	1	0	1	2	**4%**	**9%**
Not Reported	0	0	0	4	12	16		**-**
Total	**1**	**2**	**23**	**18**	**24**	**68**		
								Reported:

Gender and Severity

Gender	**Fatal**	**Severe Injury**	**Other Visible Injury**	**Complaint of Pain**	**Property Damage Only**	**Grand Total**	**Share among Reported**
				2	9	**11**	
Female		1	5	1	2	**9**	**17%**
Male	1	1	18	13	11	**44**	**83%**
Not Stated				2	2	**4**	
Grand Total	**1**	**2**	**23**	**18**	**24**	**68**	

Dublin Pedestrian Collisions -- 2014-2019

Crashes by Year

Year	Count	Percent
2014	12	15%
2015	13	16%
2016	10	12%
2017	13	16%
2018	18	22%
2019	15	19%

Collisions by Day of Week

<table>
<tr><th>Day</th><th>Count</th><th>Percent</th></tr>
<tr><td>Monday</td><td>13</td><td rowspan="4">58%</td></tr>
<tr><td>Tuesday</td><td>7</td></tr>
<tr><td>Wednesday</td><td>20</td></tr>
<tr><td>Thursday</td><td>6</td></tr>
<tr><td>Friday</td><td>13</td><td rowspan="3">43%</td></tr>
<tr><td>Saturday</td><td>12</td></tr>
<tr><td>Sunday</td><td>9</td></tr>
</table>

Collisions by Time of Day

Time	Count	Percent
6AM to 10AM	16	20%
10AM to 4PM	38	47%
4PM to 8PM	20	25%
8PM to 6AM	7	9%

Collisions by Severity

Severity	Count	Percent
Fatal	3	4%
Severe Injury	9	11%
Other Visible Injury	31	38%
Complaint of Pain	20	25%
Property Damage Only	18	22%

Collisions by Lighting and Severity

Lighting	Fatal	Severe Injury	Other Visible Injury	Complaint of Pain	Property Damage Only	Grand Total	**Share of Total**
Dark - Street Lights	1	2	5	2	1	11	**14%**
Dark - Street Lights Not Functioning		1				1	**1%**
Daylight	1	4	26	16	15	62	**77%**
Dusk - Dawn		2		2	2	6	**7%**
(blank)	1					1	**1%**
Grand Total	3	9	31	20	18	81	**100%**

Collisions by Intersection/Segment and Severity

Injury Degree	Intersection	Segment	Grand Total
Fatal	3		3
Severe Injury	8	1	9
Other Visible Injury	30	1	31
Complaint of Pain	17	3	20
Property Damage Only	16	2	18
Grand Total	74	7	81
Share of Total	**91%**	**9%**	**100%**

Collisions by Primary Collision Factor and Severity

PCF	**Fatal**	**Severe Injury**	**Other Visible Injury**	**Complaint of Pain**	**Property Damage Only**	**Grand Total**	**Share of Total**
Ped R/W Violation		2	13	2	5	22	**27%**
Other Improper Driving	1	1	6	2	6	16	**20%**
Unknown		1	4	4	2	11	**14%**
Auto R/W Violation		3	4	4		11	**14%**
Pedestrian Violation				4	1	5	**6%**
Not Stated	1	1	1	1		4	**5%**
Unsafe Speed		1	1	1		3	**4%**
Unsafe Starting or Backing					3	3	**4%**
Other Hazardous Movement				1	1	2	**2%**
Traffic Signals and Signs			1			1	**1%**
Improper Turning				1		1	**1%**
Improper Passing			1			1	**1%**
Pedestrian Violatoin	1					1	**1%**
Grand Total	3	9	31	20	18	81	**100%**

Collisions by Age and Severity

	Fatal	**Severe Injury**	**Other Visible Injury**	**Complaint of Pain**	**Property Damage Only**	**Grand Total**	**Share among reported**	**Dublin Population Share**
Under 5	0	1	2	3	4	**10**	**18%**	**8%**
5-14 years old	0	1	5	3	0	**9**	**16%**	**16%**
15-24 years old	0	1	3	5	1	**10**	**18%**	**8%**
25-44 years old	1	1	6	1	1	**10**	**18%**	**35%**
45-64 years old	1	0	3	1	2	**7**	**12%**	**25%**
65+ years old	0	3	4	3	1	**11**	**19%**	**9%**
Not Reported/other	1	3	10	7	13	**34**		
Total	**3**	**10**	**33**	**23**	**22**	**91**		
							Reported	63%

Collisions by Gender and Severity

Gender	**Fatal**	**Severe Injury**	**Other Visible Injury**	**Complaint of Pain**	**Property Damage Only**	**Grand Total**	**Share among reported**
	1	2	10	7	13	33	
F	1	5	8	3	2	19	**40%**
M	1	2	13	10	3	29	**60%**
Grand Total	3	9	31	20	18	81	

Reported 59%

APPENDIX B

EXISTING CONDITIONS: LEVEL OF TRAFFIC STRESS ANALYSIS

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TECHNICAL MEMORANDUM

Dublin Bicycle and Pedestrian Master Plan

Level of Traffic Stress Methodology, Assumptions, and Results

Date:	July 15, 2020	Project #: 24392
To:	Sai Midididdi, TE	
From:	Mike Alston, RSP; Amanda Leahy, AICP; Erin Ferguson, PE, RSP; Michael Sahimi, AICP	

The City of Dublin (City) is updating the 2014 Dublin Bicycle and Pedestrian Master Plan (Plan). The Plan will serve as a comprehensive action plan for the City to provide improved bicycle and pedestrian facilities for its residents, employees, and visitors. As part of the baseline conditions and needs assessment, Kittelson & Associates, Inc. (Kittelson) is analyzing the bicyclist level of traffic stress (LTS) on the City's existing roadway network ("on-street LTS")and on the Class I path network ("path LTS"). This memorandum (memo) details the methodology and assumptions used in the on-street LTS analysis for the existing roadway network and the results of the on-street LTS and path LTS analyses. The path LTS methodology and assumptions are included as Attachment A. The memo is organized into the following sections:

- Background
- Methodology
- Available Data and Assumptions
- Existing Conditions LTS Results
- Map Results
- Attachment A: Class I Path LTS Methodology

BACKGROUND

The on-street LTS methodology used was developed by the Mineta Transportation Institute (MTI) and documented in the *Low-Stress Bicycling and Network Connectivity* report published in 2012;[1] it was further refined by Dr. Peter Furth of Northeastern University in 2017.[2] The on-street LTS measure is a rating given to a road segment or crossing indicating the traffic stress it imposes on bicyclists. It classifies road segments and intersections as one of four levels of traffic stress:

- LTS 1: Requires little attention to surroundings; suitable for most children

[1] Mekuria, Mazza C., "Low-Stress Bicycling and Network Connectivity" (2012). *All Mineta Transportation Institute Publications*. Book 4. http://scholarworks.sjsu.edu/mti_all/4

[2] The methodology is posted at http://www.northeastern.edu/peter.furth/criteria-for-level-of-traffic-stress/. This methodology is "Version 2.0," published in June 2017.

- LTS 2: Low traffic stress; suitable for most adults
- LTS 3: Moderate traffic stress for all bicyclists
- LTS 4: High stress; only suitable for experienced bicyclists

The on-street LTS methodology has recently been used by agencies such as Alameda CTC and the City of Oakland to assess bicycling conditions and is a best practice methodology for assessing these conditions in the transportation planning profession.

This memo describes the on-street LTS methodology implemented based on the versions developed in 2012 and updated in 2017.

METHODOLOGY

The on-street LTS methodology includes criteria for establishing the score along roadway segments as well as at intersections and crossings, since the features of a signalized or unsignalized intersection can also have an impact on bicyclist comfort along a path or roadway. This section outlines the methodologies and criteria for both facilities.

Roadway Segment LTS Methodology

The on-street LTS methodology for roadway segments provides criteria for the following three bicycle facility types:[3]

- Bike lanes alongside a parking lane
- Bike lanes not alongside a parking lane
- Mixed traffic (i.e., no bike lanes present).

Note that under this methodology, Class III bicycle routes are analyzed under the criteria for mixed traffic. In addition, physically separated Class I and Class IV bikeway segments (including parking-separated bike lanes) are always scored the lowest level of traffic stress between intersections, LTS 1. Under the Furth on-street methodology, Class I and IV bikeways are assumed to have the lowest level of stress since bicyclists are separated from interacting with vehicles. This analysis instead applies path LTS scores based on separate evaluation metrics for Class I paths. (See the next section, Path LTS, for discussion of Class I path LTS within the City.)

The methodology evaluation criteria for each of the three facility types are shown in Table 1 through Table 3. These criteria operate following the "weakest link" principle, where the criterion with the

[3] Bikeways can generally be classified as:
Class I: off-street bicycle-only or multi-use path
Class II: on-street bicycle lanes (can also include painted buffer)
Class III: signed on-street bicycle route
Class IV: physically-separated or protected on-street bike lanes

highest (worst) LTS determines the stress level of the segment. For example, if the bike lane width matches the values associated with LTS 1 but the speed limit indicates LTS 3, the segment would be considered to be LTS 3.

Table 1: Roadway Segment Criteria for Bike Lanes Alongside a Parking Lane

Number of Vehicle Lanes	Bike Lane Reach (Bike plus parking lane width)	Prevailing Speed		
		≤ 25 mph	30 mph	35 mph
1 lane per direction	15+ ft	LTS 1	LTS 2	LTS 3
	12-14 ft	LTS 2	LTS 2	LTS 3
2 lanes per direction (2-way)	15+ ft	LTS 2	LTS 3	LTS 3
2-3 lanes per direction (1-way)		LTS 2	LTS 3	LTS 3
other multilane		LTS 3	LTS 3	LTS 3

Notes:
1. Bike lane reach = Bike + Parking Lane Width.
2. If bike lane is frequently blocked, use mixed traffic criteria.
3. Qualifying bike lane must have reach (bike lane width + parking lane width) ≥ 12 ft.
4. Bike lane width includes any marked buffer next to the bike lane.
Source: Peter Furth, Northeastern University, http://www.northeastern.edu/peter.furth/criteria-for-level-of-traffic-stress/

Table 2: Road Segment Criteria for Bike Lanes and Shoulders Not Adjacent to a Parking Lane

Number of Vehicle Lanes	Bike Lane Width	Prevailing Speed					
		≤ 25 mph	30 mph	35 mph	40 mph	45 mph	50+ mph
1 thru lane per direction, or no striped centerline	6+ ft	LTS 1	LTS 2	LTS 2	LTS 3	LTS3	LTS 3
	4 or 5 ft	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 4
2 thru lanes per direction	6+ ft	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3
	4 or 5 ft	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 4
3+ lanes per direction	Any width	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4

Notes:
1. If bike lane / shoulder is frequently blocked, used mixed traffic criteria.
2. Qualifying bike lane / shoulder should extend at least 4 ft from a curb and at least 3.5 ft from a pavement edge or discontinuous gutter pan seam.
3. Bike lane width includes any marked buffer next to the bike lane.
Source: Peter Furth, Northeastern University, http://www.northeastern.edu/peter.furth/criteria-for-level-of-traffic-stress/

Table 3: Road Segment Criteria for Level of Traffic Stress in Mixed Traffic

Number of Lanes	Effective Average Daily Traffic (ADT)	Prevailing Speed ≤ 20 mph	25 mph	30 mph	35 mph	40 mph	45 mph	50+ mph
2-way street with no striped centerline	0-750	LTS 1	LTS 1	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3
	751-1500	LTS 1	LTS 1	LTS 2	LTS 3	LTS 3	LTS 3	LTS 4
	1501-3000	LTS 2	LTS 2	LTS 2	LTS 3	LTS 4	LTS 4	LTS 4
	3000+	LTS 2	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4
1 thru lane per direction (1-way, 1-lane street or 2-way street with centerline)	0-750	LTS 1	LTS 1	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3
	751-1500	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3	LTS 4
	1501-3000	LTS 2	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4
	3000+	LTS 3	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4
2 thru lanes per direction	0-8000	LTS 3	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4
	8001+	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4
3+ thru lanes per direction	Any ADT	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4

Note: Effective ADT = ADT for two-way roads; Effective ADT = 1.5*ADT for one-way roads.
Source: Peter Furth, Northeastern University, http://www.northeastern.edu/peter.furth/criteria-for-level-of-traffic-stress/

Crossing LTS Methodology

Kittelson conducted LTS intersection crossing analysis for street or path intersections that are located along a link that is scored LTS 3 or 4 (i.e., high-stress facilities), since it is likely that the characteristics of a high-stress segment can affect the bicyclist experience when crossing from a low-stress street. The crossing methodology analyzes intersections and crossings for the following situations:

- Intersection approaches for pocket bike lanes (defined as a bike lane that is to the left of a dedicated right-turn vehicle lane)
- Intersection approaches for mixed traffic in the presence of right-turn lanes
- Intersection crossings for unsignalized crossings without a median refuge
- Intersection crossings for unsignalized crossings with a median refuge

The list above is provided by the Furth methodology and does not describe all circumstances. In Dublin, many Class I facilities cross at signalized intersections. See the next section, Path LTS, for a discussion of this topic.

Under the Furth methodology, the LTS at an approach is graded from LTS 1 through LTS 4 based on the criteria outlined in Table 4 through Table 7.

Table 4: Level of Traffic Stress Criteria for Pocket Bike Lanes

Configuration	Level of Traffic Stress
Single right-turn lane up to 150 ft. long, starting abruptly while the bike lane continues straight, and having an intersection angle and curb radius such that turning speed is < 15 mph.	LTS ≥ 2
Single right-turn lane longer than 150 ft. starting abruptly while the bike lane continues straight, and having an intersection angle and curb radius such that vehicle turning speed is < 20 mph.	LTS ≥ 3
Single right-turn lane in which the bike lane shifts to the left, but the intersection angle and curb radius are such that turning speed is < 15 mph.	LTS ≥ 3
Single right-turn lane with any other configuration; dual right-turn lanes; or right-turn lane along with an option (through-right) lane.	LTS ≥ 4

Source: Mekuria, Maaza. Low-Stress Bicycling and Network Connectivity, Mineta Transportation Institute, 2012.

Table 5: Level of Traffic Stress Criteria for Mixed Traffic in the Presence of a Right-Turn Lane

Configuration	Level of Traffic Stress
Single right-turn lane with length < 75 ft. and intersection angle and curb radius limit turning speed to 15 mph.	(no effect on LTS)
Single right-turn lane with length between 75 and 150 ft., and intersection angle and curb radius limit turning speed to 15 mph.	LTS ≥ 3
Otherwise.	LTS ≥ 4

Source: Mekuria, Maaza. Low-Stress Bicycling and Network Connectivity, Mineta Transportation Institute, 2012.

Table 6: Level of Traffic Stress Criteria for Unsignalized Crossings Without a Median Refuge

Speed Limit of Street Being Crossed	Width of Street Being Crossed		
	Up to 3 lanes	4-5 lanes	6+ lanes
Up to 25 mph	LTS 1	LTS 2	LTS 4
30 mph	LTS 1	LTS 2	LTS 4
35 mph	LTS 2	LTS 3	LTS 4
40+ mph	LTS 3	LTS 4	LTS 4

Source: Mekuria, Maaza. Low-Stress Bicycling and Network Connectivity, Mineta Transportation Institute, 2012.

Table 7: Level of Traffic Stress Criteria for Unsignalized Crossings with a Median Refuge at Least Six Feet Wide

Speed Limit of Street Being Crossed	Width of Street Being Crossed		
	Up to 3 lanes	4-5 lanes	6+ lanes
Up to 25 mph	LTS 1	LTS 1	LTS 2
30 mph	LTS 1	LTS 2	LTS 3
35 mph	LTS 2	LTS 3	LTS 4
40+ mph	LTS 3	LTS 4	LTS 4

Source: Mekuria, Maaza. Low-Stress Bicycling and Network Connectivity, Mineta Transportation Institute, 2012.

Path LTS

The on-street LTS methodology employed does not include a detailed path segment or crossing methodology to account for the various design factors that affect quality of service and user stress on Class I paths like those across the City. Thus, Kittelson created a parallel evaluation of path LTS that accounts for path segments and crossings to accompany the on-street LTS methodology. The intent of the path LTS methodology is to account for the varying qualities of service on paths throughout the City and to be able to carry forward the path analysis into prioritization and plan recommendations alongside the on-street LTS analysis. The details of the path LTS analysis are presented in Attachment A: Class I Path LTS Methodology. The results maps of the path LTS evaluation are included alongside the on-street LTS results in this memo.

AVAILABLE DATA AND ASSUMPTIONS

Kittelson obtained data from the City and compiled it in a spatial database to conduct the on-street and path LTS analyses. Where GIS data were not available, Kittelson combined field review, Google Earth aerial review, City input, and assumptions to build out necessary inputs. The data used in the analysis are shown in Table 8.

Table 8: Data Requirements and Assumptions

Data Requirement	Data Availability/Assumptions
Existing dedicated bicycle facilities (Class I, II, II buffered, and IV) in the City	Digitized the City's existing bicycle facilities. See Figure 1.
Presence of parking lanes adjacent to bike lanes	This attribute only applies where Class II facilities exist alongside parking (Table 1). Kittelson conducted field review of Class II locations and mapped the presence or absence of parking. See Figure 2.
Number of vehicle lanes	Kittelson used City-provided data, which was reviewed and confirmed. Kittelson reviewed missing locations to obtain complete network coverage. See Figure 3.

Data Requirement	Data Availability/Assumptions
Speed Limit	Kittelson utilized speed limit data provided by the City in shapefile format. On residential roads without speed limit data or posted speeds, speed limit of 25 mph was applied based on the City's prima facie speed limits.[4] See Figure 4.
Bike lane width	Kittelson conducted field reviews to determine bike lane widths where the methodology required them.
Bike lane buffer width	Kittelson conducted field reviews to determine bike lane buffer widths where the methodology required them.
Width of bike lane and adjacent parking lane	Kittelson conducted field reviews to determine parking lane widths adjacent to bike lanes where the methodology required this information.
Frequency of bicycle lane blockage	This attribute is a binary variable (i.e., whether the bicycle lane is frequently blocked or not) used to reassign facilities with a bike lane to be evaluated as mixed traffic facilities (see note, Table 2). Kittelson assumed that bike lanes next to driveways for large parking lots (such as retail centers) are frequently blocked and applied the mixed traffic criteria for those segments.
Average Daily Traffic	Kittelson used the ADT provided by City in shapefile and/or spreadsheet format. Where ADT was not available, ADT categories were estimated based on downstream volumes, adjacent roadways, or the general land use context around a facility. These generally included facilities that were clearly in the highest ADT category for analysis (8,001 +)
Centerline presence	Kittelson assumed collector streets are striped with centerlines and local/neighborhood streets were not. The functional classification designations came from the City's 2013 General Plan Circulation Element and from 2012 functional classification designation forms submitted to Caltrans. Where inconsistencies were present, Kittelson assumed a street to be the higher order designation between the two.
Presence of right turn lanes and features (e.g., number of lanes and length, and curb radius)	This attribute is required for intersection crossing analysis. Kittelson applied these manually based on Google Earth review on an as-needed basis.
Presence of pocket bike lanes and features (e.g., number of lanes and length, and curb radius)	This attribute is required for intersection crossing analysis. Kittelson applied these manually based on Google Earth review on an as-needed basis.
Median presence and width	This attribute is required for intersection crossing analysis. Kittelson applied these manually based on Google Earth review on an as-needed basis.

[4] https://dublin.ca.gov/2094/Speed-Surveys

EXISTING CONDITIONS LTS RESULTS

On-Street LTS

The available GIS data, field reviews, Google Earth review, and other assumptions documented above were applied using the methodologies outlined in this memo. The results of the on-street LTS analysis are shown in Figure 7.

- On-street LTS scores were first calculated for bidirectional segments utilizing the segment criteria outlined in Table 1 through Table 3 (with off-street paths receiving a score of LTS 1).
- For locations where low-stress facilities crossed high-stress facilities, the crossing LTS methodologies were applied as outlined in Table 4 through Table 7. For signalized intersections, locations with dedicated right turn lanes and/or pocket bike lanes were reviewed and the approach's LTS score was updated if intersection conditions would result in an increased level of stress. Likewise, for unsignalized intersections, LTS scores were updated as needed.

As shown in Figure 7, low-stress on-street facilities in the City generally consist of local residential roads without dedicated bicycle facilities. Arterial roads, such as Dublin Boulevard generally consist of higher-stress segments for bicyclists, due to features such as vehicular speeds, traffic volumes, and the number of travel lanes, regardless of the inclusion of bike lanes. In addition, low-stress roads are assessed as higher stress (i.e., downgraded to LTS 3 or 4) where they cross high stress facilities, meaning that some low-stress areas are "islands" isolated by high-stress segments and crossings. Figure 8 presents the City's network of low-stress facilities, which helps to highlight where gaps exist. For example, Fallon Road, Tassajara Road, San Ramon Road, and Dublin Boulevard create low-stress gaps in the on-street network.

Path LTS

As shown in Figure 12, Class IA multi-use paths most frequently score a path LTS of 2 given their width, shoulder, and wayfinding presence. Class IB sidepaths frequently score a path LTS of 3 given no wayfinding present along their segments. The path crossings vary but rarely exceed LTS 3 except at intersection crossings with high speeds, no horizontal/vertical elements, and no crossing markings or signage. Although path LTS values were assessed for every path crossing location, only the crossings with lower scores than the connecting path segments are shown in the mapped results. In other words, the only mapped crossings are those which degrade the segment path LTS score.

Combined Results

The on-street and path LTS results are presented together in Figure 13 to provide a full picture of connectivity citywide. Note that the directionality of the on-street LTS has been suppressed in order to simplify the level of detail shown; each on-street segment is displaying its highest (i.e., worst) LTS value in Figure 13 rather than directional LTS values.

NEXT STEPS

After City review and associated revisions to the results, these on-street and path LTS results will be carried forward to inform subsequent Task 3 latent demand analysis and Task 4 network prioritization processes.

MAP RESULTS

On-Street LTS Maps

Figure 1a: Existing Dedicated Bicycle Facilities (On-Street)

Figure 1b: Existing Dedicated Bicycle Facilities (Off-Street)

Figure 1c: Existing Dedicated Bicycle Facilities (Combined)

Figure 2: Presence of Parking Adjacent to Bike Lanes

Figure 3: Number of Vehicle Lanes

Figure 4: Speed Limits

Figure 5: Average Daily Traffic (ADT)

Figure 6: Roadway Functional Classifications

Figure 7: Level of Traffic Stress

Figure 8: Level of Traffic Stress (Low-Stress Facilities)

Class I Path LTS Maps

Figure 9: Existing Path Widths

Figure 10: Existing Shoulder and Roadway Separation/Buffer

Figure 11: Existing Path Wayfinding

Figure 12: Path LTS (Segment and Intersection)

Combined

Figure 13: On-Street and Path LTS

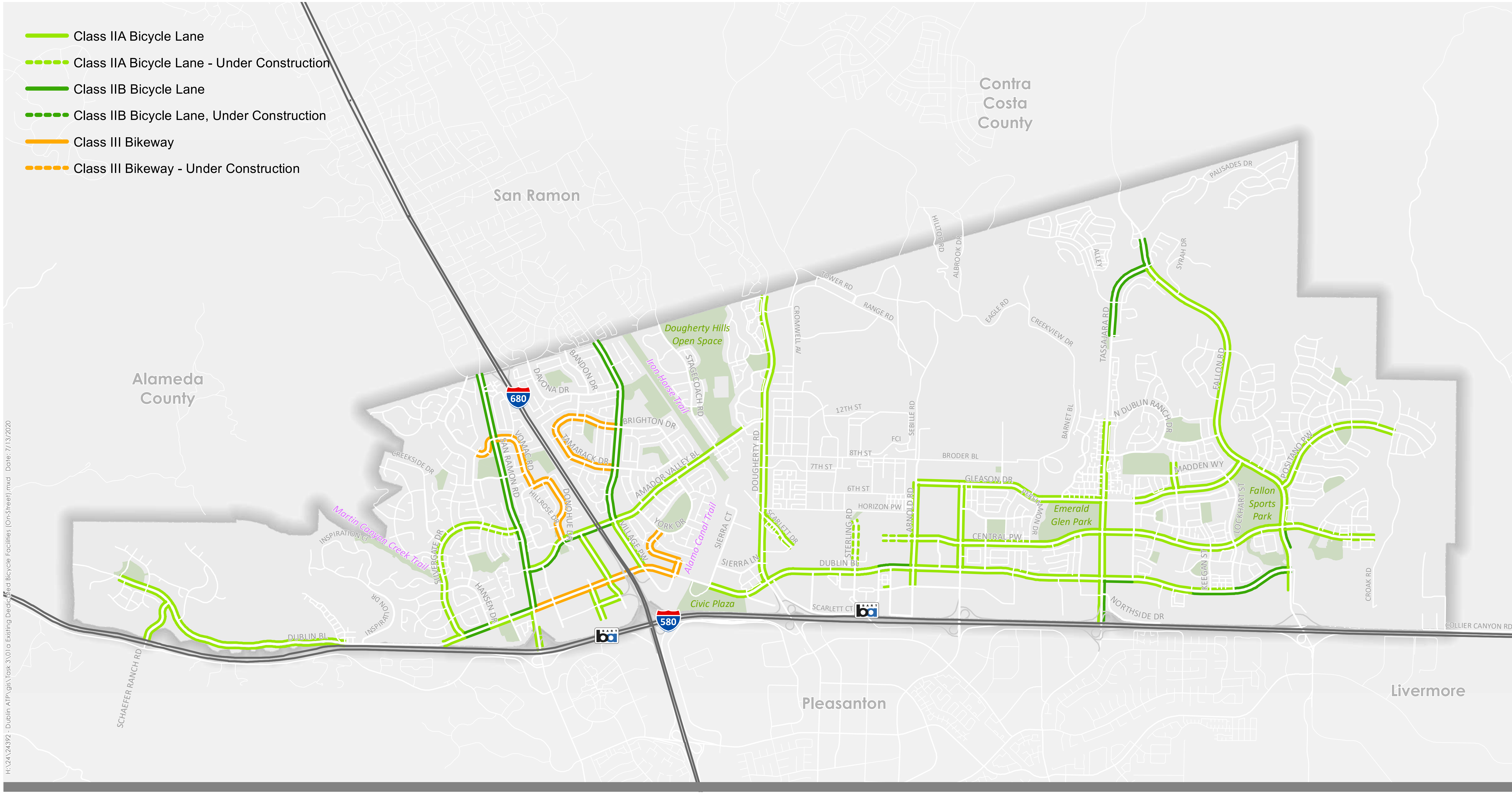


Figure 1a

Existing Dedicated Bicycle Facilities (On-Street)
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

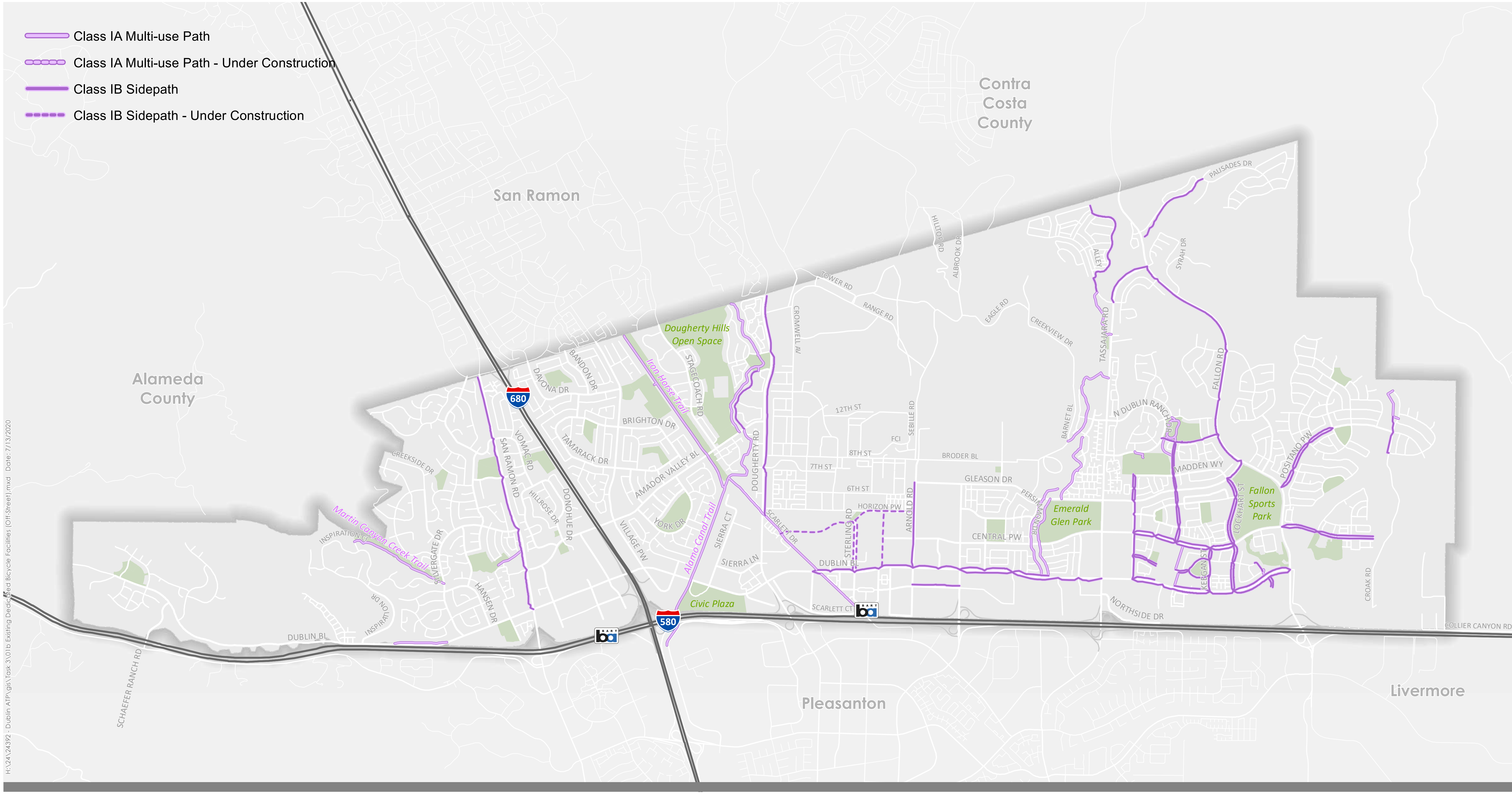


Figure 1b

Existing Dedicated Bicycle Facilities (Off-Street)
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

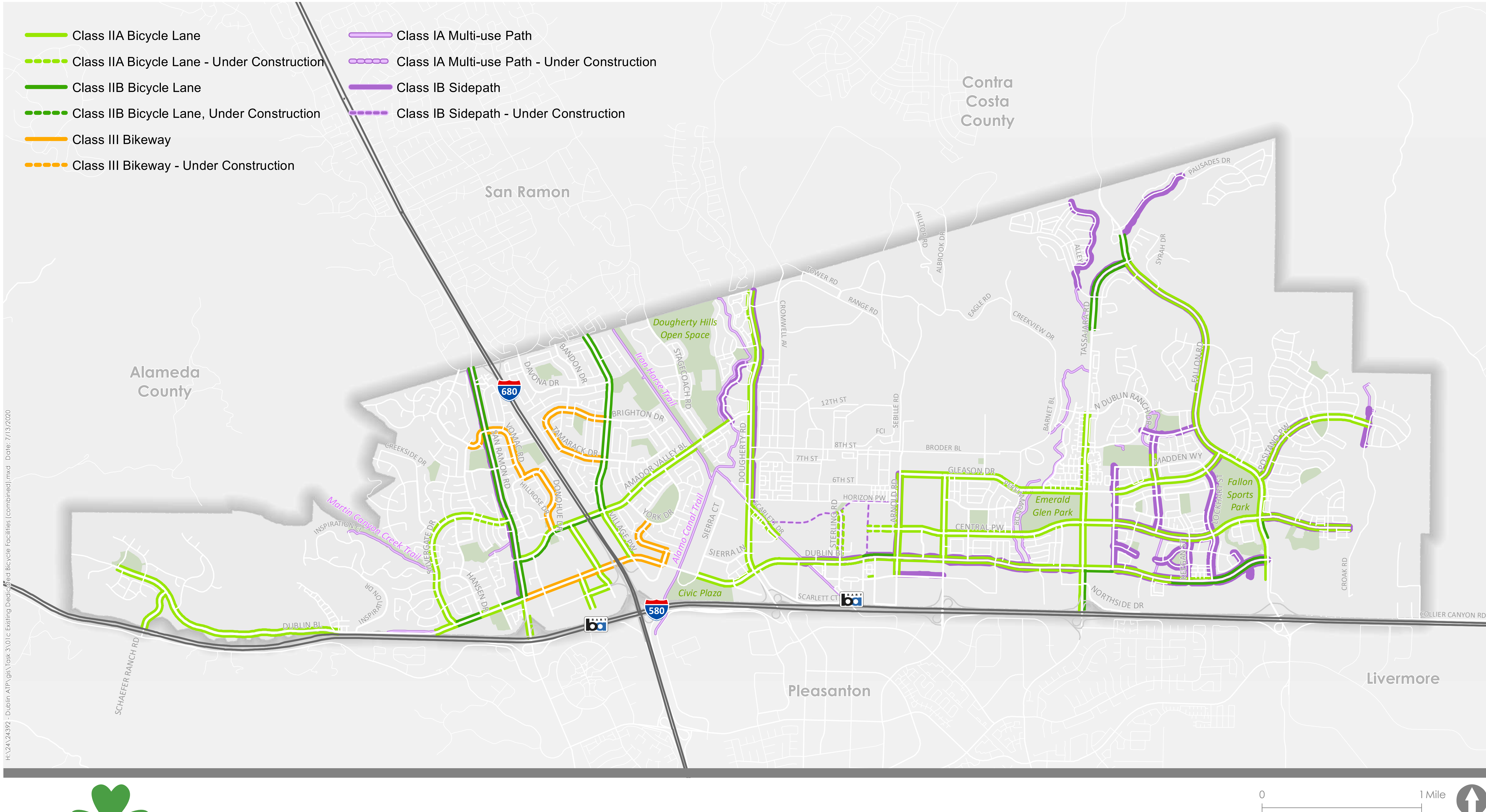


Figure 1c

Existing Dedicated Bicycle Facilities (Combined)
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

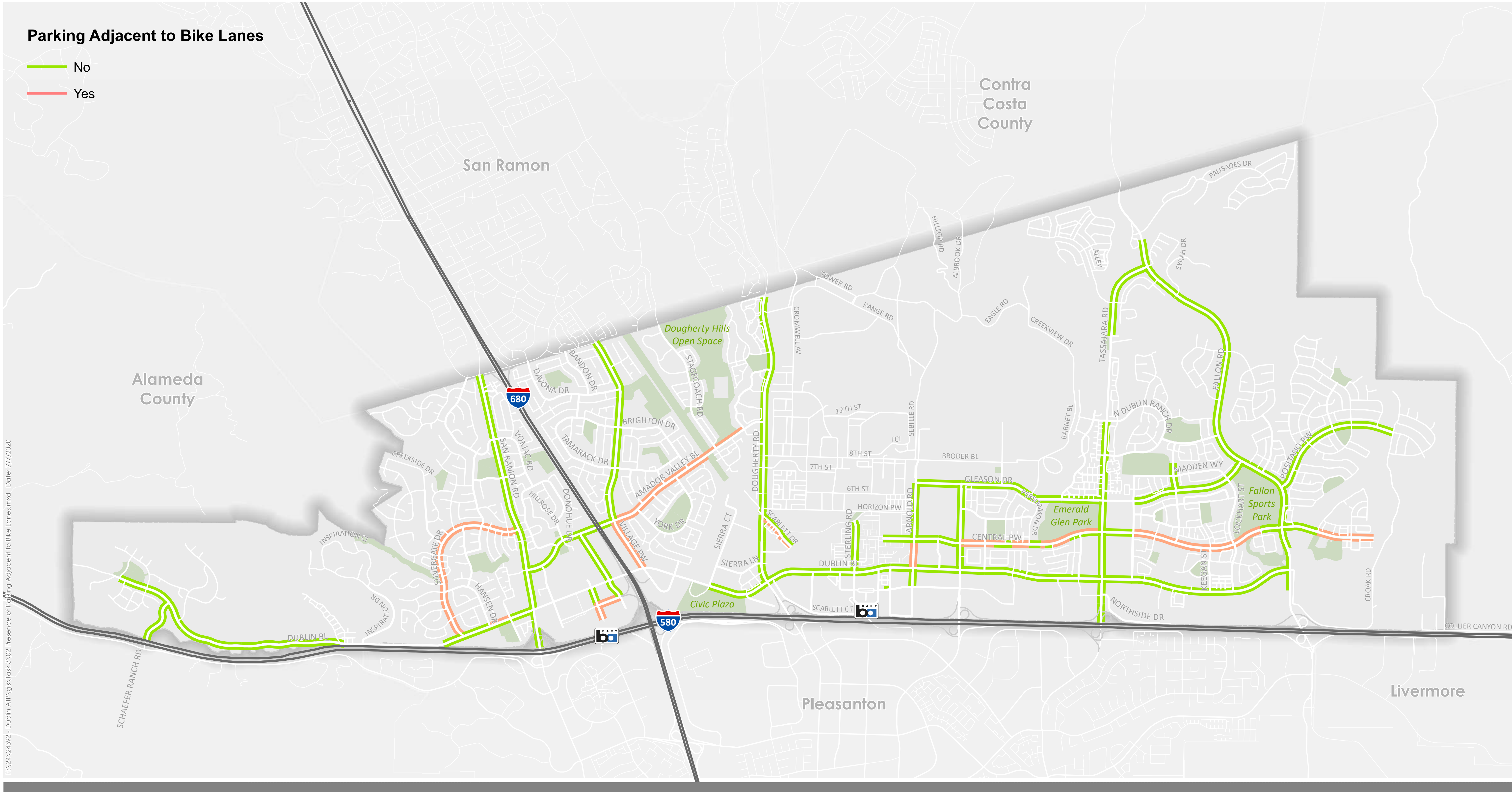


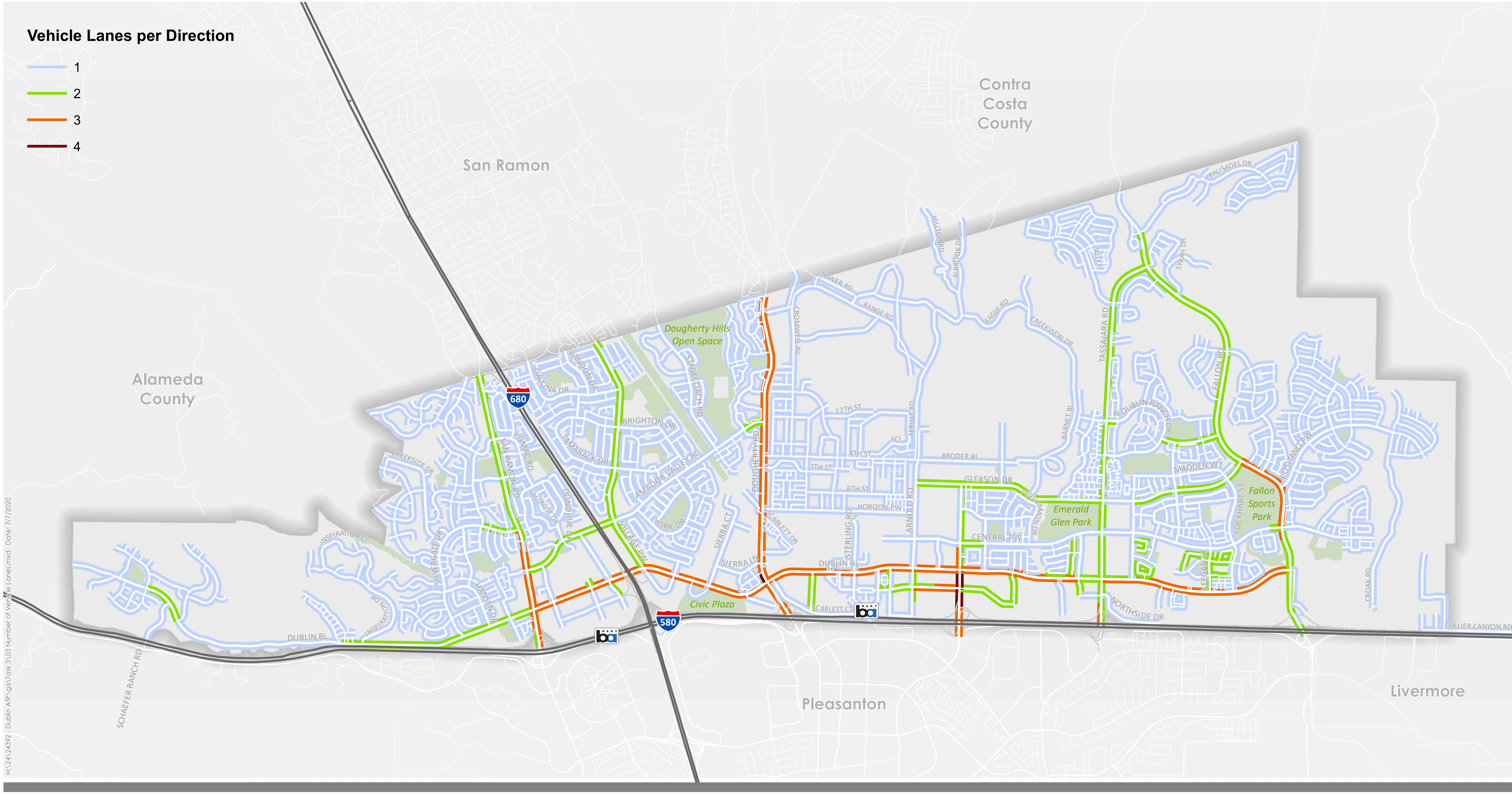
Figure 2

Presence of Parking Adjacent to Bike Lanes
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

H:\24\24392 - Dublin ATP\gis\Task 3\02 Presence of Parking Adjacent to Bike Lanes.mxd Date: 7/7/2020



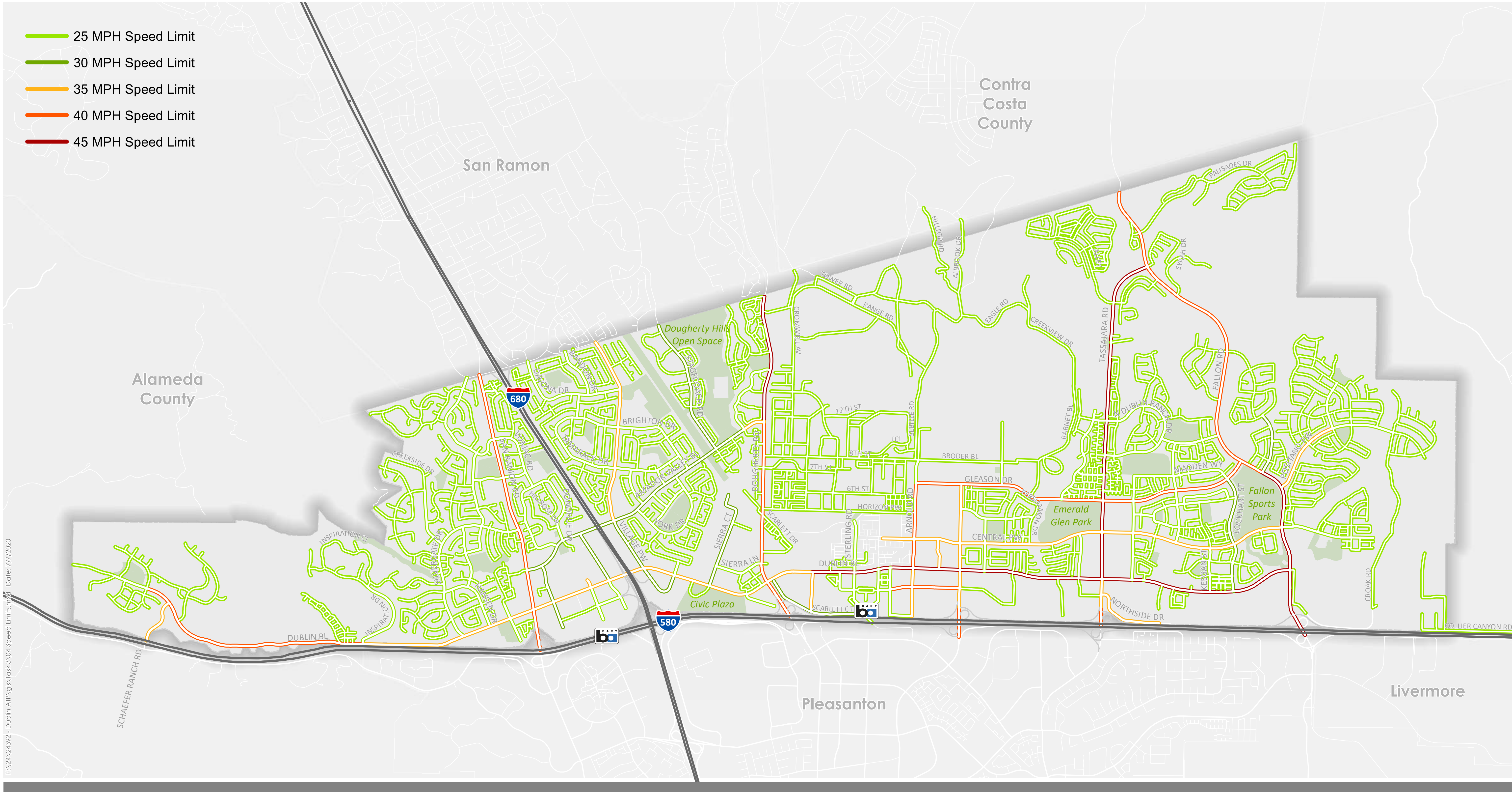
0
1 Mile

DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

Figure 3

Number of Vehicle Lanes
Dublin, California



DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

Figure 4

Speed Limits
Dublin, California

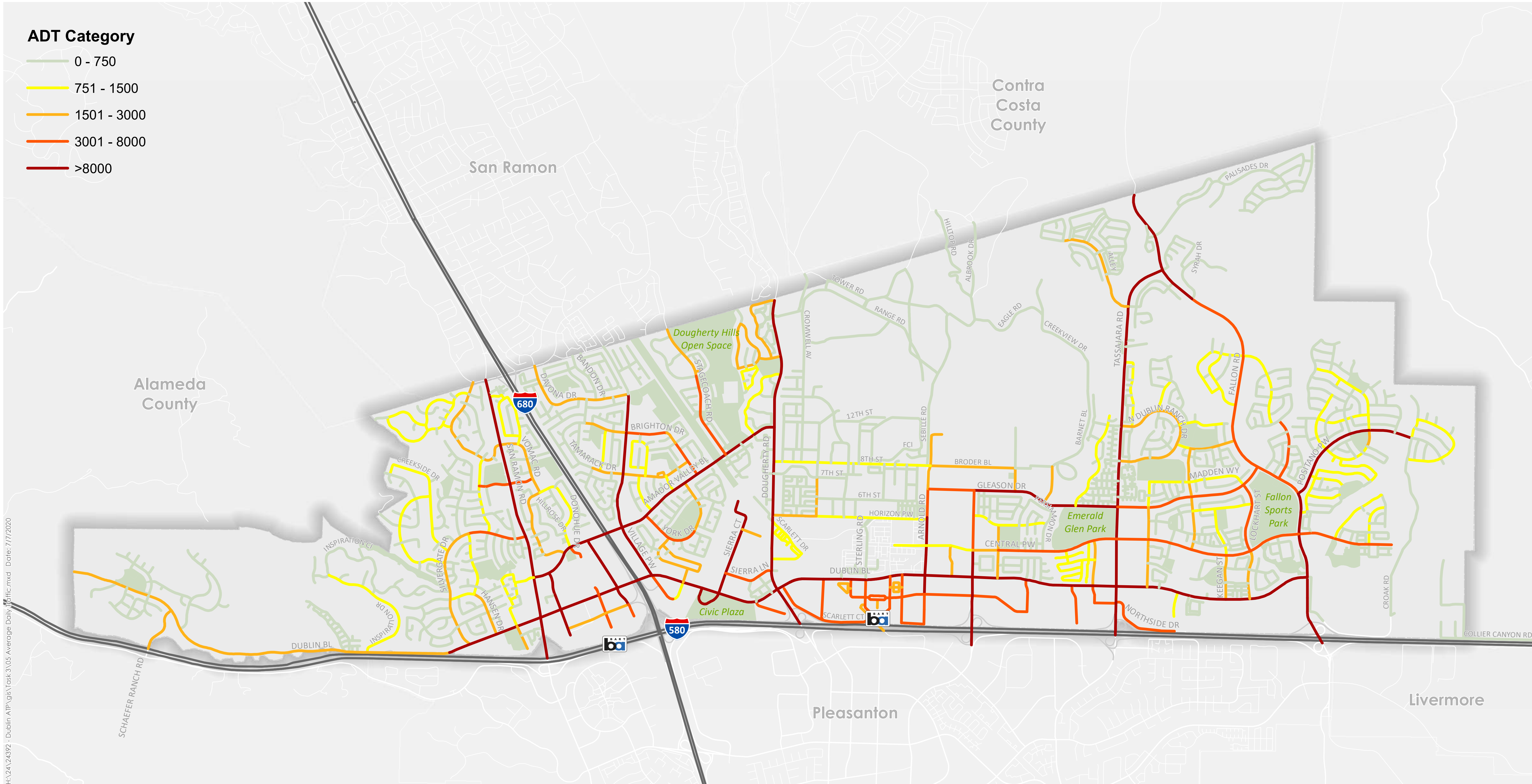


Figure 5

Average Daily Traffic (ADT)
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

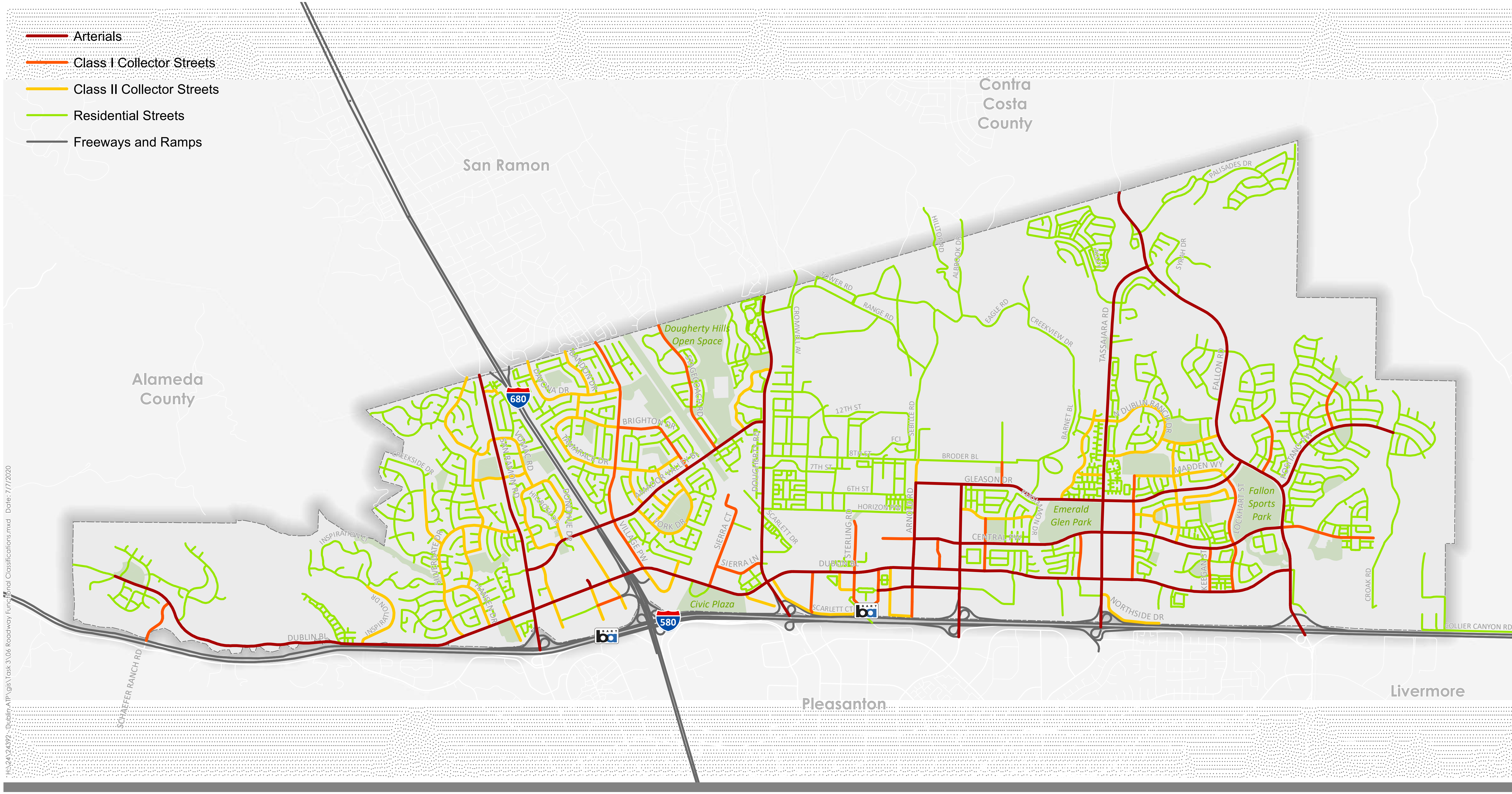


Figure 6

Roadway Functional Classifications
Dublin, California

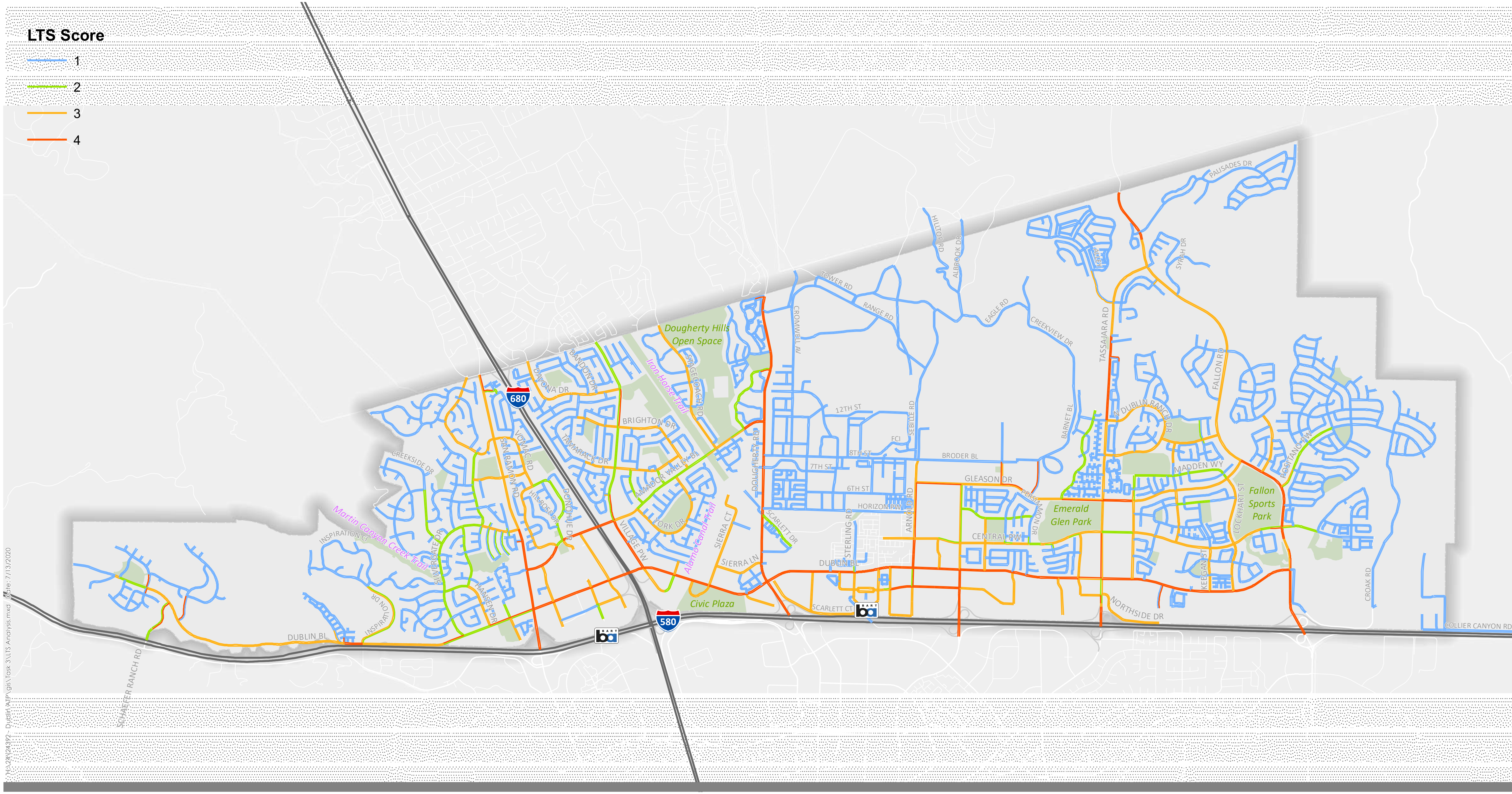


Figure 7

Level of Traffic Stress
Dublin, California

DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

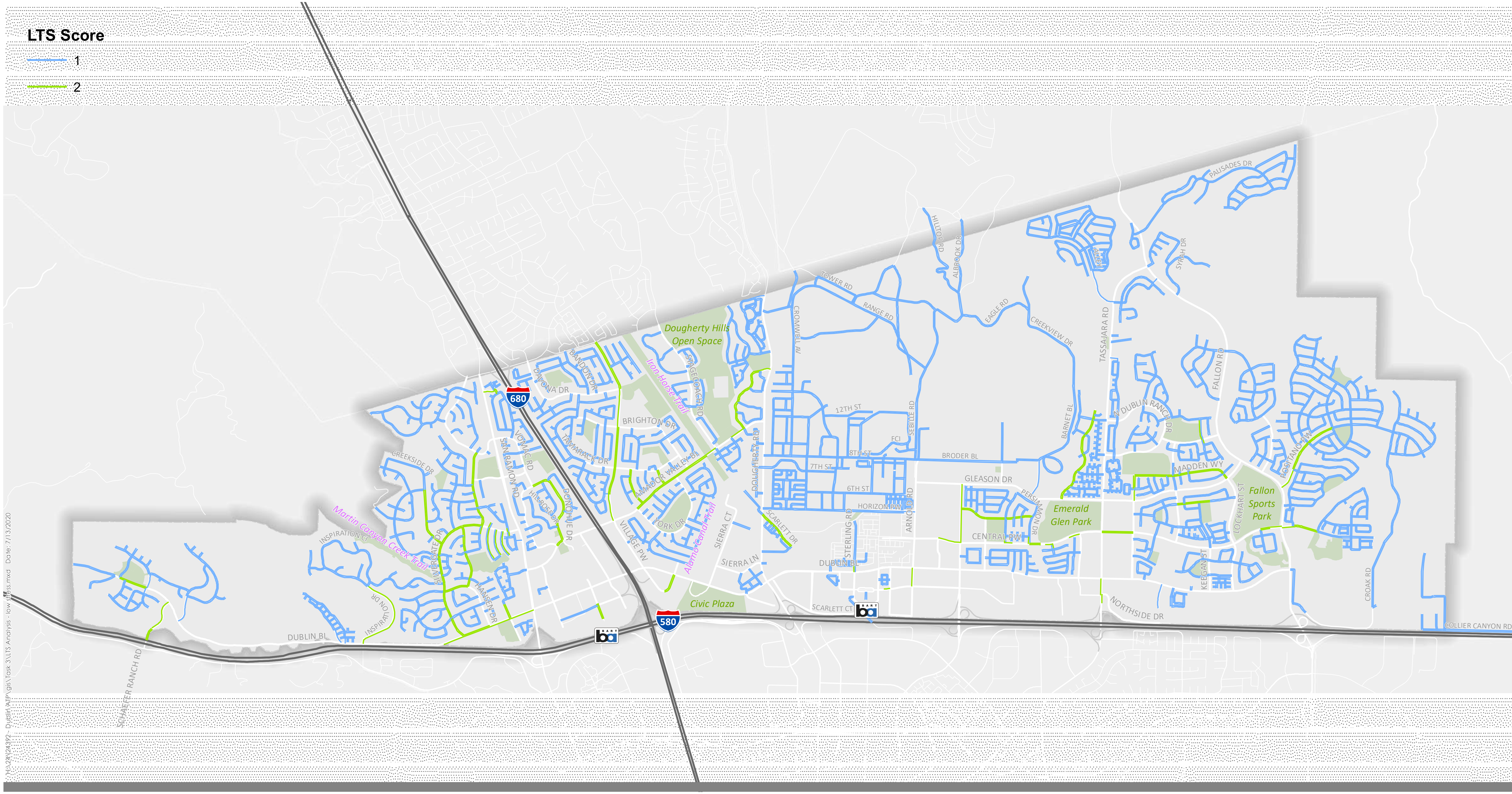


Figure 8

Level of Traffic Stress - Low Stress Facilities Dublin, California

DUBLIN CALIFORNIA

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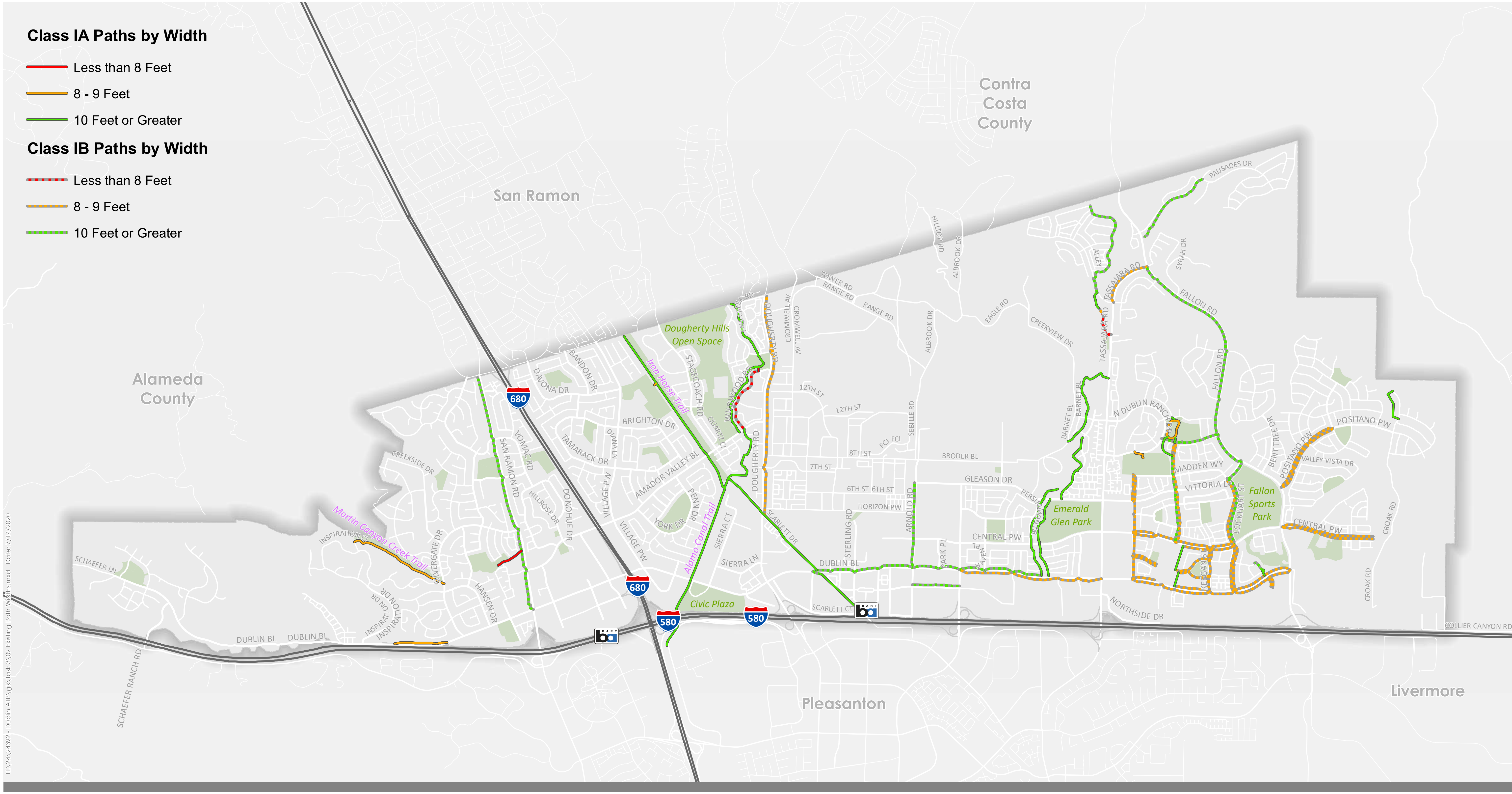
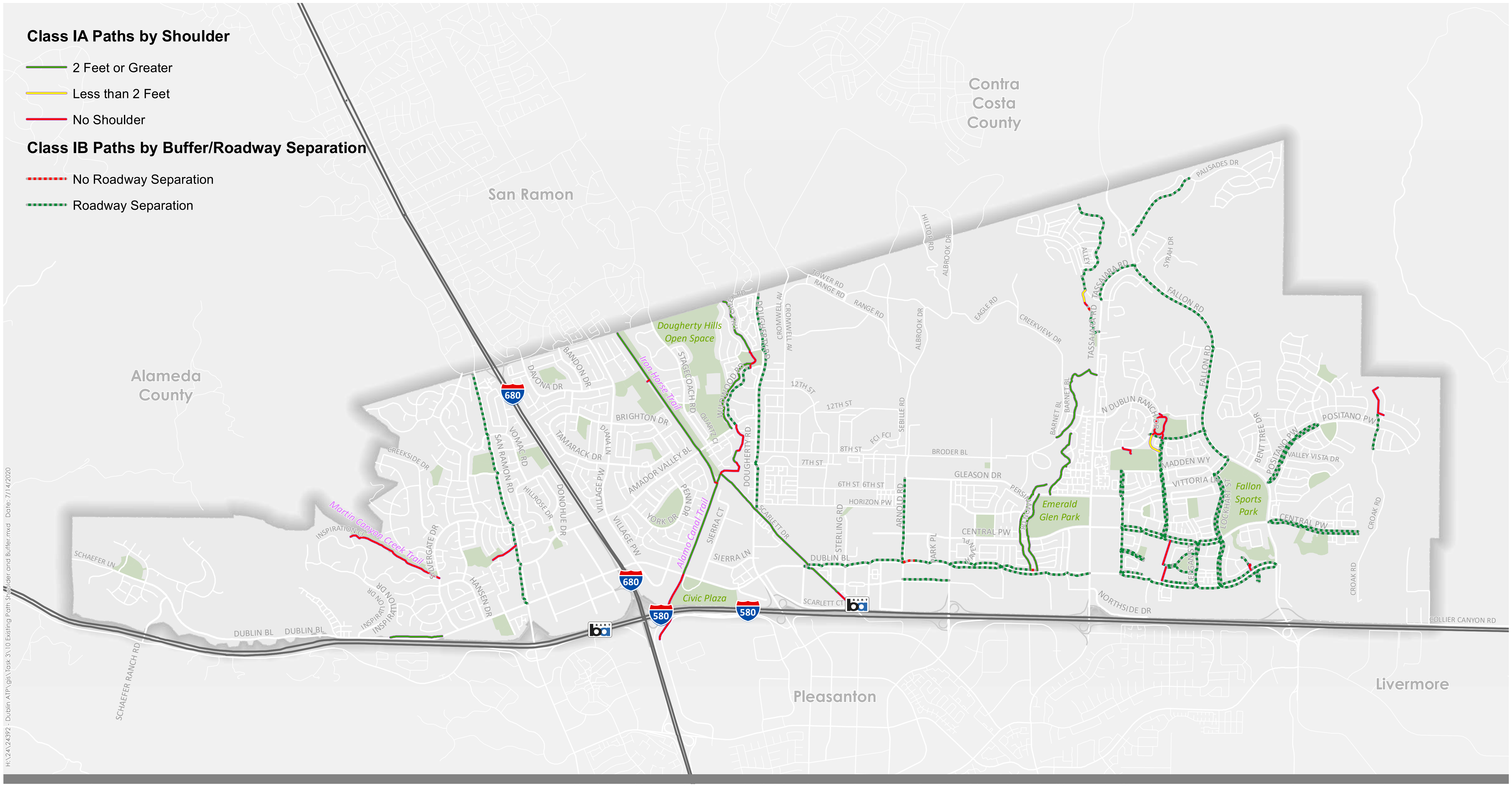


DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

Figure 9

Existing Path Widths
Dublin, California



DUBLIN
CALIFORNIA

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Figure 10

Path Shoulder and Buffer/Roadway Separation Presence
Dublin, California

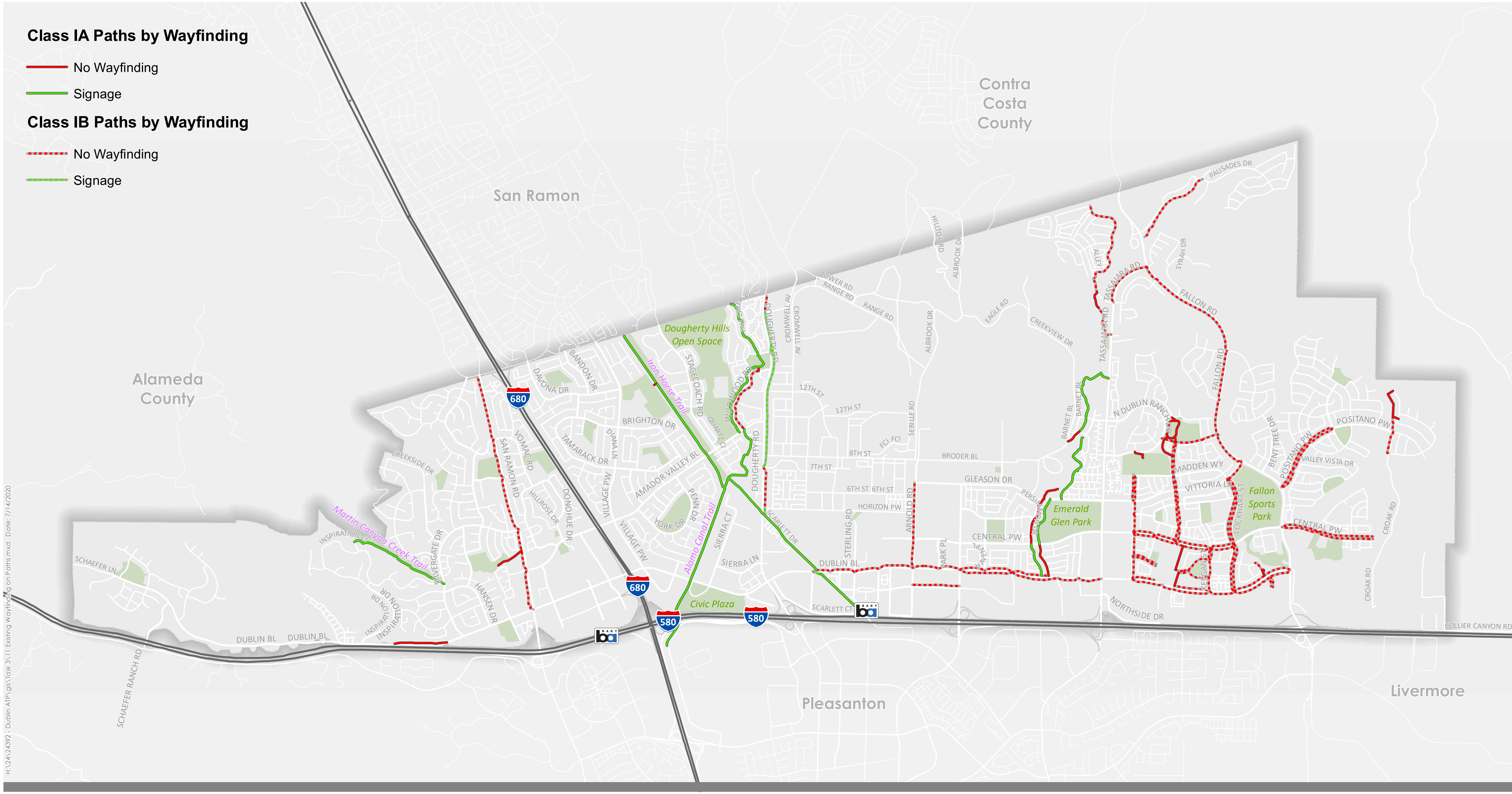


Figure 11

Existing Wayfinding on Paths
Dublin, California

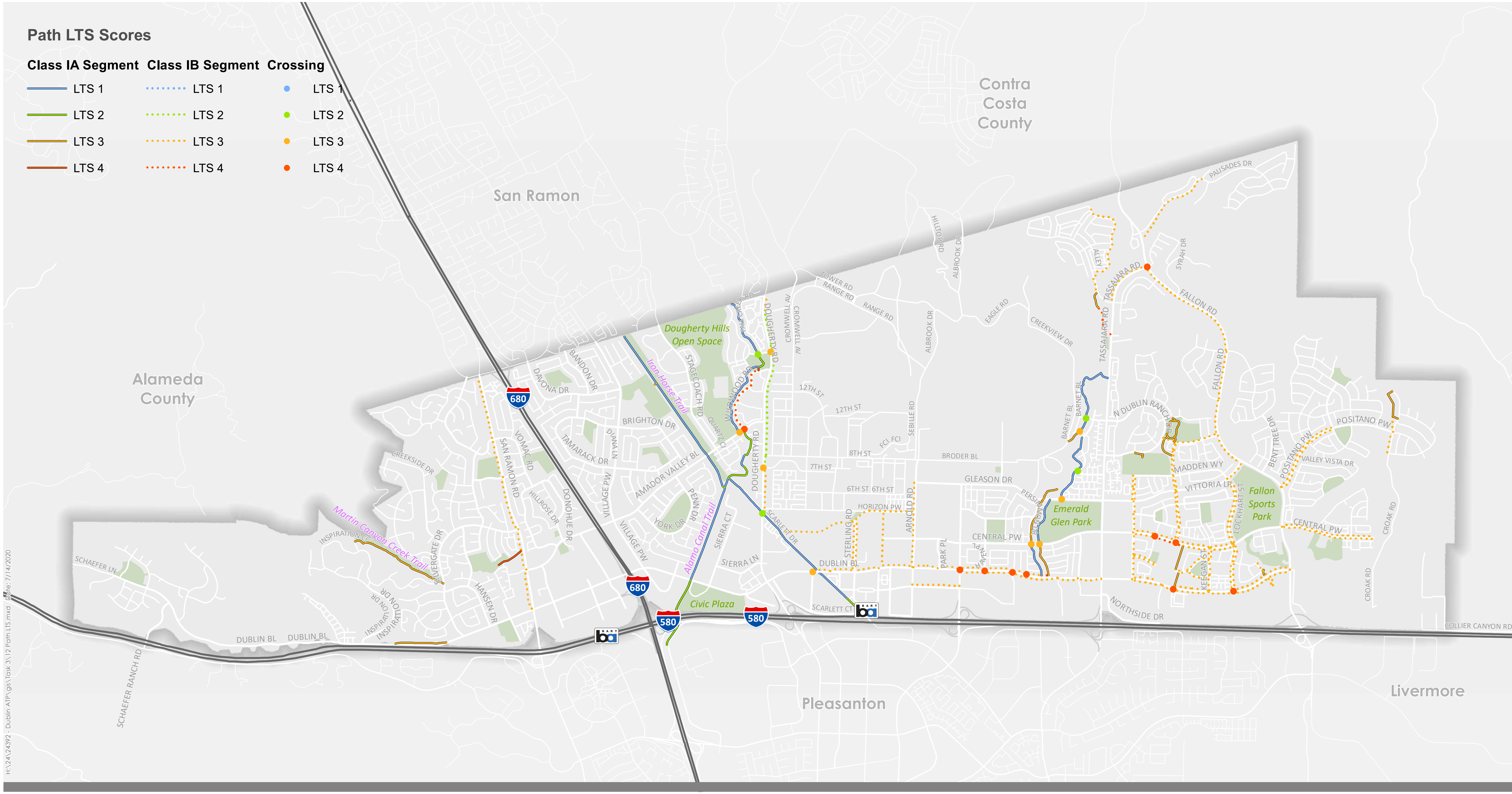
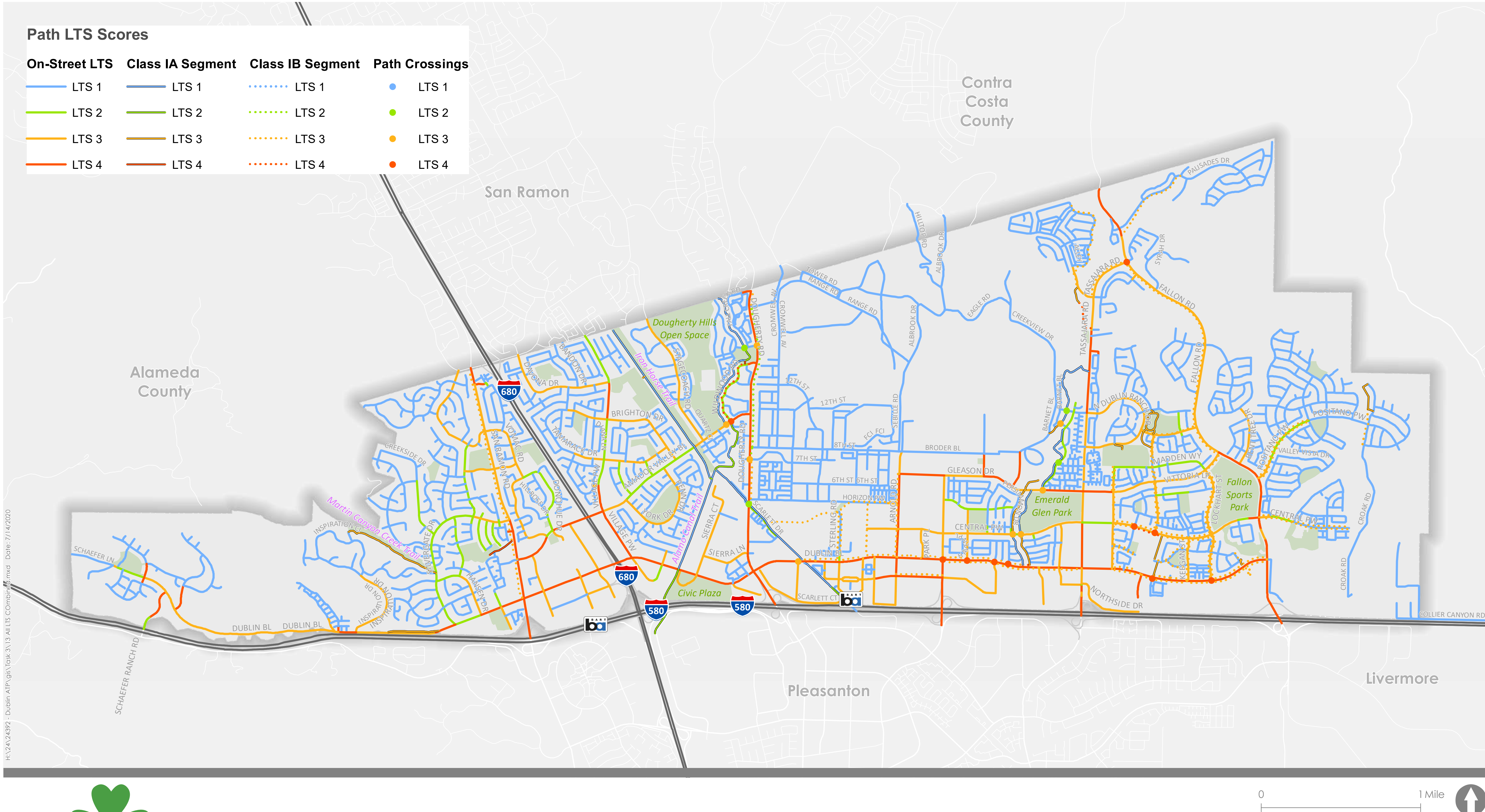


Figure 12

Path LTS - Segment and Crossing
Dublin, California



DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

Figure 13

On-Street and Path LTS
Dublin, California

ATTACHMENT A: CLASS I PATH LTS MEMORANDUM

KITTELSON & ASSOCIATES
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MEMORANDUM

Date:	July 14, 2020	Project #: 24392
To:	Sai Midididdi, TE City of Dublin	
From:	Mike Alston, RSP; Amanda Leahy, AICP; & Michael Sahimi, AICP	
Project:	Dublin Bicycle and Pedestrian Master Plan	
Subject:	Class I Path LTS Methodology	

INTRODUCTION

The following memorandum presents a methodology for evaluating a level of stress along the City of Dublin's (City's) Class I path network. The City has an extensive network of designated Class I paths, provided as an alternative to on-street facilities, that vary in width, intersection treatments, and other features. In order to identify whether adequate service quality is provided on this network, these paths will be evaluated alongside the on-street level of traffic stress (LTS) methodology. The custom methodology, referred to as path LTS, will include four levels comparable to the typical level of traffic stress methodology:

- LTS 1: Requires little attention to surroundings; suitable for most children
- LTS 2: Low traffic stress; suitable for most adults
- LTS 3: Moderate traffic stress for all bicyclists
- LTS 4: High stress; only suitable for experienced bicyclists.

The City's Class I network consists of two relevant facility types:

- **Class IA Paths:** Multiuse paths along a separate alignment. Examples include the Iron Horse Trail and the Martin Creek Trail.
- **Class IB Sidepaths:** Sidepaths along the side of a roadway, which double as sidewalks. Examples include segments along the north side of Dublin Boulevard or the west side of San Ramon Road.

The 2012 Bicycle Master Plan did not subclassify Class I paths, but the distinction is necessary to evaluate the quality of service they provide. There are distinct elements of each (e.g., buffer between Class IB sidepaths and the roadway) that determine to the quality of service provided, so they are accounted for separately for this analysis. We will account for these elements to score Class IA and IB paths within the City of Dublin on a 1 to 4 path LTS rubric alongside the on-street LTS analysis. Note that all of the Class I facilities within the City are multiuse paths (i.e., serve bicyclists and pedestrians), given that they are either off-street connections or provided along the roadside such as the only off-street accommodation. Elements of the evaluation include the following:

- Segment characteristics
  - Width
  - Path shoulder and roadway separation/buffer
  - Wayfinding and path indication
- Intersection/crossing elements
  - Control strategy and crossing distance
  - Signal treatments
  - Horizontal or vertical geometric treatments
  - Marking and signs

Segments are defined as homogenous connections between street crossings: when any of the segment input characteristics along a Class I path change, the resulting segments will be split and evaluated separately for the resulting homogeneous components. Appendix A provides an inventory of Class I facilities including their widths.

SEGMENT CHARACTERISTICS

Width

The Class I paths within the City are intended to serve two-way bicycle travel. The width requirements to allow for two-way bicycle travel are greater than for one-way bicycle travel. Additionally, the HDM recommends that "Development of a one-way bike path should be undertaken only in rare situations where there is a need for only one direction of travel."

- The Caltrans *Highway Design Manual* cites a minimum paved width of 8 feet for two-way bicycle travel, with 10 feet preferred. (Section 1003.1 (1)(a))
- For locations with "heavy bicycle volumes … and/or significant pedestrian traffic … expected," the HDM states that the path "should be" greater than 10 feet wide (preferably 12 feet). (Section 1003.1 (1)(a))
- Class IA multiuse paths would expect less significant pedestrian traffic than Class IB sidepaths would because Class IB sidepaths typically also serve the purpose of a sidewalk.
- According to the FHWA *Bikeway Selection Guide*, "Conflicts between path users are a primary source of injuries and can result in a degraded experience for all users where paths are not wide enough to handle the mixture and volume of diverse users."[1]

[1] The FHWA *Bikeway Selection Guide* is available online at https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf.

- The MassDOT *Separated Bicycle Lane Planning & Design Guide* provides guidance for separated bike lanes; it allows for a minimum of 8 feet (10 feet recommended) of width for bidirectional separated bike lanes to allow for two-way bicycle travel with fewer than 150 bidirectional bicyclists per hour. This does not account for pedestrian use.[2]

Width as a criteria for path LTS is combined with shoulder and roadway separation/barrier. See below and refer to Table 1.

Path Shoulder and Roadway Separation/Buffer

Shoulder:

Per Section 1003.1(1)(b), The HDM requires a minimum 2-foot-wide shoulder for Class I bike paths to serve as a recovery zone and to reduce conflicts with pedestrians. The shoulder should be composed of the same material as the path or should at least be free of vegetation: "adequate clearance from fixed objects is needed regardless of the paved width."

Roadway Buffer:

Per Section 1003.1(7), the HDM recommends one of the following forms of separation for paths adjacent to the traveled way:

- A minimum separation between the edge of pavement of a bicycle path and the edge of traveled way: at least 5 feet plus shoulder widths.
- For separation less than 10 feet, landscaping or other features that form a continuous barrier should be provided.

Landscaping buffers form an adequate continuous barrier along most Class IB sidepaths in the City.

[2] Although this guidance is written for the Massachusetts Department of Transportation, it is recognized as relevant best practice guidance. It is available online at https://www.mass.gov/lists/separated-bike-lane-planning-design-guide.

Table 1: Path LTS Score based on Width/Buffer/Shoulder

Path LTS Score	Class IA Multiuse Path		Class IB Sidepath	
	Path width 8 ft ≤ x < 10 ft	Path Width ≥10 ft	Path Width 8 ft ≤ x < 10 ft	Path Width ≥10 ft
LTS 1	≥2 ft shoulder provided	Shoulder provided (any width)	n/a	Roadway buffer provided (continuous barrier or 10 ft separation)
LTS 2	<2 ft shoulder provided	No shoulder provided	Roadway buffer provided (continuous barrier or 10 ft separation)	n/a
LTS 3	No shoulder provided	n/a	n/a	No roadway buffer provided
LTS 4	n/a	n/a	No roadway buffer provided	n/a

Source: Kittelson & Associates, Inc.

Figure 1: Example Class IB sidepath along the east side of Brannigan Street south of Gleason Drive. The path is between 8 and 10 feet wide and continuous separation from the roadway is provided by landscaping. The path would be eligible for LTS 2 based on the width/buffer/shoulder criterion.

Source: Google Earth

Wayfinding and Path Indication

Designated path segments should be clearly marked as such, especially including Class IB sidepaths given that they double as sidewalks. The Caltrans HDM states the following regarding mixing bicyclists and pedestrians:

> Sidewalks are not to be designated for bicycle travel. Wide sidewalks that do not meet design standards for bicycle paths or bicycle routes also may not meet the safety and mobility needs of bicyclists. Wide sidewalks can encourage higher speed bicycle use and can increase the potential for conflicts with turning traffic at intersections as well as with pedestrians and fixed objects. In residential areas, sidewalk riding by young children too inexperienced to ride in the street is common. It is inappropriate to sign these facilities as bikeways because it may lead bicyclists to think it is designed to meet their safety and mobility needs. Bicyclists should not be encouraged (through signing) to ride their bicycles on facilities that are not designed to accommodate bicycle travel. - Section 1003.3(2)

Sidewalks are thus discouraged from designation as bicycle paths. However, provided that the other criteria can be met to provide for comfortable travel (i.e., the path is “designed to meet their safety and mobility needs”), pavement or signage indications of the facility should give pedestrians an expectation that they may encounter bicyclists (and vice versa). All users should be informed that the segment is in fact designated for use as a path and not a sidewalk. Signage and wayfinding alone are therefore necessary but not sufficient to provide a low-stress path facility. This is consistent with the “weakest link” approach for path LTS evaluation. Wayfinding alone will not lower an otherwise high path LTS score but it can degrade the score of an otherwise low path LTS score facility.

Table 2: Path LTS Score based on Segment Wayfinding/Indication

Path LTS Score	Class IA Multiuse Path or Class IB Sidepath
LTS 1	Pavement markings (see Figure 2) and wayfinding signage along trail
LTS 2	Wayfinding signage along path
LTS 3	None provided
LTS 4	n/a

Source: Kittelson & Associates, Inc.

Figure 2: Example pavement markings delineating road user space along a path in San Francisco, CA and (left) and indicating status as shared-use in Emeryville, CA (right)

Source: Flickr (left) and Kittelson & Associates, Inc. (right)

INTERSECTION/CROSSING ELEMENTS

Paths are reintroduced to motor vehicle conflicts at crossings, which can be a significant source of stress. Class IA and IB paths will be treated uniformly at intersections/crossings. According to the FHWA *Bikeway Selection Guide* (Guide), "Care should be taken at intersections and driveways … Crash patterns consistently show contra-flow movement of bicyclists are a main factor in crashes due to motorists failing to yield or look for approaching bicyclists." The Guide suggests the following to mitigate these conflicts:

- Application of separate phases at signals
- Reduced corner radii or raised crossings to slow drivers
- Improved sight lines
- Marked crossings and regulatory signs to improve driver awareness

The HDM cites two particular design elements for attention at crossings (1003.1(5)):

- Crossing control: Grade separation is desirable, followed by signalization. Where traffic is "not heavy," STOP or YIELD signs may be used for the path or for the cross street.
- Crossing location: "When crossing an arterial street, the crossing should either occur at the pedestrian crossing, where vehicles can be expected to stop, or at a location completely out of the influence of any intersection to permit adequate opportunity for bicyclists to see turning vehicles….Even when crossing within or adjacent to the pedestrian crossing, "STOP" or "YIELD" signs for bicyclists should be placed to minimize potential for conflict resulting from turning autos….In some cases, Bike Xing signs may be placed in advance of the crossing to alert motorists."

Based on these sources, the three elements to be incorporated in the Class I Path LTS will include:

- Control, geometry, and crossing distance
- Markings and signs
- Horizontal or vertical treatments

Because crossings at intersections deal with turning traffic but perpendicular trail crossings do not, separate criteria are appropriate for each, termed *intersection crossings* and *perpendicular crossings*.

Figure 3: Intersection Class IB Sidepath Crossing along Lockhart Street at Central Parkway (left) and Class IA Perpendicular Crossing along Tassajara Creek Trail at Central Parkway (right).

Source: Google

Control, Geometry, and Crossing Distance

Depending on the characteristics of the crossing, different control strategies and geometric design characteristics may be appropriate.

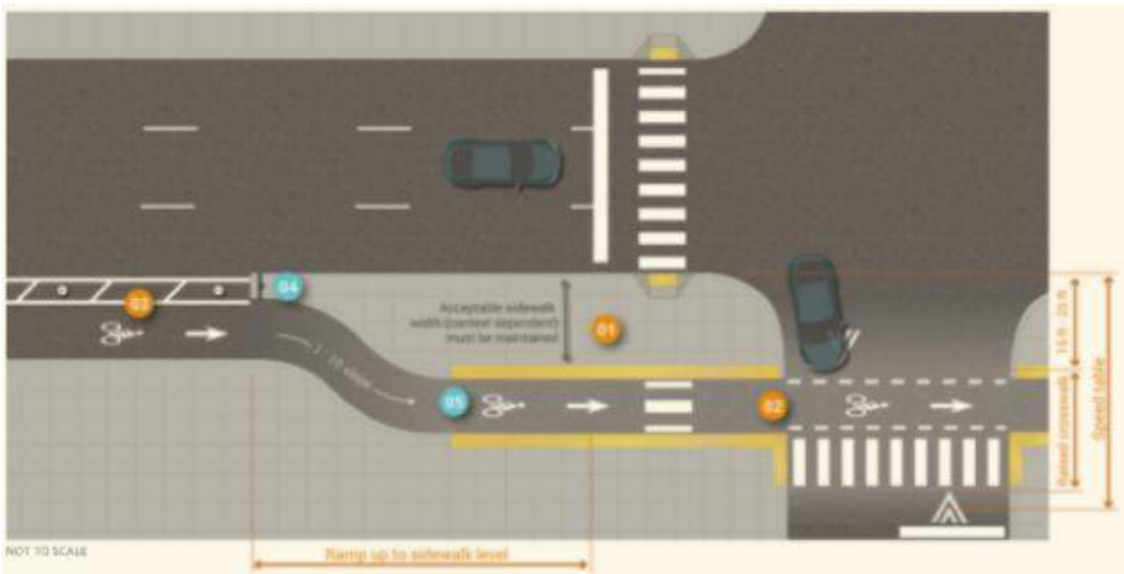
Intersection Crossings

Intersection crossings require path users to interact with turning vehicles and conflict points from all intersection approach legs. Because of this, crossing control and geometry can be used to affect conflicts in time (e.g., separate control phases) and space (e.g., separation or driver deflection).

Consistent with the recommendations in the FHWA *Bikeway Selection Guide*, physical design elements that slow drivers, enhance visibility, or both, can enhance a path's service quality. The following elements are included that would greatly improve the bicyclist' experience at crossings:

- A "bend-out" design (see Figure 4) or a protected intersection-style corner safety island that offsets the crossing from vehicle turning movements (only applicable at intersections). . Although this design treatment is most applicable to a Class II or Class IV bicycle lane, the separation benefit applies for intersection or driveway crossings along a Class IB sidepath.
- A bulb-out which reduces the curb return radius and turning movement speeds. This treatment is most effective when the lane geometry of the turning and receiving roadways force a driver to adhere to the reduced radius.
- A raised crossing, which includes vertical deflection and reduces driver speeds.
- A right-turn pocket or channelized vehicle turn lane with sufficient sight distance and geometry to encourage a comfortable provide a path crossing. The dedicated right-turn pocket or lane provides drivers the opportunity to yield without through traffic behind them.
- Signal phasing solutions including a separated bicycle signal phase or a leading pedestrian interval/leading bicycle interval, which provide separation in time between motor vehicles and path users.

Figure 4: "Bend Out" concept that pulls a bicycle crossing back from the curb to improve visibility to drivers



In applying this criterion, the geometric treatments are referred to as *horizontal or vertical treatments* and may be considered interchangeably.

Intersection Applicability

The criterion presented in Table 3 applies to path crossings either at a signalized intersection or along an uncontrolled roadway at an unsignalized crossing (i.e., the major street). For Class IB sidepaths crossing alongside a stop-controlled intersection, the criteria in Table 4 apply.

Table 3: Intersection Crossing LTS Score based on Control Strategy and Crossing Distance

Path LTS Score	Control Strategy and Crossing Distance			
	2-lane total cross-section (both roadways)		>2-lane cross-section (Either roadway)	
	Signalized Intersection	Unsignalized Intersection	Signalized Intersection	Unsignalized Intersection
LTS 1	Leading bicycle interval, separated signal phase, or horizontal/vertical elements	All-way Stop Control, parallel speed ≤ 25 mph	Separated bicycle signal phase	n/a
LTS 2	Parallel speeds <40 mph	All-way Stop Control, parallel speed > 25 mph; *OR* Parallel speeds ≤ 25 mph or with vertical/horizontal elements	Leading bicycle interval or horizontal/vertical elements	All-way Stop Control; *OR* Parallel speeds ≤25 mph or with vertical/horizontal elements
LTS 3	Parallel speeds ≥40 mph	Parallel speeds <40 mph	Parallel speeds <40 mph	Parallel speeds <40 mph
LTS 4	n/a	Parallel speeds ≥40 mph	Parallel speeds ≥40 mph	Parallel speeds ≥40 mph

Source: Kittelson & Associates, Inc.

Perpendicular Crossings

As discussed above, the control strategy appropriate for perpendicular crossings depends on the characteristics of the road being crossed: speed, volume, and crossing distance. For a simplified approach, the number of lanes provides a measure of crossing distance and a proxy for vehicle volume.

Table 4: Perpendicular Crossing LTS Score based on Control Strategy and Crossing Distance

Path LTS Score	Perpendicular Crossing Control Strategy and Crossing Distance	
	2-lane total cross-section	>2-lane cross-section
LTS 1	RRFB, PHB, or signal control; *OR* Raised crossing with yield control	Signal control
LTS 2	Stop or yield control, Cross street speed < 40 mph	RRFB, PHB *OR* Stop or yield control; cross street ≤ 25 mph
LTS 3	Stop or yield control; Cross street speed ≥ 40 mph	Stop or yield control; cross street speed > 25 mph
LTS 4	n/a	Stop or yield control; cross street speed ≥ 40 mph

Source: Kittelson & Associates, Inc.

Markings and Signs

This criterion only applies for intersection crossings, where drivers may not be expecting two-way or same-direction Class IB sidepath bicycle travel as they approach a crossing. (This includes all crossings at unsignalized intersections.) Thus, indication of a path crossing is helpful to reduce the stress of a facility. As previously described, the HDM (Section 1003.1(5)) recommends that crossing signs may be placed in advance of a crossing to alert motorists. Example signs include the combination of the MUTCD W11-15 and W11-15P signs, depicted in Figure 5, and described in Section 9B.18 of the California MUTCD. Figure 5 also depicts crossing markings already applied at various intersection crossings in the City.

Figure 5: W11-15 (left), Supplementary W11-15P (middle), and Path Pavement Markings in Dublin (right)

Source: CA-MUTCD; Google

Table 5: LTS Score based on Markings and Signage

Path LTS Score	Markings and Signage
LTS 1	Signage **and** pavement markings indicating path crossing
LTS 2	Signage **or** pavement markings indicating path crossing
LTS 3	No signage or pavement markings indicating a path crossing
LTS 4	n/a

Source: Kittelson & Associates, Inc.

Table 6: Combined Path LTS Criteria. Methodology observes a "weakest link" application whereby the highest score for any single criterion governs the overall path LTS score.

Criteria				LTS 1	LTS 2	LTS 3	LTS 4
Segment							
Class IA	Width / Buffer / Shoulder	Path Width: 8 ft ≤ x <10 ft		≥2 ft shoulder provided	<2 ft shoulder provided	No shoulder provided	n/a
		Path Width: ≥10 ft		Shoulder provided (any width)	No Shoulder provided	n/a	n/a
	Wayfinding / Indication			Pavement markings (see Figure 2); Wayfinding signage along path	Wayfinding signage along path	None provided	n/a
Class IB	Width / Buffer	8 ft ≤ x <10 ft		n/a	Roadway buffer provided (continuous barrier or 10 ft separation)[1]	n/a	No separation provided
		≥10 ft		Roadway buffer provided (continuous barrier or 10 ft separation)[1]	n/a	No separation provided	n/a
	Wayfinding / Indication			Pavement markings designating space for path users (see Figure 2); Wayfinding signage	Wayfinding signage along path	None provided	n/a
Crossing							
Intersection Crossing	Control, Geometry, Crossing Distance	2-lane Total Cross-Section (both roadways)	Signalized	Leading bicycle interval, separated bicycle signal phase, or horizontal/vertical elements	Parallel speeds <40 mph	Parallel speeds ≥40 mph	n/a
			Unsignalized	All-way stop control, parallel speeds ≤25 mph	All-way stop control, parallel speeds >25 mph *OR* Parallel speeds ≤25 mph or with vertical/horizontal elements	Parallel speeds <40 mph	Parallel speeds ≥40 mph
		>2-lane Total Cross Section (either roadway)	Signalized	Separated bicycle signal phase	Leading bicycle interval or horizontal/vertical elements	Parallel speeds <40 mph	Parallel speeds ≥40 mph
			Unsignalized	n/a	All-way stop control *OR* Parallel speeds ≤25 mph or vertical/horizontal elements	Parallel speeds <40 mph	Parallel speeds ≥40 mph
	Markings / Signs*			Signage **and** pavement markings indicating path crossing*	Signage **or** pavement markings indicating path crossing*	No signage or pavement markings indicating a path crossing*	n/a
Perpendicular Crossing	Control, Geometry, Crossing Distance	2-lane Total Cross-Section		RRFB, PHB, or signal control, *OR* Raised crossing with yield control	Stop or yield control, speed < 40 mph	Stop or yield control, speed ≥ 40 mph	n/a
		>2-lane Total Cross Section		Signal control	RRFB or PHB; *OR* Stop or yield control, cross street ≤ 25 mph	Stop or yield control, cross street > 25 mph	Stop or yield control, cross street speed ≥ 40 mph

*Criterion does not apply to all-way stop control crossings.
Source: Kittelson & Associates, Inc.

ATTACHMENT A: CLASS I FACILITIES – WIDTH INVENTORY

Table 7: Class I Facility – Width Inventory

Trail	Path Type	Location	Width
Martin Creek Canyon Trail	Class IA	Bidirectional - one side only	7’
Dublin Boulevard	Class IA	N side --- west of Silvergate	4.5’
San Ramon Road sidepath	Class IB	West side of roadway	10’
Unnamed trail branching west off of San Ramon Road	Class IA	Connection to Mape Memorial Park	Varies; 7-8’
Alamo Canal Trail	Class IA	Continuous	≥10’
Iron Horse Trail	Class IA	Continuous	≥10’
Dougherty Road	Class IB	E Side – Scarlett to N City Limits	9 to 14’ from Scarlett to Fall Creek; 8’ Fall Creek to N. City Limits
Dublin Boulevard	Class IB	N side -- Iron Horse Trail to Tassajara Creek	12’
Dublin Boulevard	Class IB	S side - Hacienda Drive to Tassajara Road	8’
Martinelli Way	Class IB	N side b/w Arnold and Hacienda	8.5’
Brannigan Street	Class IB	East side - Dublin to Fallon Middle School	8'
Brannigan Street	Class IA	West side - Gleason to Fallon Middle school	8’
Horizon Parkway (In Progress)	Class IB	N side - Scarlett to Arnold	10’
Sterling Road (In Progress)	Class IB	Both sides - Dublin to Horizon	10’
Iron Horse Parkway (In Progress)	Class IB	E Side – Dublin to Horizon	10’
Arnold Way	Class IB	W Side – Dublin to Gleason	≥10’
Central Parkway	Class IB	N side - Brannigan to Lockhart	8’
Central Parkway	Class IB	S side - Brannigan to Lockhart	Varies; 5-8’
Dublin Boulevard	Class IB	S side - Brannigan to Grafton	8’
Dublin Boulevard	Class IB	N side - Brannigan to Finnian Way	8’
Dublin Boulevard	Class IB	N side – Finnian Way to Grafton	7’
Tassajara Creek Trail	Class IA	Continuous	≥10’
Finnian Way	Class IB	S side - Brannigan St to Bray Commons	8’
Finnian Way	Class IB	N side - Brannigan St to Bray Commons	8’

Trail	Path Type	Location	Width
Grafton Street	Class IB	W side - Central to Fairfield Park	12’
Grafton Street	Class IB	E side - Central to Fairfield Park	8’
Lockhart Street	Class IB	E side - N of Dublin to Gleason	12’
Positano Pkwy	Class IB	S side - Fallon to school	8'
Positano Pkwy	Class IB	N side - Fallon to school	8'
Antone Way	Class IB	N side - Dublin Ranch to Fallon	40’
Fallon Road	Class IB	W side - Gleason to Tassajara	12'
Sterling Street	Class IB	Dublin to Central	8'
Central Parkway	Class IB	Fallon to eastern extents	8’
Central Parkway	Class IB	Fallon to eastern extents	8’
Wallis Ranch Drive	Class IB	W side between Tassajara Creek and Stags Leap	8'
Rutherford Drive	Class IB	E side from Tassajara to trail connection	8'
Trail parallel to Croak Road/Volterra Drive	Class IB	S. Terracina to N extents of Volterra	Varies; 9 - 10’

APPENDIX B

EXISTING CONDITIONS: DEMAND ANALYSIS

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TECHNICAL MEMORANDUM

Dublin Bicycle and Pedestrian Master Plan Update

Demand Analysis Results - Bicycle Access

Date:	May 10, 2021	Project #: 24392
To:	Sai Midididdi, TE	
From:	Mike Alston, RSP; Amanda Leahy, AICP	
cc:	Pratyush Bhatia	

The City of Dublin (City) is updating its 2014 Dublin Bicycle and Pedestrian Master Plan (Plan). The Plan will serve as a comprehensive action plan for the City to provide improved bicycle and pedestrian facilities for its residents, employees, and visitors.

Per the scope of work, the demand analysis task (Task 3.3.4) identifies baseline levels of walking and biking around existing activity nodes and assesses latent bicycle and pedestrian demand that could be realized through improved infrastructure recommended in the Plan. The intent of this task to indicate the magnitude of potential latent demand for walking and biking based on a set of assumptions about the known relationship between infrastructure and mode choice. There are a number of other factors that influence mode choice decisions and could provide a more precise estimate of mode share which are beyond the intent and scope of this task.

Mode share estimates based on existing infrastructure will be compared to estimates for a future recommended network to determine potential mode shift. This potential for mode shift associated with latent demand will be presented in the Plan. The outputs from this analysis will also serve as inputs for network prioritization as part of Plan development.

This memorandum (memo) is organized as follows:

- Summary
  - Assumptions and Methodology
  - Results
  - Next Steps
- Biking and Walking Typologies for Dublin
- Mode Share Data
- Detailed Results
- Map Figures
- Appendices A through F

SUMMARY

This latent demand analysis presents mode share estimates for Dublin residents to access four categories of activity centers: schools, BART stations, job centers, and parks. These results will be compared to access for a recommended improved network that will show the potential for an improved biking and walking network to unlock latent demand for biking and walking. The Plan will present the potential for mode shift associated with recommended improvements.

Assumptions and Methodology

For both biking and walking, the existing network is compared to a future network by modeling mode choice sensitivity to changes in the built environment, including presence and quality of bicycle and pedestrian infrastructure. For biking, potential mode shift indicative of latent demand is assessed through the availability of low-stress bicycle routes as measured by bicycle level of traffic stress (LTS) scores. For walking, potential mode shift is assessed through modeling uncontrolled crossings along major roadways in the City as crossing barriers.

Kittelson used available land use and demographic data to model residential locations and their network distance (i.e., distance along available paths) to activity centers. The path of travel for Dublin residents was blocked or impeded at identified barriers, with the resulting perceived network distances increased. Propensity to walk or bike is estimated based on perceived travel distance to destinations.

More detail on the analysis methodology is presented in the methodology memo in Appendix A.

Results

How to interpret these results

For each activity center, a mode share point estimate is presented that represents the share of the Dublin population that *could be expected* walk or bike to a given destination given their natural propensity to walk or bike, their distance to the destination, and the quality of the infrastructure available. These estimates were determined by four inputs:

1. **Demographic data:** Dublin residents are grouped into differing walking and biking *typology* groups based on age; these groups are assumed to exhibit different propensities to walk or bike and responsiveness to supportive infrastructure (explained in the *Biking and Walking Typologies in Dublin* section).
2. **Network distance to destination:** The actual network distance between residential parcels in the City and each activity center is determined based on the shortest available route.

3. **Barriers or impediments:** For walking, uncontrolled crossings of major roads either block or impede an available walking route.[1] For biking, a high LTS score (3 or 4) similarly blocks or impedes available routes. Barriers block access and require a different route; impediments increase the *perceived* travel distance which in turn decreases likelihood of walking or biking.
4. **Available mode share data:** Kittelson used data from the National Household Travel Survey (NHTS), BART station profile surveys, the American Community Survey (ACS), and Safe Routes to School (SRTS) mode share surveys to estimate the percentage of people walking and biking and the relationship between mode share and distance from destination. Kittelson constructed a lookup table (shared in the *Mode Share Data* section of this memorandum) to estimate percentage of the population to walk or bike for a given perceived distance to destination (e.g., a higher share of people would walk for a 0.5-mile trip compared to a 1-mile trip).

An example of the mode share estimation procedure is provided in Appendix G.

Existing Network – Bicycle Access

The analysis produces the following results based on the existing bicycle network:

- **Schools:** Walk and bike share estimates are provided for each school. Biking estimates range between 0 percent and 14 percent, and walking estimates range between 13 and 37 percent. The availability of low-stress bicycle routes (i.e., comprised exclusively of LTS 1 or 2 facilities) on routes to school varies depending on the school location.
  - For two elementary schools, a low-stress biking route is available to over half of students. Six schools are located with a low-stress biking route available to 10 percent or fewer of students.
  - In general, elementary schools serve a more localized population of students and have a natural opportunity for higher biking or walking shares than the middle or high schools, which serve a broader geographic area with longer travel distances.
- **BART:** A mode share estimate is provided for access to *either* the West Dublin/Pleasanton or Dublin/Pleasanton BART station. The biking mode share estimate among Dublin residents is 6 percent overall, and the walking mode share estimate is 11 percent overall.
  - These mode share estimates should be interpreted with caution, as they do not account for trip type and origin-destination pairs (e.g., which residents have job locations that make BART a feasible option). Rather, they represent estimated propensity to walk or bike to BART for Dublin residents based on distance and infrastructure availability.
  - Approximately 40 percent of Dublin residents are able to access the closest BART station using a low-stress biking route.

[1] *Major roads* were determined collaboratively with the City, using the FHWA *Guide for Improving Pedestrian Safety at Uncontrolled Crossings* as a reference point. More details are provided in Appendix A.

- **Job Centers:** A mode share estimate is provided for each of the seven job centers identified. Biking mode share estimates range between 1 and 3 percent, and walking mode share estimates range between 4 and 9 percent.
  - These mode share estimates should be interpreted with caution, as they do not represent true home and job location combinations but instead represent estimated propensity for Dublin residents to walk or bike to each job center based on distance and infrastructure availability.
  - The availability of low-stress bike routes varies depending on job center location. The share of Dublin residents with a low-stress bicycle route available to each job center ranges from approximately 19 percent to 37 percent.[2]
- **Parks:** A mode share estimate is provided for access to *any* park for each resident. Bike mode share is estimated to be 3 percent overall, and walking share is estimated to be 62 percent.
  - These mode share estimates should be interpreted with caution, as they do not represent all park trips but instead represent estimated propensity to walk or bike for Dublin residents to their nearest available park (i.e., walking- or biking-accessible parks to residents).
  - Overall, 41 percent of Dublin residents have a low-stress biking route to their nearest City park.

Next Steps

The mode share estimates and the summary of residents with low-stress biking access to activity centers will be included in the Plan and available to the City to demonstrate the potential benefit of infrastructure improvements in the future. The maps and descriptions displaying biking and walking perceived distances provide an indication of the availability of low-stress biking routes and of direct walking routes that promote walking and biking. As a next step, Kittelson will work with the City to identify roadway and path network segments that impede or prevent walking and biking access to highlight for the Task 4 prioritization.

The following Plan goals are relevant to the findings of this analysis:

- **Goal 3: Improve Connectivity** – Develop a bicycle and pedestrian network that provides well-connected facilities for users of all ages and abilities.
- **Goal 5: Prioritize Investments –** Maintain sufficient funding to provide for existing and future bicycle and pedestrian needs; including supporting programs, operations, and maintenance. Leverage biking and walking projects to promote economic activity and social equity outcomes among people of all ages and abilities.

The results of this analysis, especially the mapped results illustrating barriers to low-stress biking routes and walking routes, allow the project team to address both goals through this and subsequent tasks.

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[2] "Bicycle route available" indicates that a feasible route exists between origin and destination based on LTS rules (e.g., the *Interested but Concerned* population only rides on LTS 1 or 2 facilities)

BIKING AND WALKING TYPOLOGIES FOR DUBLIN

For this analysis, the Dublin population was grouped into biking and walking typologies based on age. The typologies represent varying propensities to walk and bike and varying sensitivities to infrastructure quality.

Table 1 presents the estimated distribution of bicyclist types by age group in Dublin, and Table 2 presents the effect calculated LTS score has on biking access as modeled in this analysis. More details of the bicyclist type definitions and determinations are included in the methodology memo, which is attached as Appendix A.

Table 1: Bike Group Typology – Assumed Share of Biker Type by Age Group

Type	Biker Type Share of Age Group (Columns Sum to 100%)				
	Under 5	6 - 18	18 - 34	35 – 54	55+
Strong and Fearless	0%	0%	11%	2%	0%
Enthused and Confident	0%	0%	7%	12%	7%
Interested but Concerned	0%	100%	61%	59%	46%
No Way, No How	100%	0%	21%	27%	47%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Table developed by Kittelson & Associates, Inc. from data presented by Dill and McNeil

Table 2: Impedance Factors for Bike Network

<table>
<tr><th rowspan="2">LTS Value of Roadway</th><th colspan="4">Impedance Effect for Biking Groups</th></tr>
<tr><th>No Way, No How</th><th>Interested but Concerned</th><th>Enthused and Confident</th><th>Strong and Fearless</th></tr>
<tr><td>LTS 1 / 2</td><td>No Access</td><td colspan="3">No effect</td></tr>
<tr><td>LTS 3</td><td>No Access</td><td>Absolute Impedance: Cannot use segment</td><td>Relative impedance: 1.5 distance multiplier along segment[1]</td><td>No effect</td></tr>
<tr><td>LTS 4</td><td>No Access</td><td>Absolute Impedance: Cannot use segment</td><td>Absolute Impedance: Cannot use segment</td><td>No effect</td></tr>
</table>

[1]This impedance factor is based on research by Broach, Gliebe, and Dill "Bicycle Route Choice Model Developed Using Revealed Preference GPS Data" indicating how far riders will diverge from the shortest path to avoid higher stress facilities

Table 3 presents the modeled walking population types by age and the effect infrastructure has on their walking routes as modeled in this analysis. More details of the walking type definitions and determinations are included in the methodology memo, which is attached as Appendix A.

Table 3: Proposed Impedance Factors for Walking Network

Infrastructure condition	Impedance Effect for Walking Group		
	Youth (≤14)	Teenage and Working Age Adults (15-55)	Aging (56 +)
Known Sidewalk gap[1]	**Absolute impedance:** Breaks network; inaccessible route		
Uncontrolled crossing of high-volume roads	**Absolute impedance:** Breaks network; inaccessible route	**Relative Impedance:** Adds 2.5 minutes to journey[2]	**Absolute impedance:** Breaks network; inaccessible route

[1] Comprehensive sidewalk gaps were not available, but sidewalk gaps were observed and modeled along major roadways.

[2]For this population, the route is available but is given the additional time penalty to approximate travel delay and general undesirability of crossing.

Source: Table developed by Kittelson & Associates, Inc.

MODE SHARE DATA

The mode share values used to estimate biking mode share are derived from a number of sources:

- City of Dublin and Alameda County Transportation Commission *Safe Routes to School* reports, including comparison among reported mode share data from assessments for Dougherty Elementary School, for Dublin Elementary School, and countywide. Detailed information is included in Appendix B.
- BART station profile access surveys. These surveys produce mode share estimates for each BART station, available online.[3] Kittelson worked with BART to identify home-based travel mode share to Dublin BART stations based on respondents' home location and distance to the nearest station. Detailed information is included in Appendix C.
- 2017 National Household Travel Survey (NHTS) data, conducted by the Federal Highway Administration with assigned travel dates from April 19, 2016 through April 25, 2017. The California Department of Transportation (Caltrans) participated in an add-on program to purchase extra household samples, resulting in 26,095 household samples statewide. The results presented below are based on a query within the 26,095 samples to reduce trips to those in Alameda and Contra

[3] https://www.bart.gov/about/reports/profile

Costa Counties, with place type defined "Suburban." Appendix D includes a memo describing the place typology development; Figure 3 in that memo shows an overlay of place type which includes Dublin in the suburban neighborhood category.

- 2015-2019 American Community Survey (ACS) data, which includes data on residents' commute mode share and is available at the Census block group level and at higher spatial resolutions.

DETAILED RESULTS

Mode share estimates for existing conditions are presented by activity center and are organized as follows:

- **Schools:** All public K-12 schools within Dublin Unified School District
- **BART:** West Dublin/Pleasanton station and Dublin/Pleasanton station
- **Job Centers:** A number of job centers within Dublin identified with City staff
- **Parks:** Neighborhood and community parks in Dublin, as identified in the City's Parks and Recreation Master Plan and confirmed with City staff.

Mode share estimates vary by destination because people have different mode selection choices based on trip type and the characteristics of their destinations. Discussion of each activity center includes a table or chart illustrating the distribution of the relevant Dublin population by perceived travel distance as well as mode share estimates. Accompanying maps provide visual representation of available routes to activity centers. The mode share estimates should be interpreted with caution, as they are point estimates indicating estimated propensity for Dublin residents to walk or bike based on home location and distance to activity centers. However, they do not account for the remaining multitude of variables that impact mode share— including for example parking availability, household vehicle access, income and wealth level, disability status, trip chaining, and other infrastructure factors not collected, and many other factors. Constructing precise mode share estimates including those factors is beyond the scope of this task.

Table 4 presents the lookup values used for biking and walking estimates based on perceived distance. These lookup values are estimates based on the best available data for this task. An example illustrates how this table was used:

- The top row, "0 -1/8 miles," indicates 79 percent walking and 5 percent biking to parks.
- This is the percent of the population estimated to have a perceived travel distance in that range to their nearest park.
- This process was repeated at every distance range listed.

Table 4: Biking and Walking Mode Share by Activity Center Type and Distance

Distance (Miles)	Activity Center Type							
	School[1]		BART[2]		Job Centers[3]		Parks[4]	
	Walk	Bike	Walk	Bike	Walk	Bike	Walk	Bike
0 – 1/8	55%	25%	85%	10%	75%	0%	79%	5%
1/8 – 1/4	55%	30%	85%	10%	75%	0%	79%	5%
1/4 – 3/8	40%	30%	80%	10%	45%	1%	67%	9%
3/8 – 1/2	40%	25%	80%	10%	45%	1%	67%	9%
1/2 – 5/8	16%	20%	66%	14%	13%	6%	42%	9%
5/8 – 3/4	16%	20%	66%	14%	13%	6%	42%	9%
3/4 – 7/8	16%	15%	50%	12%	13%	6%	42%	9%
7/8 – 1	16%	15%	50%	12%	13%	6%	42%	9%
1 – 1-1/8	10%	10%	29%	8%	6%	9%	22%	9%
1-1/8 – 1-1/4	10%	10%	29%	8%	6%	9%	22%	9%
1-1/4 – 1-3/8	10%	10%	12%	8%	6%	9%	22%	9%
1-3/8 – 1-1/2	10%	10%	12%	8%	6%	6%	22%	9%
1-1/2 – 1-5/8	0%	1%	7%	8%	3%	14%	10%	4%
1-5/8 – 1-3/4	0%	1%	7%	8%	3%	14%	10%	4%
1-3/4 – 1-7/8	0%	1%	5%	8%	3%	14%	10%	4%
1-7/8 – 2	0%	1%	5%	8%	3%	14%	10%	4%
2+	0%	1%	2%	7%	1%	10%	6%	3%

[1]Data are based on comparison among reported mode share data from *Safe Routes to School* Assessments at Dougherty Elementary School, at Dublin Elementary School, and countywide.
[2]Data are based on BART's 2015 Station Access Profiles, available at https://www.bart.gov/about/reports/profile.
[3]Data are based on NHTS work-based trips from the above-described sample.
[4]Data are based on NHTS recreational trips from the above-described sample.
[5]Biking and walking mode share would taper off further at distances greatly exceeding 2 miles, but residents' access distance as modeled here never greatly exceeds 2 or 3 miles given the size of Dublin. Hence, for simplicity, the outer distance band for this analysis is "2+ miles."

Schools

The school analysis was conducted based on residential location and school enrollment information provided by the Dublin Unified School District. The data used to calibrate the mode share estimates are provided in Table 4 and Appendix B. The estimated walking and biking mode share by school is presented in Table 5. The perceived walking and biking distances for students at each school, along with mode share estimates, are provided in Figure 1 and Figure 2.

Table 5: Mode Share Estimates by School

School	Walking	Biking	Share of student population with bicycle route available[1]
Amador Elementary	28%	14%	55%
Cottonwood Creek K-8	35%	7%	27%
Dougherty Elementary	36%	10%	35%
Dublin Elementary	23%	1%	5%
Dublin High	13%	0%	0%
Fallon Middle	23%	2%	8%
Frederiksen Elementary	24%	0%	1%
Green Elementary	31%	6%	22%
Kolb Elementary	37%	14%	53%
Murray Elementary	24%	0%	0%
Wells Middle	16%	0%	0%

[1]This statistic measures the portion of the population who have a bicycle route available based on LTS rules (e.g., the *Interested but Concerned* population only rides on LTS 1 or 2 facilities but the *Strong and Fearless* population rides on all facilities)

Source: Prepared by Kittelson & Associates, Inc.

Walking

For elementary and middle schools all students are modeled as *youth*: they do not cross at uncontrolled crossings along major roads. All high school students are modeled as *teenage and working age adults*: uncontrolled crossings along major roads are modeled as impediments that increase perceived travel distance but do not fully block access.

Dougherty Elementary exhibits the highest estimated walk share at 36 percent, which is close to the available mode share survey data of 39 percent (see Appendix B). Other elementary schools similarly exhibit high estimated walk shares, due in part to the localized nature of their student population compared to middle and high schools.

The perceived walking distances for students at each school, along with mode share estimates, are provided in Figure 1. Walking access for each school is mapped in Figure W.S.1 through Figure W.S.11 (presented in the *Map Figures* section).

Biking

All students are assumed to be *Interested but Concerned* bicyclists because of their age range: the do not ride on LTS 3 or 4 segments. Mode share estimates for each school range between 0 percent and 14 percent. The percentage of students with a complete low-stress biking route from home to school ranged between 0 and 55 percent by school.

The analysis results in a 0 percent biking mode share estimate for Dublin High, Frederiksen Elementary, Murray Elementary, and Wells Middle School. As described already in this memo, this estimate is not intended to claim that zero students ride to school; it is a point estimate based on propensity to bike as a result of infrastructure availability and quality. Biking access to both schools is provided along roadways that have LTS scores of 3 or 4, resulting in a barrier to low-stress access. Reducing LTS along roadways providing access to these two schools has the potential to result in a substantial bicycle access mode shift.

The perceived biking distances for students at each school, along with mode share estimates, are provided in Figure 2. Biking access for each school is mapped in Figure B.S. through B.S.11.

Figure 1: Share of School Population by Perceived Walking Distance and Estimated Walking Mode Share

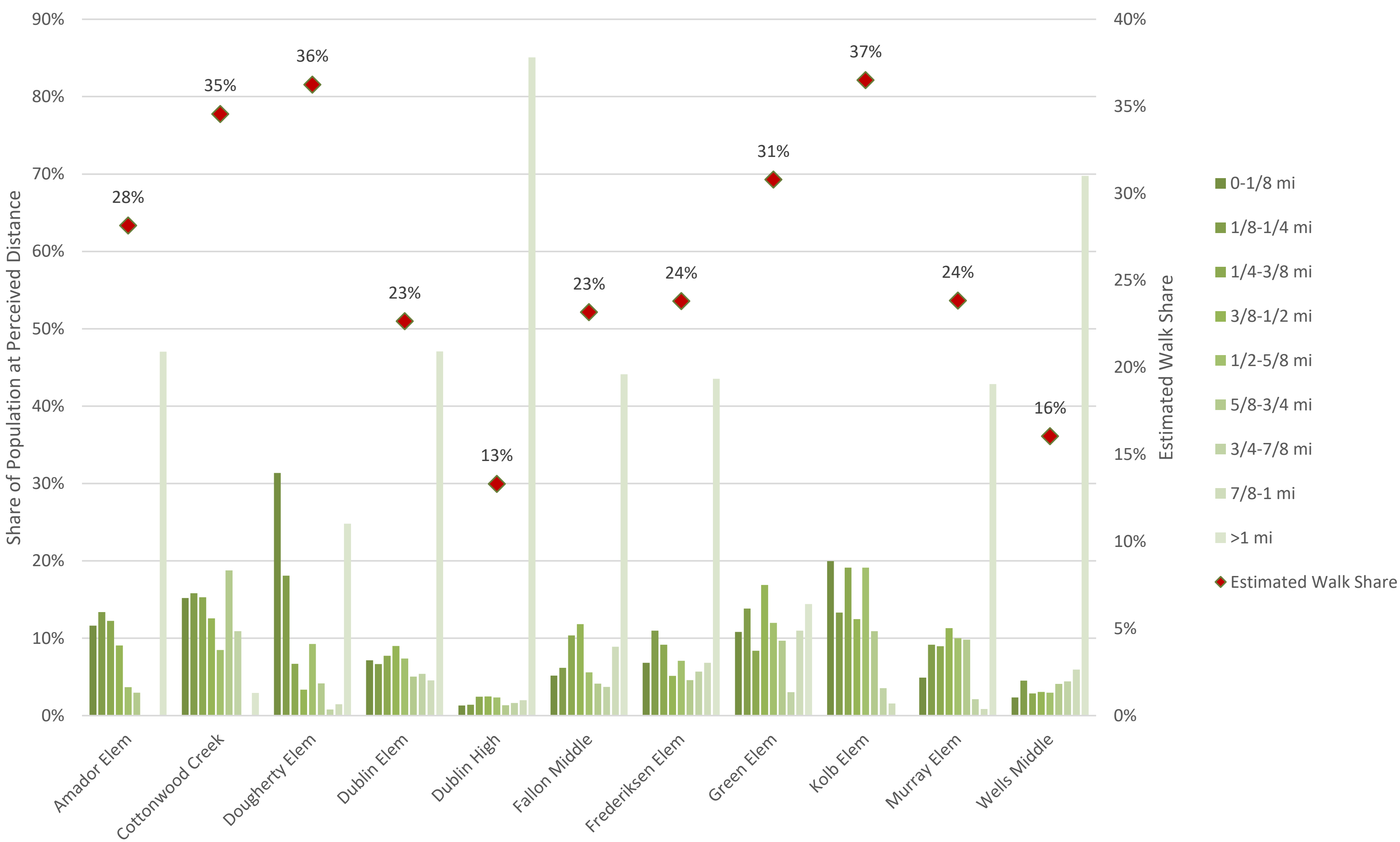
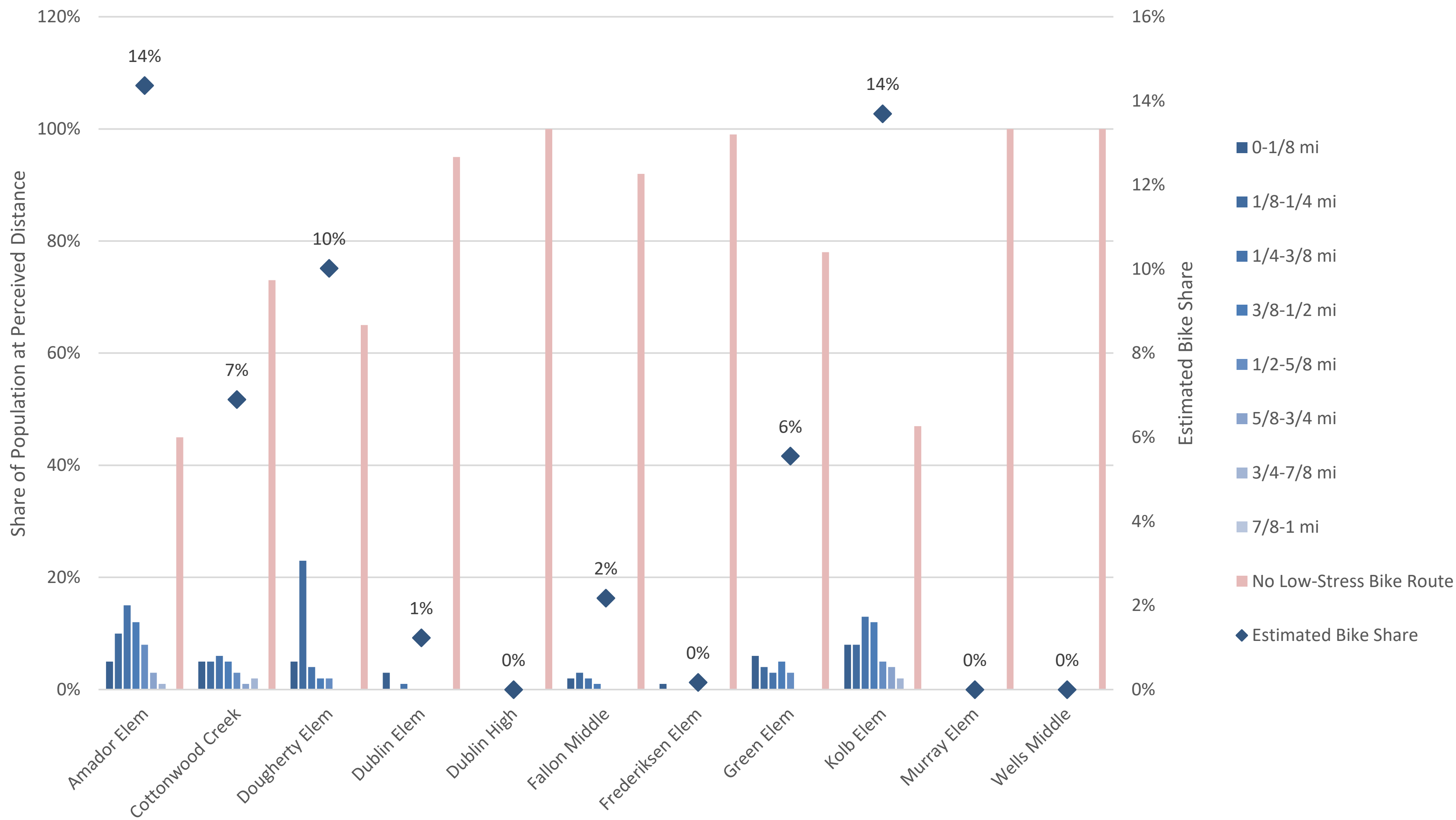


Figure 2: Share of School Population by Perceived Biking Distance and Estimated Biking Mode Share



BART

The estimated walking and biking mode shares are presented in Table 6,which shows an estimated 6 percent biking share and 11 percent walking share. BART mode share was estimated for all Dublin adults (16 and above). Access for each resident is determined by the nearest station (West Dublin/Pleasanton or Dublin/Pleasanton); in other words, the analysis measures perceived distance to *either* station for each resident rather than a specific station. The mode share data used to calibrate estimates are provided in Table 4 and Appendix D.

Table 6: BART Access by Perceived Distance and Bicyclist Type and Estimated Mode Share

Estimate	Share of Population
Walking	11%
Biking	
No Way, No How	*0%*
Interested but Concerned	*<1%*
Enthused and Confident	*36%*
Strong and Fearless	*52%*
Total across all Biker Types	6%
Share of Population with Bicycle Route Available[1]	31%

[1]This statistic measures the portion of the population who have a bicycle route available based on LTS rules (e.g., the *Interested but Concerned* population only rides on LTS 1 or 2 facilities but the *Strong and Fearless* population rides on all facilities)

Note: Population for Analysis includes all Dublin adults (43,491)

Source: Prepared by Kittelson & Associates, Inc.

Walking

Walking analysis was conducted separately for the population between 16 and 55 years old and the population above 56 years and older, with walking barriers modeled differently (as explained in Table 3). The perceived distance to the nearest BART station for Dublin residents is presented in Figure 3. The figure demonstrates that the available walking route for most Dublin residents is outside of a conventional half-mile walk shed.

Walking access to BART is mapped in Figures W.B.1 and W.B.2.

Biking

The perceived distance to the nearest BART station for Dublin residents is presented in Figure 4. The figure demonstrates that barriers dissuade the assumed *Interested but Concerned* and *Enthused and Confident* populations from biking to BART. Among the assumed *Strong and Fearless* population, 58 percent are within two miles of a BART station. By contrast, LTS 4 facilities are barriers for *Enthused and Confident* riders, resulting in 72 percent of this population with an available biking route to BART. For *Interested but Concerned* riders who are blocked by LTS 3 and 4 facilities, 1 percent have an available biking route to BART. Improving a few key barriers would improve the availability of bicycle routes for these portions of the Dublin population and unlock latent demand. For example, because both BART stations are south of Dublin Boulevard, people biking need to cross or travel along Dublin Boulevard and other nearby arterial segments.

Biking access to BART is mapped in B.B.1 through B.B.3.

Figure 3: Share of Population by Perceived Walking Distance to BART

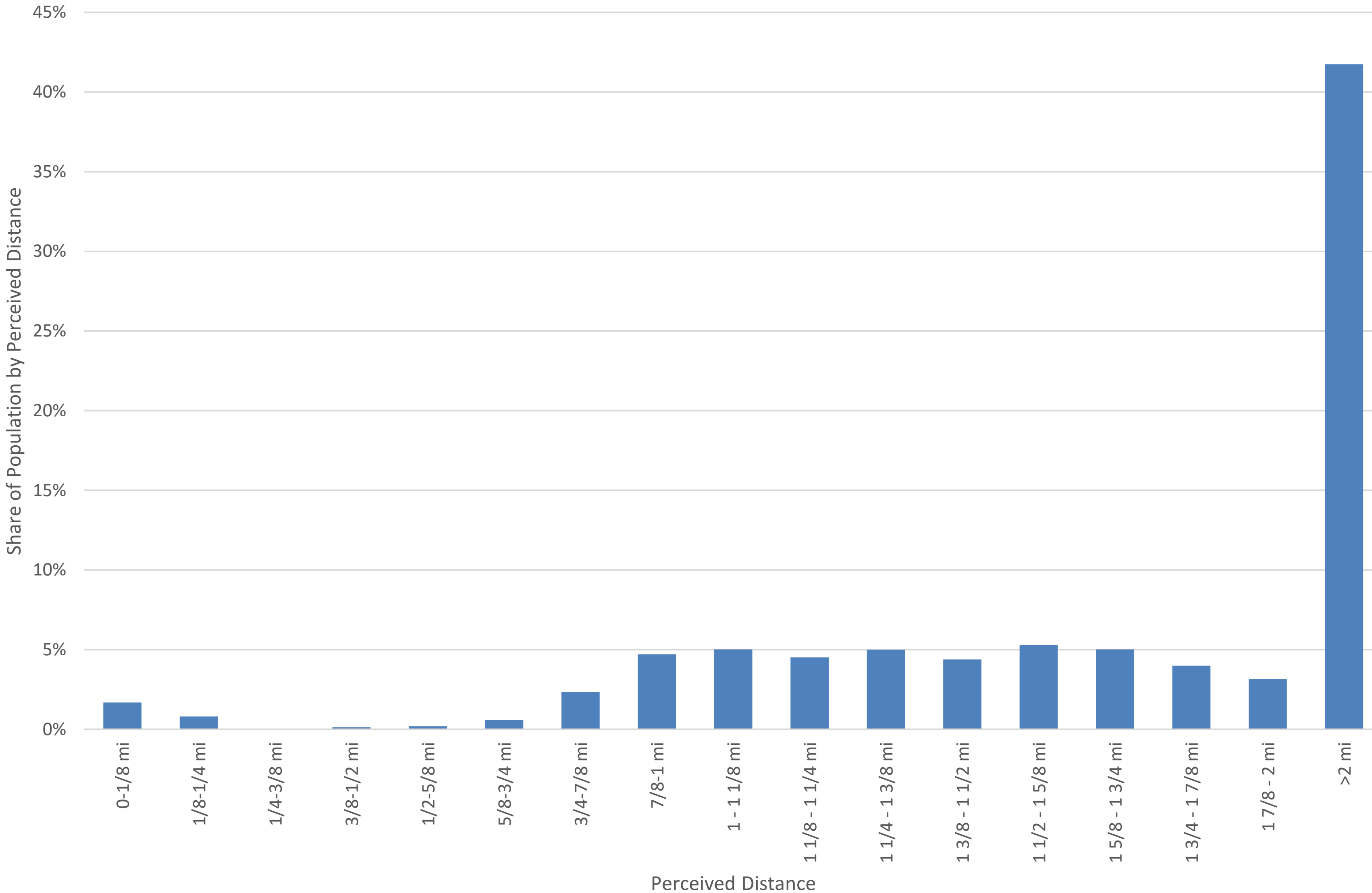
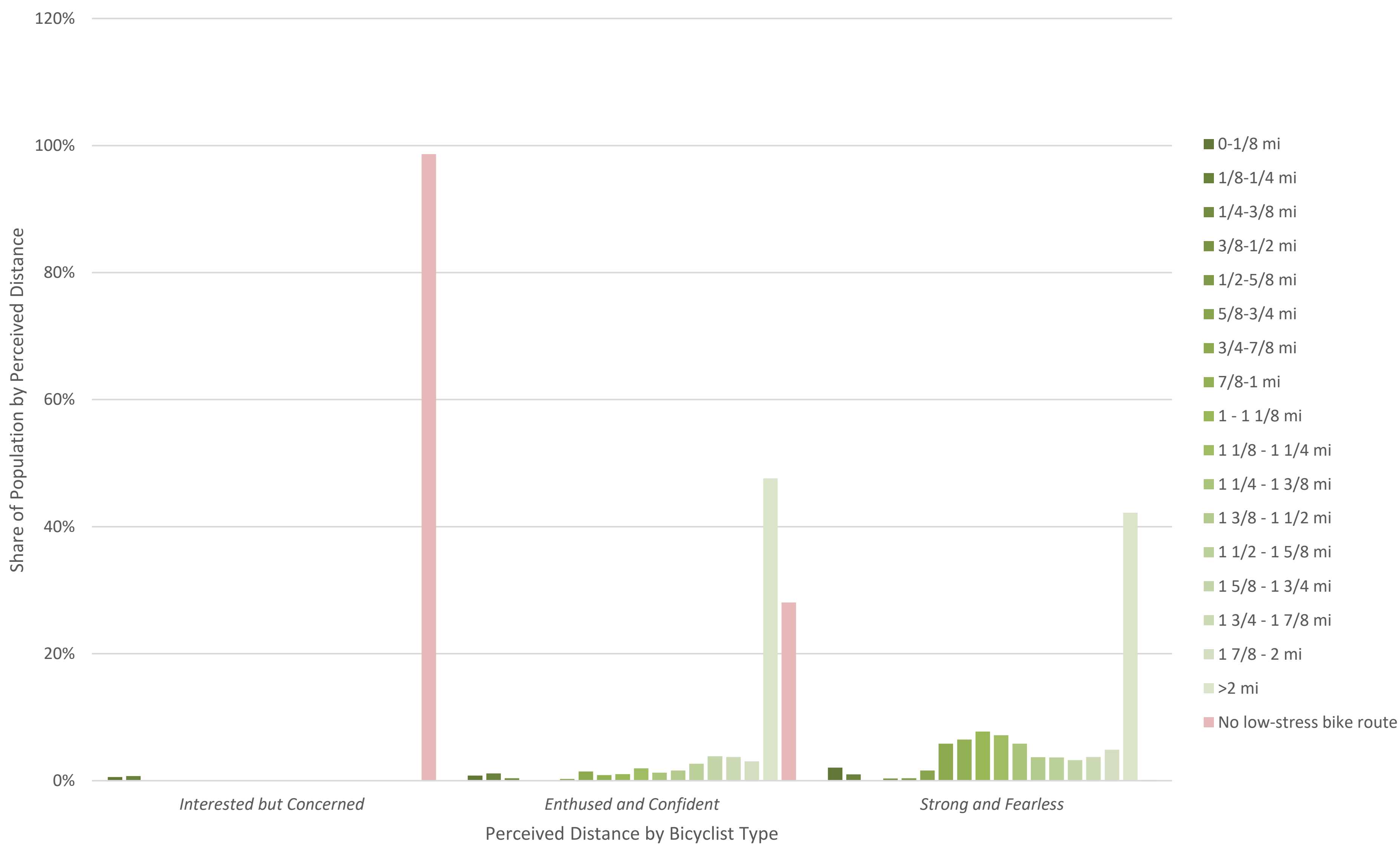


Figure 4: Share of Population by Perceived Biking Distance to BART



Job Centers

Job center mode share estimates are presented for each job center in Table 7. Job center mode share was estimated for all Dublin adults (16 and above). Access to multiple job centers is not a concern for all Dublin residents; each worker typically only commutes to one of these job centers, to another job in Dublin, or to a job outside Dublin. However, access to each job center is analyzed because it is *potentially relevant* for each Dublin resident or worker (whereas access to job centers in aggregate would not be relevant to any resident or worker). The mode share data used to calibrate estimates are provided Table 4 and are substantiated by citywide commute mode shares based on ACS data as discussed in the June 22 Demographic Analysis memorandum. A map excerpt from that memorandum is shared in Appendix E. The job centers are identified A through G, with each representing the following employers (based on data provided by the City's Economic Development Department):

- **Job Center A:** Dublin Blvd & Fallon Rd (Target, Kaiser Permanente, and others)
- **Job Center B:** Dublin Blvd & Dougherty Rd (NCM Demolition and Remediation, North Star Group, Park West, Gold Metal Press, Touch Place, and others)
- **Job Center C:** Dublin Corporate Center (Dublin Blvd & Tassajara Rd)
- **Job Center D:** Gleason Dr/Central Pkwy at Arnold Dr (Ross, Carl Zeiss Meditec, DTI Dental Technologies)
- **Job Center E:** Dublin Blvd & San Ramon Rd (DeSilva Gates, Hexcel Corporation, Challenge Dairy HQ, Graybar Electric, 580 Executive Center)
- **Job Center F:** Central Pkwy/Dublin Blvd at Arnold Dr (AEye, Patelco Credit Union, TriNet, Alameda County Sheriff's Office, Zeiss Innovation Center)
- **Job Center G:** Hacienda Crossings

The walking share estimates range between 4 and 9 percent per job center, and the bike share estimates range from between 1 and 3 percent. The variability among job centers can be attributed to their locations relative to residential locations within Dublin and the infrastructure immediately surrounding them. For example, Job Center E is located in the western portion of Dublin away from the bulk of residential locations and is accessible via Dublin Boulevard, which includes portions with LTS scores of 3 or 4. The portion of Dublin residents with a low-stress bicycle route available varies between 16 percent (Job Center E) and 37 percent (Job Center B).[4]

The perceived walking and biking distances for each job center are provided in Figure 5 and Figure 6. Walking access and routes to job centers are presented in Figures W.J.1 through W.J.16. Biking access and routes to job centers are presented in B.J.1 through B.J.7.

[4] "Bicycle route available" indicates that a feasible route exists between origin and destination based on LTS rules (e.g., the *Interested but Concerned* population only rides on LTS 1 or 2 facilities)

Table 7: Mode Share Estimates by Job Center

School	Walking	Biking	Share of population with bicycle route available[1]
Job Center A: Dublin Blvd & Fallon Rd (Target, Kaiser Permanente, and others)	8%	2%	18%
Job Center B: Dublin Blvd & Dougherty Rd (NCM Demolition and Remediation, North Star Group, Park West, Gold Metal Press, Touch Place, and others)	8%	3%	37%
Job Center C: Dublin Corporate Center (Dublin Blvd & Tassajara Rd)	6%	2%	20%
Job Center D: Gleason Dr/Central Pkwy at Arnold Dr (Ross, Carl Zeiss Meditec, DTI Dental Technologies)	9%	3%	32%
Job Center E: Dublin Blvd & San Ramon Rd (DeSilva Gates, Hexcel Corporation, Challenge Dairy HQ, Graybar Electric, 580 Executive Center)	4%	1%	16%
Job Center F: Central Pkwy/Dublin Blvd at Arnold Dr (AEye, Patelco Credit Union, TriNet, Alameda County Sheriff's Office, Zeiss Innovation Center)	9%	2%	20%
Job Center G: Hacienda Crossings	9%	2%	19%

[1]This statistic measures the portion of the population who have a bicycle route available based on LTS rules (e.g., the *Interested but Concerned* population only rides on LTS 1 or 2 facilities but the *Strong and Fearless* population rides on all facilities)

Note: Population for analysis includes all Dublin adults (43,491)

Source: Prepared by Kittelson & Associates, Inc.

Figure 5: Share of Population by Perceived Walking Distance to Job Centers

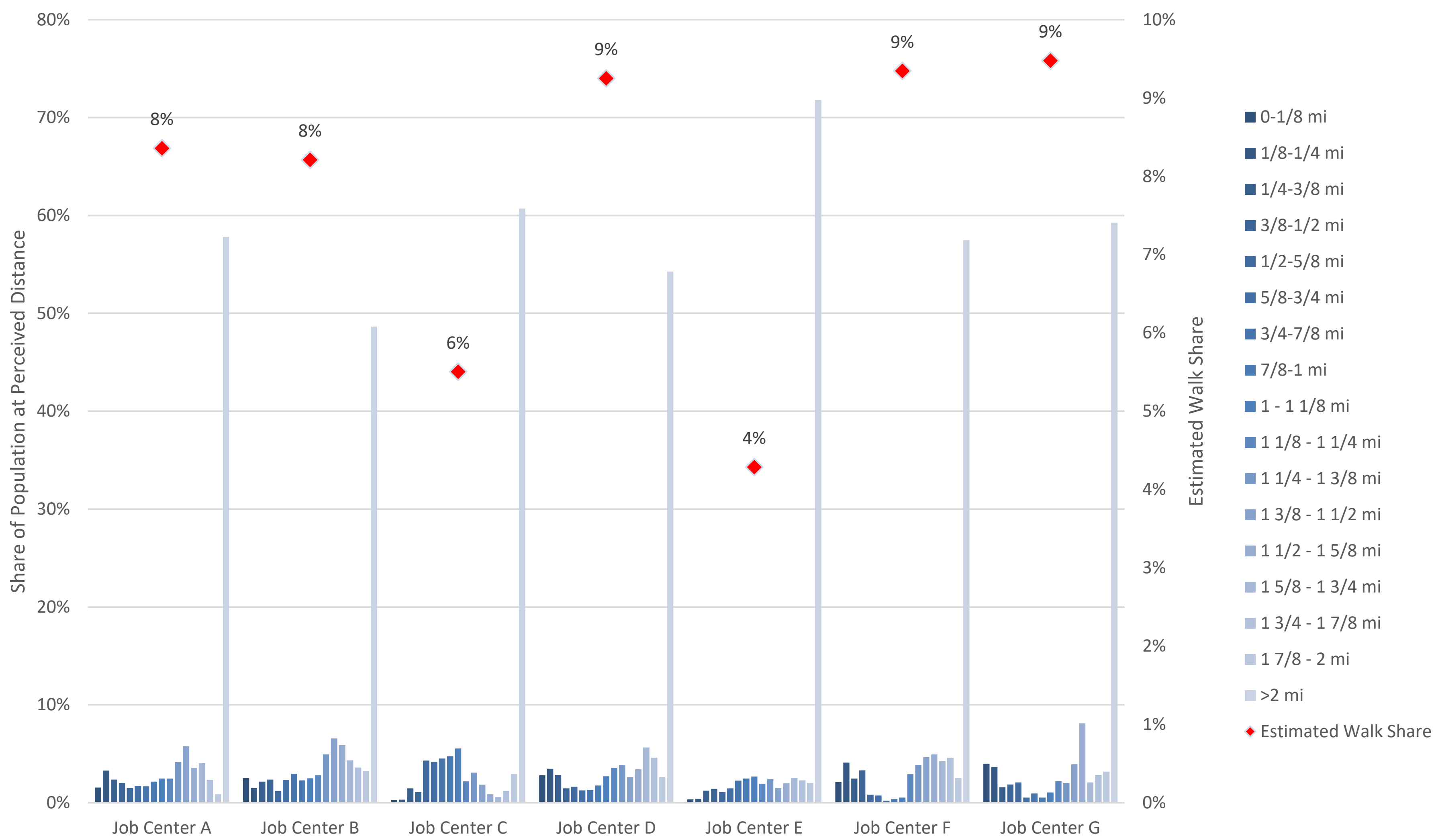
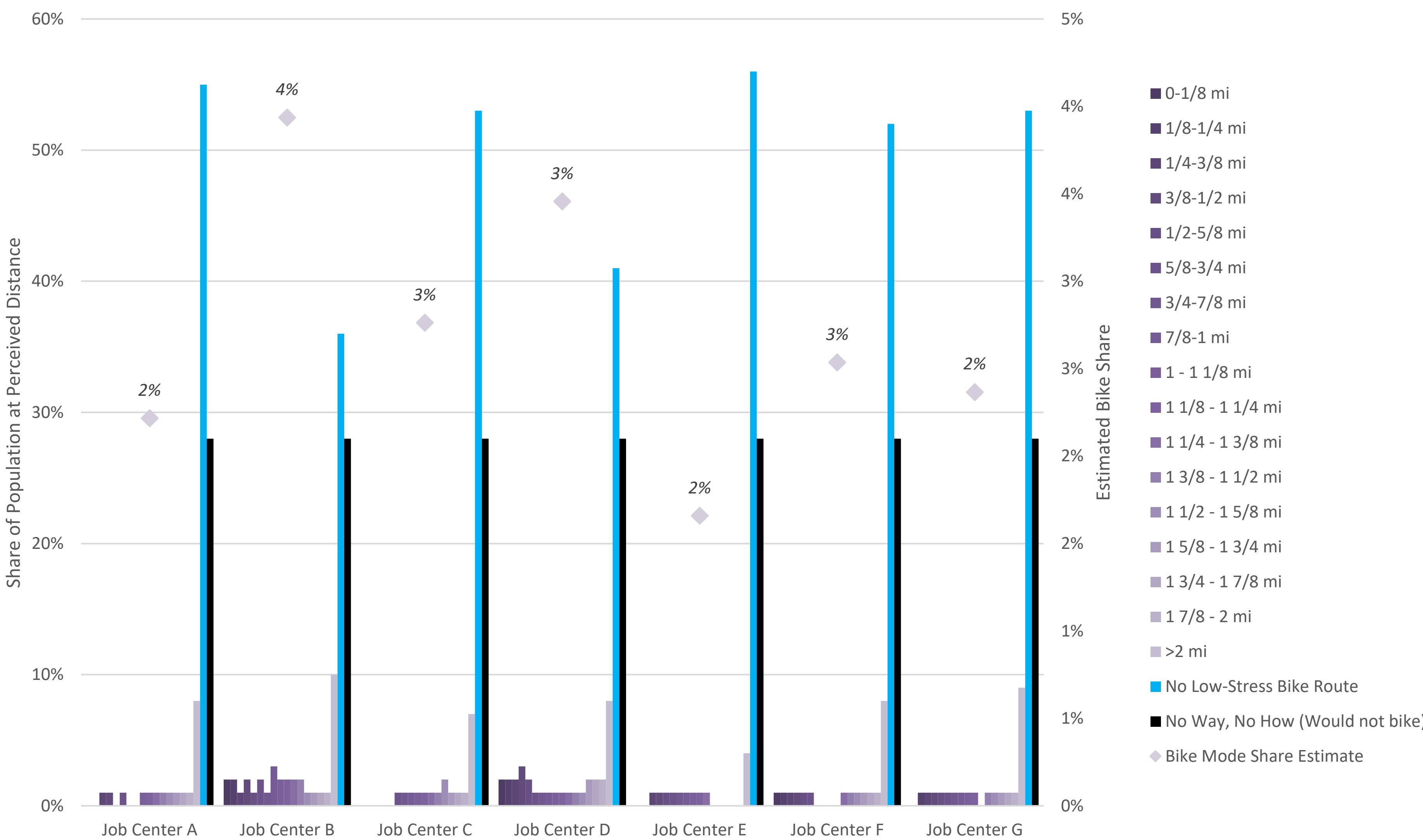


Figure 6: Share of Population by Perceived Biking Distance to Job Centers



Parks

Park access and mode share estimates were conducted for all Dublin residents. Access for each resident is determined by the nearest City park; in other words, the analysis measures perceived distance to *any* park for each resident rather than for a specific one. The mode share data used to calibrate estimates are provided in Table 4 and Appendix D. The estimated walking and biking mode shares are presented in Table 8, which shows an estimated 3 percent biking share and 62 percent walking share. As the results indicate, the ubiquity of parks provides a relatively close park to most Dublin residents. However, low-stress bicycle routes are not abundant which prevents some residents from having an appropriately low-stress bicycle route to their nearest park.

The perceived walking and biking distances by population are presented in Figure 7 and Figure 8, respectively. The comparative perceived distances illustrate the difference in available walking routes compared to available low-stress bicycle routes.

Table 8:Park Mode Share Estimates

Estimate	Share of Population
Walking	62%
Biking	3%
Share of Population with Bicycle Route Available[1]	42%

[1]This statistic measures the portion of the population who have a bicycle route available based on LTS rules (e.g., the *Interested but Concerned* population only rides on LTS 1 or 2 facilities but the *Strong and Fearless* population rides on all facilities)

Note: Population for Analysis includes all Dublin residents (59, 274)

Source: Prepared by Kittelson & Associates, Inc.

Walking access to parks is mapped in Figures W.P.1 and W.P.2. Biking access to parks is mapped in B.P.1 through B.P.3.

Figure 7: Share of Population by Perceived Walking Distance to Nearest Park

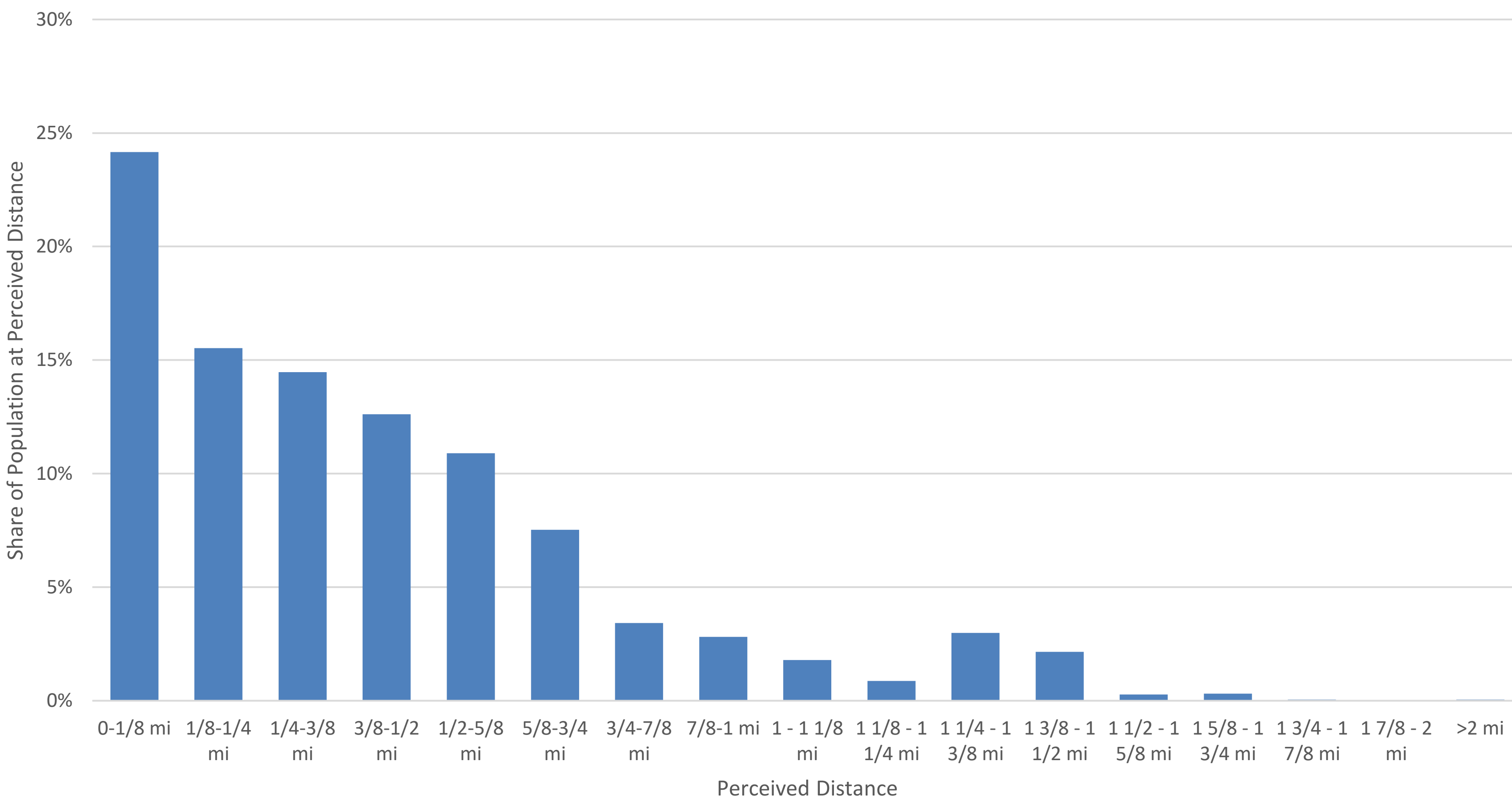
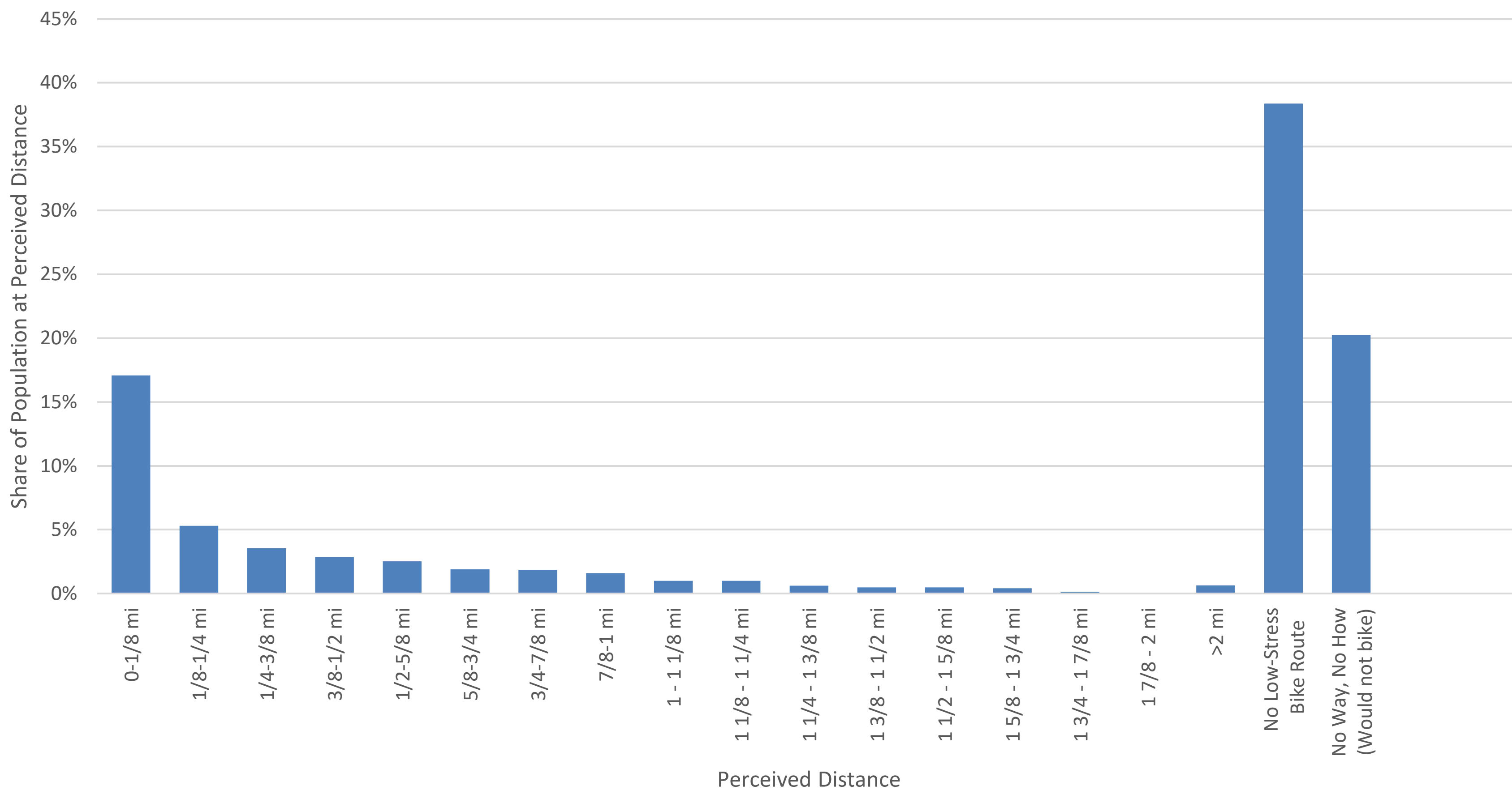


Figure 8: Share of Population by Perceived Biking Distance to Nearest Park



MAP FIGURES

Schools

Walking: Figures W.S.1-W.S.11 - Each figure illustrates the relevant walking typology group for each school

Biking: Figures W.B. 1-W.S.11 - Each figure illustrates the relevant walking typology group for each school

BART

Walking: Figures W.B.1-W.B.2 -- Each figure illustrates access for one walking age typology group.

Biking: Figures B.B.1-B.B.2 -- Each figure illustrates access for one biking typology group. The *No way, no how* group is not shown, given that they are assumed not to bike.

Job Centers

Walking: Figures W.J.1-W.J.16 -- Each figure illustrates access for one walking age typology groups and one job center. Figures 1 and 2 illustrate Job Center A, 3 and 4 illustrate Job Center B, and so forth.

Biking: Figures B.J.1-B.B.7 -- Each figure illustrates access for one biking typology group and one job center. Figures B.J.1a through B.J.1c illustrate Job Center A, B.J.2a through B.J.2c illustrate Job Center B, and so forth.

Parks

Walking: Figures W.P.1-W.P.2 -- Each figure illustrates access for one walking age typology group.

Biking: Figures B.P.1-B.P.3 -- Each figure illustrates access for one biking typology group. The *No way, no how* group is not shown, given that they are assumed not to bike.

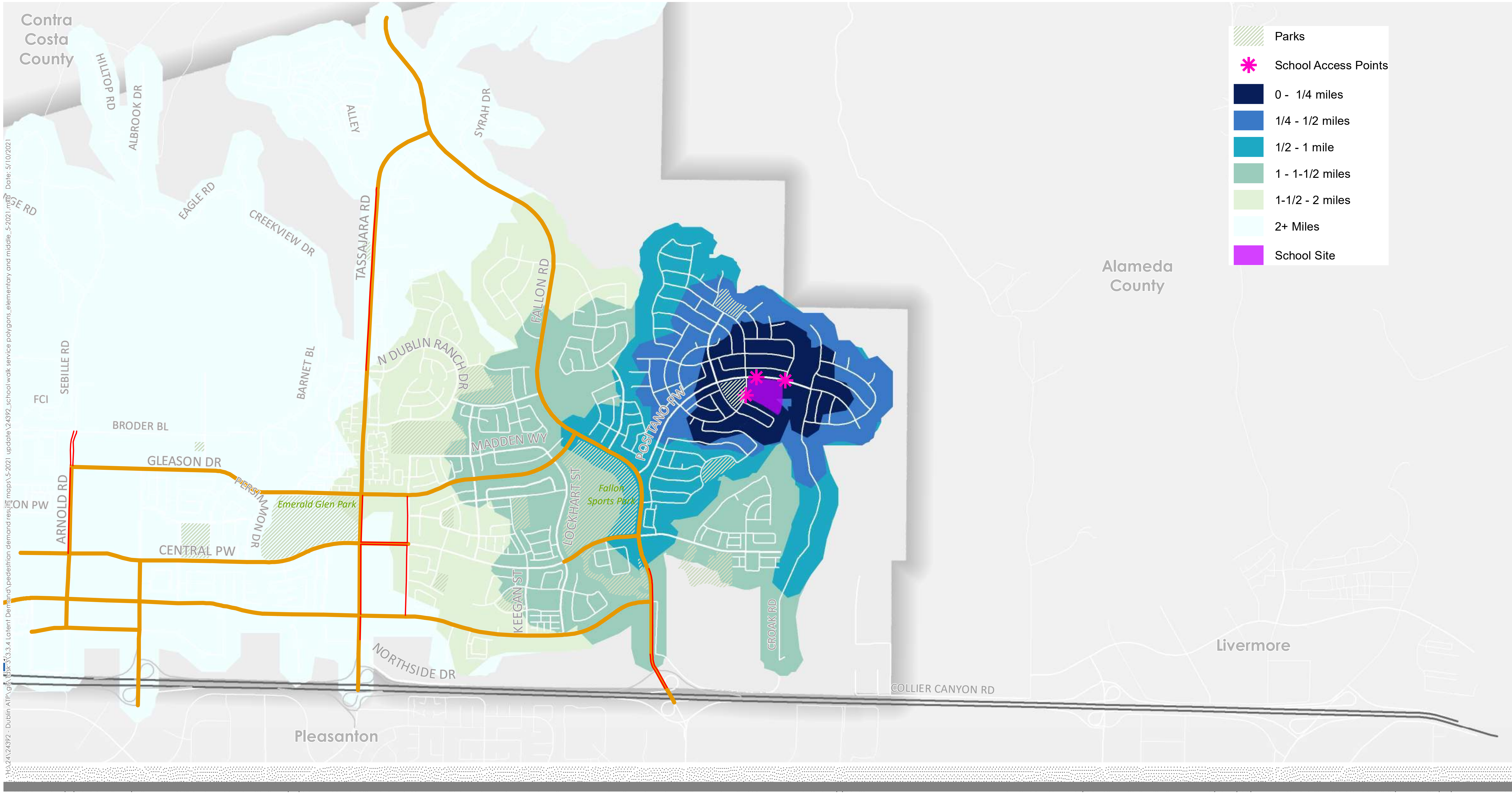
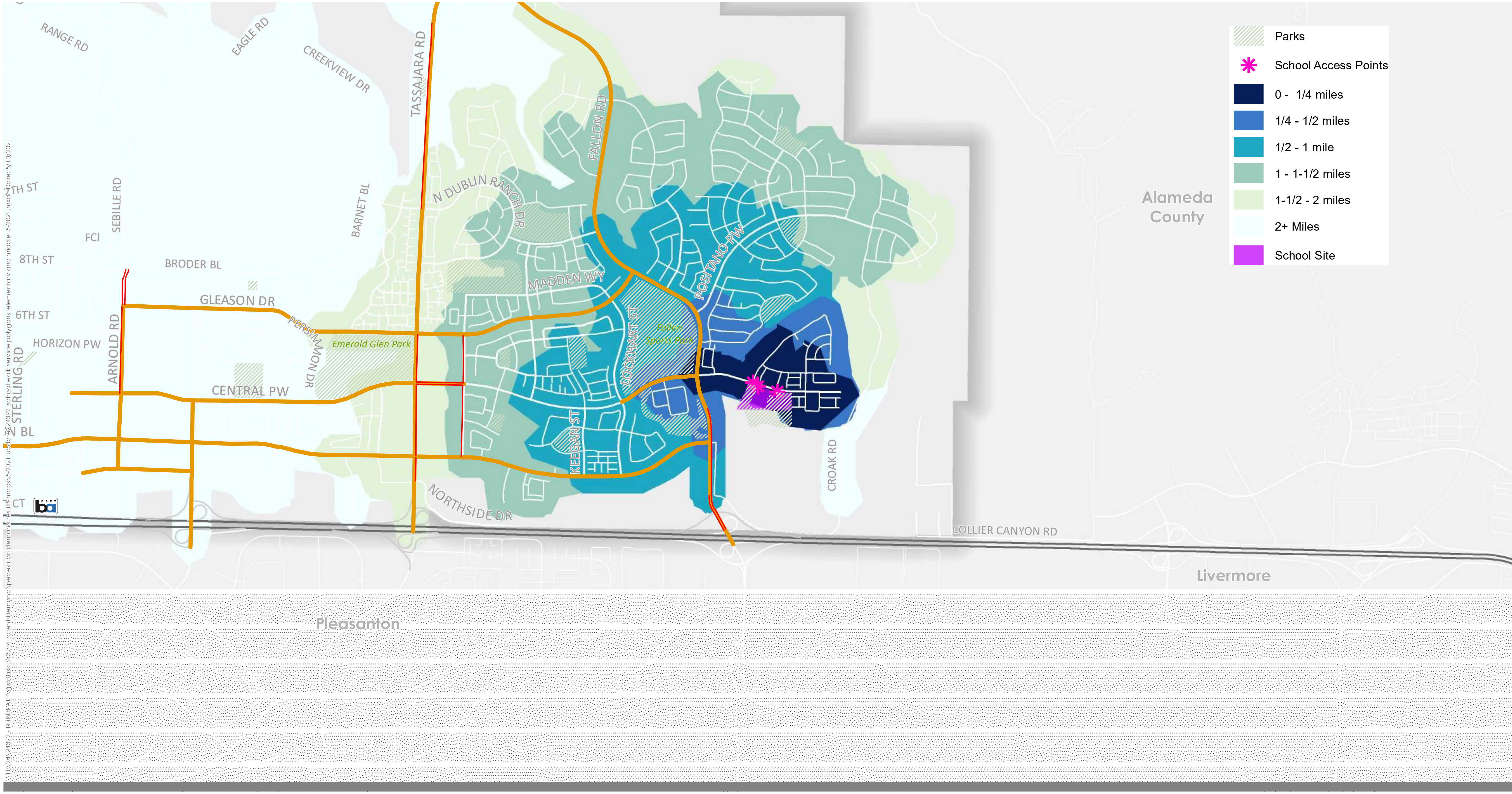


Figure W.S.1

Elementary And Middle School Network Service Areas: Walking Perceived Distances
Amador Elem
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES



DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

Figure W.S.2

Elementary And Middle School Network Service Areas: Walking Perceived Distances
Cottonwood Creek
Dublin, California

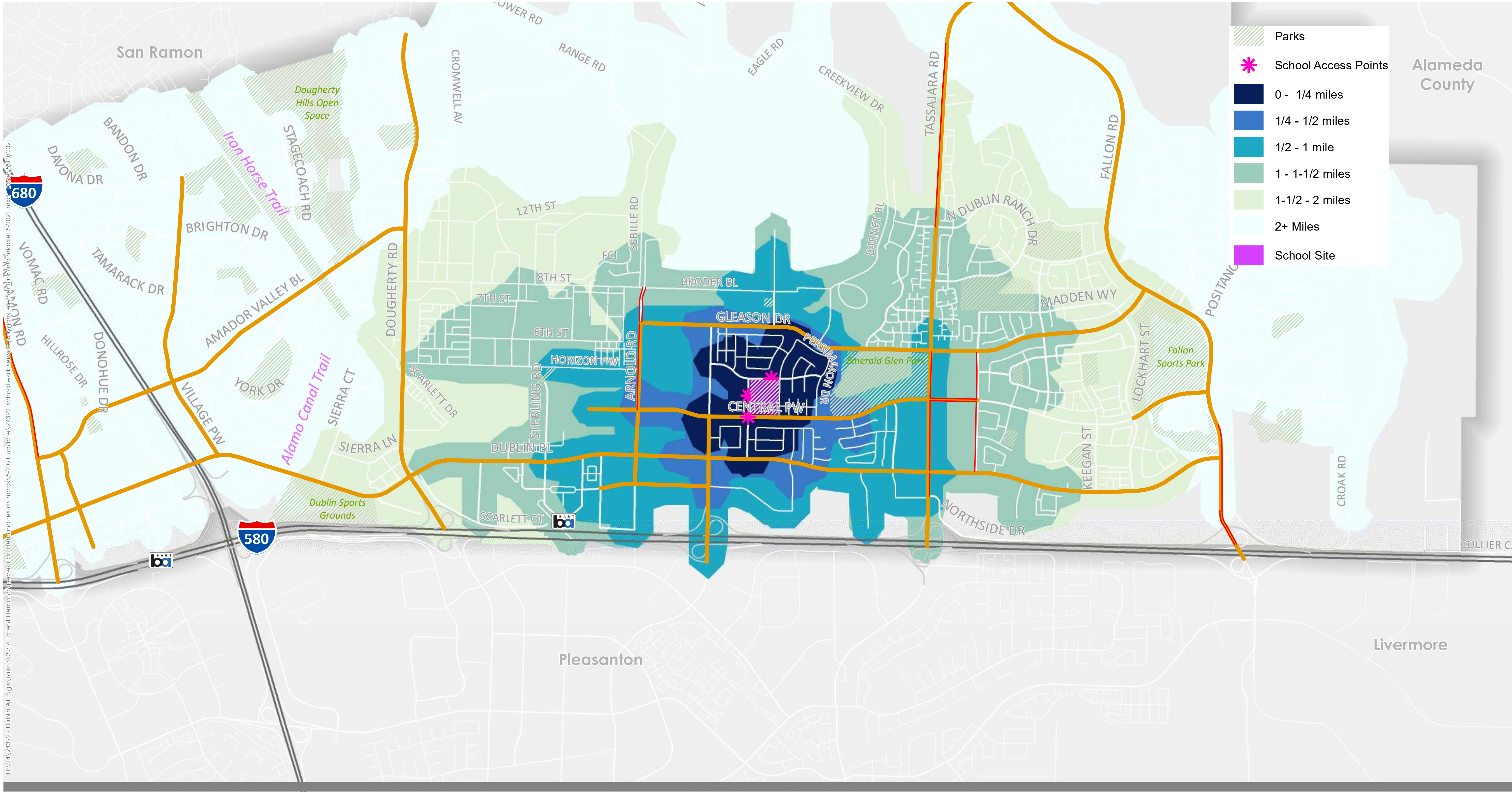


Figure W.S.3

Elementary And Middle School Network Service Areas: Walking Perceived Distances
Dougherty Elem
Dublin, California

DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

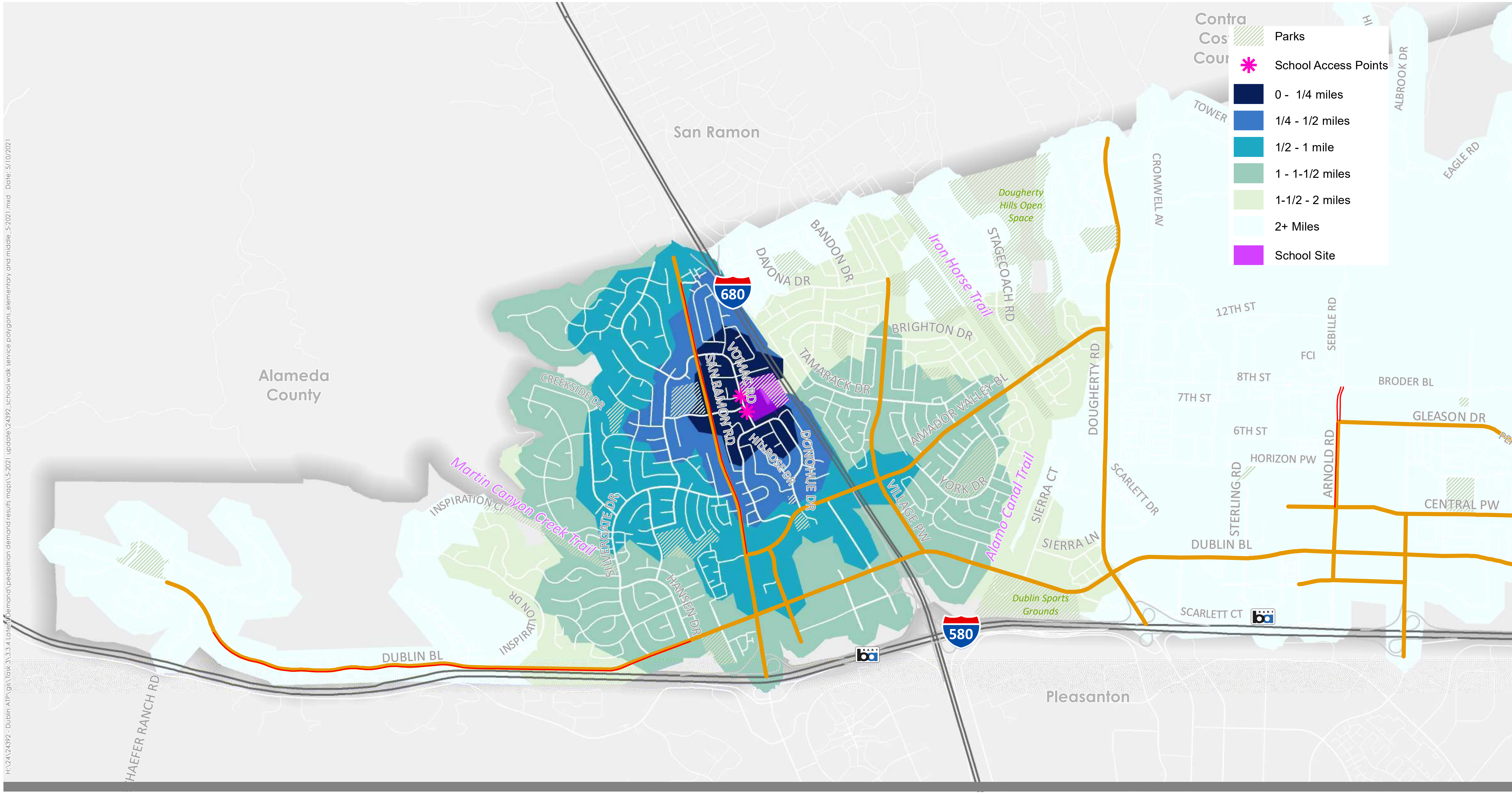
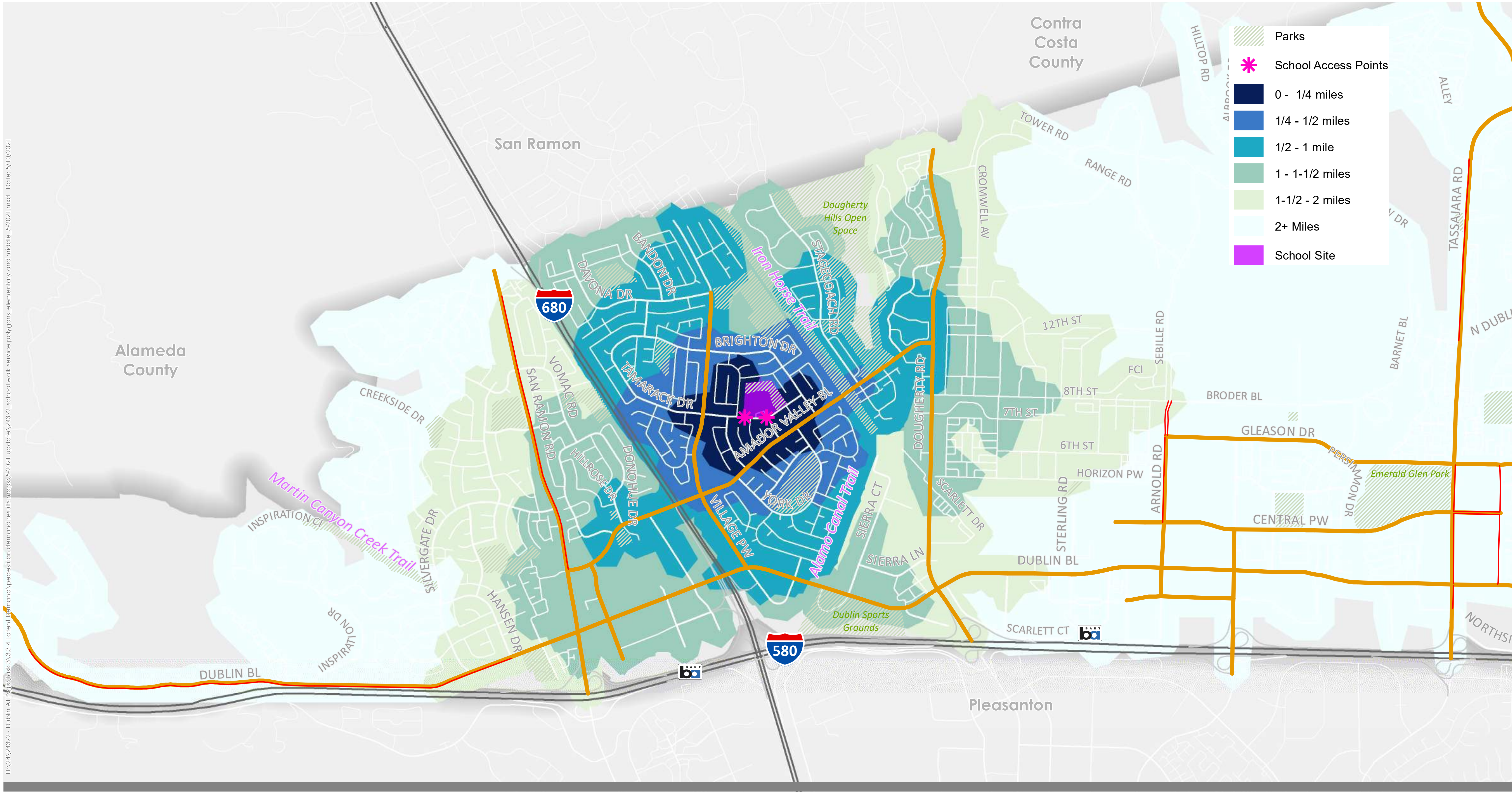


Figure W.S.4

Elementary And Middle School Network Service Areas: Walking Perceived Distances
Dublin Elem
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES



DUBLIN CALIFORNIA

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Figure W.S.5

Elementary And Middle School Network Service Areas: Walking Perceived Distances
Frederiksen Elem
Dublin, California

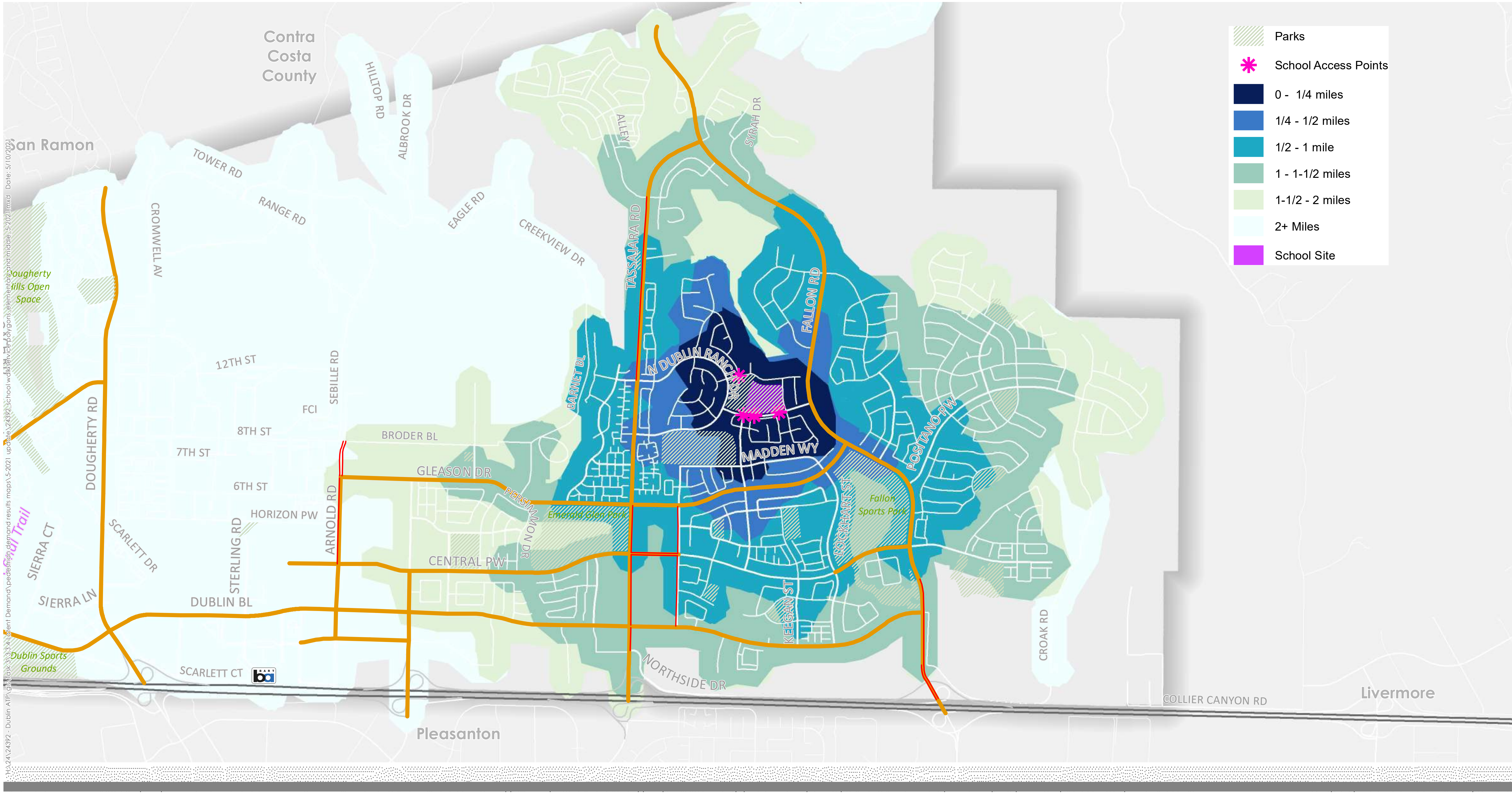


Figure W.S.6

Elementary And Middle School Network Service Areas: Walking Perceived Distances
Green Elem
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

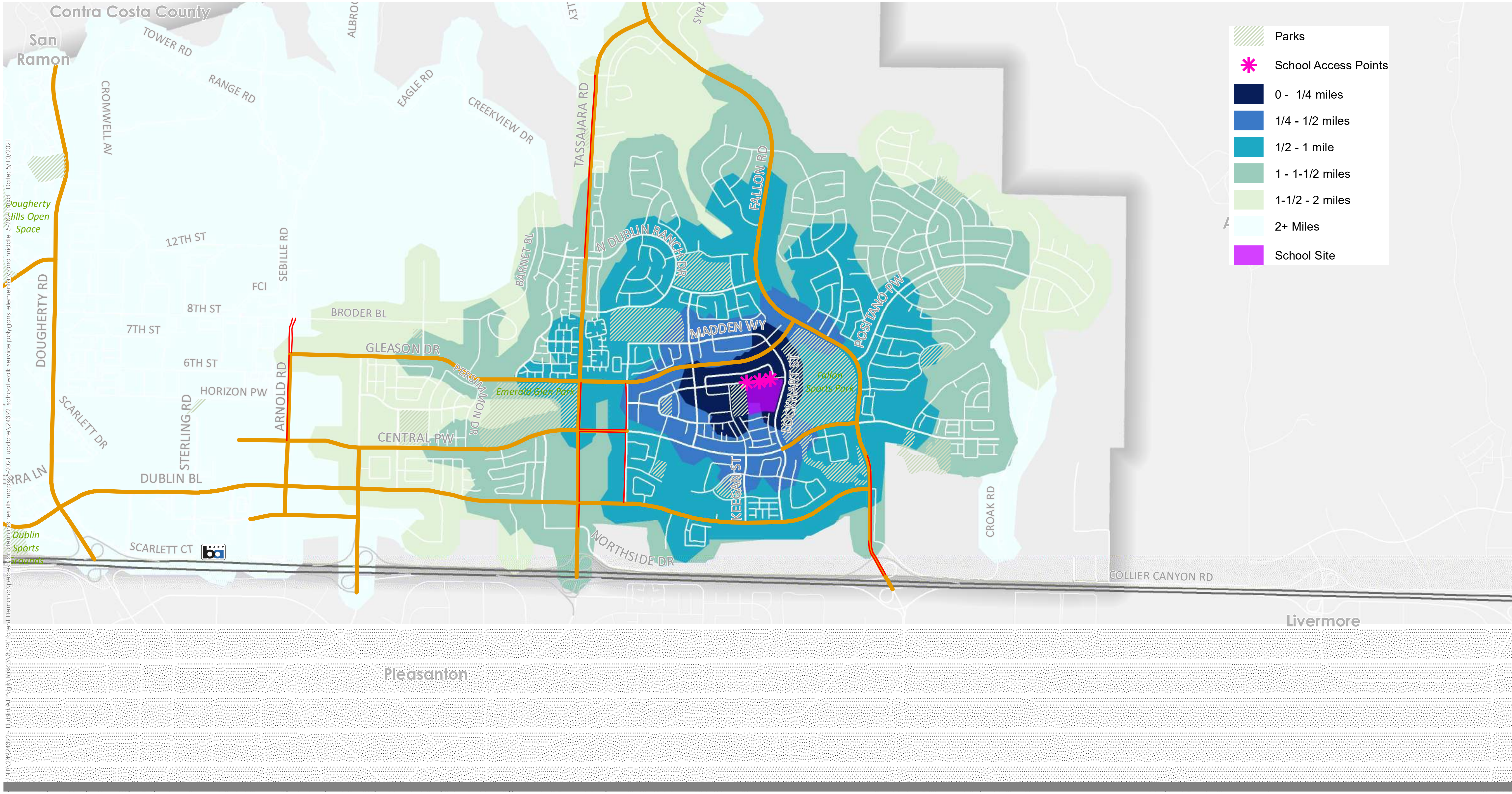


Figure W.S.7

Elementary And Middle School Network Service Areas: Walking Perceived Distances
Kolb Elem
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

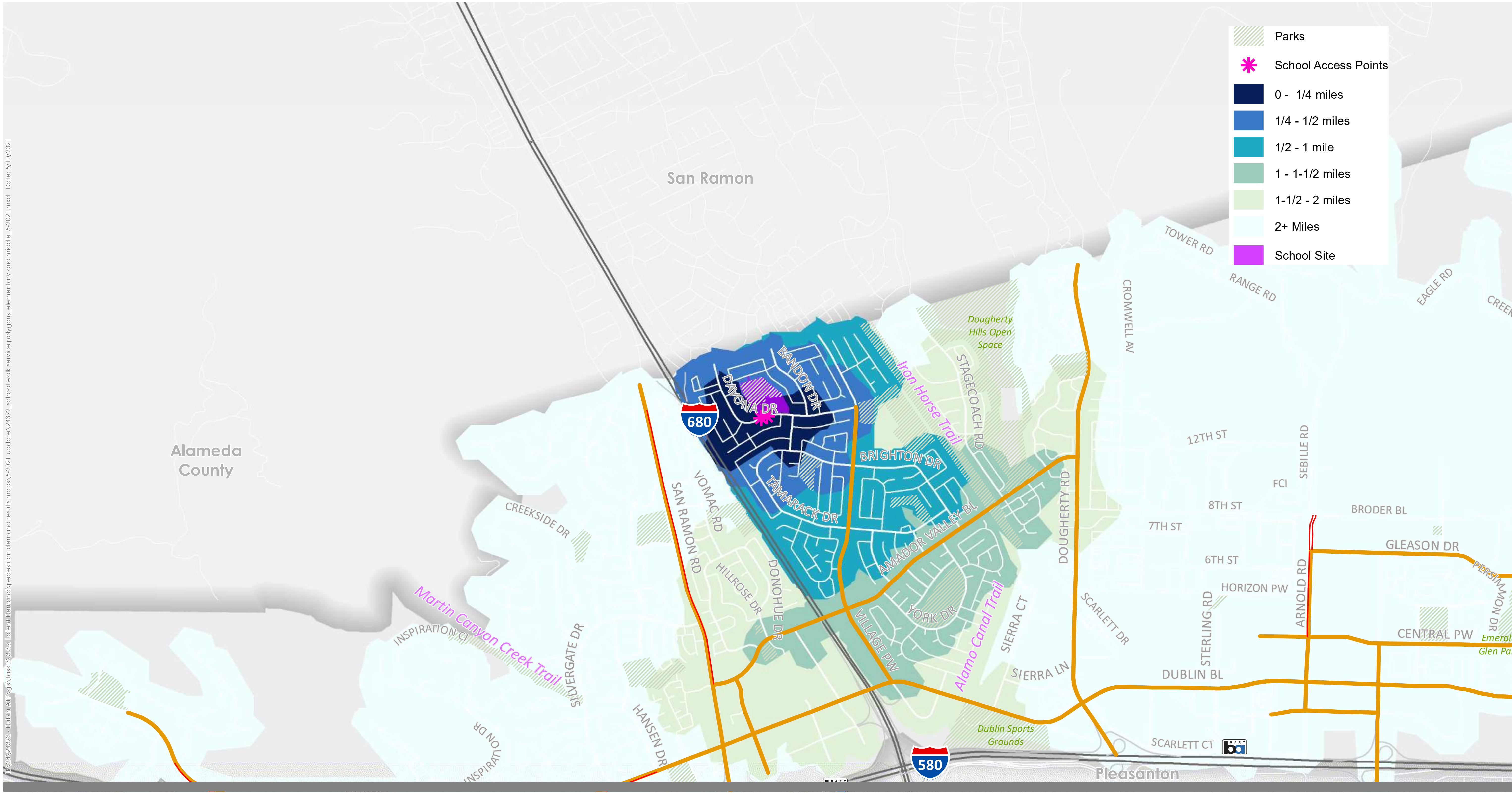


Figure W.S.8

Elementary And Middle School Network Service Areas: Walking Perceived Distances
Murray Elem
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

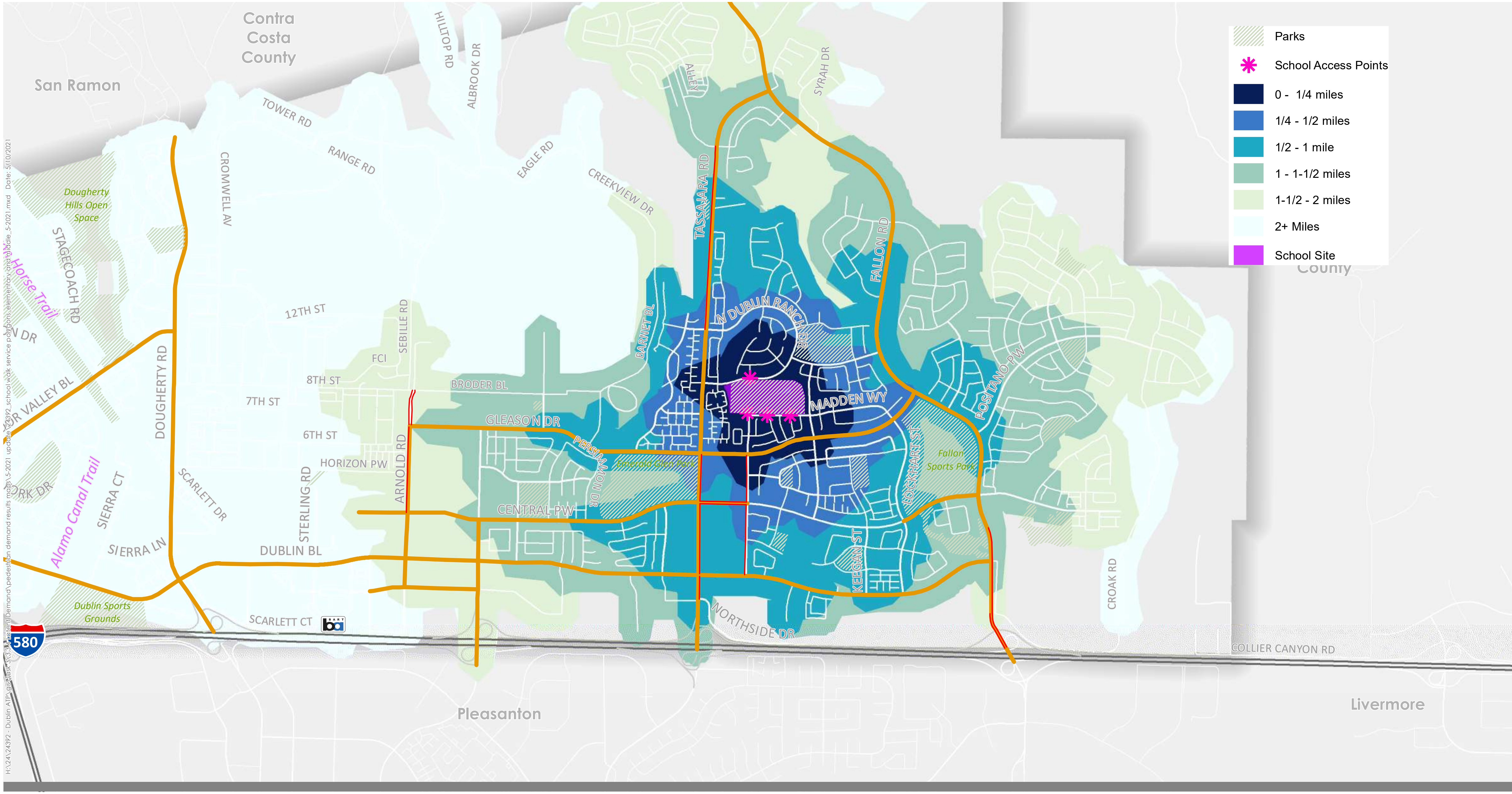


Figure W.S.9

Elementary And Middle School Network Service Areas: Walking Perceived Distances
Fallon Middle
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

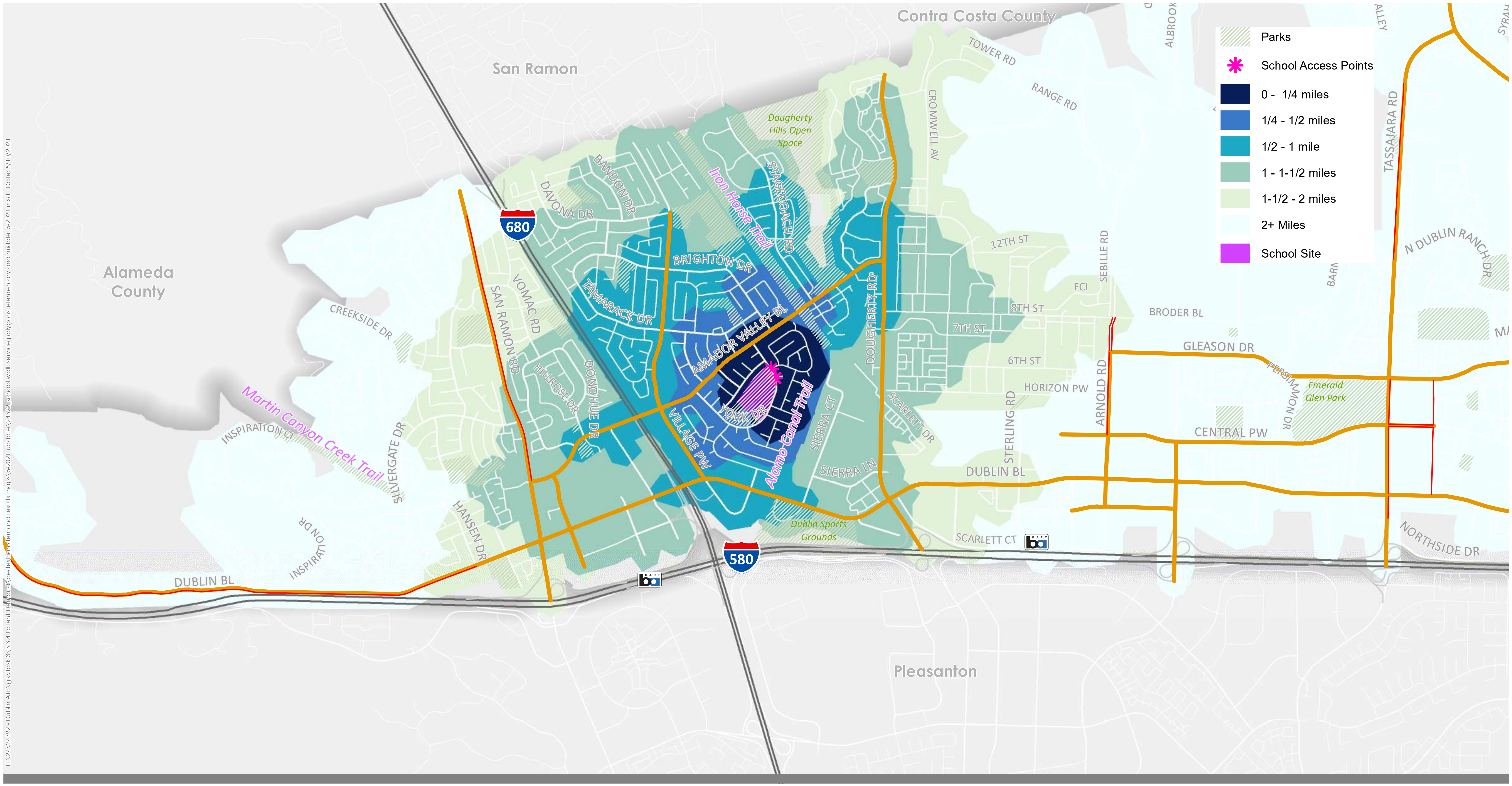
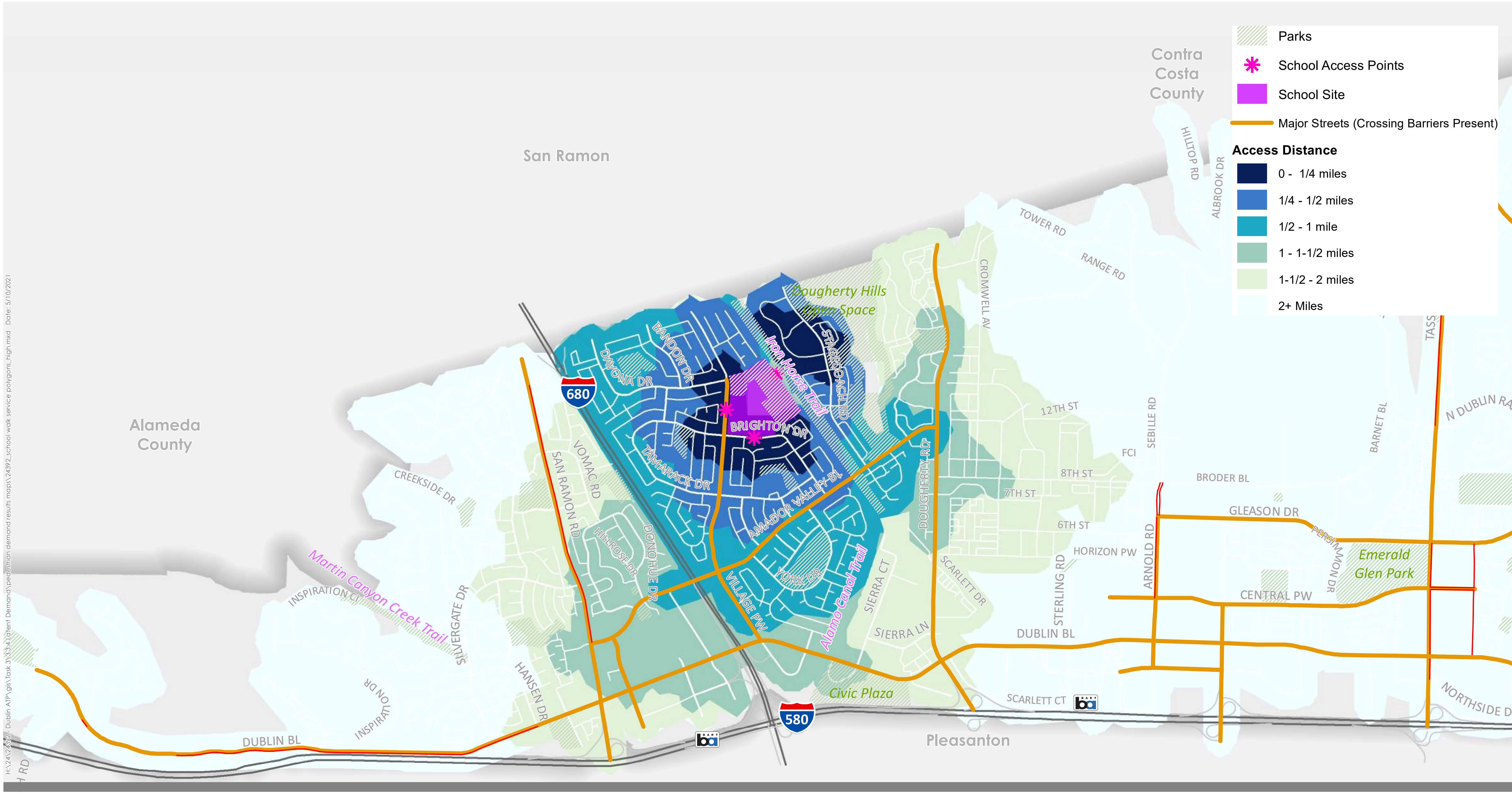


Figure W.S.10

Elementary And Middle School Network Service Areas: Walking Perceived Distances
Wells Middle
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES



DUBLIN CALIFORNIA

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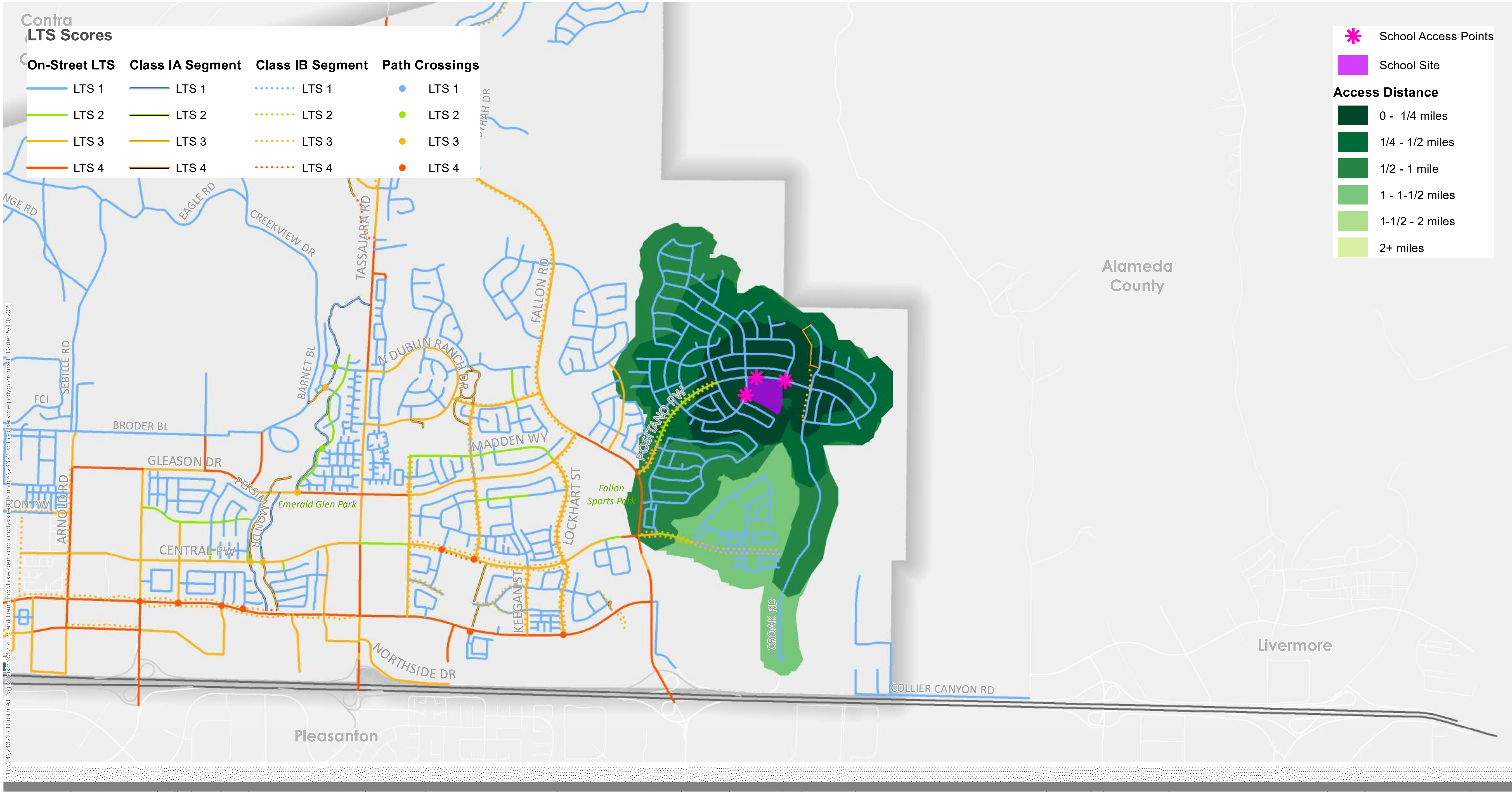
Figure W.S.11

High School Network Service Areas: Walking Perceived Distances
Dublin High
Dublin, California



DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

Figure B.S.1

Amador Elem Network Service Area Dublin, California

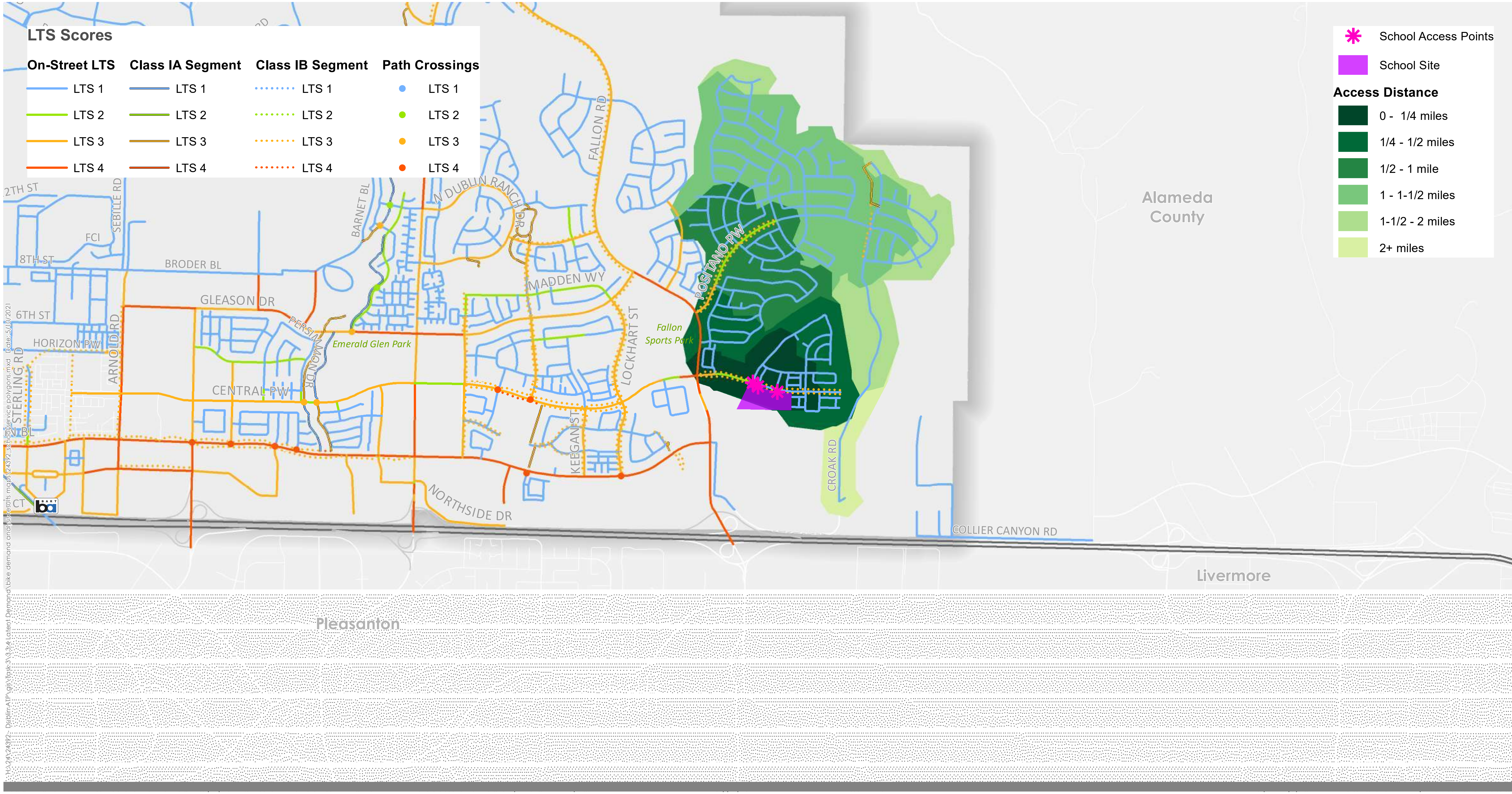


Figure B.S.2

Cottonwood Creek Network Service Area Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

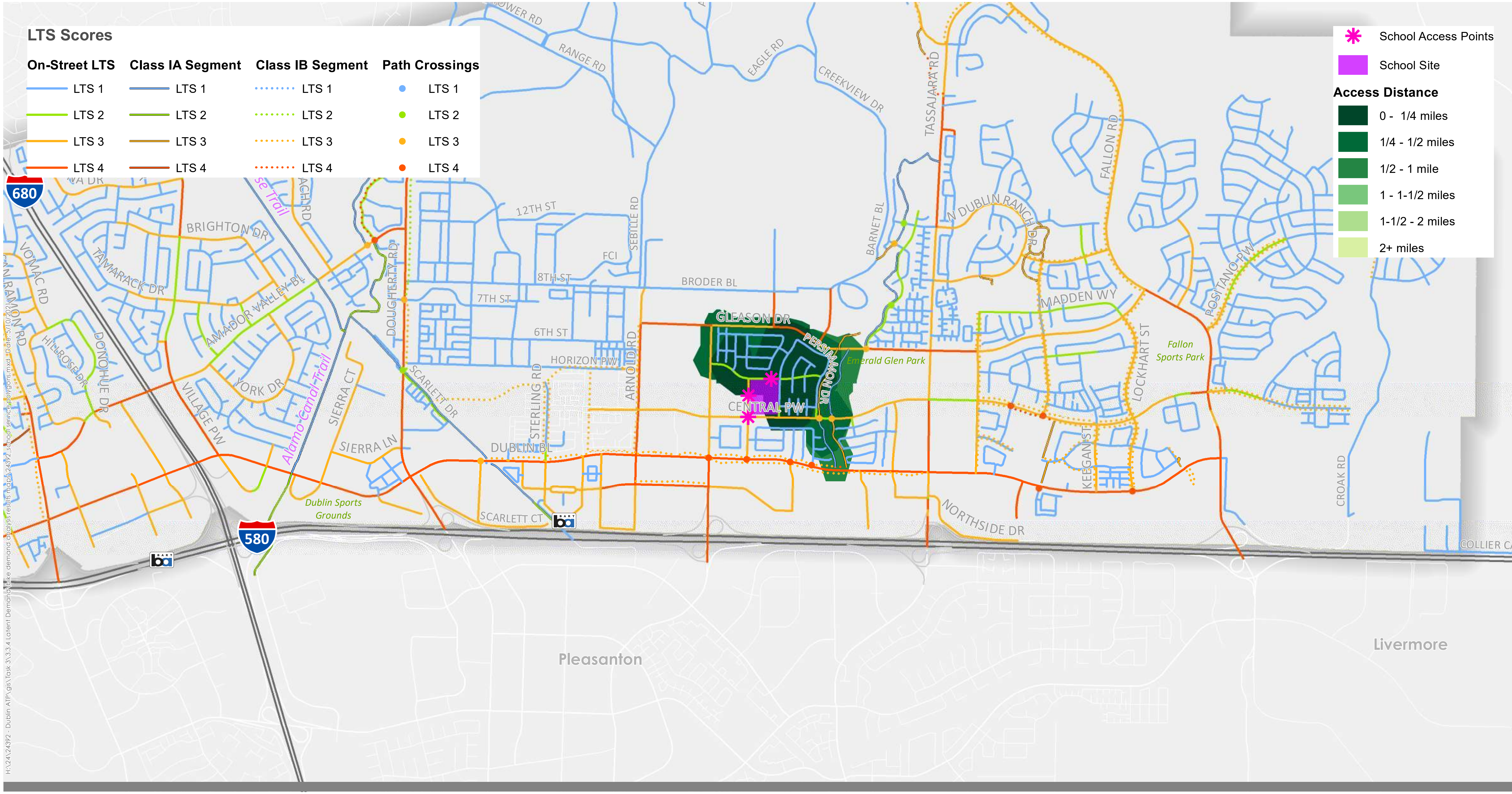


Figure B.S.3

Dougherty Elem Network Service Area Dublin, California

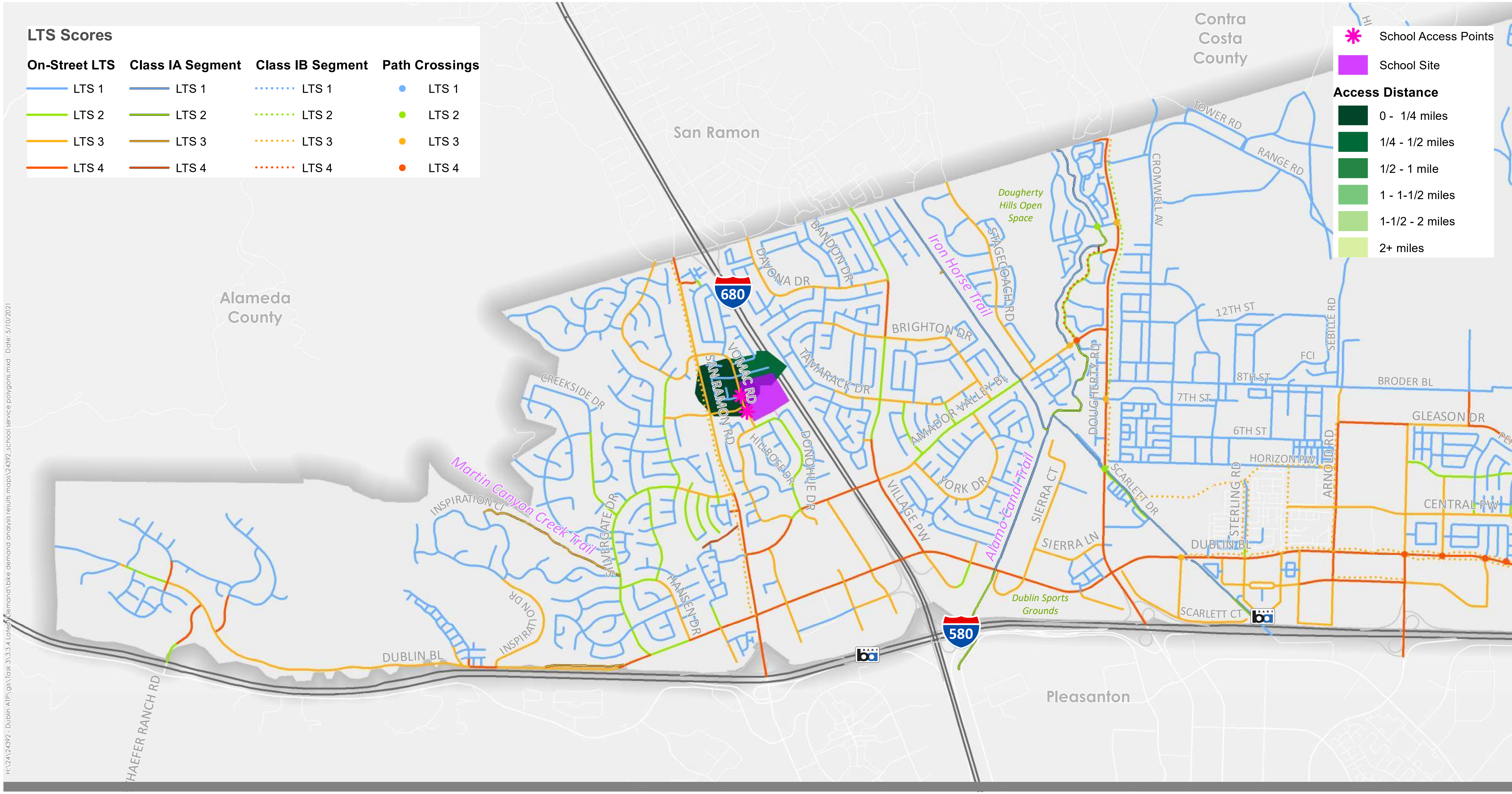


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Figure B.S.4

Dublin Elem
Network Service Area
Dublin, California

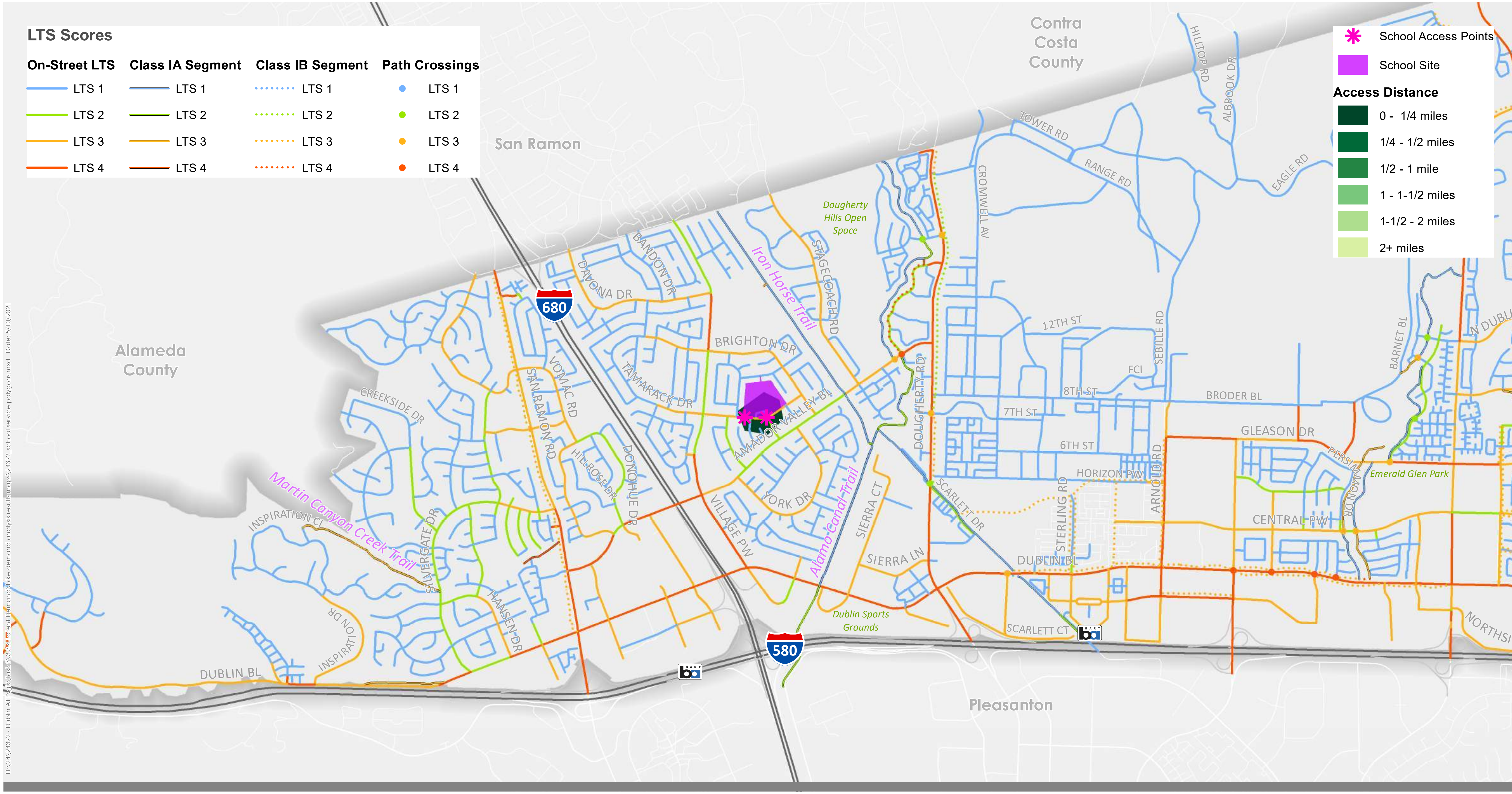

Figure B.S.5

Frederiksen Elem Network Service Area Dublin, California

DUBLIN CALIFORNIA

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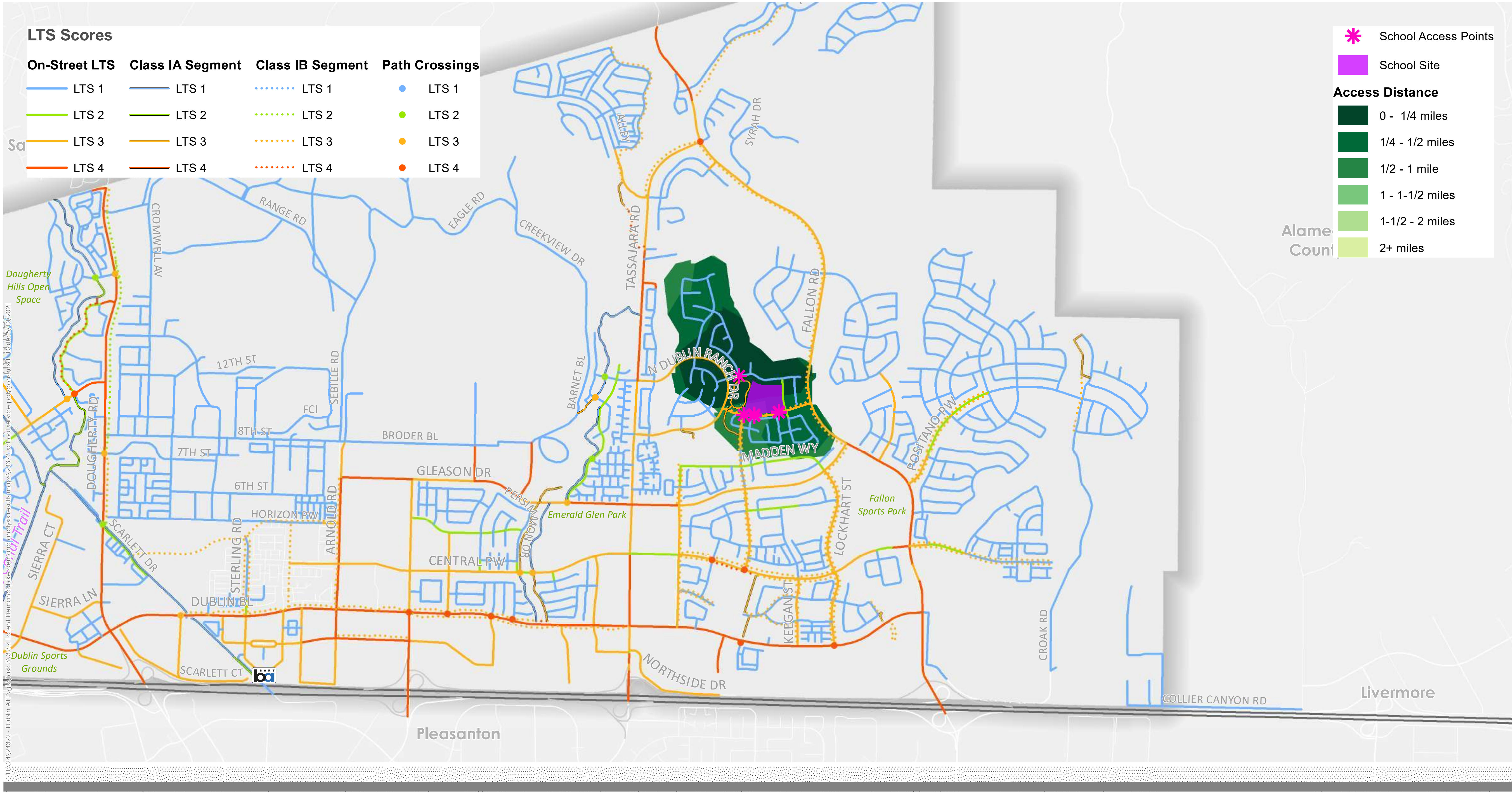

DUBLIN
CALIFORNIA

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Figure B.S.6

Green Elem
Network Service Area
Dublin, California

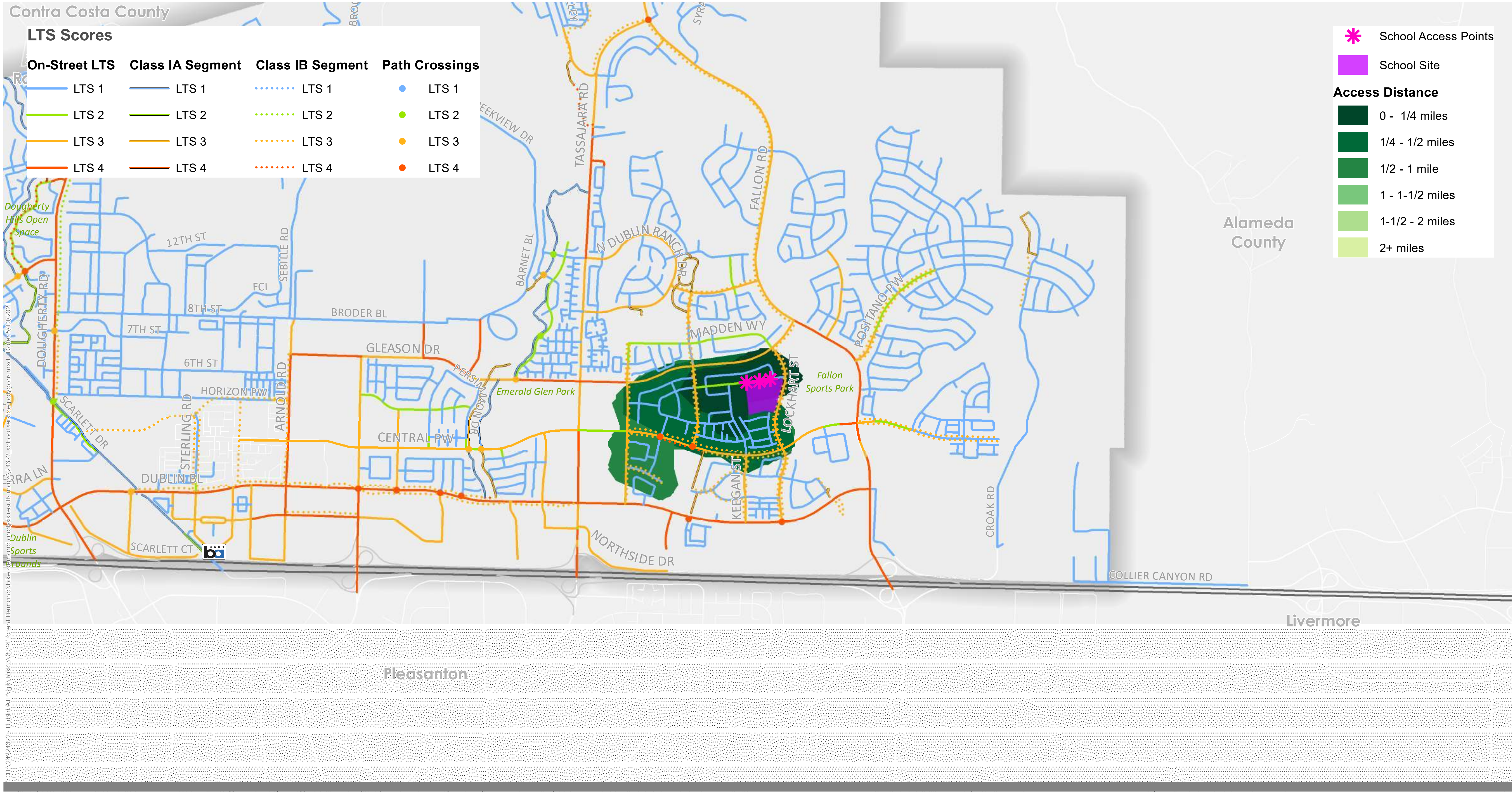

Figure B.S.7

Kolb Elem
Network Service Area
Dublin, California

DUBLIN CALIFORNIA

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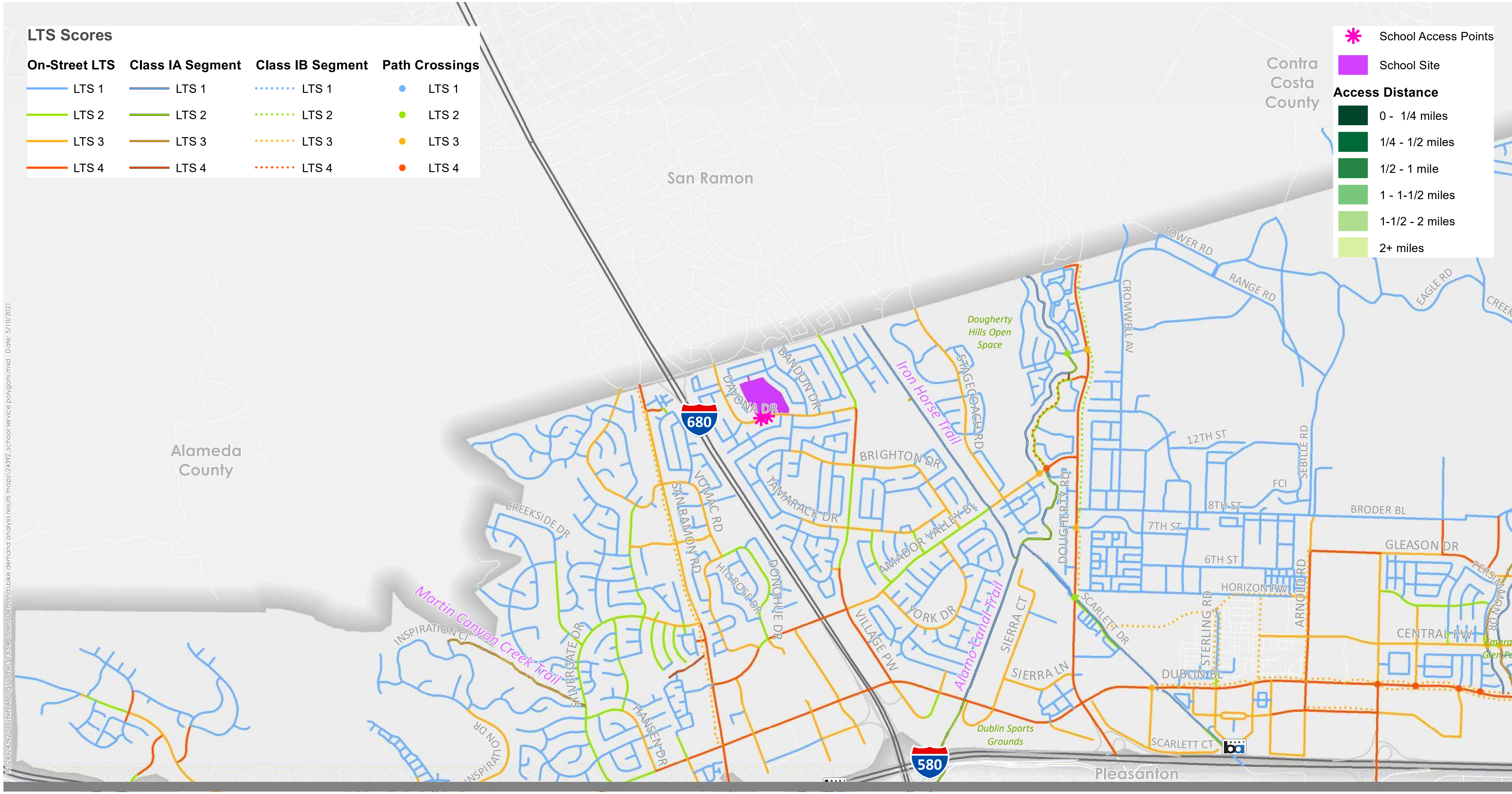

Figure B.S.8

Murray Elem
Network Service Area
Dublin, California

DUBLIN CALIFORNIA

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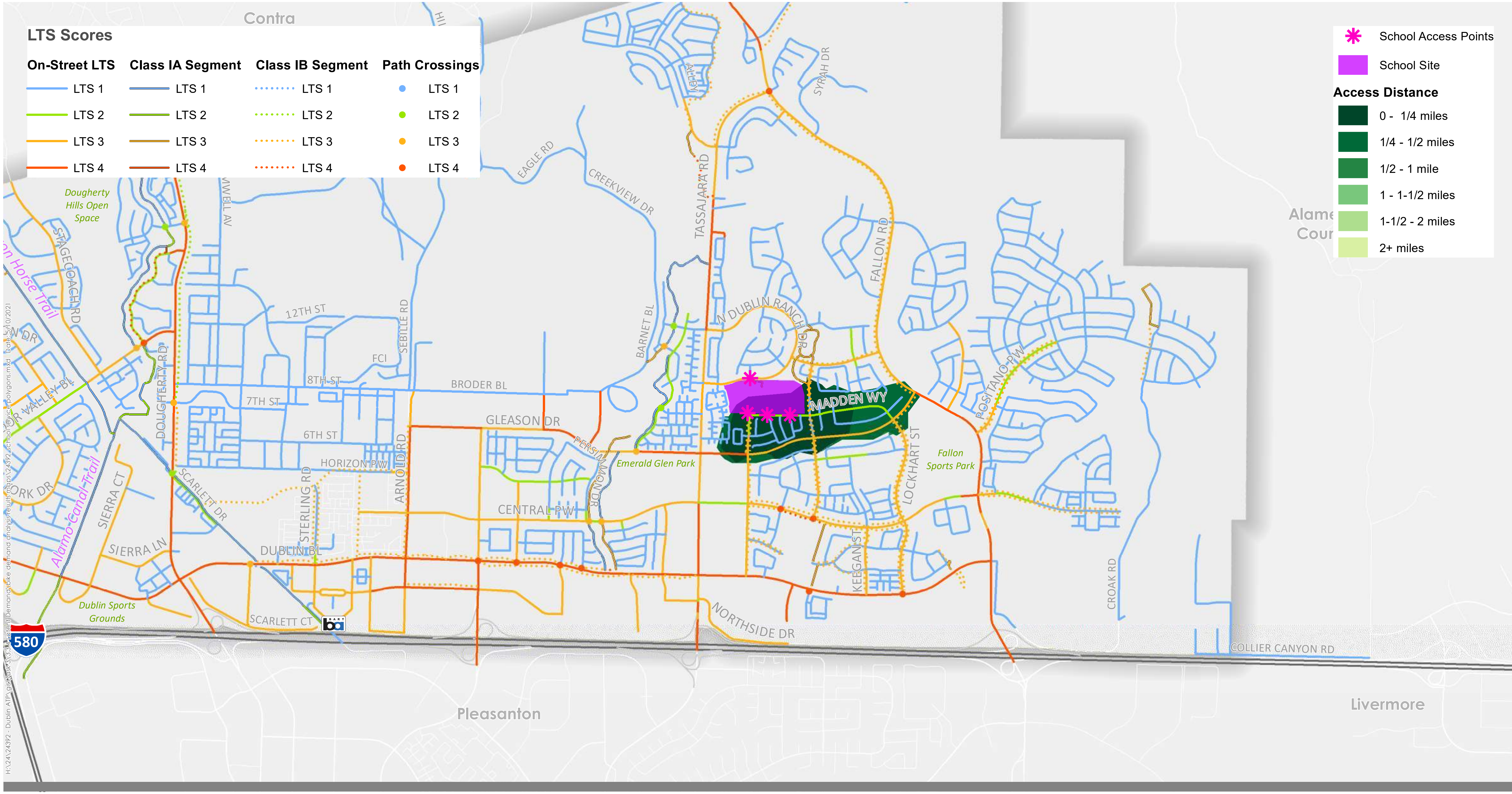

Figure B.S.9

Fallon Middle
Network Service Area
Dublin, California

DUBLIN CALIFORNIA

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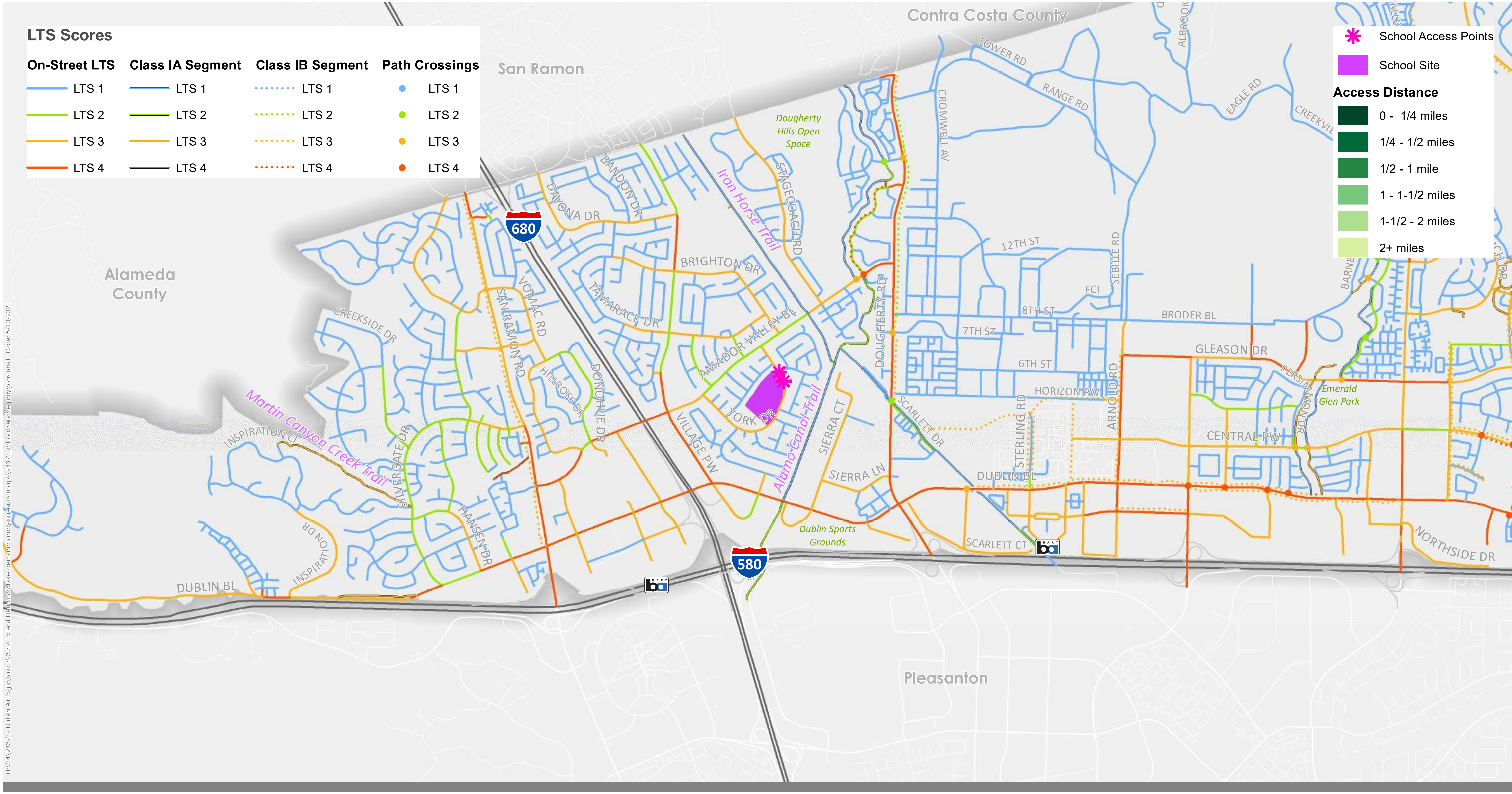

Figure B.S.10

Wells Middle
Network Service Area
Dublin, California

DUBLIN CALIFORNIA

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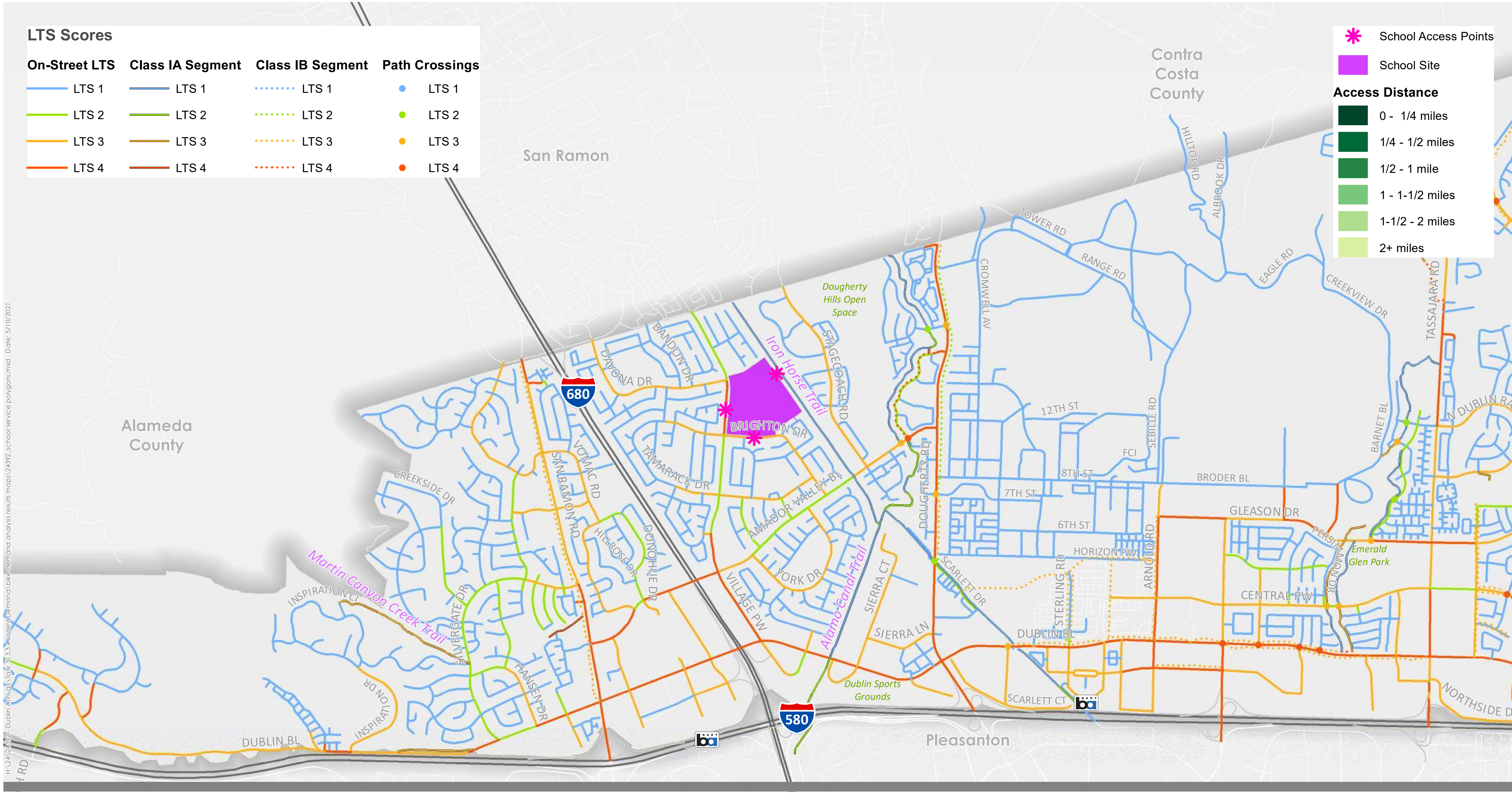

DUBLIN CALIFORNIA

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Figure B.S.11

Dublin High Network Service Area Dublin, California

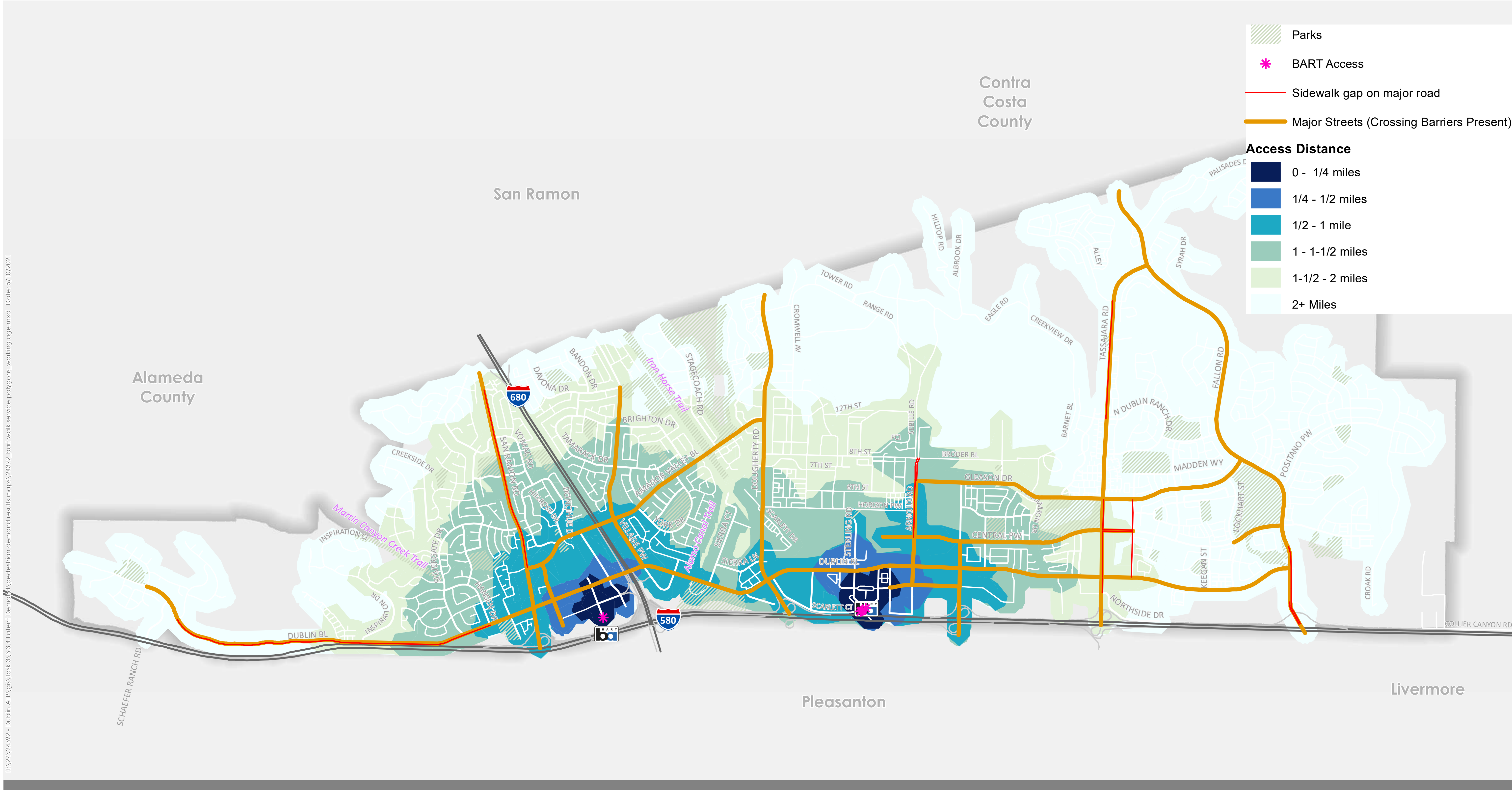

Figure W.B.1

BART Network Service Areas: Walking Perceived Distances
BART Access - 14 to 55 Years Old
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

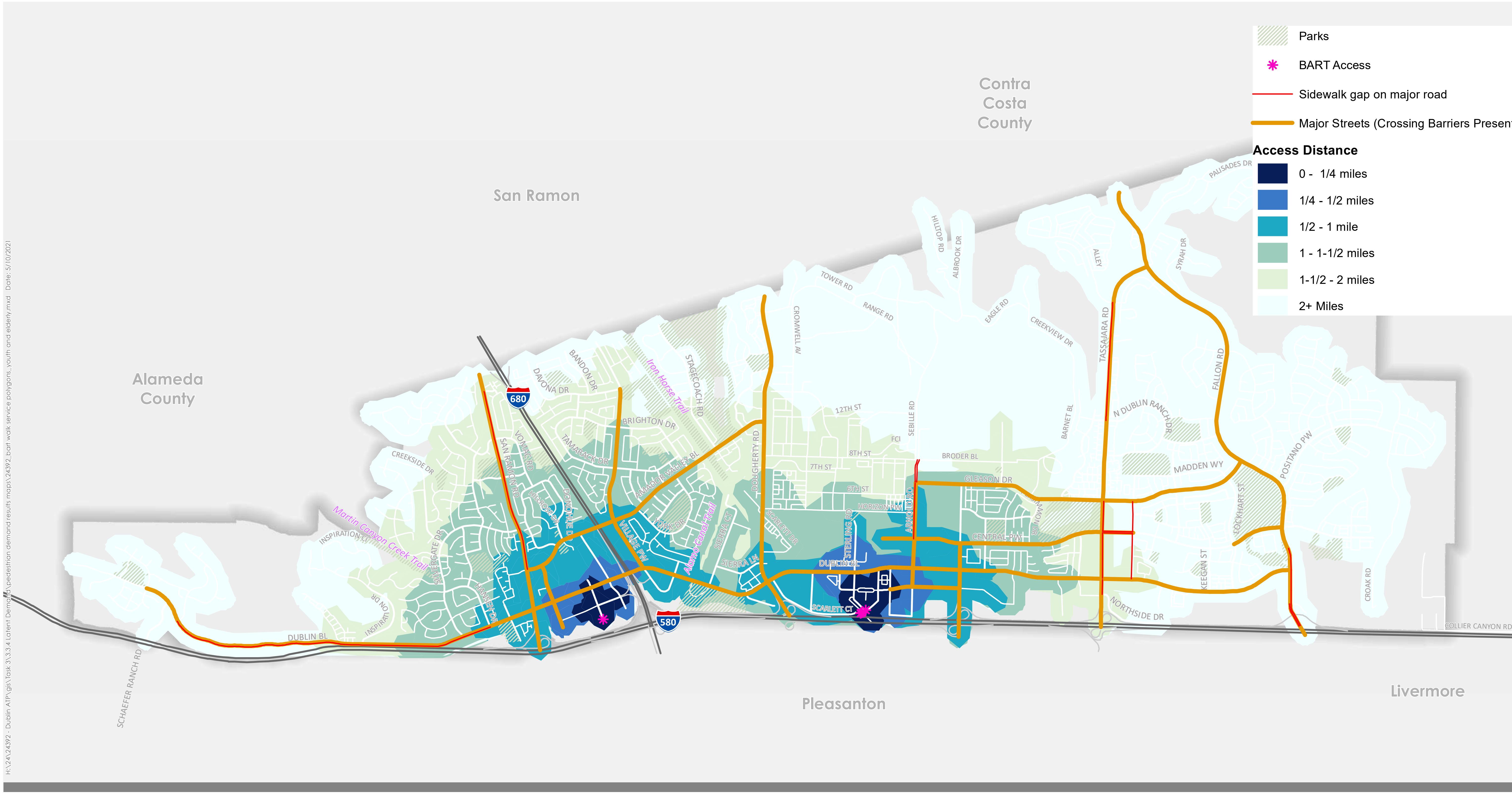

Figure W.B.2

BART Network Service Areas: Walking Perceived Distances
BART Access - Over 55 Years Old
Dublin, California

DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

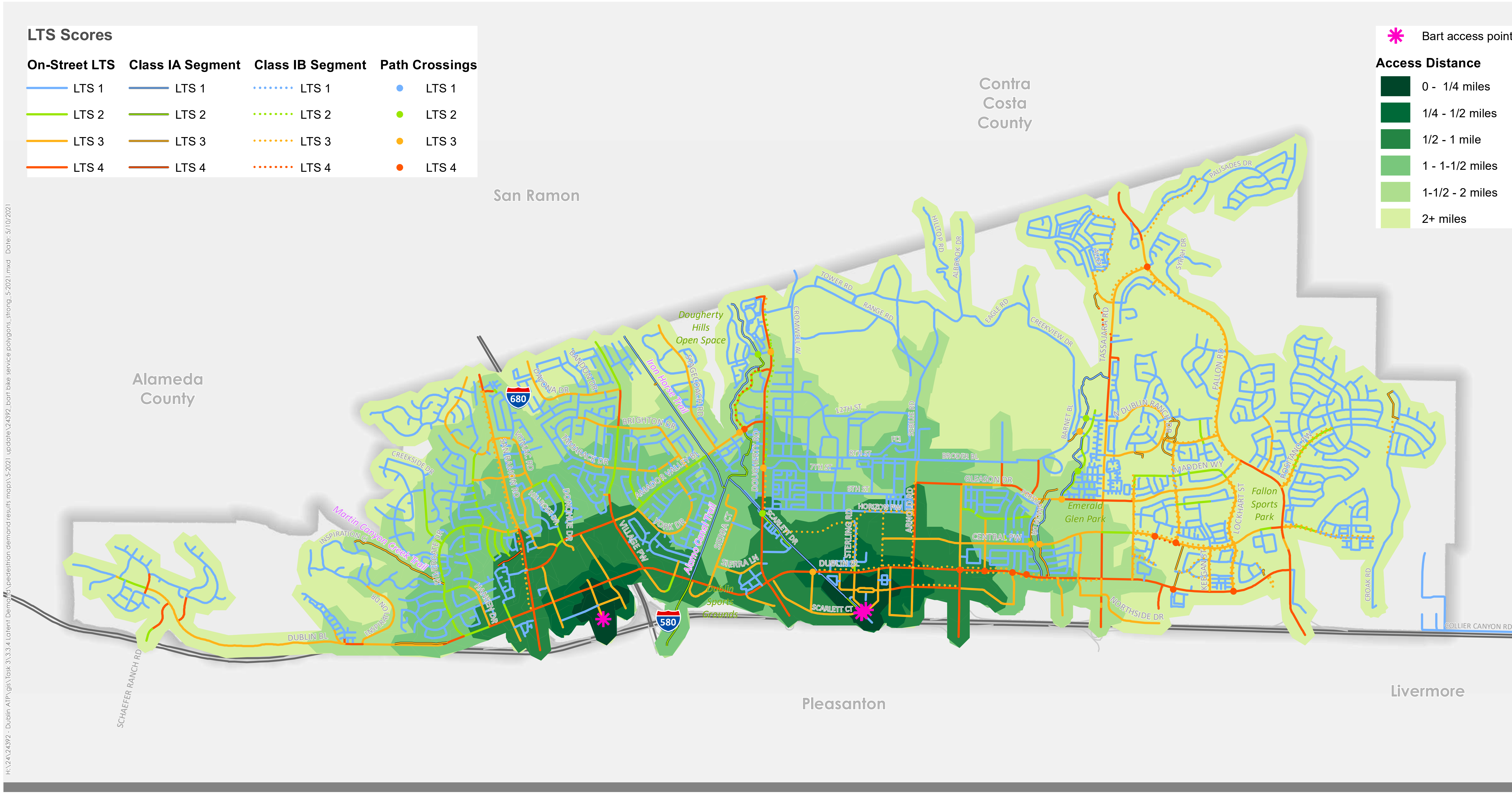

Figure B.B.1

BART Access - "Strong and Fearless" Network Service Area Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

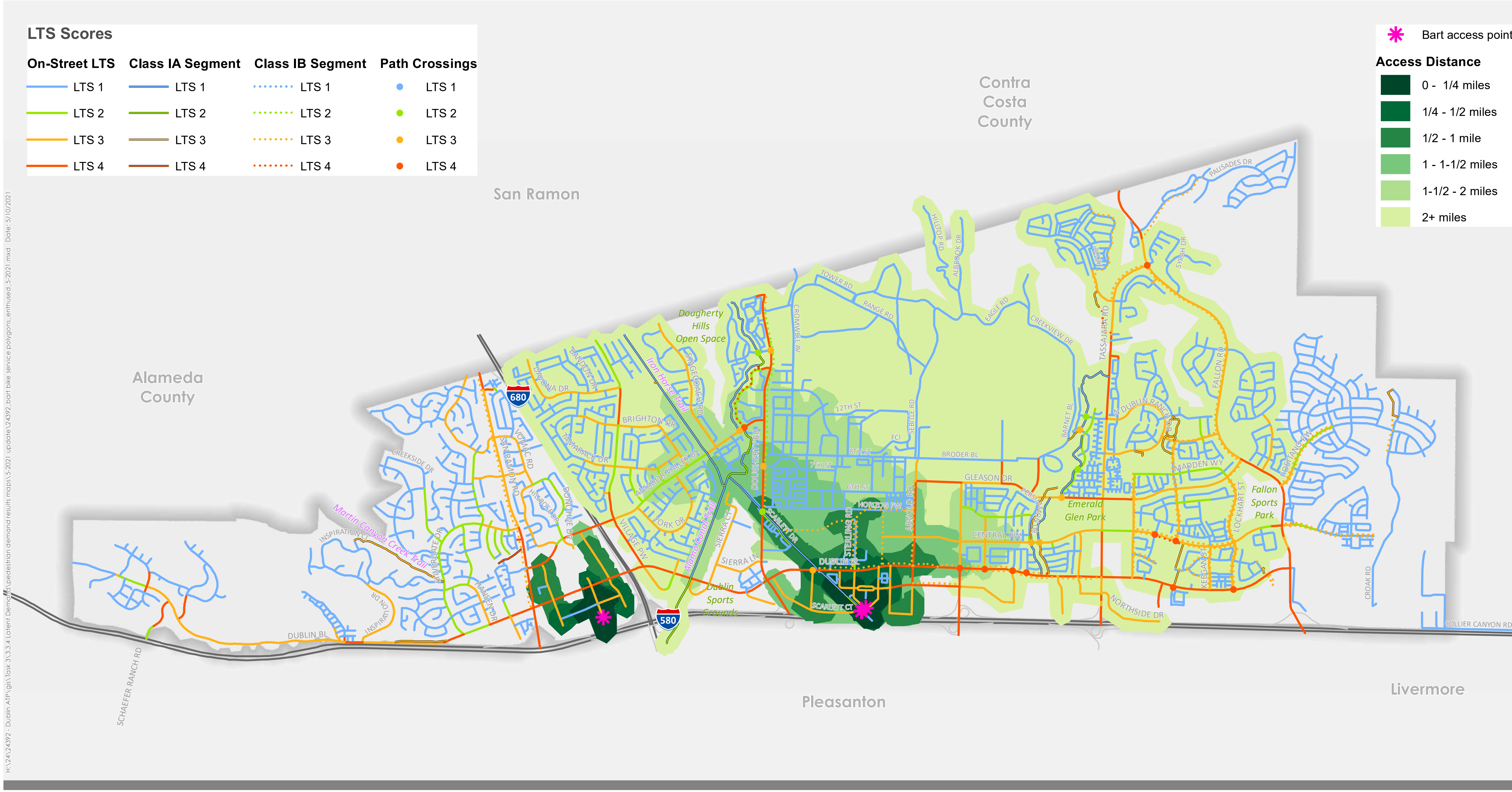

Figure B.B.2

BART Access - "Enthused and Confident"
Network Service Area
Dublin, California

DUBLIN
CALIFORNIA

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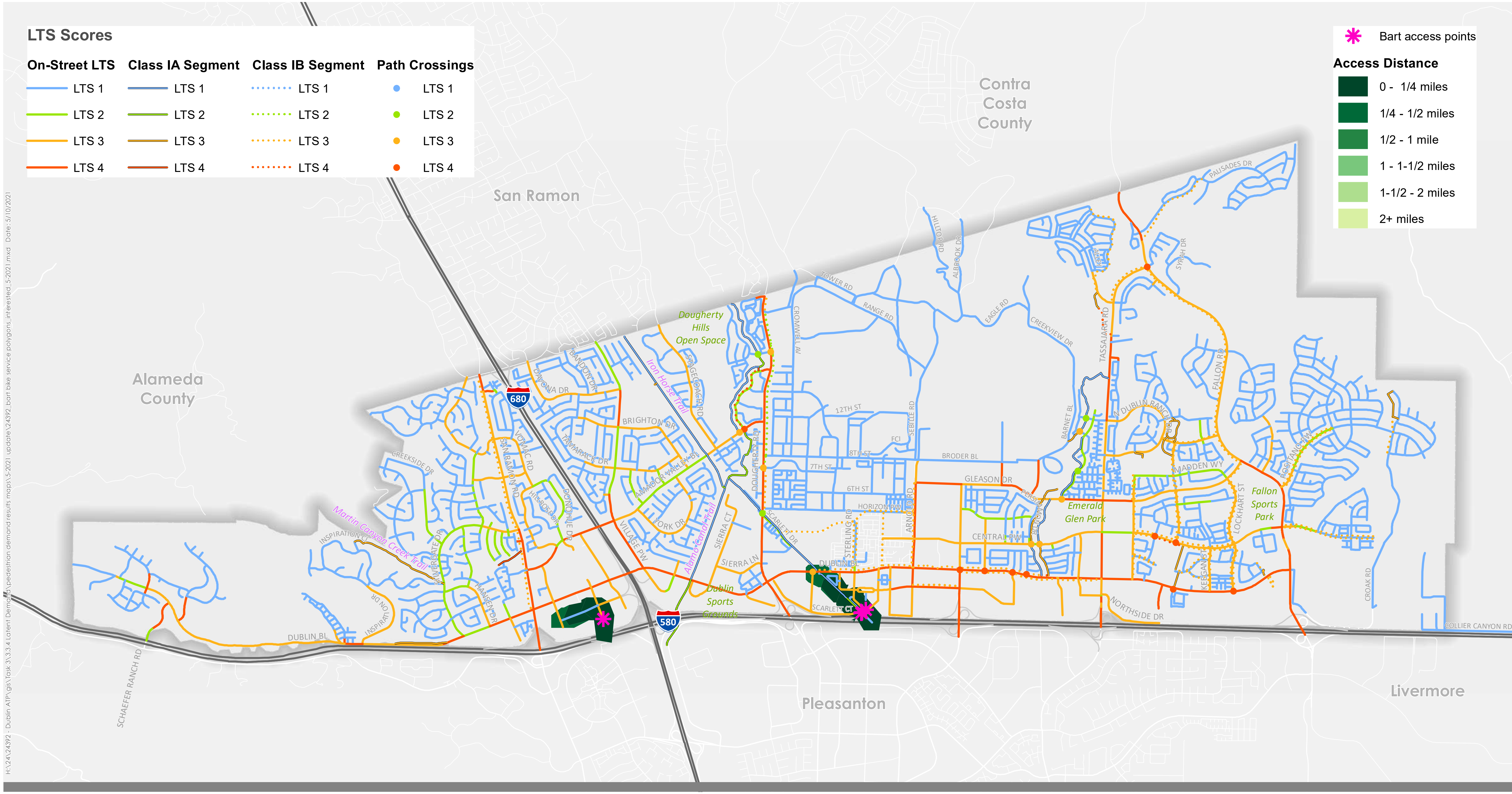

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Figure B.B.3

BART Access - "Interested but Concerned" Network Service Area
Dublin, California

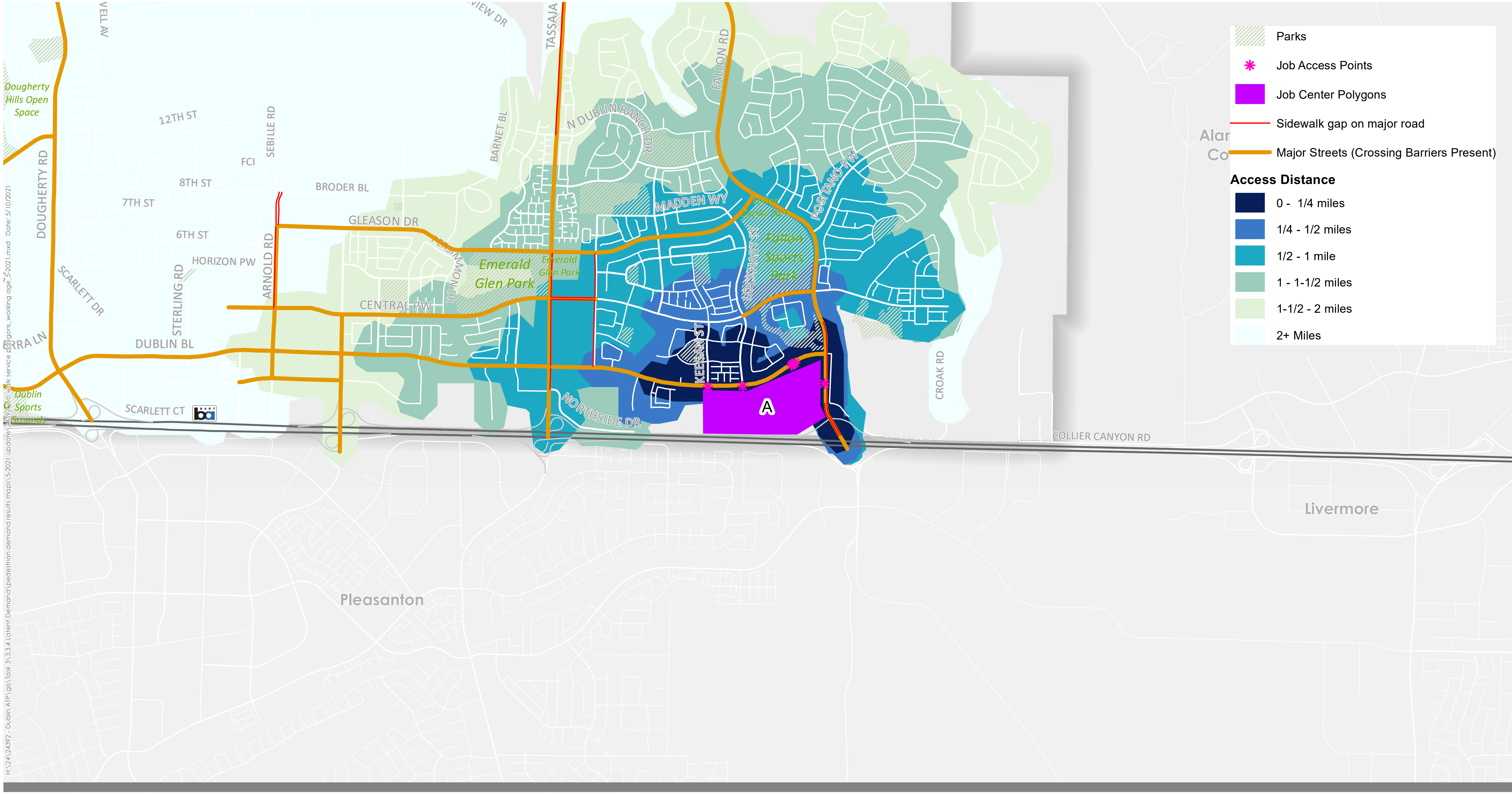


Figure W.J.1a

Job Center Network Service Areas: Walking Perceived Distances
Job Center A Access - 14 to 55 Years Old
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

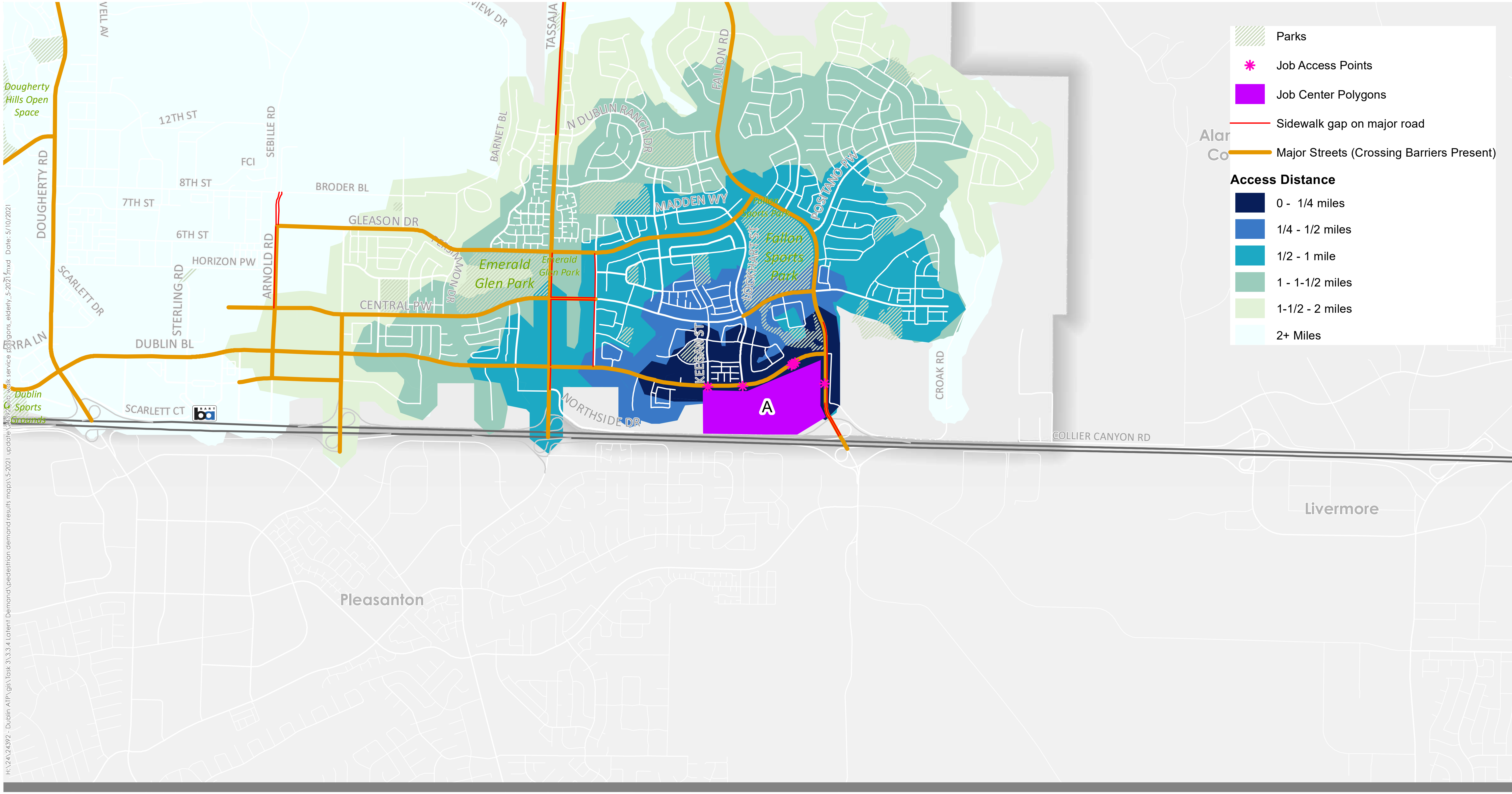


Figure W.J.1b

Job Center Network Service Areas: Walking Perceived Distances
Job Center A Access - Over 55 Years Old
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

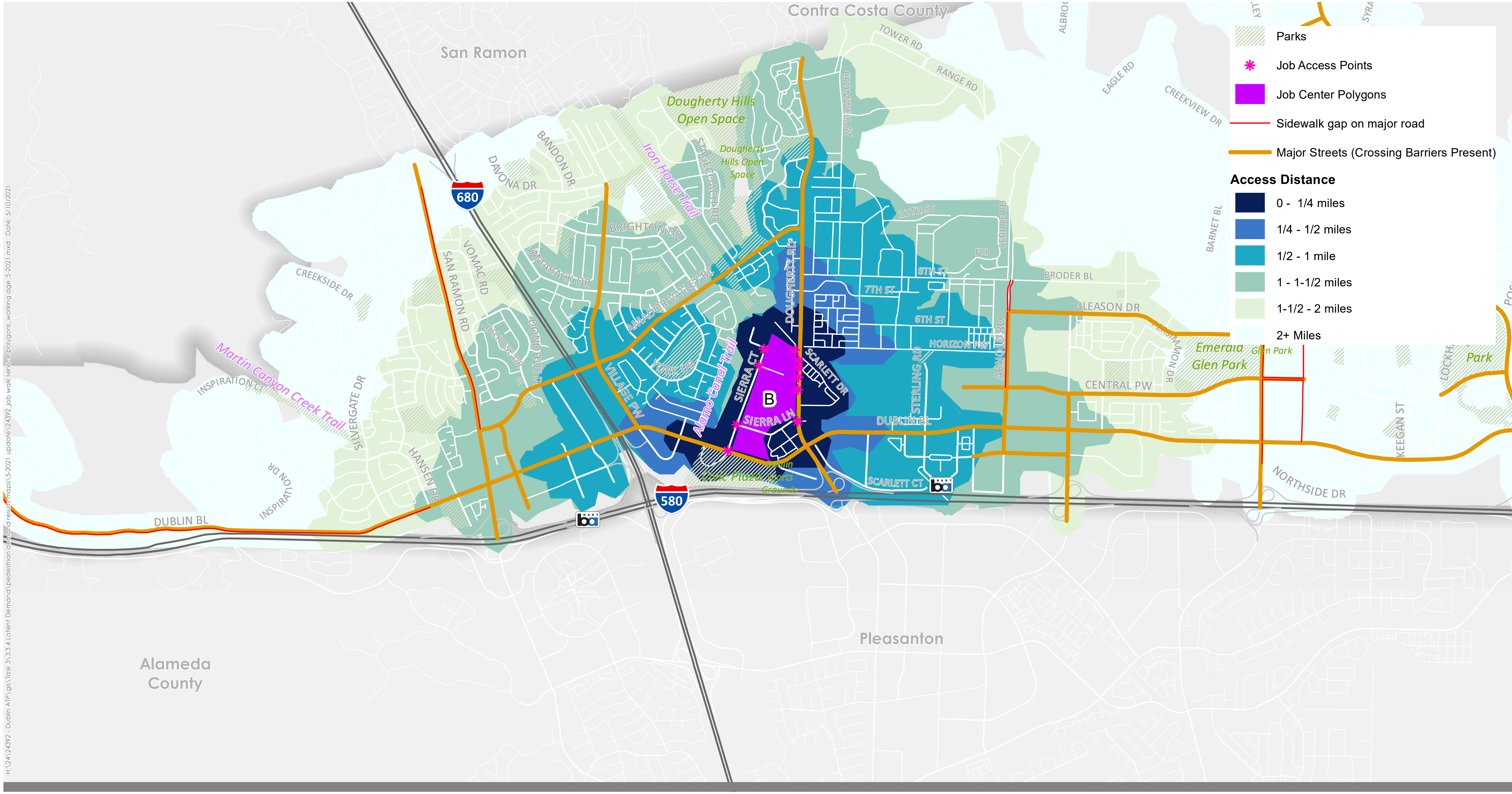
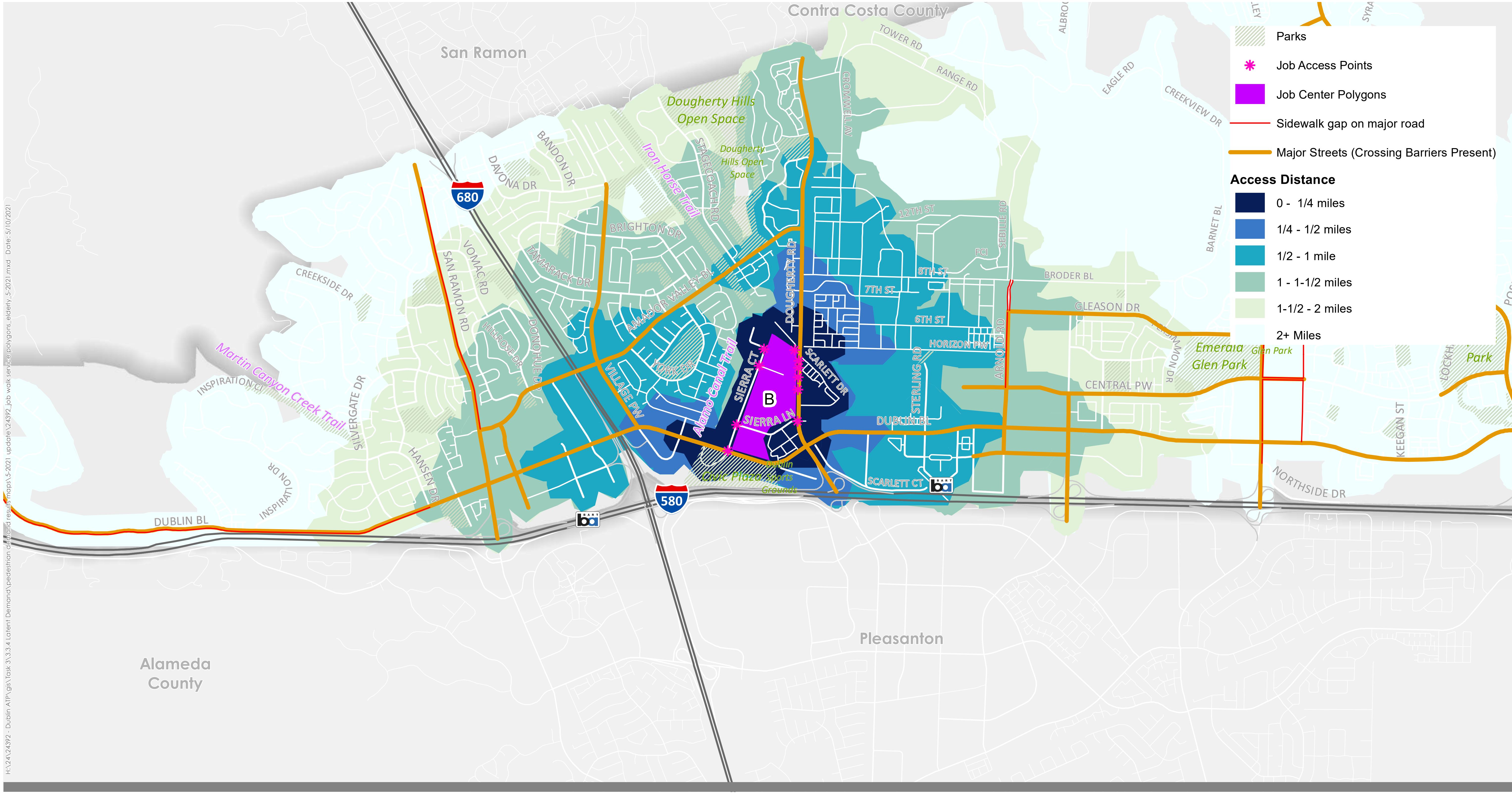


Figure W.J.2a

Job Center Network Service Areas: Walking Perceived Distances
Job Center B Access - 14 to 55 Years Old
Dublin, California

DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES



DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

Figure W.J.2b

Job Center Network Service Areas: Walking Perceived Distances
Job Center B Access - Over 55 Years Old
Dublin, California

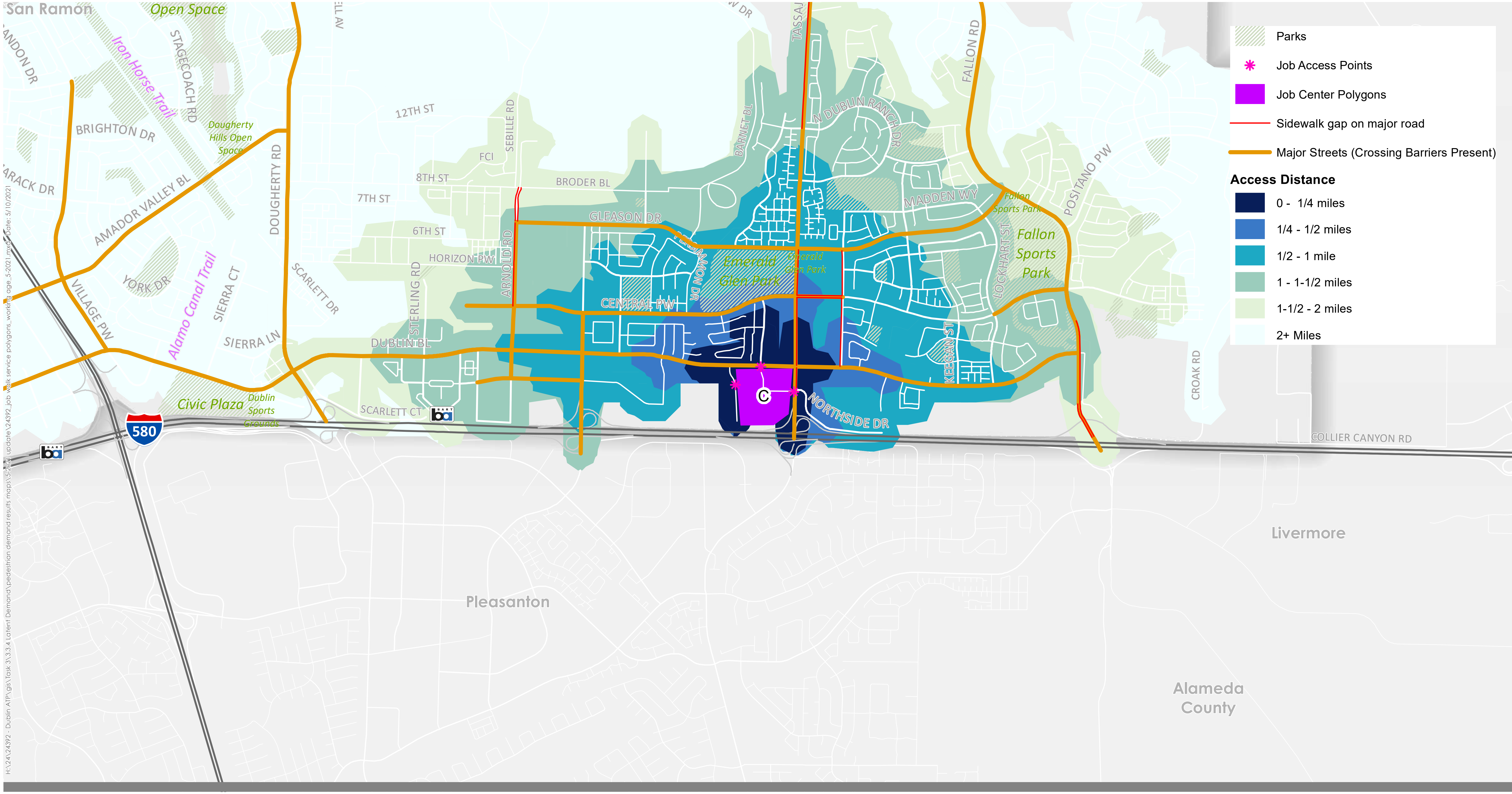
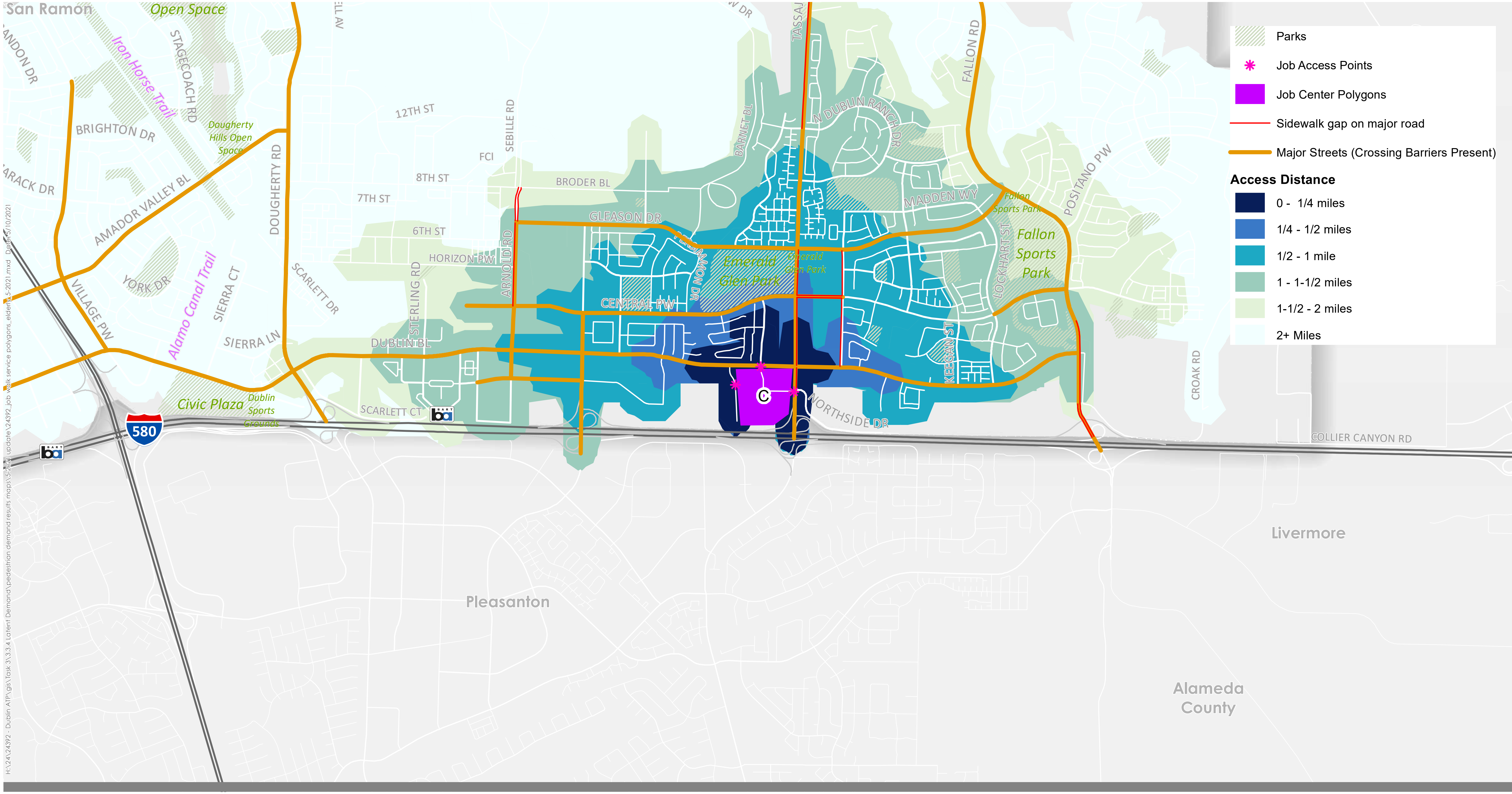


Figure W.J.3a

Job Center Network Service Areas: Walking Perceived Distances
Job Center C Access - 14 to 55 Years Old
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES



DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

Figure W.J.3b

Job Center Network Service Areas: Walking Perceived Distances
Job Center C Access - Over 55 Years Old
Dublin, California

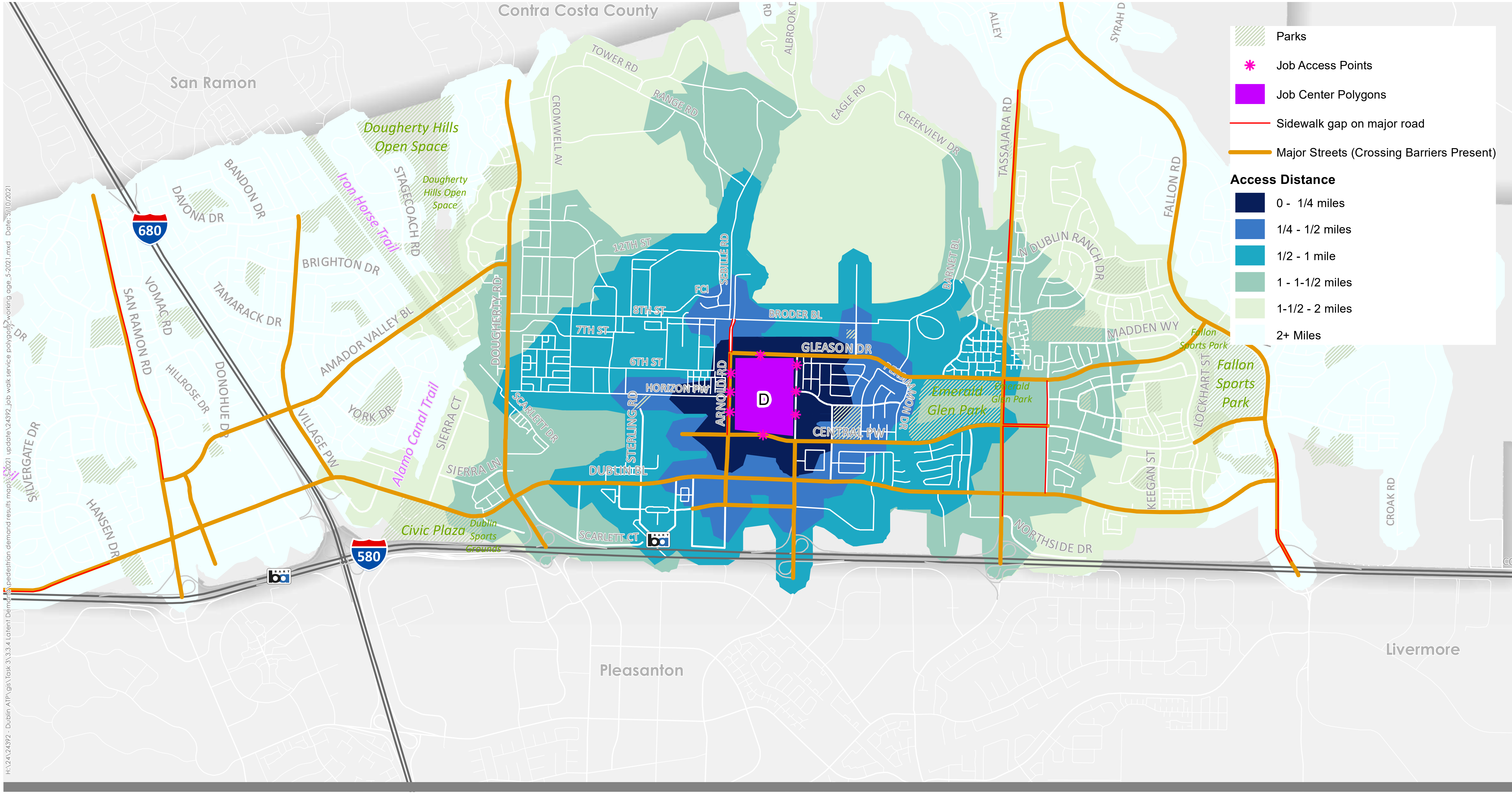


Figure W.J.4a

Job Center Network Service Areas: Walking Perceived Distances
Job Center D Access - 14 to 55 Years Old
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

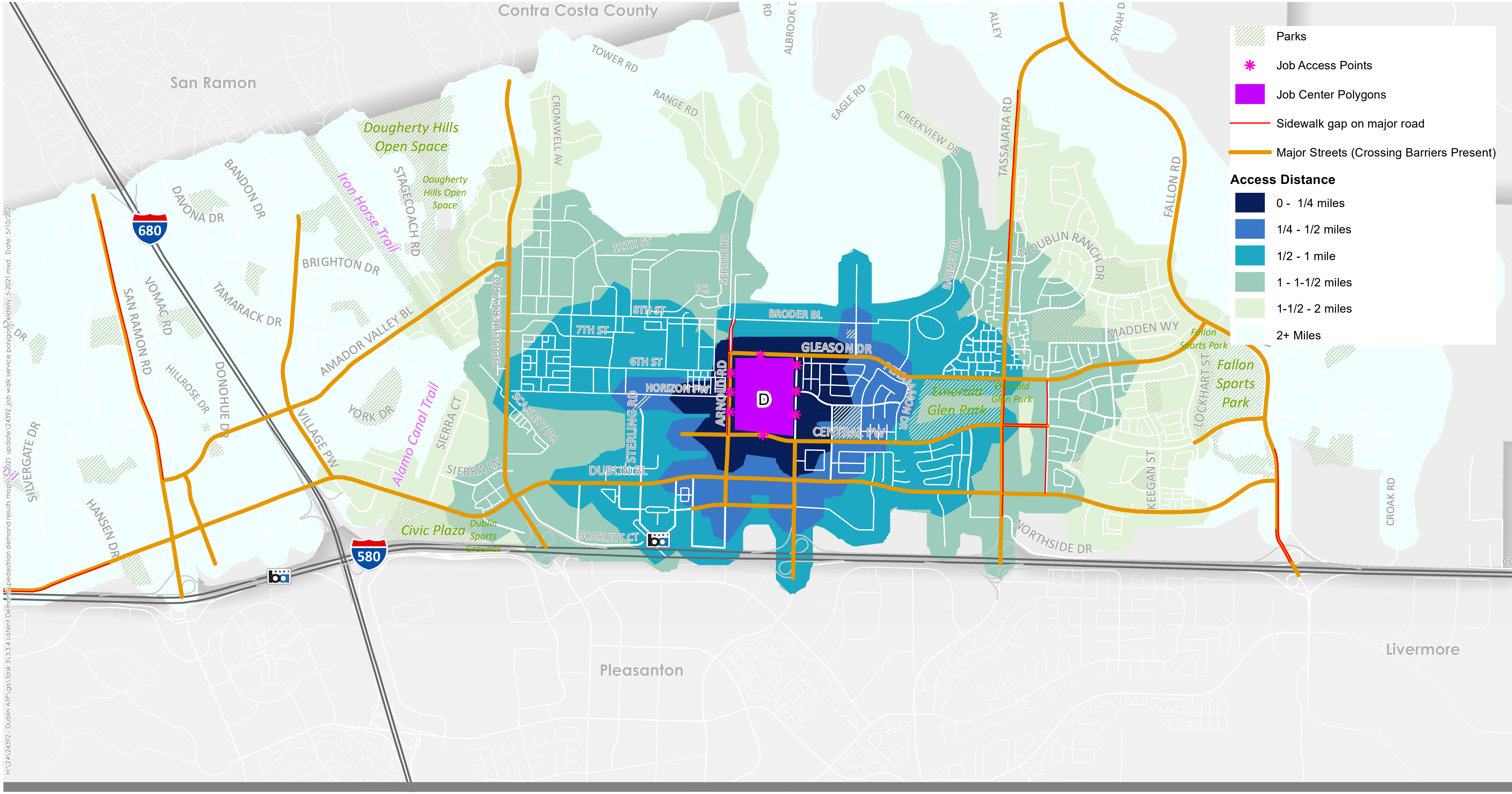


Figure W.J.4b

Job Center Network Service Areas: Walking Perceived Distances
Job Center D Access - Over 55 Years Old
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

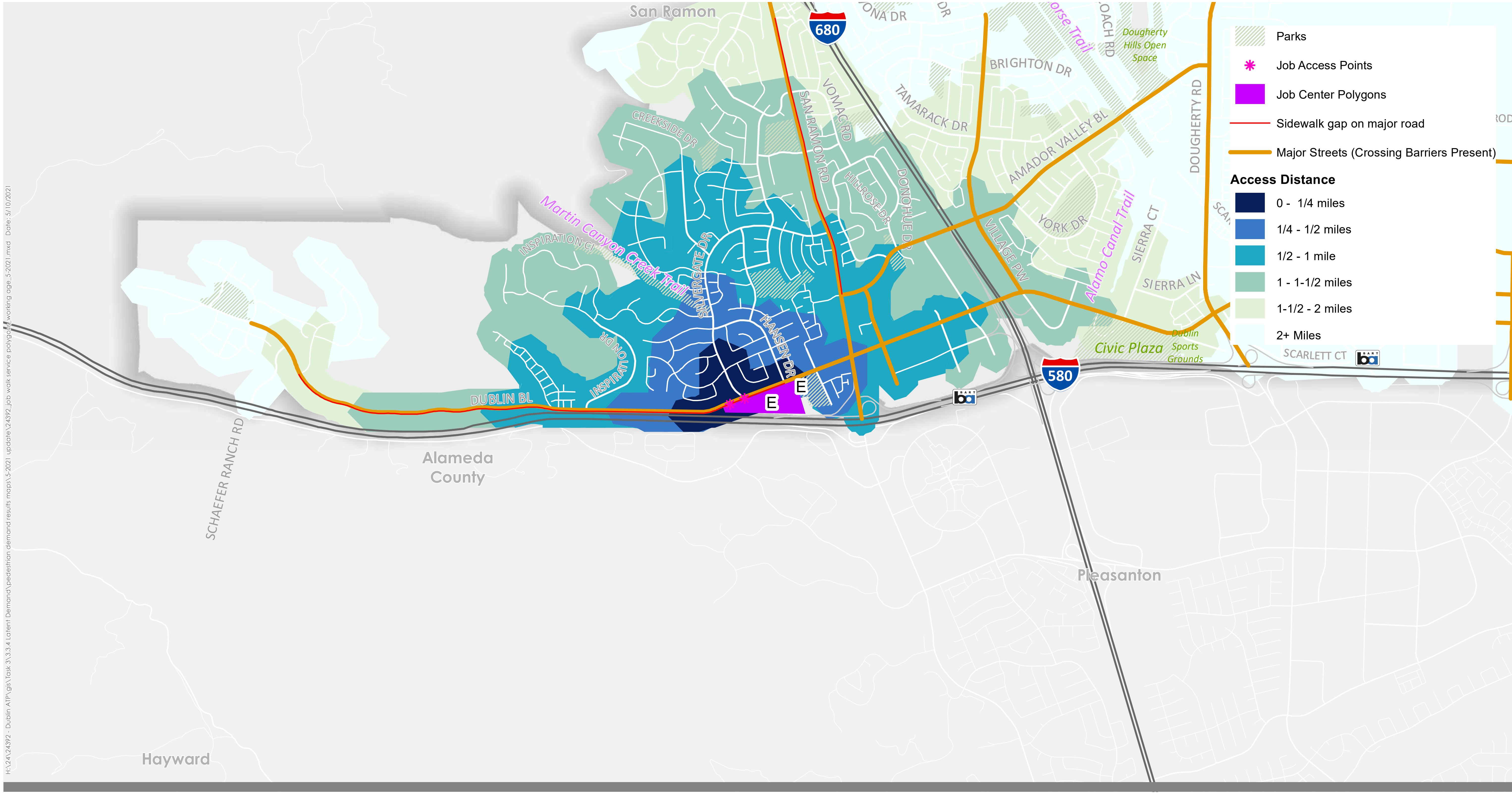


Figure W.J.5a

Job Center Network Service Areas: Walking Perceived Distances
Job Center E Access - 14 to 55 Years Old
Dublin, California

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

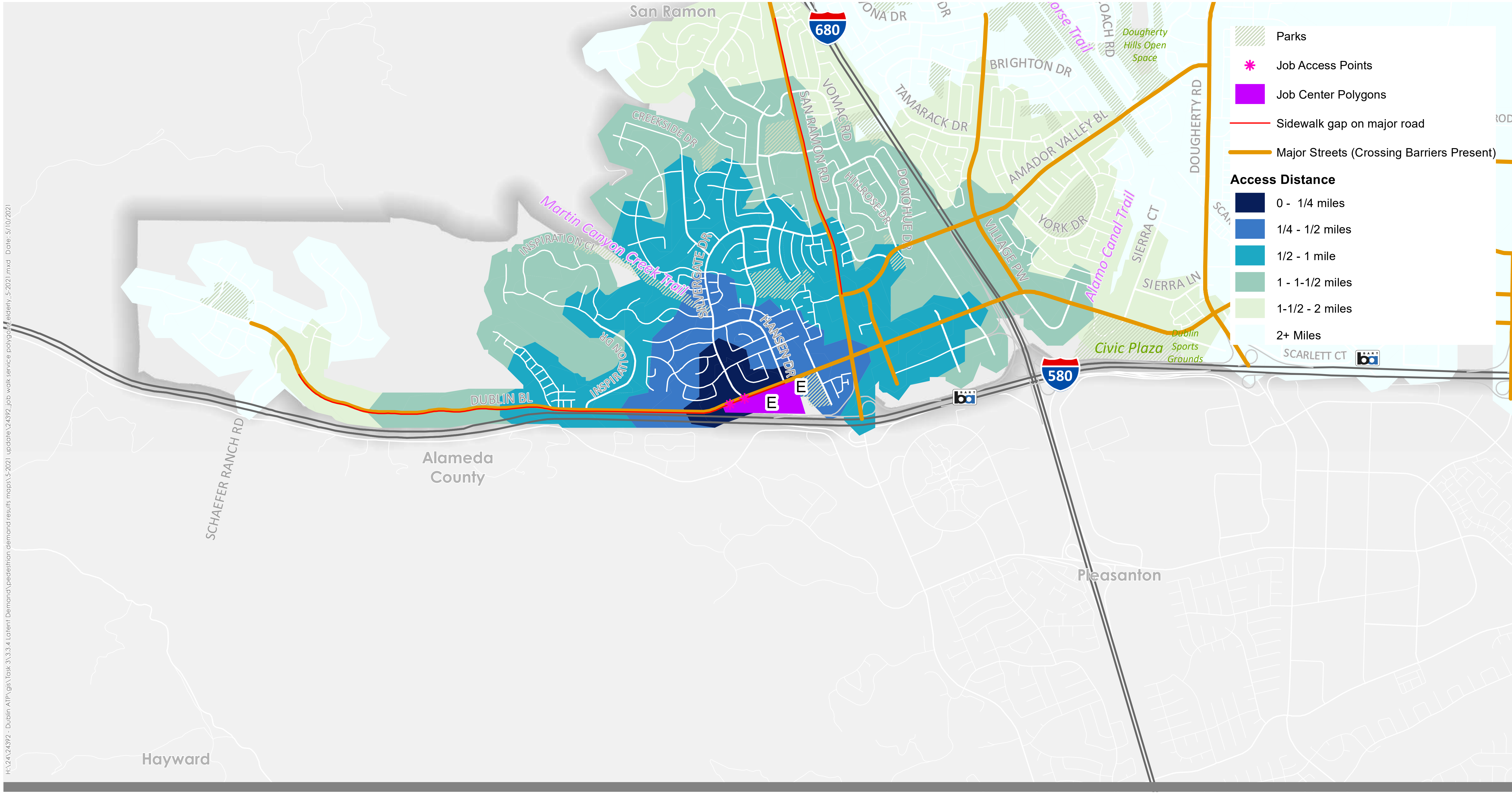


Figure W.J.5b

Job Center Network Service Areas: Walking Perceived Distances
Job Center E Access - Over 55 Years Old
Dublin, California

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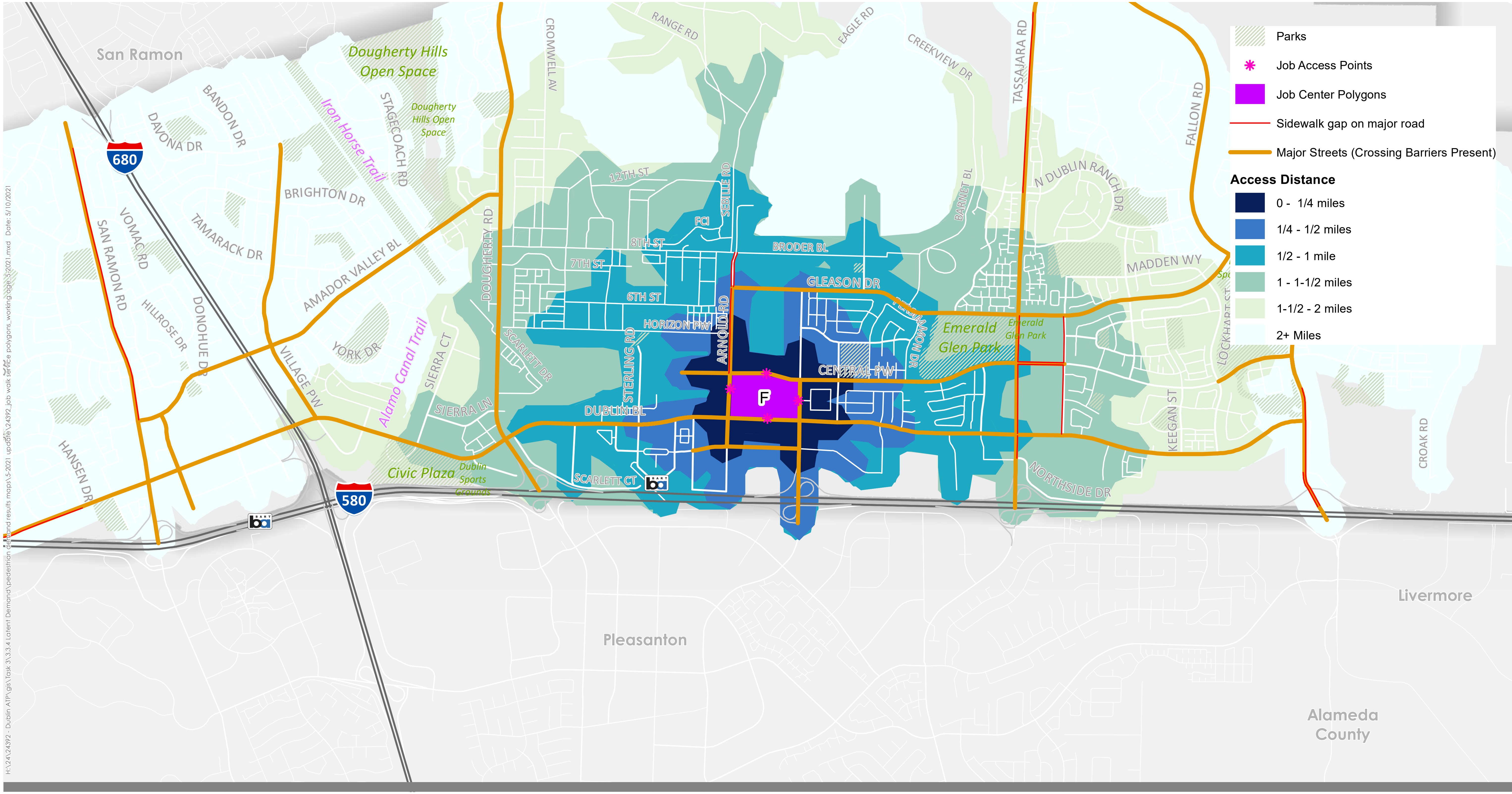

Figure W.J.6a

Job Center Network Service Areas: Walking Perceived Distances
Job Center F Access - 14 to 55 Years Old
Dublin, California

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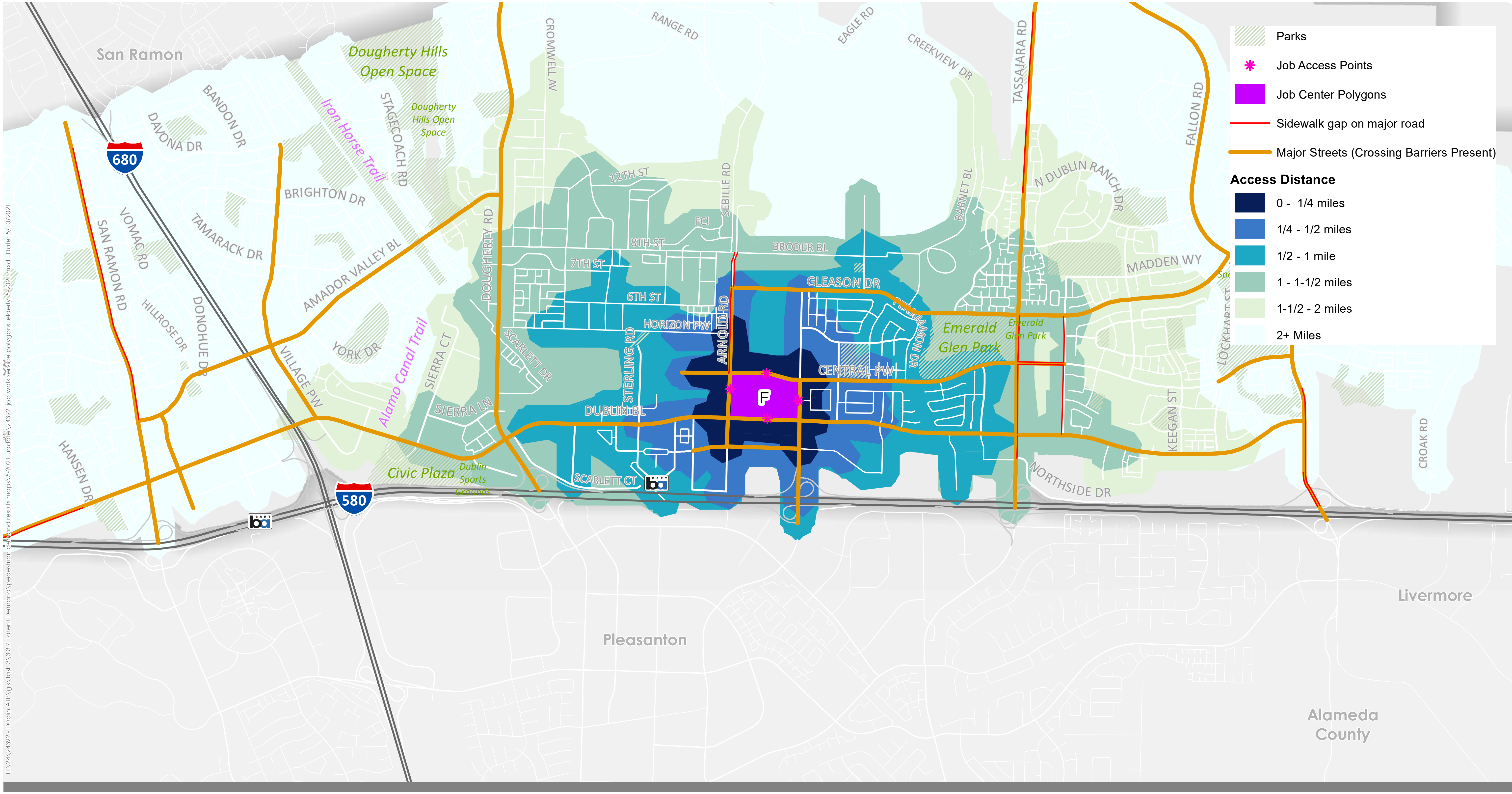

Figure W.J.6b

Job Center Network Service Areas: Walking Perceived Distances
Job Center F Access - Over 55 Years Old
Dublin, California

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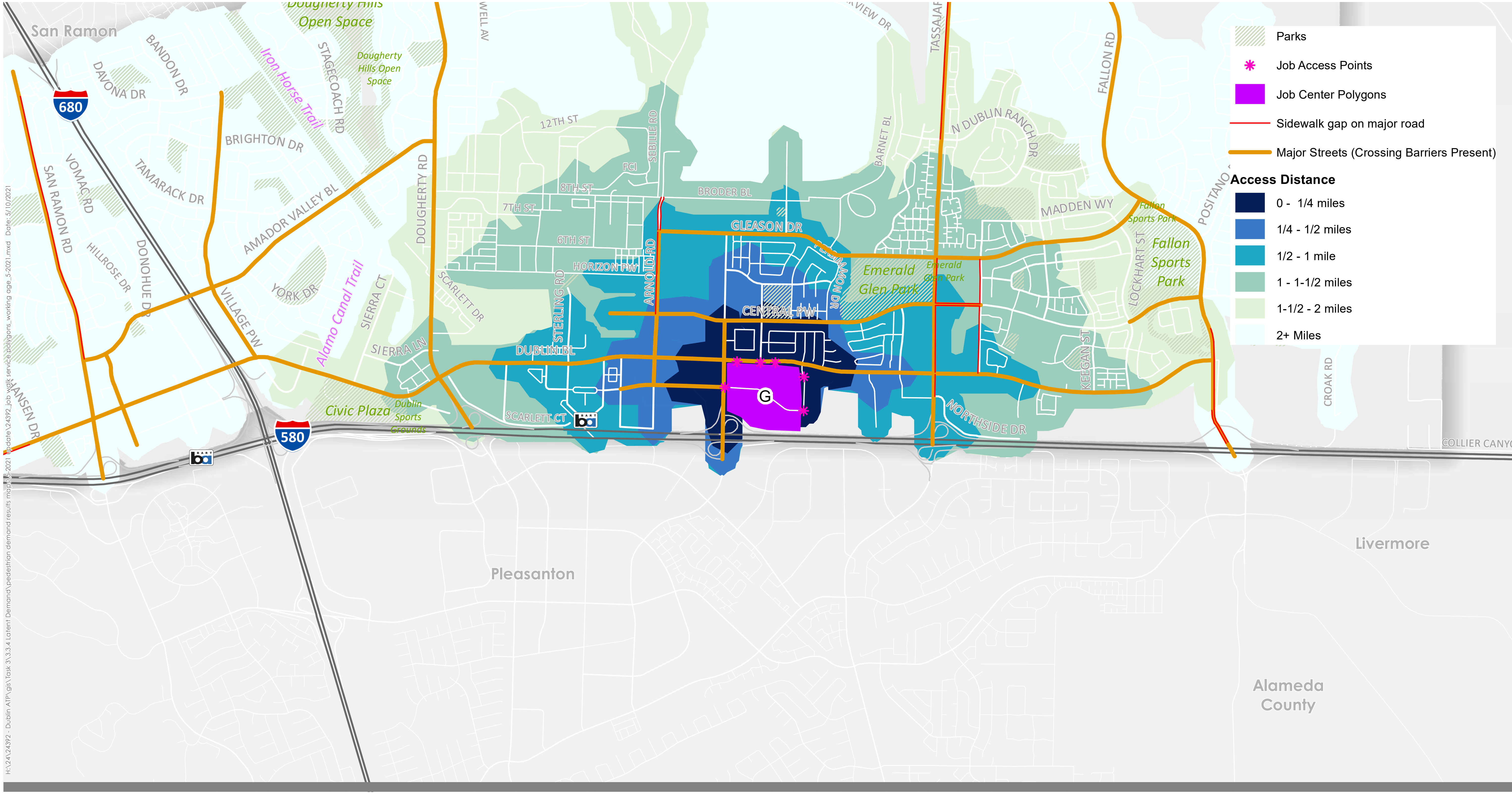

Figure W.J.7a

Job Center Network Service Areas: Walking Perceived Distances
Job Center G Access - 14 to 55 Years Old
Dublin, California

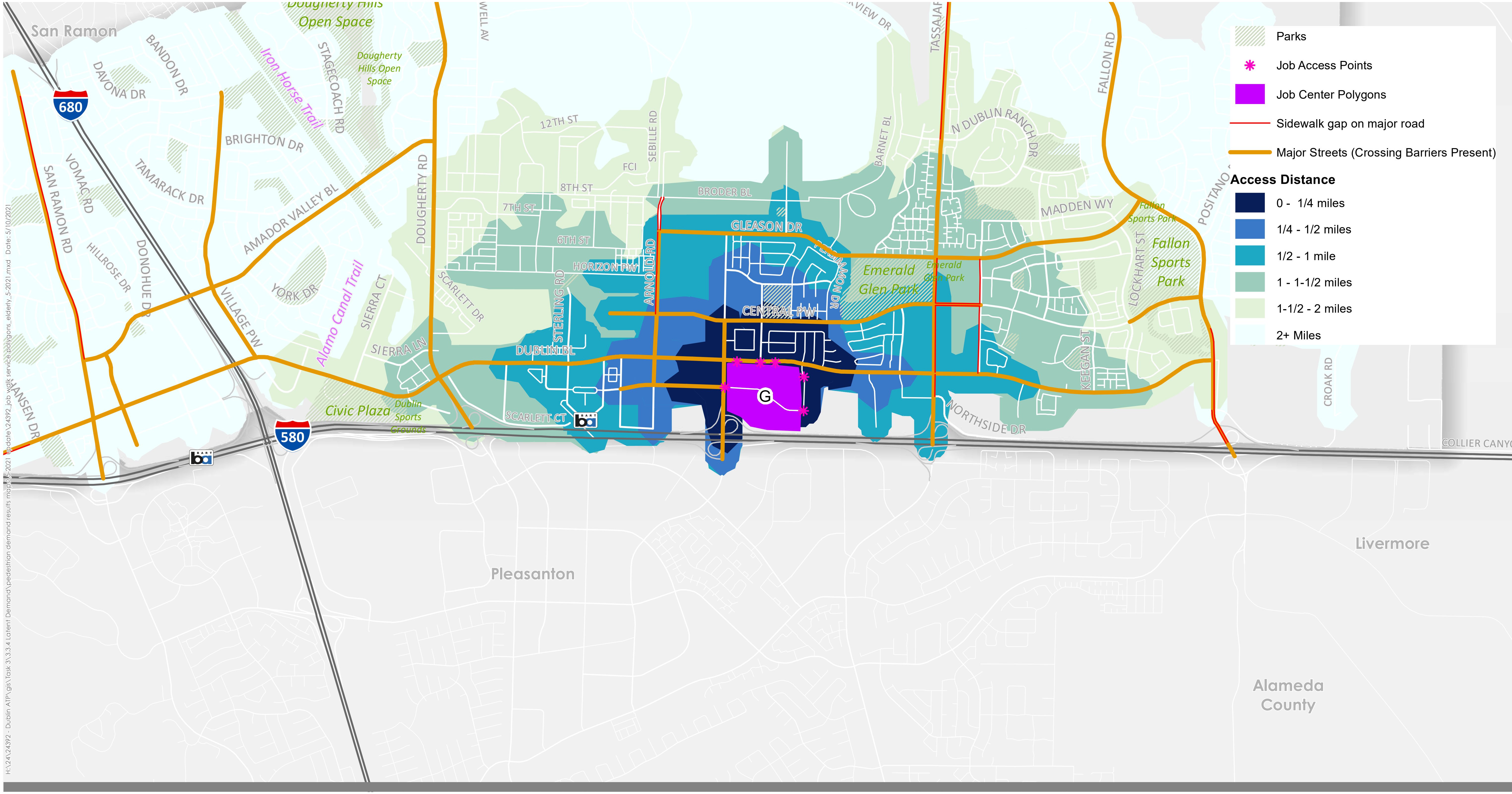

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Figure W.J.7b

Job Center Network Service Areas: Walking Perceived Distances
Job Center G Access - Over 55 Years Old
Dublin, California

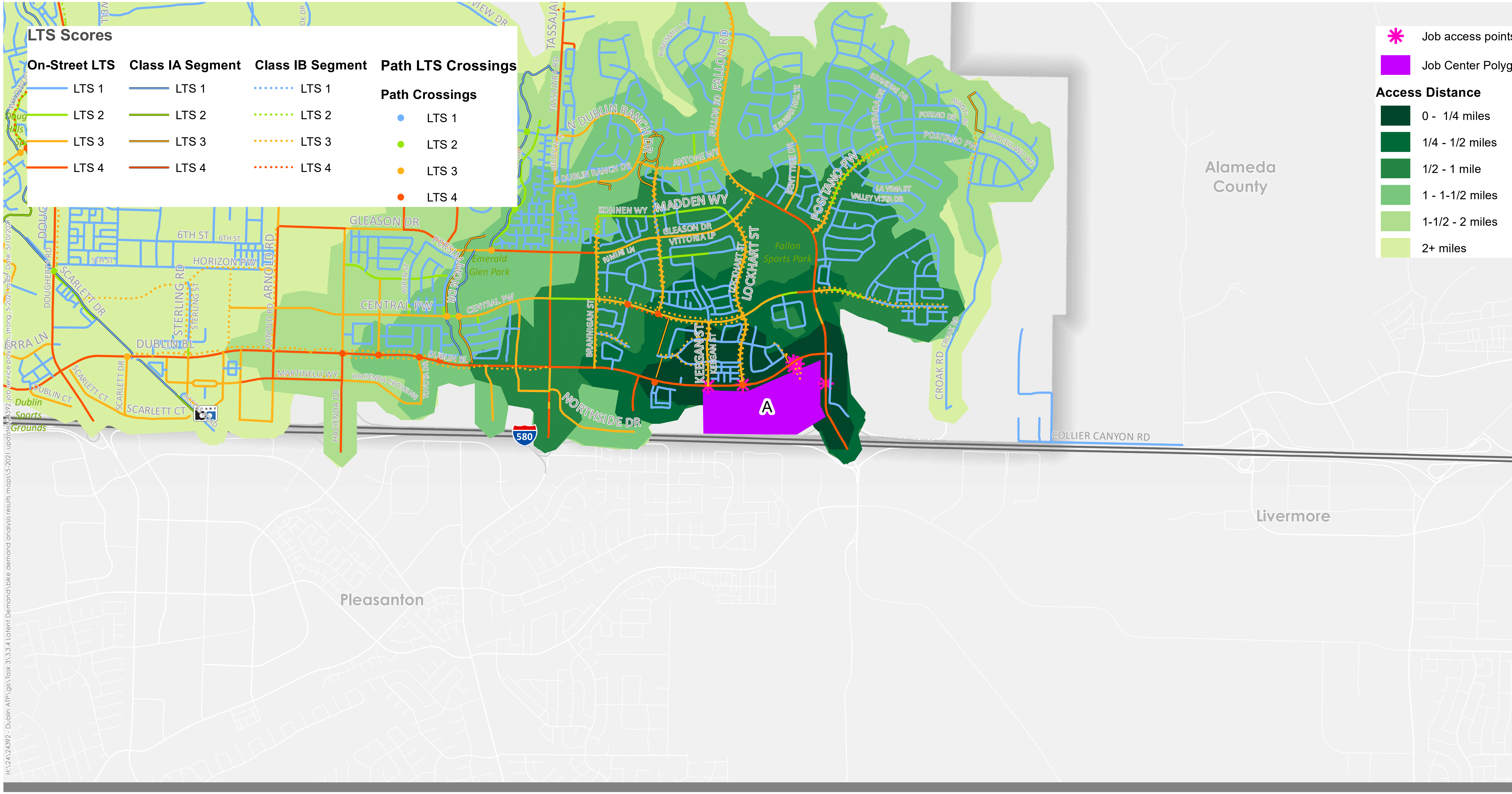

Figure B.J.1a

Job Center Polygon A Access - "Strong and Fearless" Network Service Area
Dublin, California

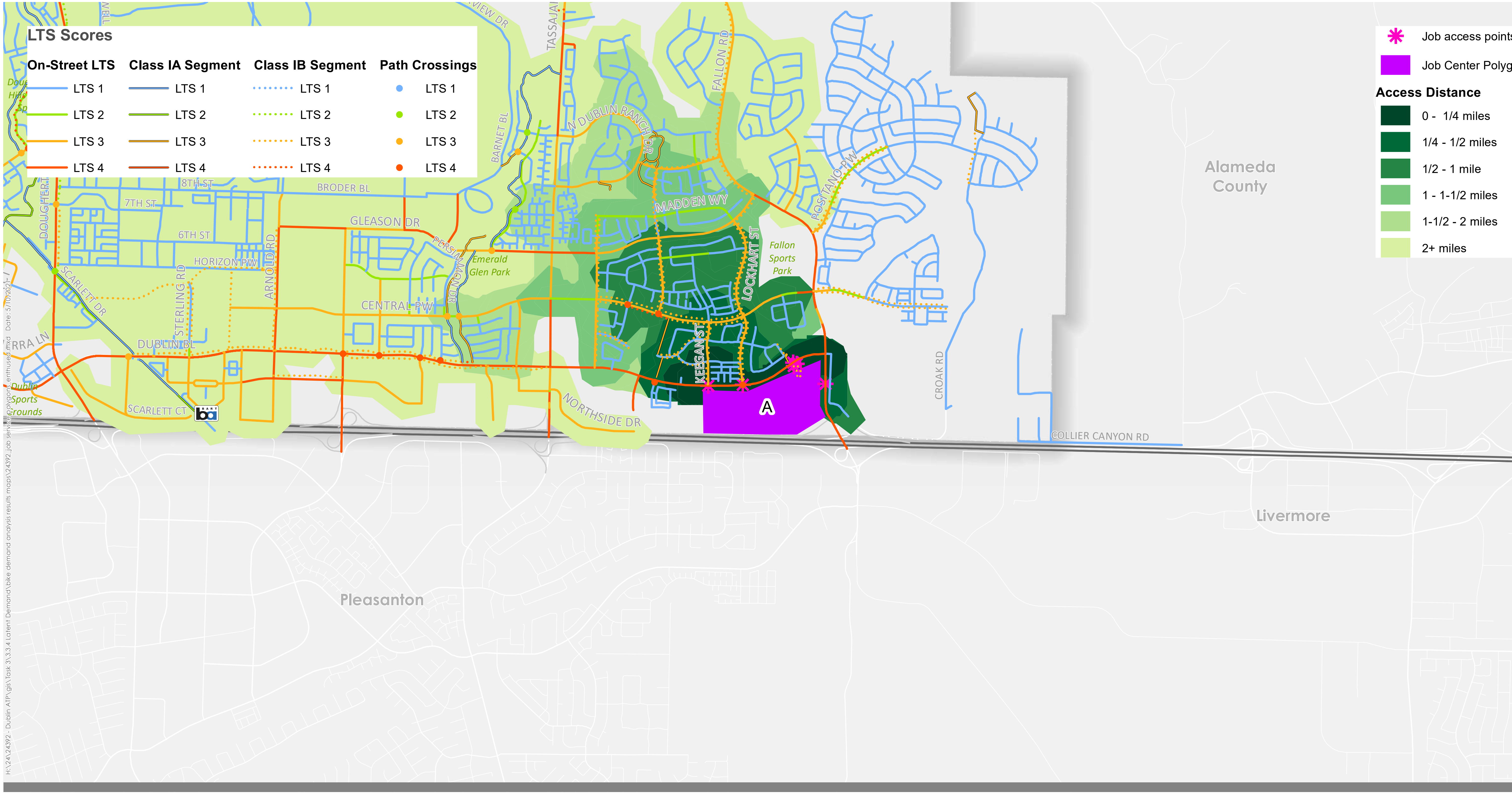

Figure B.J.1b

Job Center Polygon A Access - "Enthused and Confident" Network Service Area
Dublin, California

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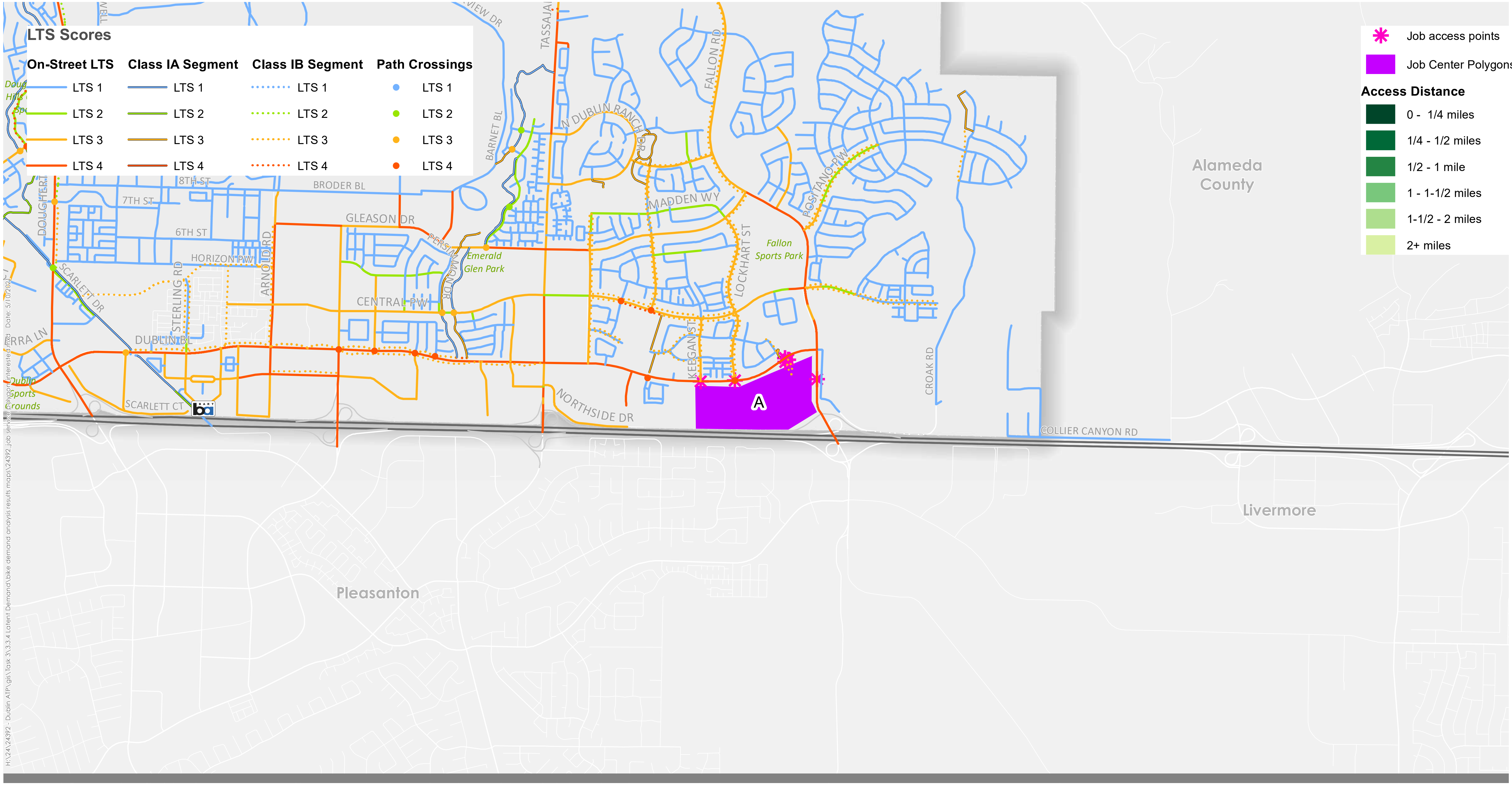

Figure B.J.1c

Job Center Polygon A Access - "Interested but Concerned" Network Service Area
Dublin, California

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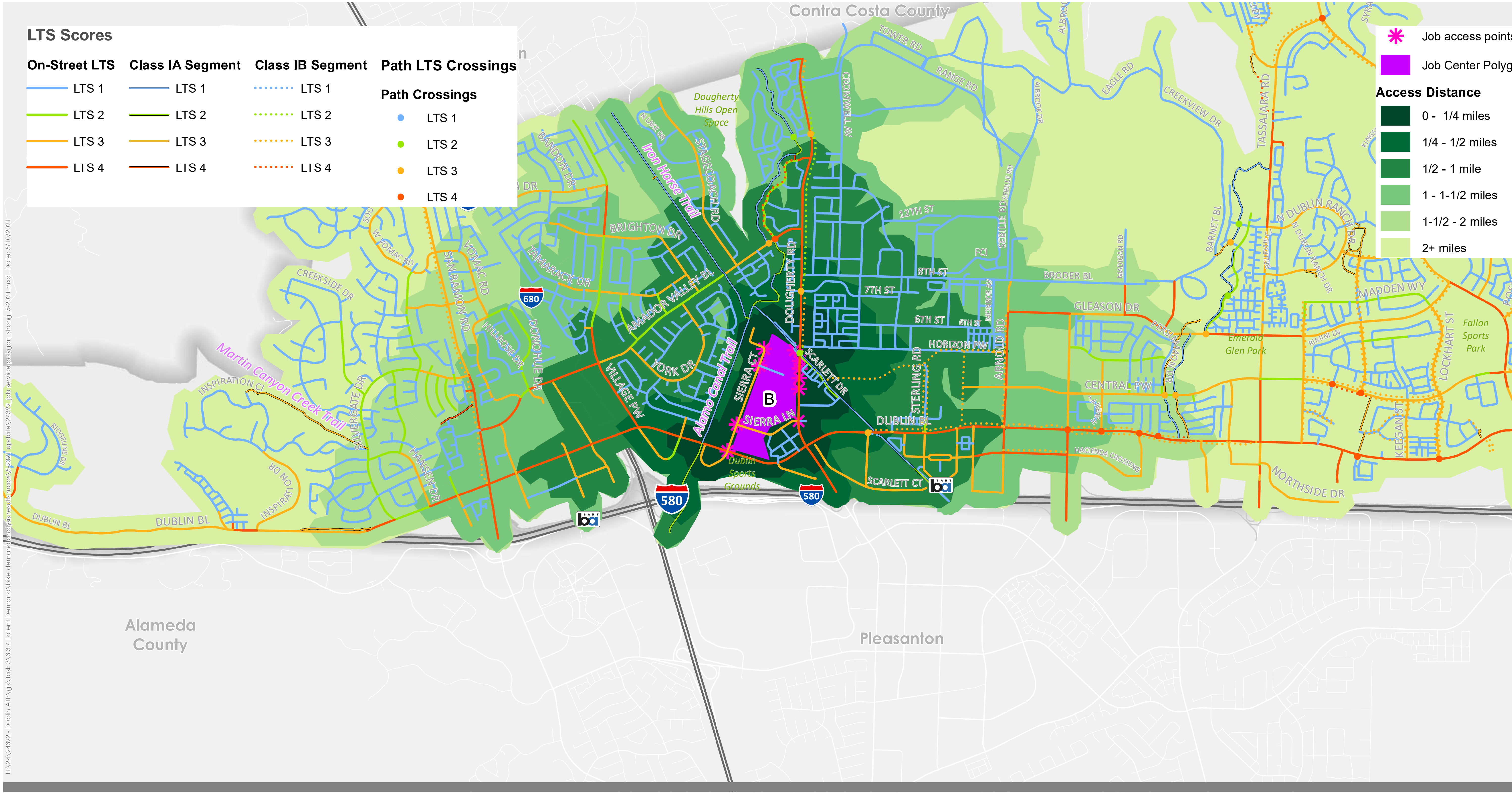

Figure B.J.2a

Job Center Polygon B Access - "Strong and Fearless" Network Service Area
Dublin, California

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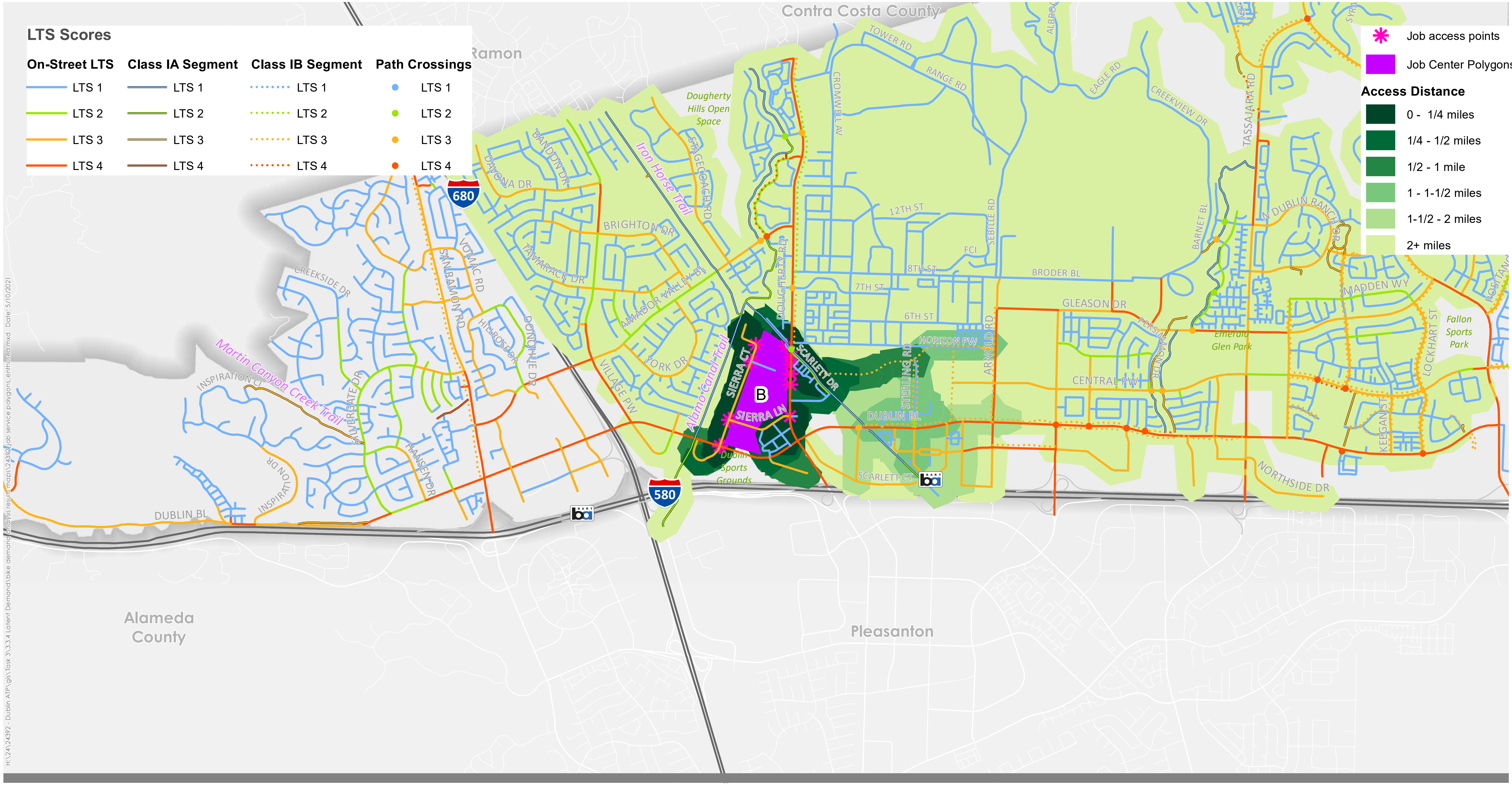

Figure B.J.2b

Job Center Polygon B Access - "Enthused and Confident" Network Service Area
Dublin, California

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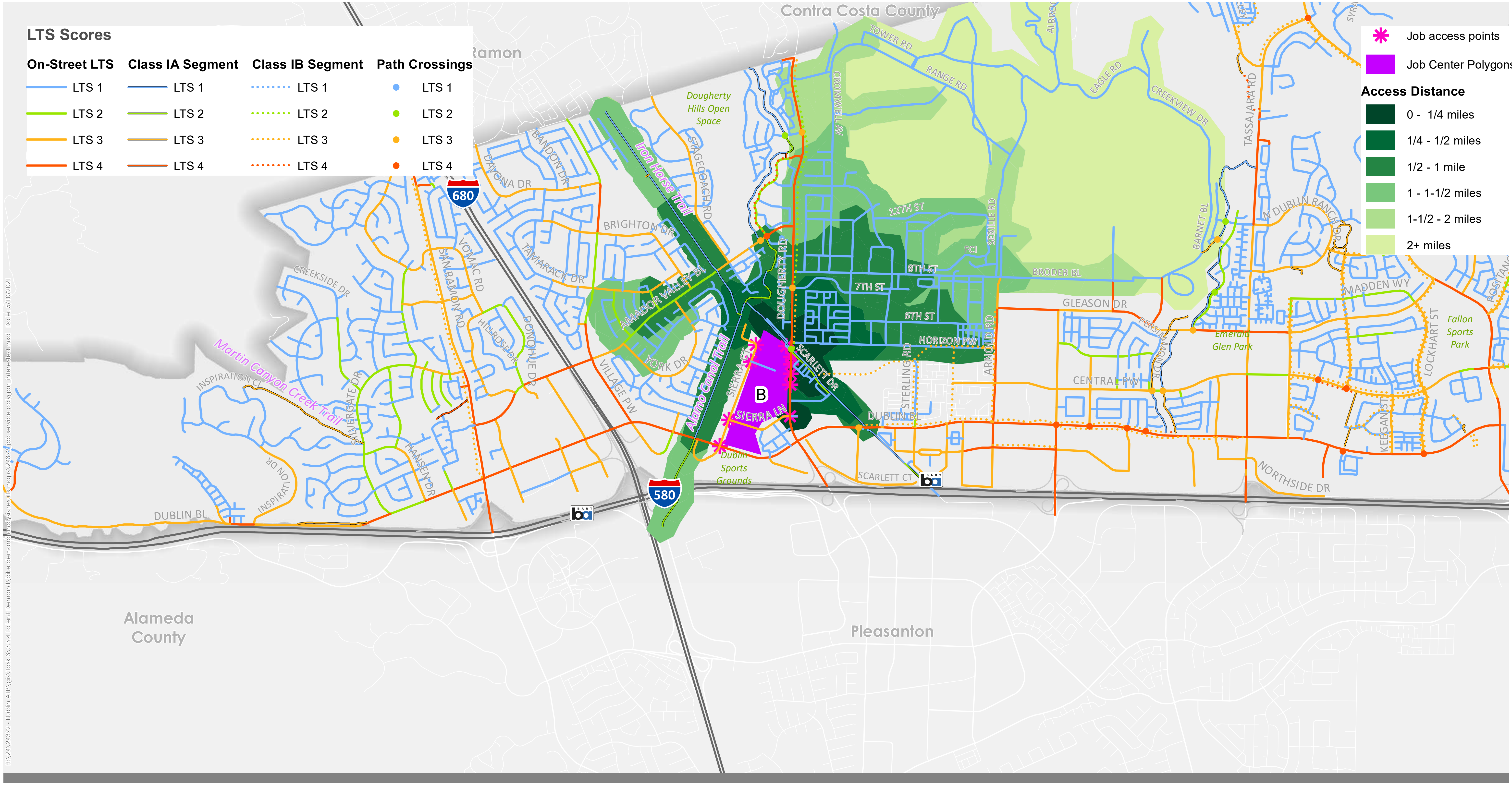

Figure B.J.2c

Job Center Polygon B Access - "Interested but Concerned" Network Service Area
Dublin, California

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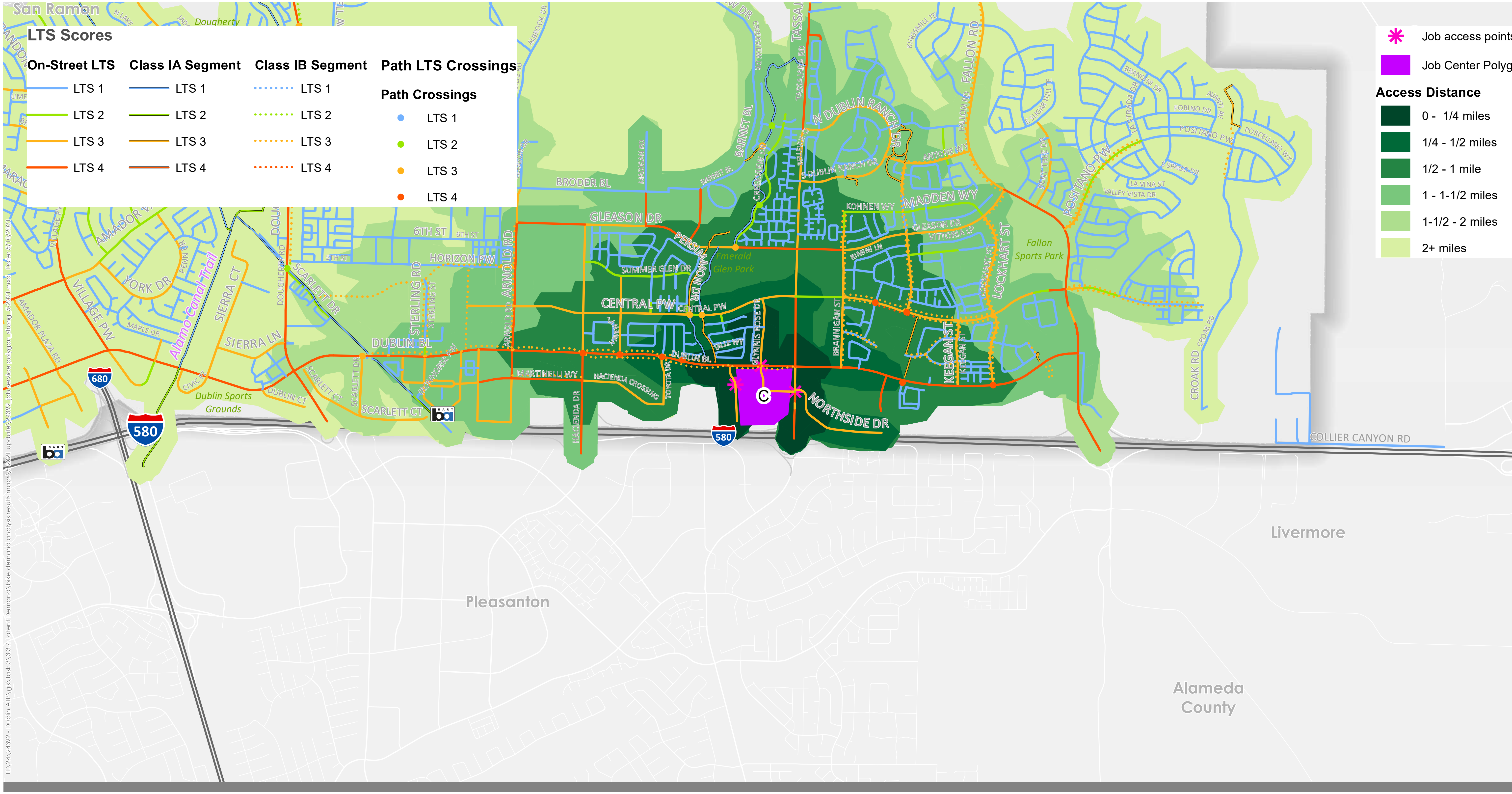

Figure B.J.3a

Job Center Polygon C Access - "Strong and Fearless" Network Service Area
Dublin, California

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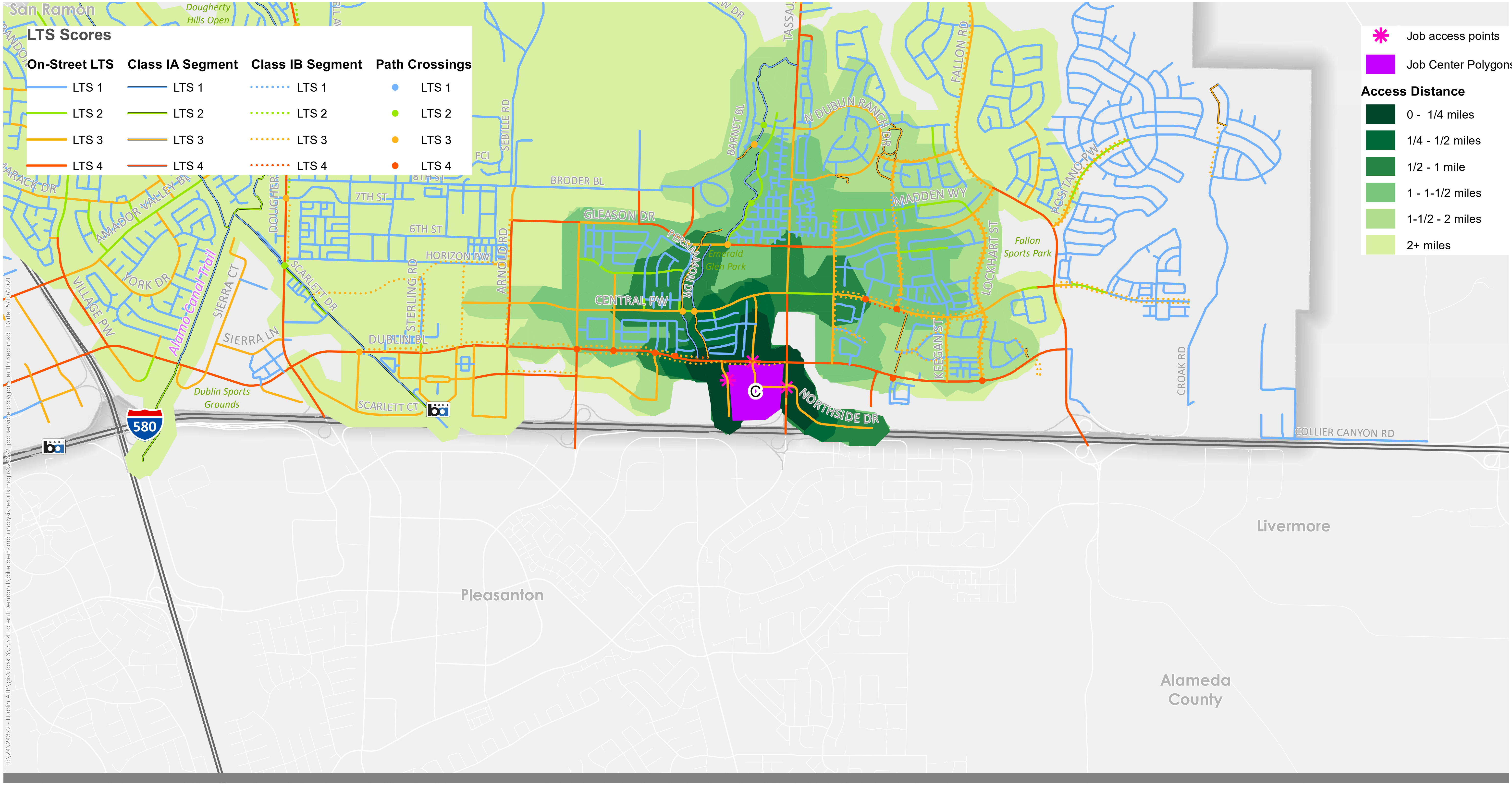

Figure B.J.3b

Job Center Polygon C Access - "Enthused and Confident" Network Service Area
Dublin, California

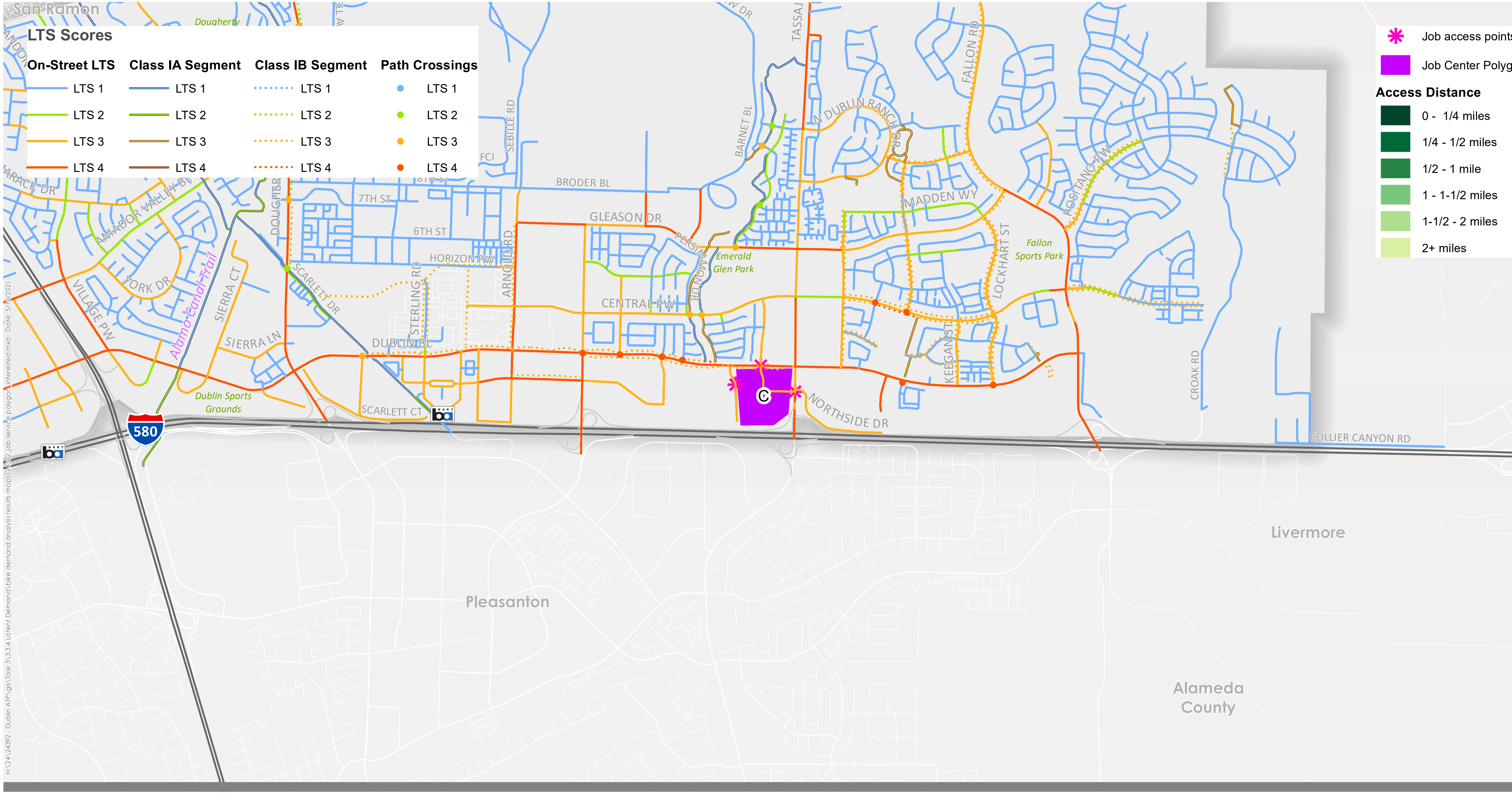

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Figure B.J.3c

Job Center Polygon C Access - "Interested but Concerned" Network Service Area Dublin, California

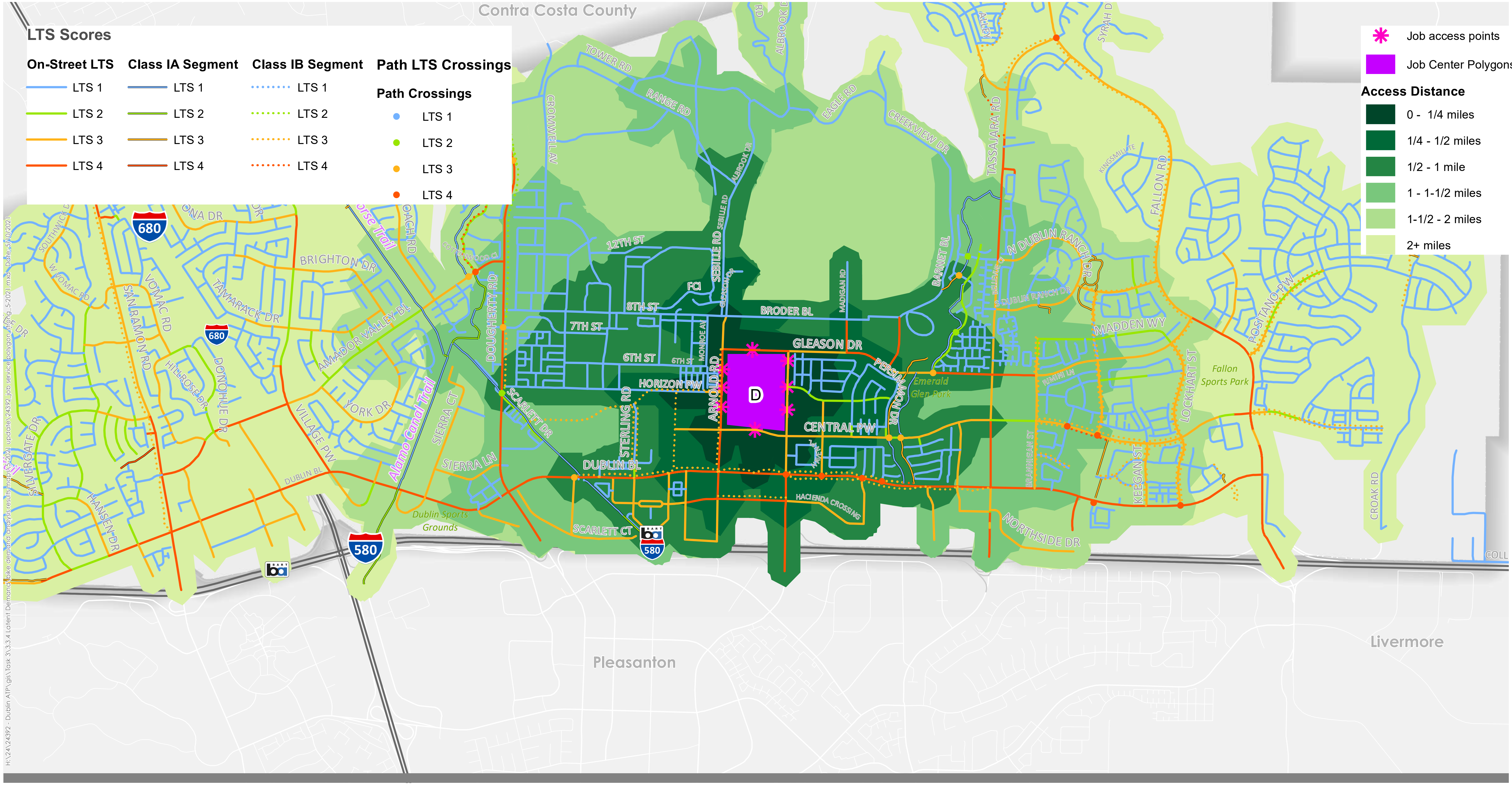

Figure B.J.4a

Job Center Polygon D Access - "Strong and Fearless" Network Service Area
Dublin, California

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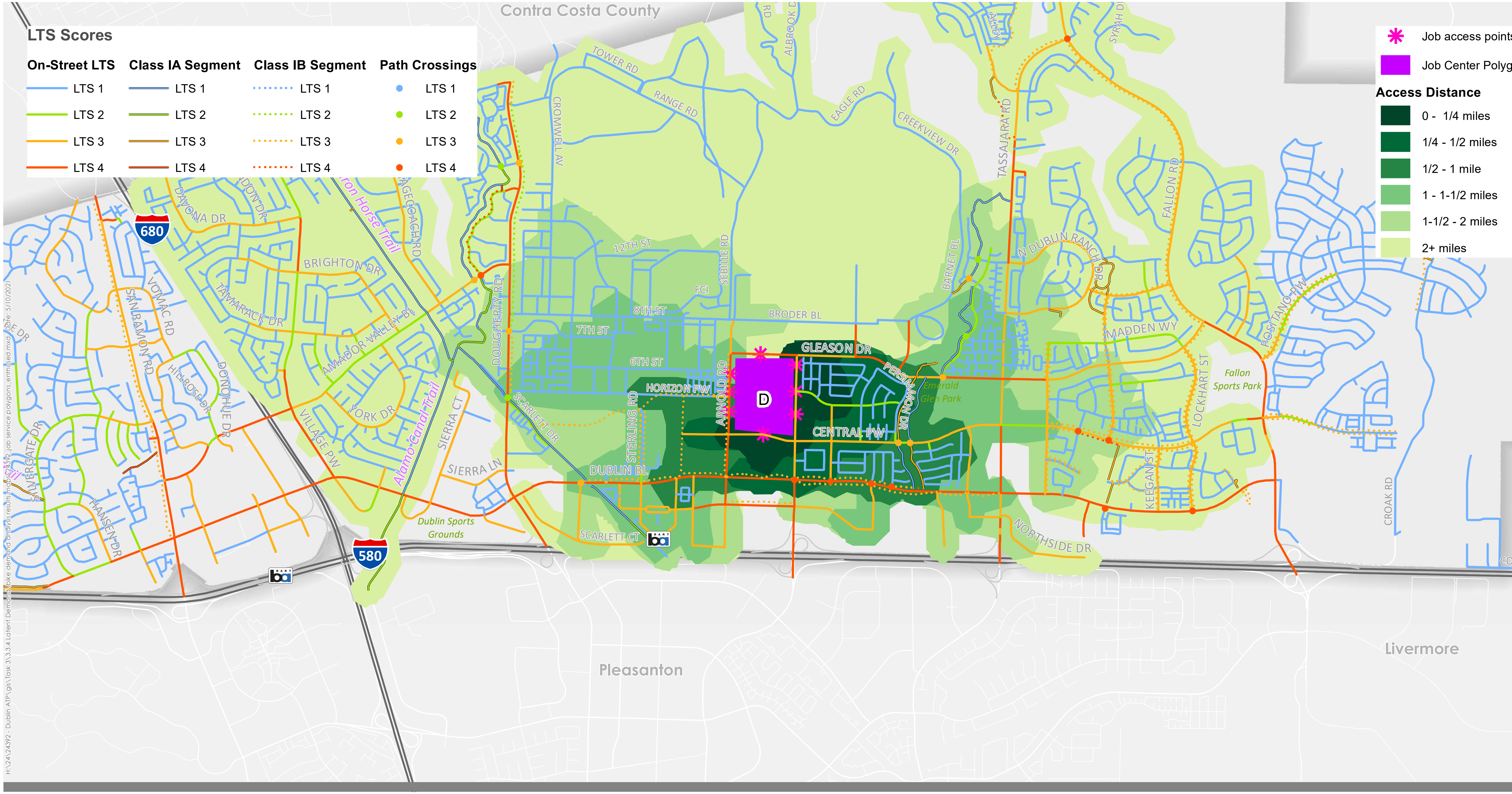

Figure B.J.4b

Job Center Polygon D Access - "Enthused and Confident" Network Service Area
Dublin, California

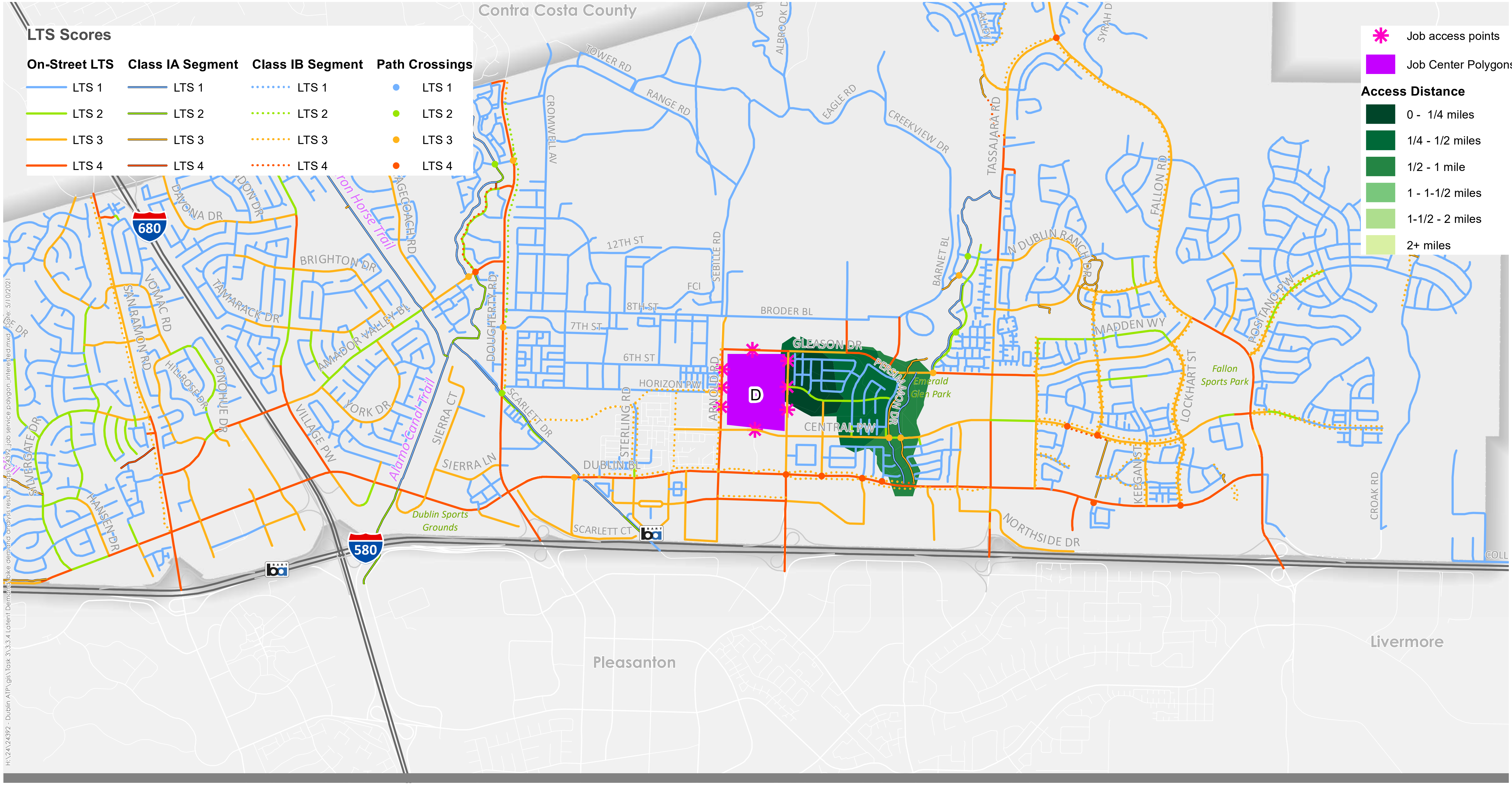

Figure B.J.4c

Job Center Polygon D Access - "Interested but Concerned" Network Service Area
Dublin, California

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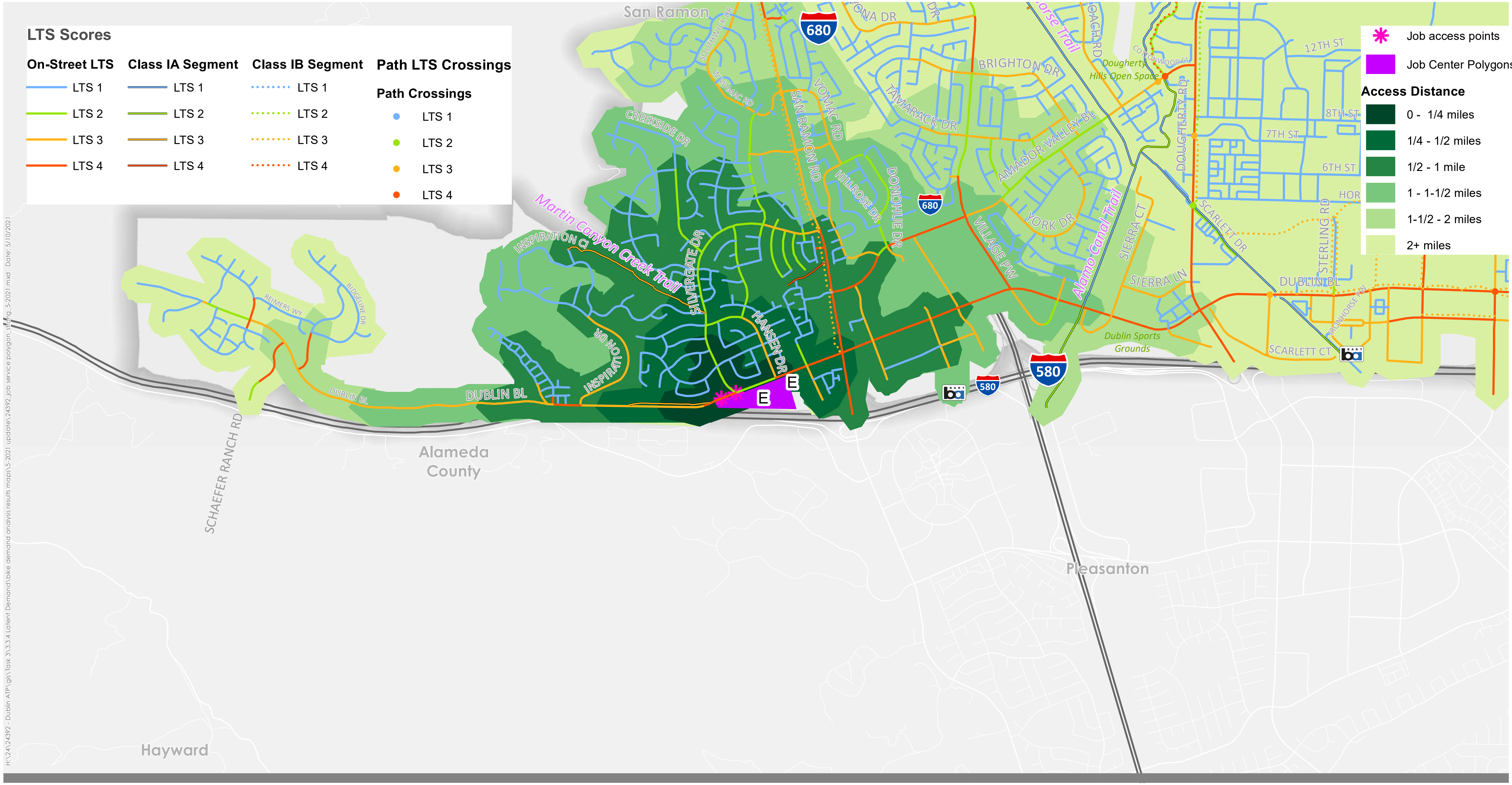

Figure B.J.5a

Job Center Polygon E Access - "Strong and Fearless" Network Service Area
Dublin, California

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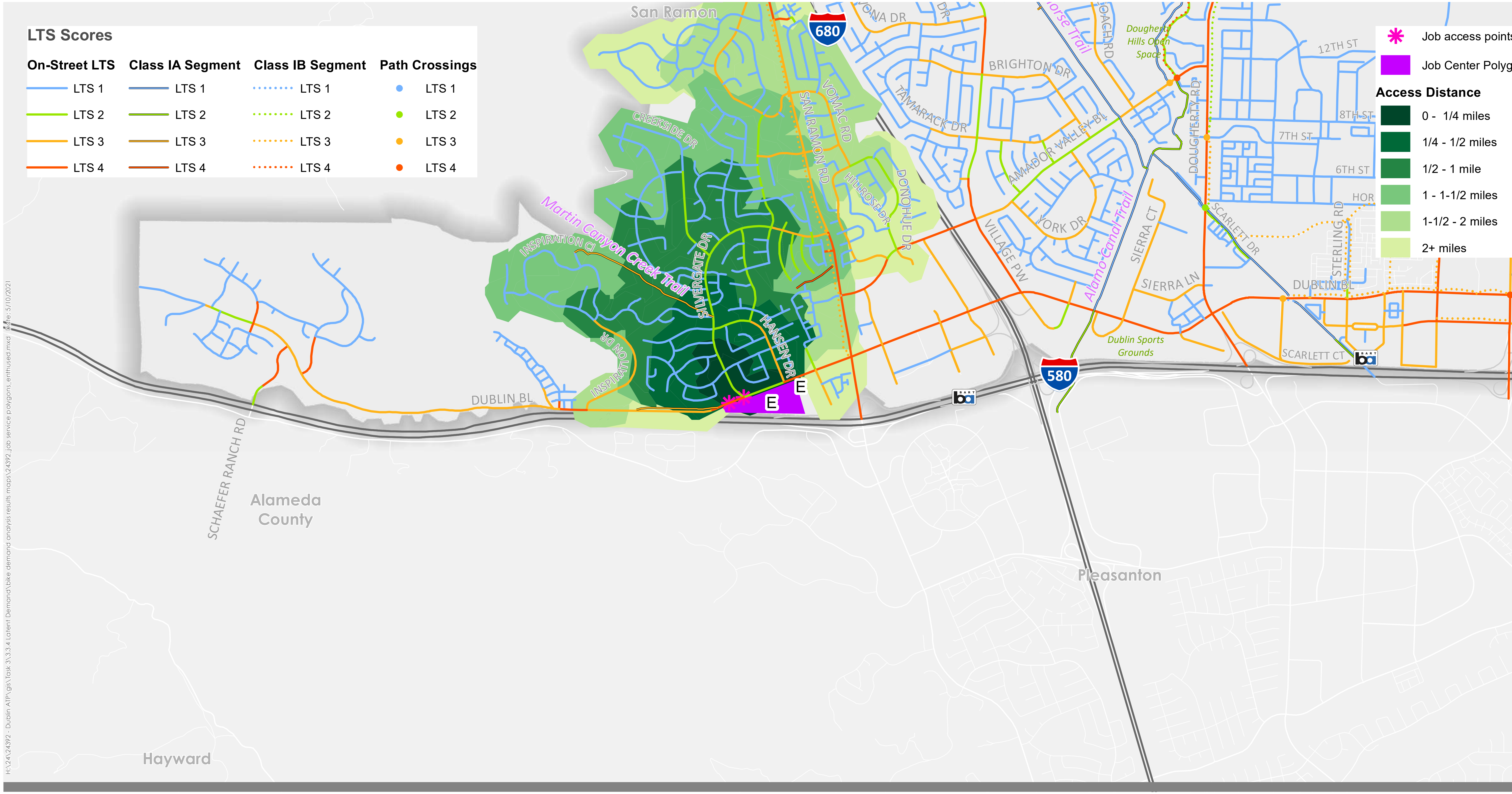

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Figure B.J.5b

Job Center Polygon E Access - "Enthused and Confident" Network Service Area
Dublin, California

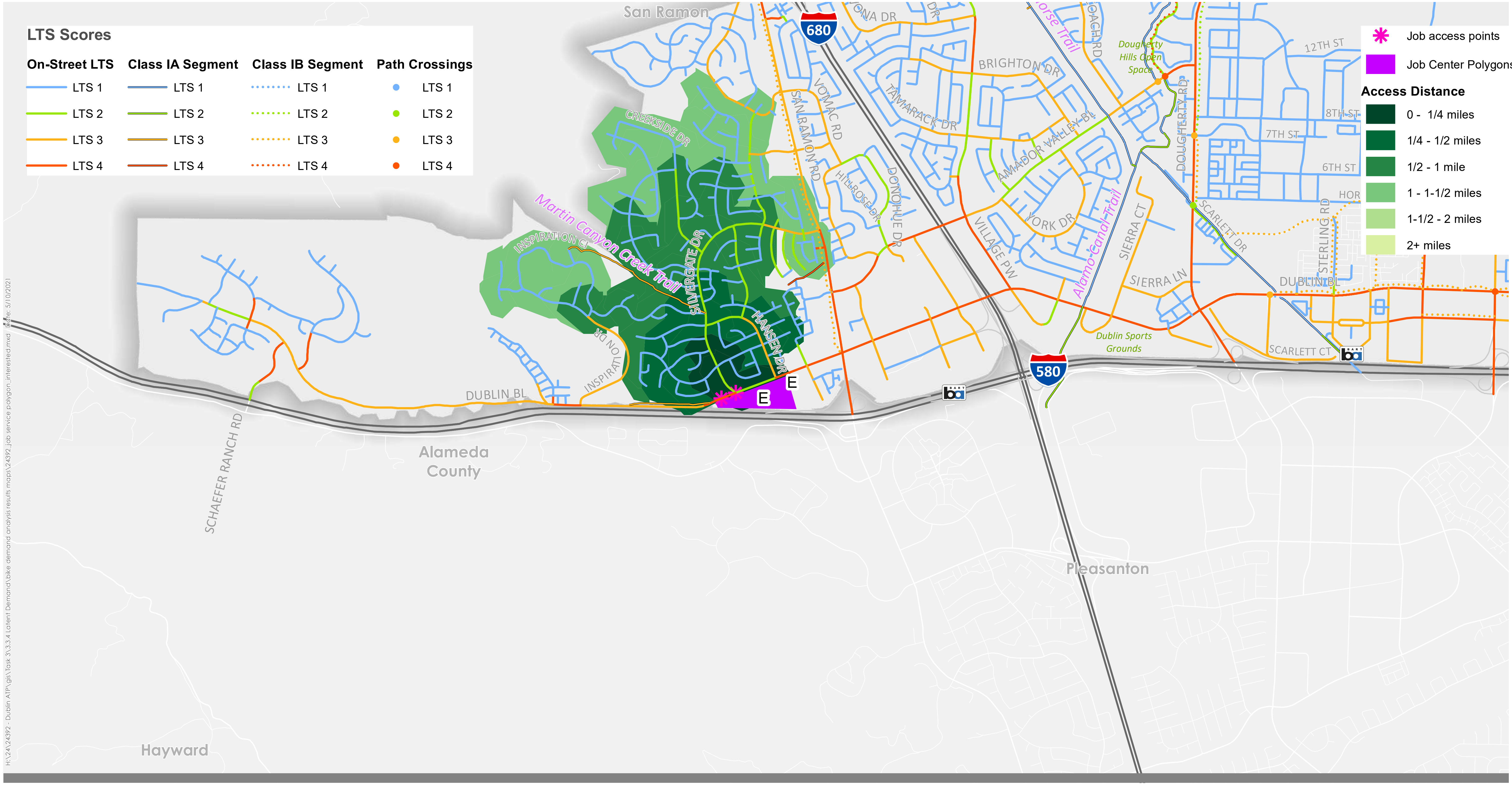

Figure B.J.5c

Job Center Polygon E Access - "Interested but Concerned" Network Service Area
Dublin, California

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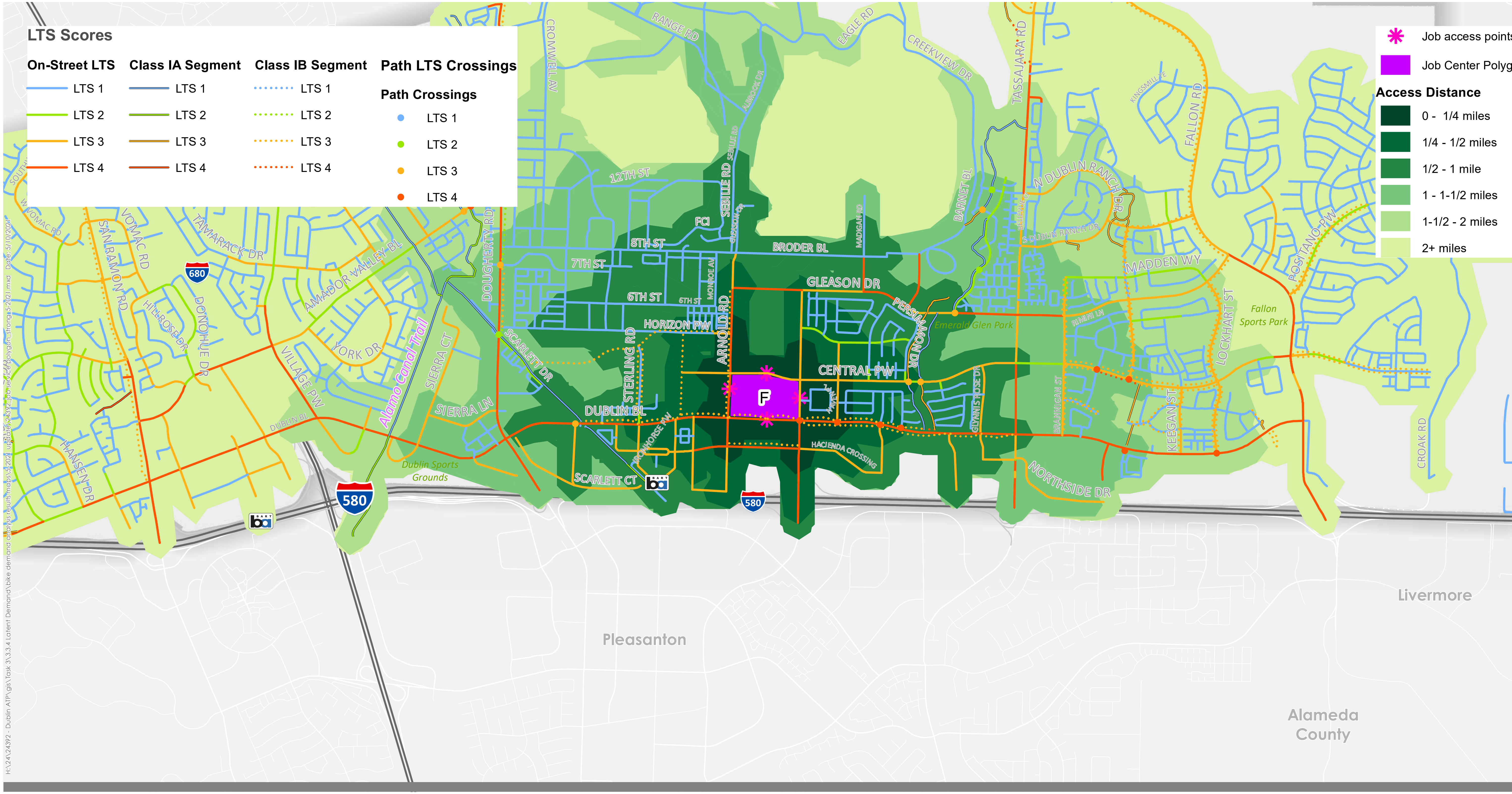

Figure B.J.6a

Job Center Polygon F Access - "Strong and Fearless" Network Service Area
Dublin, California

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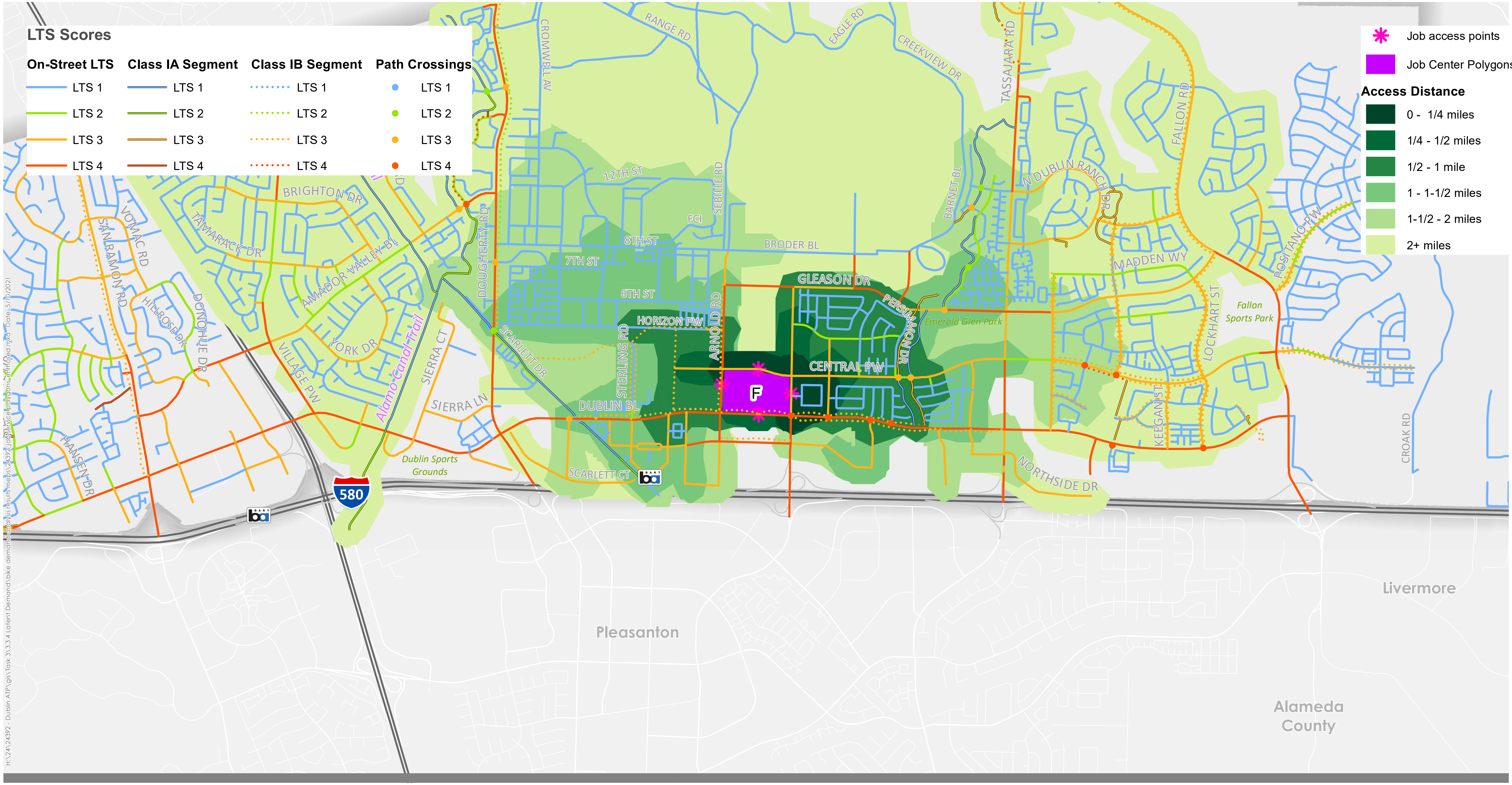

Figure B.J.6b

Job Center Polygon F Access - "Enthused and Confident" Network Service Area Dublin, California

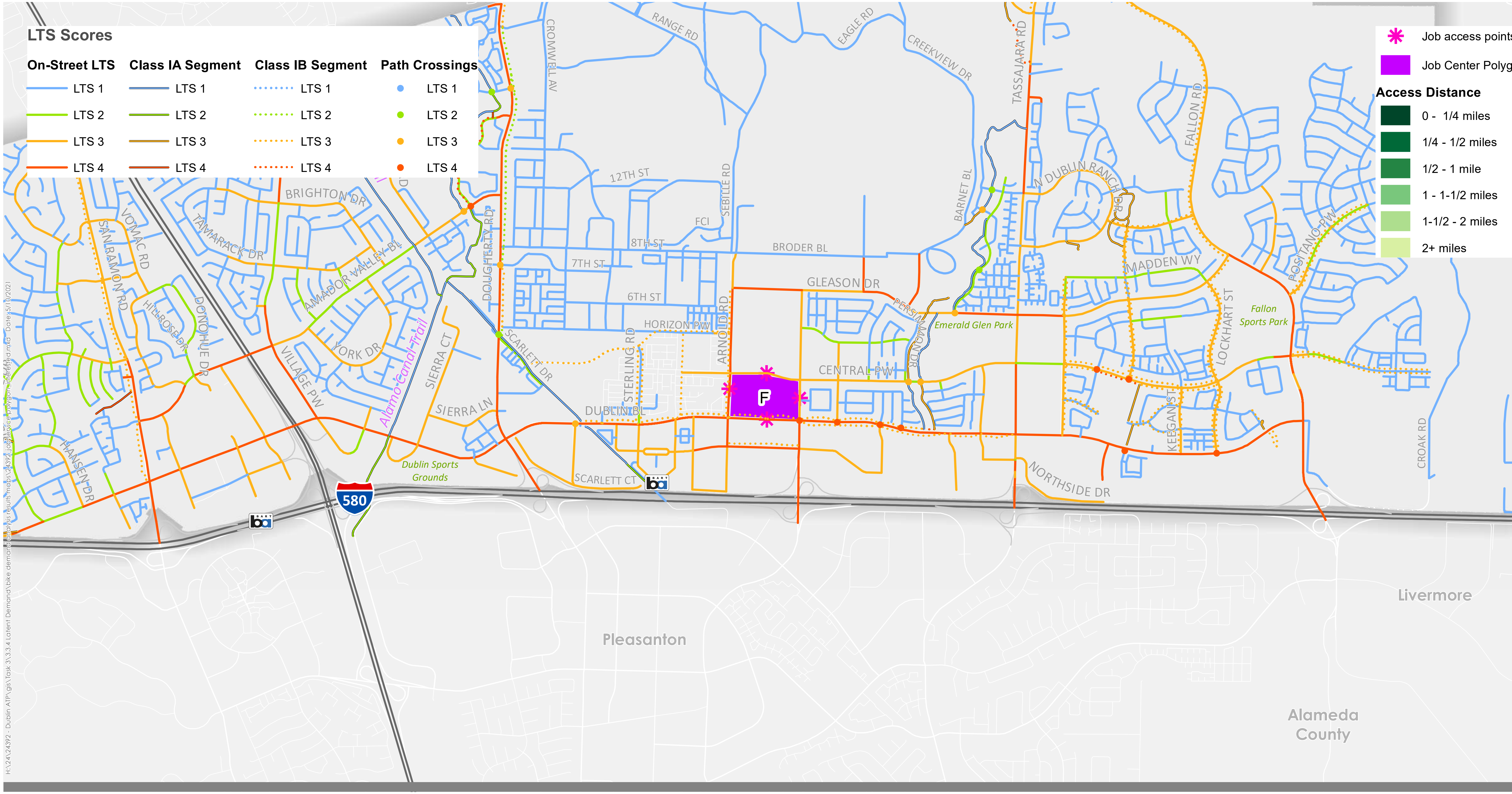

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Figure B.J.6c

Job Center Polygon F Access - "Interested but Concerned" Network Service Area Dublin, California

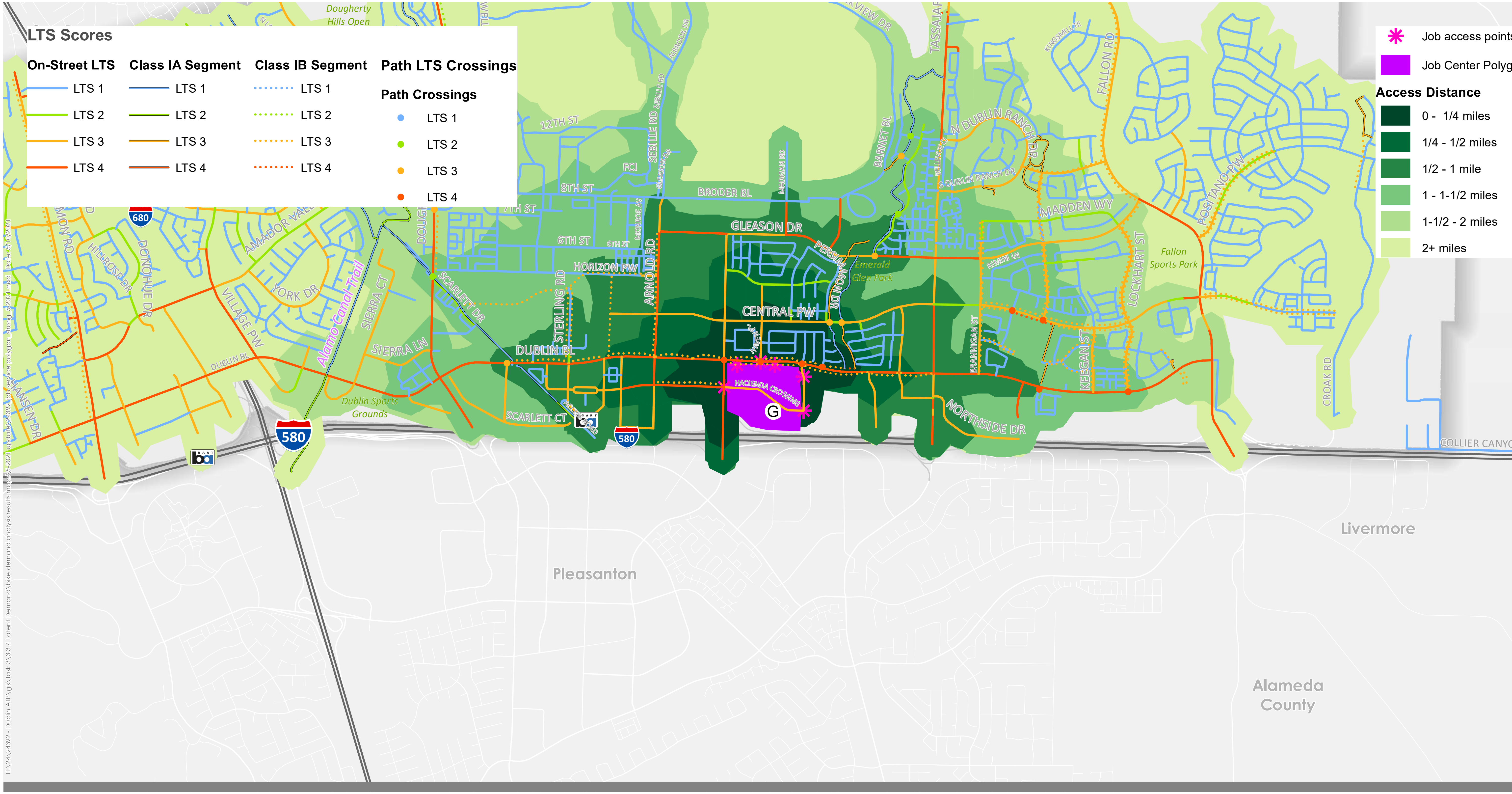

Figure B.J.7a

Job Center Polygon G Access - "Strong and Fearless" Network Service Area Dublin, California

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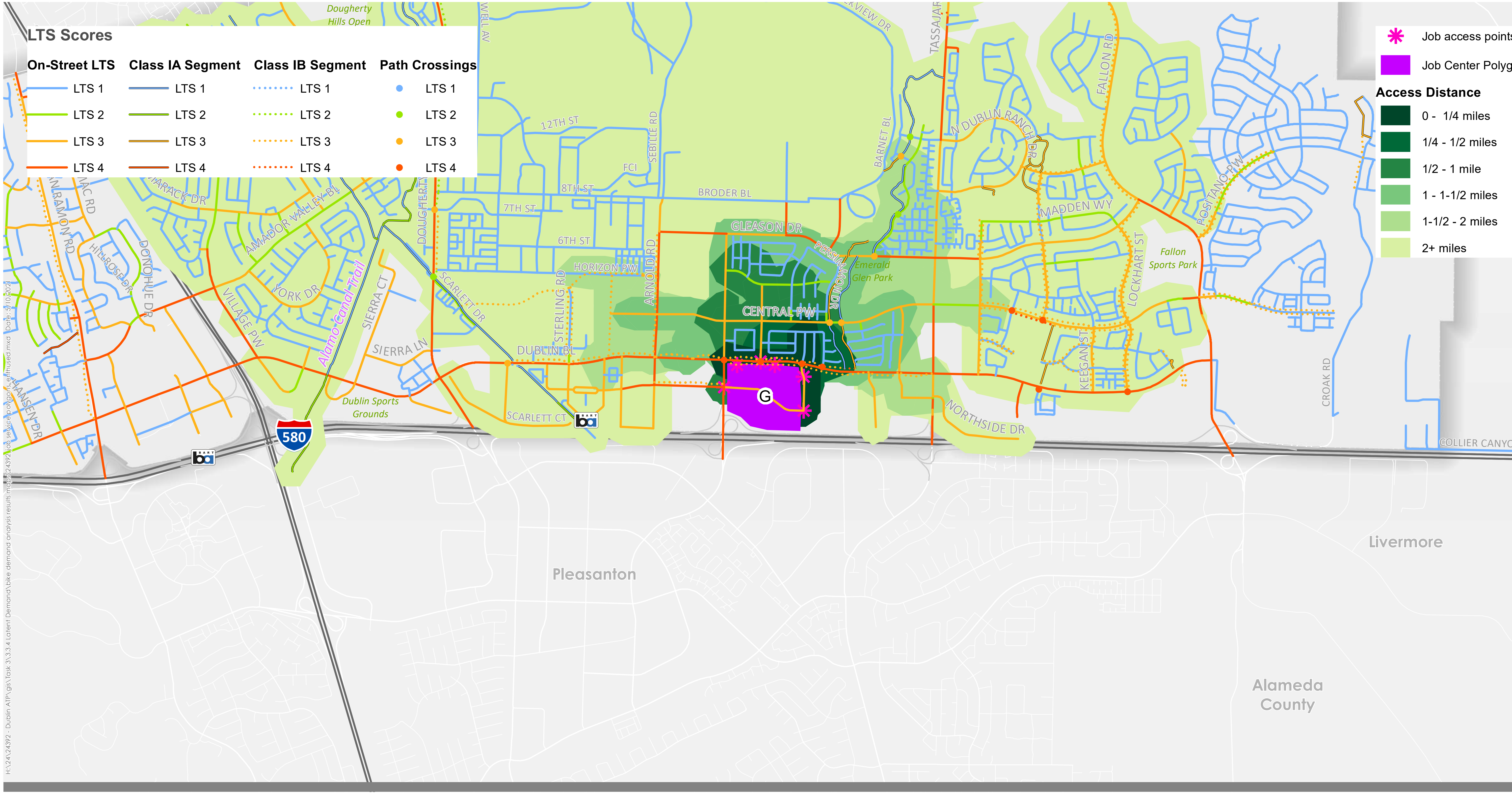

Figure B.J.7b

Job Center Polygon G Access - "Enthused and Confident" Network Service Area
Dublin, California

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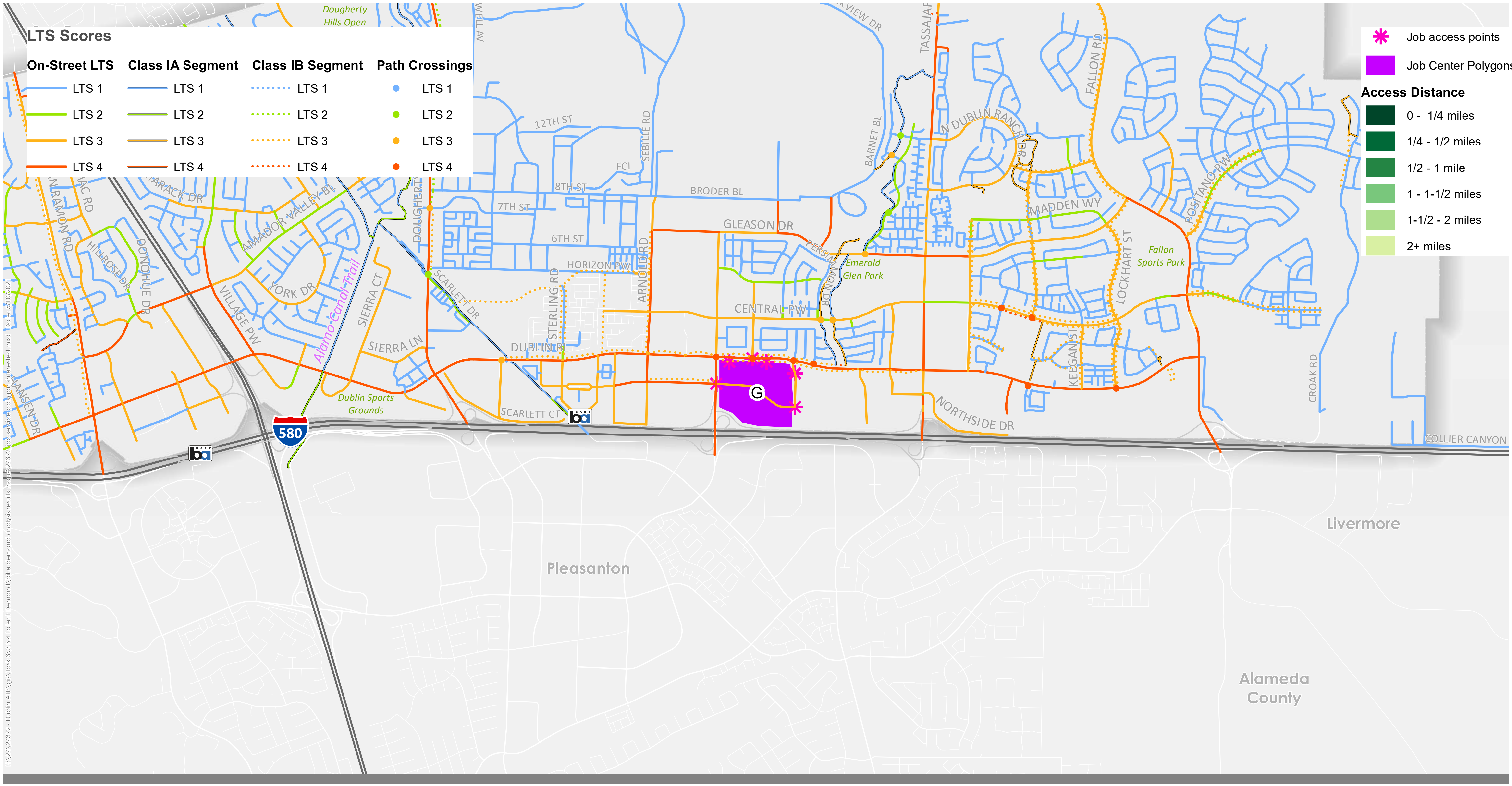

Figure B.J.7c

Job Center Polygon G Access - "Interested but Concerned" Network Service Area
Dublin, California

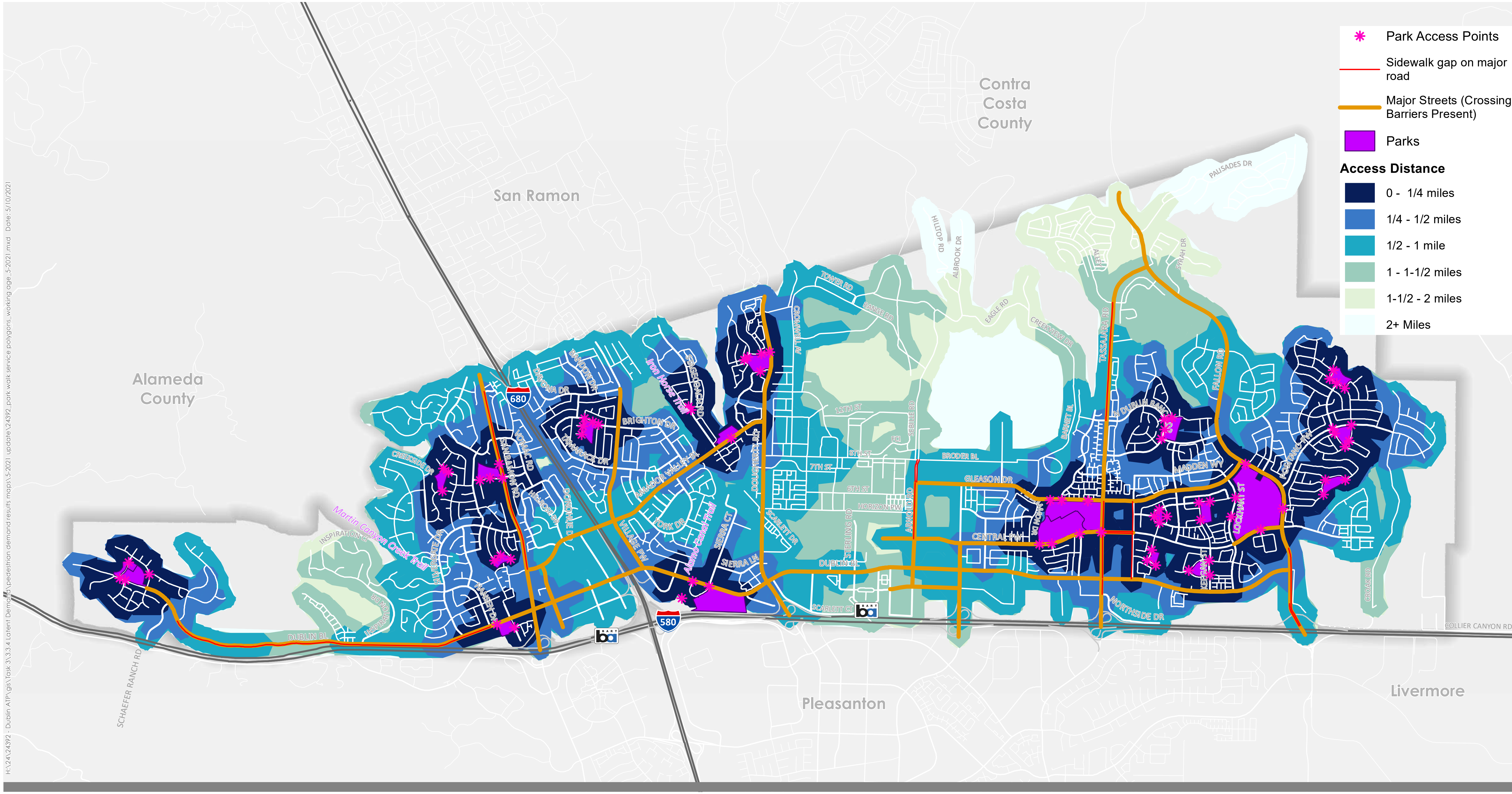

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Figure W.P.1

Park Network Service Areas: Walking Perceived Distances
Neighborhood and Community Parks - 14 to 55 Years Old
Dublin, California

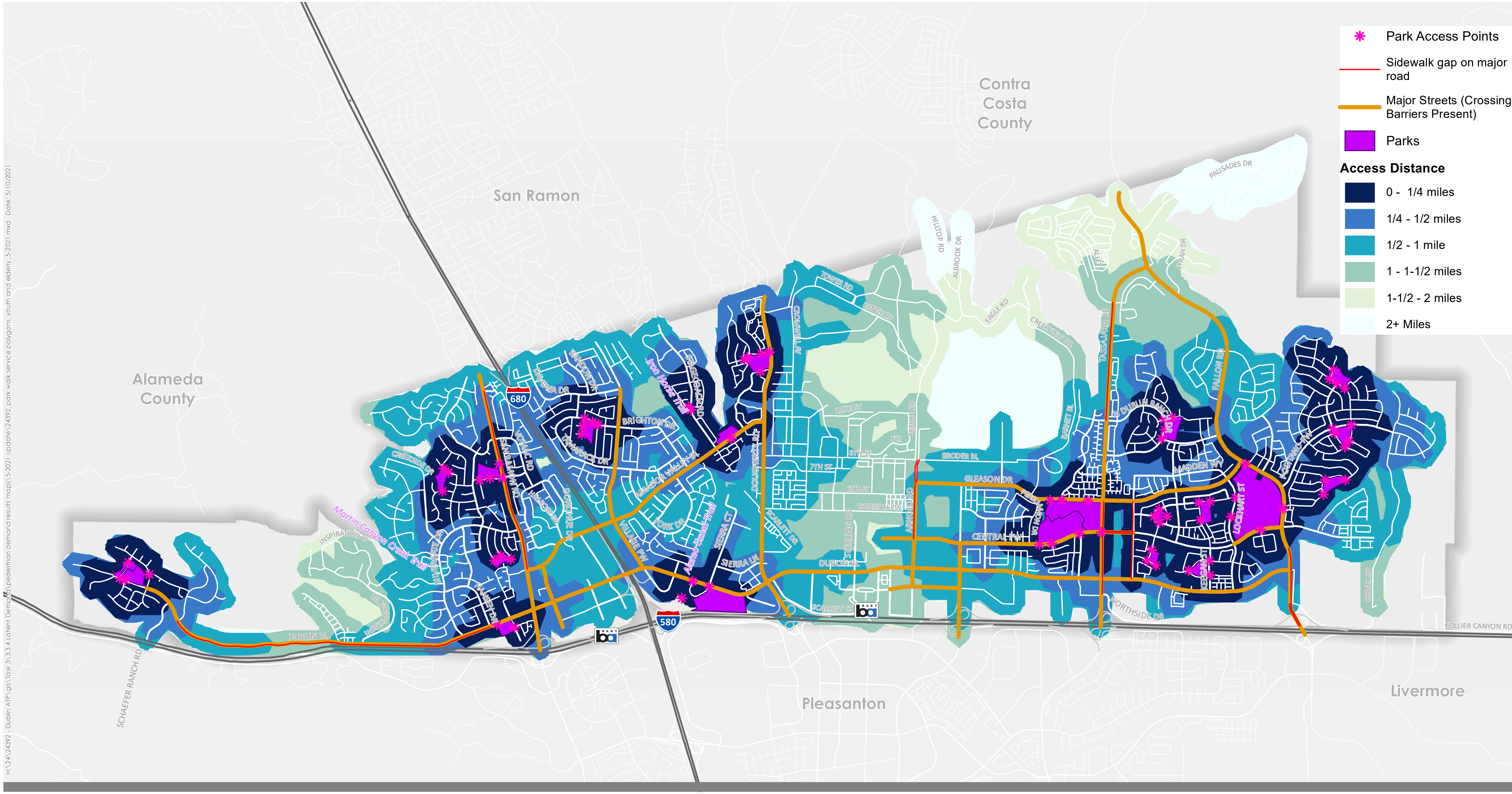

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Figure W.P.2

Park Network Service Areas: Walking Perceived Distances
Neighborhood and Community Parks - Under 14 and Over 55 Years Old
Dublin, California

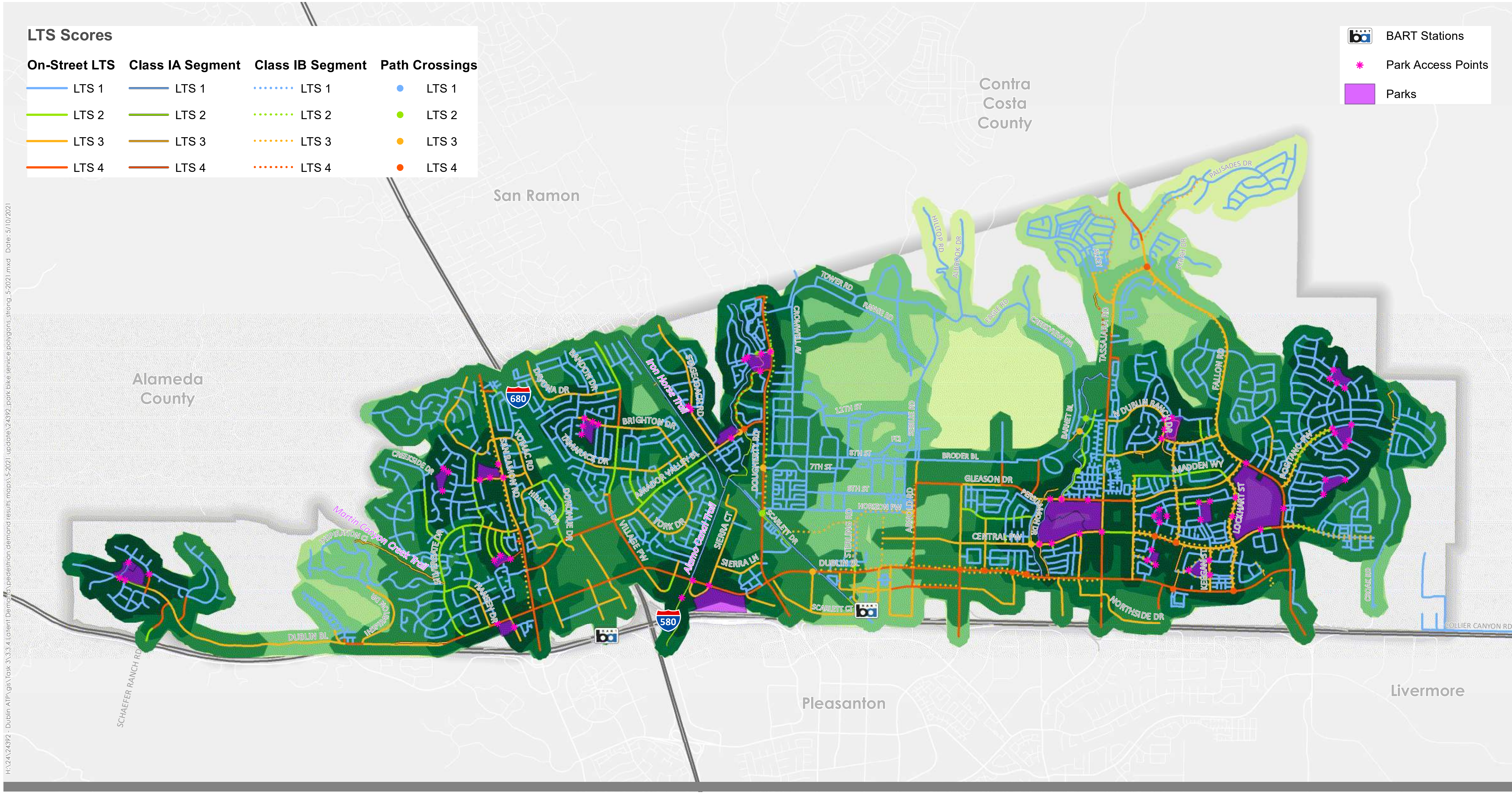

Figure B.P.1

Parks - "Strong and Fearless" Network Service Area
Dublin, California

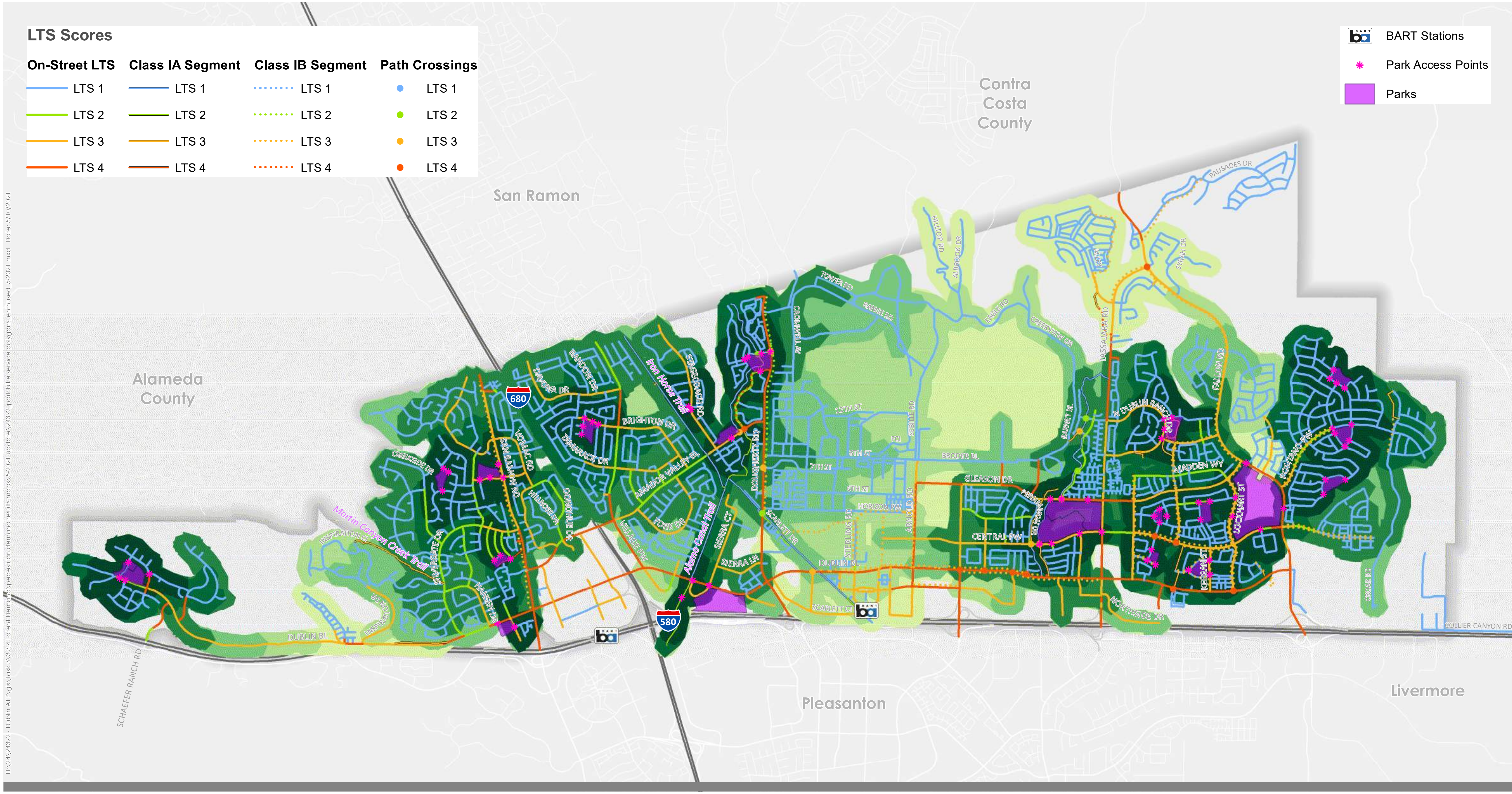

Figure B.P.2

Parks - "Enthused and Confident" Network Service Area Dublin, California

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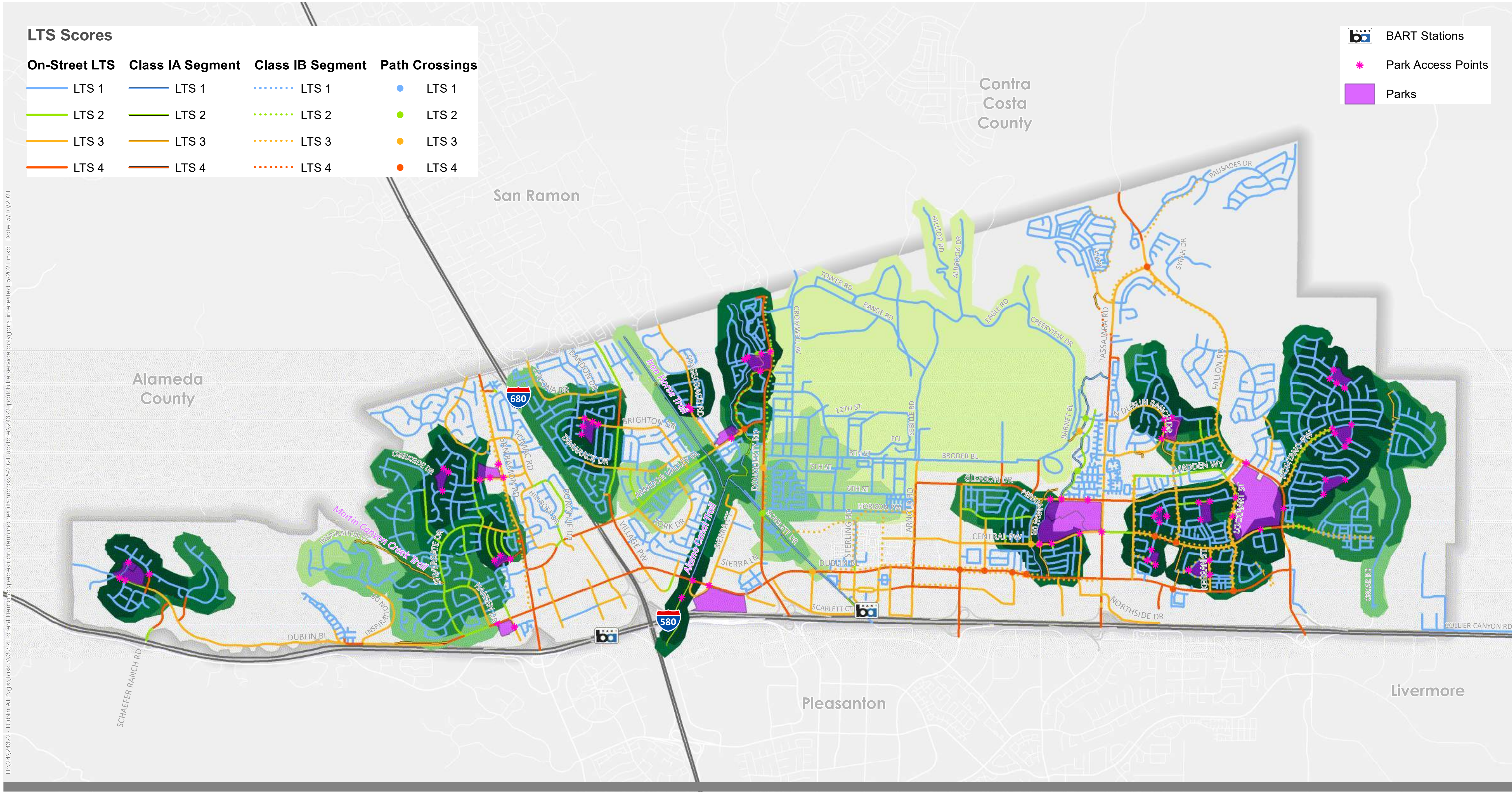

Figure B.P.3

Parks - "Interested but Concerned" Network Service Area
Dublin, California

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APPENDIX C

NETWORK RECOMMENDATIONS: PRIORITIZATION FRAMEWORK

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MEMORANDUM

Date:	May 20, 2021	Project #: 24392
To:	Sai Midididdi, TE City of Dublin	
From:	Amanda Leahy, AICP; Mike Alston, RSP, Camilla Dartnell	
Project:	Dublin Bicycle and Pedestrian Master Plan	
Subject:	Prioritization Framework	

INTRODUCTION

The City of Dublin Bicycle and Pedestrian Master Plan Update (Plan) will provide recommendations and an implementation framework to support the maintenance and improvement of bicycle and pedestrian infrastructure, policies, and programs in the City. Planned infrastructure improvements should connect users with key destinations – schools, transit connections, parks, trails, and commercial destinations including job centers—within the City and in adjacent jurisdictions. A spatial evaluation and prioritization of roads and paths in the City can determine which can provide the greatest potential benefit to help meet Plan goals.

This memorandum outlines the process for this prioritization. This memorandum includes the following sections:

- Prioritization Process
- Proposed Factors and Variables
- Public Input
- Factor Weights
- Criteria Scaling
- Criteria Methodology

The process outlined in this memorandum will produce evaluation scores for roadway segments for each variable identified. The factor weights outlined in this memorandum will then be applied and each segment will receive one combined evaluation score, allowing for comparison of every roadway and path segment in the City.

The evaluation scores will provide an understanding of the priority of each segment based on the selected factors but will not consider feasibility or constructability. During post processing, the team will identify general trends in the prioritization scores and consider context to "smooth" the results into project corridors. Feasibility and constructability will be considered in subsequent Tasks 4.2, *Identify Network Recommendations* and 4.4, *Develop Implementation Plan,* during the project creation process.

PRIORITIZATION PROCESS

The proposed evaluation process is informed by the framework from NCHRP Report 803: ActiveTrans Priority Tool[1] (APT), the result of a national research effort. The APT methodology was based on an extensive review of existing prioritization processes being used by agencies across the country at the state, regional, and local level. It uses a standard set of terms and definitions to describe the different steps in the process. The following definitions apply within the APT:

- **Factors** are the categories used to express community or agency values considered in the prioritization process and contain groups of variables with similar characteristics. The APT has selected nine primary factors commonly used by agencies across the country that are particularly suited for prioritization of active transportation needs.
- **Weights** are the numbers used to indicate the relative importance of different factors based on community or agency values. In order to increase transparency and legibility in the weighting step, weights are applied to factors, not to variables (which are often much more technical in nature).
- **Variables** are characteristics of roadways, households, neighborhood areas, and other features that can be measured, organized under each factor. The terms *variables* and *evaluation criteria* may be used interchangeably.
- **Scaling** is the process of making two variables comparable to one another (e.g., number of collisions versus population density.)

The APT outlines the 10-step process (described below) in two phases:

- **Scoping**, (steps 1-6) in which the prioritization purpose is established, factors and variables are selected, and data resources are assessed; and
- **Prioritization,** (steps 7-10) in which data is organized, scaling is applied, and prioritization scores are calculated.

[1] Lagerwey, Peter A., et al. *Pedestrian and Bicycle Transportation Along Existing Roads—ActiveTrans Priority Tool Guidebook*. NCHRP Report 803. Project No. 07-17. 2015. Available online at http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_803.pdf

The process is often iterative, as agencies may find a need to substitute variables if they find a lack of data availability.

The Steps are listed in Table 1.

Table 1: Prioritization Steps

Phase	Step
Scoping	Step 1: Define Purpose
	Step 2: Select Factors
	Step 3: Establish Weights
	Step 4: Select Variables
	Step 5: Assess Data Availability
	Step 6: Assess Technical Resources
Prioritization	Step 7: Set up Prioritization Tool
	Step 8: Input Data
	Step 9: Scale the Variables
	Step 10: Calculate Priority Scores

Source: NCHRP Report 803

Although all steps in this 10-step process will be performed, this memorandum focuses on **Step 2: Selecting Factors**, **Step 3: Establishing Weights**, **Step 4: Selecting Variables**, and **Step 9: Scaling the Variables.**

The team has already completed **Step 1: Define Purpose** through plan scoping, and the team has completed **Step 5: Assess Data Availability** and **Step 6: Assess Resources** through other plan development efforts so far. The recommended factors and variables have been chosen with consideration of available data and resources. **Steps 7, 8, and 10** are straightforward spreadsheet exercises that implement the decisions documented in this memorandum in the spreadsheet.

Step 1: Define Purpose

An agency first determines the purpose of the prioritization. In this step, an agency selects the mode they would like to prioritize; decides whether they are prioritizing specific projects, generalized needs, or something between the two; and defines the extent and number of the improvement locations.

For the Plan, the process will be applied separately for bicycle and pedestrian modes along roadway segments and off-street segments like paths. Paths will be included in both bicycle and pedestrian modes. The process prioritizes generalized needs, which will result in each segment receiving its own score. The team will use that score to inform selection of corridors for improvement during post processing.

Step 2: Select Factors

An agency next selects the factors to be used in prioritization that align with their goals for the prioritization process. The factors included in the APT are as follows:

1. Stakeholder input;
2. Costs and/or legal constraints;
3. Opportunities;
4. Safety;
5. Existing conditions;
6. Demand;
7. Connectivity;
8. Equity; and
9. Compliance with standards/plans.

Agencies can select anywhere from one to nine factors in their prioritization. Depending on their prioritization purpose, some factors may be less relevant or not relevant.

This evaluation will utilize a subset of the APT factors. Recommended factors are included in Table 2 of this document.

Step 3: Establish Weights

Each factor is weighted on a scale of 1 to 10 to indicate its relative importance to other factors. The selected weights are ultimately used in calculating the prioritization score. Agencies can revisit the weights at any point in the process.

For this plan, weights are recommended to be established through a process of input from the project management team, Technical Advisory Committee, and stakeholders.

Step 4: Select Variables

For each selected factor, agencies can select one or more variables. Each selected factor must have at least one variable by which it is measured. Using multiple variables will decrease the relative impact of each variable for that factor in the prioritization process unless the factor weighting is also increased.

This memorandum recommends variables in Table 2 of this document.

Step 5: Assess Data Availability

The availability of data is a critical consideration in determining what variables to include in a prioritization exercise, and data availability varies substantially across cities, towns, counties, MPOs, and state DOTs.

Through the variable selection process and methodology creation, the team simultaneously performed step 5, assessing data availability, to ensure each criterion could be evaluated as proposed.

Step 6: Assess Technical Resources

Agencies assess their existing technical resources and capabilities to determine if existing resources are sufficient, or if new resources will be needed to complete their intended prioritization with the selected variables. In step 6, agencies also select their technological platform for performing the calculations – using the APT spreadsheet tool, a different spreadsheet, a GIS database, manual tabulation, or other method(s).

The Plan's process will use the APT spreadsheet tool, informed by GIS-based calculations for each evaluation criterion.

Step 7: Set up Prioritization Tool

Having established the purpose, factors, variables and required data, the next step is to set up a tool to implement the prioritization method.

The Plan will use the APT pre-programmed spreadsheet tool, with separate versions for each mode.[2]*The raw version of the spreadsheet will be provided with this memorandum.*

[2] The spreadsheet tool is available online at http://www.trb.org/Publications/Blurbs/172459.aspx.

Step 8: Input Data

Next, agencies input data into the prioritization tool. Depending on the variables, agencies may need to do additional calculations or assessments outside the prioritization spreadsheet tool to calculate or measure the correct value for each improvement location.

The Plan's process will conduct a GIS-based spatial analysis to calculate values for each variable prior to inputting the data into the spreadsheet tool.

Step 9: Scale the Variables

Scaling involves selecting a common numeric scale and adjusting raw values to fit the common scale. Scaling should not be confused with weighting. Scaling is a more objective, technical function, while weighting is based on community/agency values. Scaling is necessary so that variables have a comparable impact on the prioritization score in the absence of weighting. Different scaling methods, such as proportional and rank order, can produce different results. Scaling methods should be chosen carefully depending on the distribution and range of the data points.

The proposed scaling method for each variable will ultimately depend on the variable's range of calculated values, but an initial recommendation is provided for each variable in this document.

Step 10: Calculate Priority Scores

Finally, agencies sum the weighted values for each factor to derive a total score for each segment. The segments can then be ranked based on the prioritization score. In some cases, agencies may wish to revisit factors, variables, and/or weighting, and make adjustments to their prioritization based on additional input or evolving prioritization purposes.

Although all steps in this 10-step process will be performed through the development of this Plan, this memorandum focuses on selecting factors, selecting variables, establishing weights, and scaling the variables. Through the variable selection process and methodology creation, the team simultaneously performed step 5, assessing data availability, to ensure each criterion could be evaluated as proposed.

PROPOSED FACTORS AND VARIABLES

To select prioritization factors and variables, the team reviewed NCHRP Report 803 and this Plan's goals. Table 2Table 2: Proposed Prioritization Factors and provides a summary of the selected factors and criteria, includes brief notes, and indicates to which mode each criterion can be applied.

Table 2: Proposed Prioritization Factors and Variables

Factor	Variable	Notes	Pedestrian	Bicycle
Safety	High-Injury Corridors	This criterion will prioritize locations based on network screening analysis of bicycle- and pedestrian-related collisions. The network screening was conducted in Task 2 of the project. This variable aligns with the goal *enhance safety.*	X	X
Social Equity	Youth population and senior population	Use variables from Census data at the block group level as indicators. This variable aligns with the goals *improve connectivity* and *enhance accessibility*.	X	X
Connectivity	Demand Analysis	Identify top bicycle or pedestrian infrastructure elements that would unlock latent demand (results of demand analysis). This variable aligns with the goal *improve connectivity.*	X	X
	Proximity to Schools	Identify roadways within 1 mile of schools to provide increased opportunities to bike and walk to school. This variable aligns with the goal *improve connectivity.*	X	X
Quality of Service	Bicycle Level of Traffic Stress	Prioritize locations based on the presence of existing high-stress riding facilities. This variable aligns with the goal *increase walking and biking.*		X
	Sidewalk gaps	Identify locations with sidewalk gaps that may create barriers for those walking. This variable aligns with the goal *improve connectivity.*	X	
Major Barriers	Freeway crossings	Prioritize improving safety and quality of service for ramp terminal intersection and freeway crossings. This variable aligns with the goal *improve connectivity.*	X	X
Consistency with Past Planning	Previously identified projects	Prioritize pedestrian and bicycle projects that were identified in the previous plan. This variable aligns with the goal *prioritize investments.*	X	X

PUBLIC INPUT

Understanding and addressing the needs and concerns of the public is a key step in creating a successful plan representative of the needs and values of the community. The nature of the public feedback requires qualitative integration into the project. After the quantitative analysis is complete through the application of the evaluation criteria identified above, the team will perform a “smoothing” process to identify the overall future walking and biking corridors that form the basis for project identification. During this process, the team will refer to the public input and the quantitative evaluation in determining which areas are priority corridors and where those corridors start and end.

FACTOR WEIGHTS

Factor weights allow different factors to be given different emphasis in the prioritization process. Factors that are deemed to be more important may be given higher weight than other factors to create this emphasis in the scoring process. Scaled variable scores are averaged for each factor and multiplied by the factor weight to get the final prioritization score for each segment.

For this plan, weights are recommended to be established through a process of input from the Technical Advisory Committee and the public. Input received from each group will be averaged to get a recommended set of weights for each group (Project Management Team, Technical Advisory Committee, and the public). These will then be averaged to determine the overall final weighting to be applied.

Table 3: Example Factor Weights

<table>
<tr><th>Factor</th><th>Variables</th><th>Equal Weights</th><th>Other Options</th></tr>
<tr><td>Safety</td><td>High-Injury Corridors</td><td>10</td><td rowspan="8">Averaged weights from Project Management Team, Technical Advisory Committee, and the public</td></tr>
<tr><td>Social Equity</td><td>Youth and senior populations</td><td>10</td></tr>
<tr><td rowspan="2">Connectivity</td><td>Demand Analysis</td><td>10</td></tr>
<tr><td>Proximity to Schools</td><td>10</td></tr>
<tr><td rowspan="2">Quality of Service</td><td>Bicycle Level of Traffic Stress</td><td rowspan="2">10</td></tr>
<tr><td>Sidewalk Gaps</td></tr>
<tr><td>Major Barriers</td><td>Freeway crossings</td><td>10</td></tr>
<tr><td>Consistency with Past Planning</td><td>Previously identified projects</td><td>10</td></tr>
</table>

SCALING

NCHRP Report 803 provides guidance on adjusting raw values for a given variable (criterion) to fit a common scale. There are multiple ways to adjust the values to fit the scale, depending on the distribution of the data and relative importance of the values. NCHRP Report 803 distinguishes the adjustment methods based on their appropriateness for addressing outliers. Two primary methods will be used in this project to adjust raw values to fit the selected common scale of 0 to 10. Each is described below. Scaling should be refined when evaluation scores are received depending on the range of scores, but a preliminary recommendation for scoring each criterion is included in the Proposed Methodologies section of this document.

Each scaling mechanism has an associated inverse scaling mechanism, where the same scoring method is applied but the scaling considers lower scores as having a higher scaled value. An example of when this may be applied is when a roadway segment near an essential destination should be prioritized over one far from an essential destination, and the evaluation is being performed based on distance to the destination. An inverse scaling mechanism can be used to provide higher scaled values to those with shorter distances and lower raw input values than those farther away.

Proportionate and Inverse Proportionate Scaling

- Appropriate for data without outliers.
- Raw values are adjusted proportionately to fit the common scale.
- The highest value in the common scale is assigned to the highest raw value and the lowest value in the common scale is assigned to the lowest raw value. The raw values in between are scaled proportionately based on their relationship to the highest and lowest raw values.
- $Y = (X - MIN)/(MAX - MIN) \times S$, where Y is the scaled value, X is the raw value, MIN is the minimum raw value, MAX is the maximum raw value, and S is the scale.
- Zero values may be excluded and assigned a value of zero or included in the calculation and scaled.

Rank Order Scaling and Inverse Rank Order Scaling

- Appropriate for data with outliers.
- Raw values are ranked and then scaled proportionately to fit the selected scale.
- Zero values may be excluded and assigned a value of zero or included in the calculation and scaled.
- Example from NCHRP 803:

Table 29. Example of rank scaling.

Raw Value	Rank	Scaled Value
0	1	0
0	1	0
0	1	0
0	1	0
5	2	2
7	3	4
9	4	6
10	5	8
32	6	10

Note: In this example, the minimum raw value is 0 and the maximum raw value is 32. 32 is also an outlier, since it is more than three times larger than the next highest raw value. To address this, the values are ranked from low to high (i.e. the lowest value gets a rank of 1, next lowest value gets a rank of 2, and so on). The ranked values are then scaled proportionately.

Quantile Scaling and Inverse Quantile Scaling

- Appropriate for data with outliers.
- Raw values are grouped into equal groups with the same number of values and then those groups, or quantiles, are scaled proportionately to fit the selected scale

Non-Linear Scaling and Inverse Non-Linear Scaling

- Not appropriate for data with outliers.
- Appropriate when the importance of raw numeric values increases in a non-linear fashion

PROPOSED METHODOLOGIES

This section provides details and outlines the methodologies and recommended scaling for applying each evaluation criterion.

Safety: High-Injury Corridors

Variable	High-Injury Corridors
Factor	Safety
Description	The team conducted a collision analysis in Task 3 of this plan production to identify the high injury network based on collision history and trends. The team evaluated bicycle and pedestrian involved crash data from 2014 through 2019 on public streets within the city, excluding freeways, using an Equivalent Property Damage Only (EPDO) analysis. This EPDO analysis considered fatal and severe injury collisions to be worth 10 equivalent PDOs, moderate and minor injury collisions to be worth 5 equivalent PDOs, and PDO collisions to be worth 1 equivalent PDO. The team then selected approximately the top 10 percent of roadways to be included in the high injury network as high injury corridors.
Data Needs	Bicycle and pedestrian high injury network results
Same method for pedestrian and bicycle?	The same methodology will be used for the bicycle and pedestrian analysis, but due to different pedestrian and bicycle equivalent PDO scores, results for each mode may be different.
Proposed Methodology	The EPDO analysis scores will be applied to each roadway segment in the City. For paths that intersect roadways, each path will be given the score equivalent to the intersecting roadway, for a half mile segments around the intersection.
Limitations	Bicycle and pedestrian crashes may be lower or not reported on shared use paths. The methodology applies the intersecting roadway score to the segments on the path within one half mile of the intersection to try to account for this and the crashes that may occur at the intersection of the path and road, but for path segments not near an intersection, the maximum score a path can receive is lower than the maximum score for roadway segments.
Recommended Scaling	Proportionate

Social Equity: Youth and Senior Population

Variable	Youth and Senior Populations
Factor	Social Equity
Description	This criterion identifies areas with higher concentrations of youth and senior populations, designed to help prioritize improvements on highway segments that serve areas with populations with higher propensity to bike and walk and of greater need for comfortable infrastructure.
Data Needs	Most recent available American Community Survey data at the block group level for the following attributes: ▪ Elderly populations (65 and older) ▪ Youth populations (under 18)
Same method for pedestrian and bicycle?	The same methodology will be used for the bicycle and pedestrian analysis, and because the data used will not vary by mode, the results of this criterion will be the same for each mode.
Proposed Methodology	This criterion will be calculated at the census block group level as the sum of people 65 and older and 17 and younger divided by total block group population. The equation used to develop the segment score is shown below: $Youth\ and\ senior\ populations = \frac{(Eld + Yth)}{Pop}$ where: Eld = # of residents over 65 Yth = # of residents under 18 Pop = Total population
Limitations	This criterion does not include other available indicators of transportation disadvantage, including but not limited to income or poverty status, disability status, English proficiency, car ownership, or race. Through the demographic analysis conducted in Task 3 and subsequent discussion with the City, it was determined that such trends do not show substantial spatial variation within the City, so they are not incorporated into this prioritization.
Recommended Scaling	Proportionate

Connectivity: Demand Analysis

Variable	Demand Analysis
Factor	Connectivity
Description	The team performed a demand analysis in Task 3 of Plan production. This demand analysis identifies baseline levels of walking and biking around existing activity nodes and assesses latent bicycle and pedestrian demand that could be realized through the Plan.
Data Needs	Task 3 Demand Analysis results
Same method for pedestrian and bicycle?	The same methodology will be used for the bicycle and pedestrian analysis, but due to different pedestrian and bicycle demand scores, results for each mode may be different.
Proposed Methodology	The team will conduct a work session with the City to consider the results of the demand analysis and determine the most high-leverage segments or intersections to improve to provide better connectivity. Segments identified as priority demand segments will receive 1 point, while all other segments will receive 0 points.
Limitations	Simplifying the results of the demand analysis can allow for an easy to understand application, but it does not differentiate between areas that provide moderate but different levels of connectivity.
Recommended Scaling	Proportionate (binary)

Connectivity: Proximity to Schools

Variable	Proximity to Schools
Factor	Connectivity
Description	Schools are an essential destination and are especially important for providing low stress biking and walking facilities. School districts are generally determined by location, increasing the opportunity for many students to bike and walk to school, but because most students are youth, they require less stressful facilities to bike and walk safely and comfortably.
Data Needs	School locations
Same method for pedestrian and bicycle?	The same methodology will be used for the bicycle and pedestrian analysis, and because the data used will not vary by mode, the results of this criterion will be the same for each mode.
Proposed Methodology	The team will create a 1-mile buffer around each school. Segments within the buffer will receive 1 point, while all other segments will receive 0 points. Segments may receive more than 1 point if they are within 1 mile of multiple schools
Limitations	This will prioritize all schools equally; smaller schools that may have less walking and biking demand will receive the same priority as schools with more students.
Recommended Scaling	Proportionate (binary)

Quality of Service: Bicycle Level of Traffic Stress

Variable	Bicycle Level of Traffic Stress
Factor	Quality of Service
Description	Level of Traffic Stress (LTS) is a measure originally developed at the Mineta Transportation Institute to estimate the level of stress a bicyclist may feel while riding along a particular roadway. In general, higher vehicle speeds, higher vehicle volumes, and lower levels of separation between bicyclists and vehicles lead to higher levels of traffic stress. In Task 3 of this Plan production, the team performed an on-street LTS analysis for the City and a corresponding path LTS evaluation to provide scores for off-street segments.
Data Needs	Task 3 LTS analysis results
Same method for pedestrian and bicycle?	This criterion only applies to the bicycling mode.
Proposed Methodology	Low stress facilities (LTS 1 and 2) will receive 0 points, and high stress facilities (LTS 3 and 4) will receive 1 point.
Limitations	Level of traffic stress has been emerging as an analysis approach and metric that is widely applicable, intuitive, and easy to understand. It can also help inform the type of design that will provide "low-stress" facilities that are attractive to all users. However, some risk factors that may affect bicyclist comfort are not included in the Level of Traffic Stress assessment (e.g., driveway density and presence of signals).
Recommended Scaling	Proportionate (binary)

Quality of Service: Sidewalk Gaps

Variable	Sidewalk Gaps
Factor	Quality of Service
Description	Existing sidewalk gaps can create barriers to walking. If people walking do not know to expect a sidewalk gap, they may choose to walk that route and need to cross to avoid the sidewalk gap or may choose to walk in the road. Both of these options increase their exposure to motor vehicles. Others may plan their trip to avoid the sidewalk gap, which can add time and distance to the trip and in some circumstances may encourage the individual to take a different mode or not take the trip. Identifying and prioritizing locations where there are sidewalk gaps can lead to improvements in these locations, which can ultimately increase the safety and comfort for pedestrians.
Data Needs	Geolocated sidewalk gap data
Same method for pedestrian and bicycle?	This criterion only applies to the pedestrian mode.
Proposed Methodology	Locations with no sidewalk gap will receive 0 points, while locations with a sidewalk gap will receive 1 point.
Limitations	Pedestrian safety and comfort can be affected by other characteristics not captured in this variable, like presence of a barrier, type of barrier, presence of street trees, speeds, number of lanes, and sidewalk width.
Recommended Scaling	Proportionate (binary)

Major Barriers: Freeway Crossings

Variable	Freeway Crossings
Factor	Major Barriers
Description	Freeway ramps and crossings can create barriers for people biking and walking. Sometimes the crossing infrastructure over or under freeways is uncomfortable to bike and walk on, and intersections with freeway ramps may include high motor vehicle design speeds and volumes. This criterion will prioritize improving safety and quality of service for ramp terminal intersection and freeway crossings.
Data Needs	Locations of ramp terminals
Same method for pedestrian and bicycle?	The same methodology will be used for the bicycle and pedestrian analysis, and because the data used will not vary by mode, the results of this criterion will be the same for each mode.
Proposed Methodology	Segments within 250 feet of a ramp terminal will receive a score of 1 and all other segments will receive a score of 0.
Limitations	This evaluation may not include all major barriers to biking and walking in the City, which may also include short segments of bridge, guardrail, or poor roadway or sidewalk conditions.
Recommended Scaling	Proportionate (binary)

Consistency with Past Planning: Previously Identified Projects

Variable	Previously Identified Projects
Factor	Consistency with Past Planning
Description	This criterion will prioritize locations identified as needing improvements through the 2014 Dublin Bicycle and Pedestrian Master Plan. The Plan included a ranking of priority projects. Those are as follows: - Tier Zero: Designed and planned, under-construction, scheduled, - Tier One: Highest priority projects for grant funding with initial feasibility analysis and concept development in the Plan update - Tier Two: High priority projects for grant funding that may require additional feasibility analysis - Tier Three: All other projects Those project tiers were based on feasibility of project delivery rather than project need.
Data Needs	Spatial priority project data from the 2014 Dublin Bicycle and Pedestrian Master Plan
Same method for pedestrian and bicycle?	The same methodology will be used for pedestrian and bicycle modes. Many projects include both bicycle and pedestrian improvements.
Proposed Methodology	Locations where there is a project and it has not yet been implemented will receive 1 point, while all other segments receive 0 points.
Limitations	Because the 2014 Dublin Bicycle and Pedestrian Master Plan did not consider project need in the tiering process, all projects will be scored the same.
Recommended Scaling	Proportionate (binary)

APPENDIX C

NETWORK RECOMMENDATIONS: PROJECT LIST AND COST ESTIMATES

Project ID	Tier	2014 Plan Project Number	Project Description	Project Location	From	To			Miles	Cost- High	Cost - Low	Bicycle Project Type
Segment Projects												
S-1	Tier I		Study opportunities and create designs for traffic calming, striping, and signs to create Class III bikeways	Various locations for Class III facilities/neighborhood bikeways: Tamarack Drive, Davona Drive, St. Patrick Way, Lucania Street, Brighton Drive, Grafton Street, Antone Way, South Bridgepointe Lane, and Brannigan Street				5.139639	5.14	$ 25,000	$ 25,000	Class III
S-2	Tier I		Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV)	Gleason Drive	Arnold Road	Brannigan Street		1.357487	1.36	$ 239,000	$ 239,000	Class IIB
S-3	Tier I		Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV)	Hacienda Drive	Southern City Limits	Gleason Drive		0.6	0.60	$ 106,000	$ 106,000	Class IIB
S-4	Tier I		Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV)	Dublin Boulevard	Scarlett Drive	Tassajara Road		1.3	1.30	$ 229,000	$ 229,000	Class IIB
S-5	Tier I		Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future and evaluate opportunities to lower speed limit; if speeds are not lowered, as a future phase provide a separated facility (Class I or Class IV)	Arnold Road	Dublin Boulevard	Altamirano Ave		0.3	0.30	$ 53,000	$ 53,000	Class IIB
S-6	Tier I		Convert to a Class IIB bikeway through restriping	Grafton Street	Kohnen Way	Antone Way		0.235965	0.24	$ 42,000	$ 42,000	Class IIB
S-7	Tier I		Convert to a Class IIB bikeway by restriping travel lanes on Tassajara, Dougherty, and Hacienda at the I-580 overcrossings	Tassajara Road, Dougherty Road, and Hacienda Drive	Southern City Limits	Dublin Boulveard		0.84877	0.85	$ 150,000	$ 150,000	Class IIB
S-8	Tier I		Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV)	Tassajara Road	North Dublin Ranch Drive	Rutherford Drive		0.521904	0.52	$ 2,784,000	$ 138,000	Class IIB
S-9	Tier I		Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment	Village Parkway	Amador Valley Boulevard	Northern City Limits		0.857586	0.86	$ 4,803,000	$ 945,000	Class IV/Class I
S-10	Tier II		Implement the traffic calming, striping, and signs plans and designs created in project S-1 to create Class III bikeways	Various locations for Class III facilities/neighborhood bikeways: Tamarack Drive, Davona Drive, St. Patrick Way, Lucania Street, Brighton Drive, Antone Way, South Bridgepointe Lane, and Brannigan Street	0	0		5.139639	5.14	$ 691,000	$ 691,000	Class III
S-11	Tier II		Restripe to add buffer to the Class II facilities and evaluate opportunities to lower speed limit or provide a Class IV or Class I facility	Village Parkway	Dublin Boulevard	Amador Valley Boulevard		0.342414	0.34	$ 1,826,000	$ 91,000	Class IIB; reduced speed
S-12	Tier II		Evaluate opportunities to reduce speed limit along this corridor	Tassajara Road	Palisades Drive	North Dublin Ranch Drive		0.719841	0.72	$ 18,000	$ 18,000	Reduced speed
S-13	Tier II		Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment	Dougherty Road	Dublin Boulevard	Southern city limits		0	0.25	$ 1,393,000	$ 274,000	Class IV/Class I
S-14	Tier II		Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment	Amador Valley Boulevard	Stagecoach Road	Dougherty Road		0.3	0.30	$ 1,680,000	$ 331,000	Class IV/Class I
S-15	Tier II		Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate for this location, and implement the chosen separated bicycle treatment. This project is anticipated to be implemented after the lower cost solution in S-7.	Tassajara Road	Gleason Drive	Southern City Limits	but not the bridge upgrades	0.458282	0.46	$ 2,567,000	$ 505,000	Class IV/Class I
S-16	Tier II		Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment	Dublin Boulevard	Inspiration Drive	San Ramon Road		1.1	1.10	$ 6,161,000	$ 1,212,000	Class IV/Class I
S-17	Tier II		Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment	Dublin Boulevard	Inspiration Drive	Western extent		1.5	1.50	$ 8,401,000	$ 1,653,000	Class IV/Class I
S-18	Tier II		Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate for this location, and implement the chosen separated bicycle treatment.	Fallon Road	Gleason Drive	Southern city limits	but not the bridge upgrades	1.2	1.20	$ 6,721,000	$ 1,322,000	Class IV/Class I

S-19	Tier II		Make improvements to adjacent sidepaths to provide two-way bicycle and pedestrian connectivity by evaluating needs for and implementing wayfinding, signing, and striping improvements, intersection improvements, and crossings, as needed.	Fallon Road	Gleason Drive	Tassajara Road		0	1.58	$	1,583,000	$	238,000	Class IB
S-20	Tier II		Add buffered bike lanes along the Dublin Boulevard Extension	Dublin Boulevard	Tassajara Road	Eastern city limits		0	0.98	$	5,334,000	$	259,000	Class IIB
S-21	Tier II		Work with Contra Costa County to design and implement Class IIB facilities	Tassajara Road	Palidsades Drive	Northern City Limits	1584	1.584992	0.30	$	1,640,000	$	80,000	Class IIB
S-22	Tier II	1-2A/1-2B	As recommended in the 2014 plan, upgrade to separated Class I facilities providing sufficient space to reduce conflicts between people walking and biking; evaluate opportunities to improve walkability by reducing obstructions; enhance median and lighting along Dublin Boulevard under I-680; improve sidewalk connection across commercial driveway and at bus stop (east of Regional Street); add pedestrian-scale lighting under I-680 Overpass. Install barrier in median underneath overcrossing to prohibit pedestrian crossings.	Dublin Boulevard	San Ramon Road	Dougherty Road		1.5	1.5	$	4,956,000	$	4,956,000	Class IB
S-23	Tier II		Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment	Dublin Boulevard	Dougherty Road	Scarlett Drive		0.3	0.45	$	1,974,000	$	497,000	Class IV/Class I
S-24	Tier II		Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment	Dublin Boulevard	Tassajara Road	Fallon Road			1.20	$	6,887,457	$	1,322,083	Class IV/Class I
S-25	Tier II		Upgrade to a Class IIB Bicycle lane and evaluate opportunities to lower the speed limit or provide Class IV or Class I facility	Central Parkway	Tassajara Road	Fallon Road		1.126547	1.13	$	5,135,000	$	227,000	Class IIB; reduced speed
S-26	Tier III		Study opportunities, create designs, and implement traffic calming and signs to create Class III Bikeways along the identified roadways	Various locations: N Dublin Ranch Drive, S Dublin Ranch Drive, Hansen Drive, Starward Drive, San Sabana Road, Southwick Drive, Hibernia Drive, Donohue Drive, Keegan Street, Peppertree Road, Madden Way, Kohnen Way, York Drive, Maple Drive, Inspiration Drive, and Vomac Road	0	0		7.302099	7.30	$	982,000	$	982,000	Class III
S-27	Tier III		Add a Class IIA Bicycle Lane where no bike lane currently exists	Lockhart Street	Central Parkway	Dublin Boulevard		0.5	0.30	$	1,507,000	$	66,000	Class IIA
S-28	Tier III		Add a Class IIA Bicycle Lane where no bike lane currently exists	John Monego Court	Dublin Boulevard	Southern extent		0.3	0.30	$	1,507,000	$	66,000	Class IIA
S-29	Tier III		Add a Class IIA Bicycle Lane where no bike lane currently exists	Sierra Lane	Sierra Court	Dougherty Road		0.367522	0.37	$	1,846,000	$	81,000	Class IIA
S-30	Tier III		Add a Class IIA Bicycle Lane where no bike lane currently exists	York Drive	Amador Valley Boulevard	Poplar Way		0.4	0.40	$	2,009,000	$	88,000	Class IIA
S-31	Tier III		Add a Class IIA Bicycle Lane where no bike lane currently exists	Hibernia Drive	Dublin Boulevard	Summer Glen Drive		0.4	0.40	$	2,009,000	$	88,000	Class IIA
S-32	Tier III		Add a Class IIA Bicycle Lane where no bike lane currently exists	Shannon Avenue	Vomac Road	Peppertree Road		0.4	0.40	$	2,009,000	$	88,000	Class IIA
S-33	Tier III		Add a Class IIA Bicycle Lane where no bike lane currently exists	Glynnis Rose Drive	Central Parkway	Dublin Boulevard		0.3	0.30	$	1,507,000	$	66,000	Class IIA
S-34	Tier III		Extend bike lanes and sidepaths along Central Parkway to Croak Road	Central Parkway	500' west of Croak Road	Croak Road		0.087884	0.09	$	697,000	$	697,000	Class IIA
S-35	Tier III		If Croak Road is improved south of S Terracina Drive, add low stress bicycle facilities based on anticipated speeds, volumes, and FHWA Bikeway Selection Guide recommendations	Croak Road/Volterra Drive	Volterra Court	Dublin Boulevard		1	1.10	$	2,860,000	$	2,860,000	Class IIA
S-36	Tier III		Restripe to add buffer to the Class II facilities and evaluate opportunities to lower speed limit or provide Class IV or Class I facility	Central Parkway	Iron Horse Parkway	Tassajara Road		1.545072	1.40	$	223,000	$	223,000	Class IIB; reduced speed
S-37	Tier III		Upgrade to a Class IIB Bicycle lane and evaluate opportunities to lower the speed limit or provide Class IV or Class I facility	Gleason Drive	Fallon Road	Brannigan Road		0.742513	0.74	$	3,384,000	$	150,000	Class IIB; reduced speed
S-38	Tier III		Upgrade to a Class IIB Bicycle lane and evaluate opportunities to lower the speed limit or provide Class IV or Class I facility	Amador Plaza Road	Southern Extent	Amador Valley Boulevard		0.6	0.60	$	2,720,000	$	106,000	Class IIB; reduced speed
S-39	Tier III		Upgrade to a Class IIB Bicycle lane and evaluate opportunities to lower the speed limit or provide Class IV or Class I facility	Silvergate Drive	San Ramon Road	Peppertree Road		0.2	0.20	$	907,000	$	35,000	Class IIB; reduced speed
S-40	Tier III		Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment	Arnold Road	Dublin Boulevard	Southern city limits		0	0.30	$	1,600,000	$	80,000	Class IIB; reduced speed
S-41	Tier III		Improve wayfinding and signage for parallel path on east side; restripe to upgrade Class IIA facilities to Class IIB facilities	Dougherty Road	Scarlett Drive	Northern City Limits	improve wayfinding	1.4	1.40	$	284,000	$	284,000	Class IIB
S-42	Tier III		Add a Class IIB bike lane where no bike lane currently exists or improve adjacent sidepaths to provide two-way bicycle and pedestrian connectivity by evaluating needs for and implementing wayfinding, signing, and striping improvements, intersection improvements, and crossings, as needed.	Lockhart Street	Central Parkway	Gleason Drive		0.5	0.50	$	499,000	$	75,000	Class IIB
S-43	Tier III		Add a Class IIB Bicycle Lane where no bike lane currently exists	Stagecoach Road	Amador Valley Boulevard	Northern City Limits	lower speed limit--need a study?	0.9	0.90	$	4,800,000	$	239,000	Class IIB
S-44	Tier III		Add a Class IIB Bicycle Lane where no bike lane currently exists	Sierra Ct	Dublin Boulevard	Northern extent		0.7	0.70	$	3,734,000	$	186,000	Class IIB
S-45	Tier III		Upgrade from Class IIA to Class IIB Bicycle Lane	Amador Valley Boulevard	Village Parkway	Stagecoach Road		0.8	0.80	$	3,626,000	$	141,000	Class IIB

S-46	Tier III		Restripe to a Class IIB Bicycle Lane where no bike lane currently exists	Bent Tree Drive	Fallon Road	East Sugar Hill Terrace		0.4	0.40	$ 106,000	$ 106,000	Class IIB
S-47	Tier III		As a follow up to S-3, evaluate opportunities to lower the speed limit or provide Class IV or Class I facility	Hacienda Drive	Gleason Road	Dublin Boulevard		0	0.60	$ 2,735,000	$ 121,000	Reduced speed
S-48	Tier III		Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment	Dougherty Road	Dublin Boulevard	Scarlett Drive		0.45123	0.45123	$ 1,974,000	$ 497,000	Class IV/Class I
S-49	Tier III		Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location, and implement the chosen separated bicycle treatment. This project is anticipated to be implemented after the lower cost solution in S-7.	Hacienda Drive	Dublin Boulevard	Southern city limits	not bridge	0	0.30	$ 1,680,000	$ 331,000	Class IV/Class I
S-50	Tier III		Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, and conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment	San Ramon Road	Dublin Boulevard	Southern city limits	not bridge	0.251646	0.30	$ 1,680,000	$ 331,000	Class IV/Class I
S-51	Tier III		Make improvements to adjacent sidepaths to provide two-way bicycle and pedestrian connectivity by evaluating needs for and implementing wayfinding, signing, and striping improvements, intersection improvements, and crossings, as needed.	Dublin Boulevard	Scarlett Drive	Tassajara Road		1.77	1.77	$ 1,768,000	$ 266,000	Class IB
S-52	Tier III		Upgrade from Class IIB to Class IV Bicycle Lane	Clark Ave/Village Parkway	Dublin Boulevard	Dublin Boulevard		0.3	0.50	$ 2,227,000	$ 320,000	Class IV/Class I
S-53	Tier III		Add Class I facilities on both sides of the road on Martinelli Way and support the Class I facilities by adding signage, wayfinding, and crossing improvements at the intersections; connect to the BART Station by providing continuous Class I or Class IIA facilities along Iron Horse Parkway.	Martinelli Way and Iron Horse Parkway	BART Station on Iron Horse Parkway	Hacienda Drive		0.683253	1.50	$ 3,900,000	$ 3,900,000	Class IV/Class I
S-54	Tier III		Add bike lanes with the implementation of the Golden Gate extension project	Golden Gate Drive	Dublin Boulevard	Amador Valley Boulevard		0.350907	0.350907	$ 1,806,000	$ 77,000	Class IIA
Trail Projects												
T-1	Tier I		Implement Phase I and II of the Iron Horse Nature Park Master Plan to create park space and trail access and connectivity improvements	Iron Horse Regional Trail						$ 11,560,000	$ 11,560,000.00	Trail
T-2	Tier II		Add trail connection from Regional Street to Amador Plaza Road	Downtown Dublin	Regional Street	Amador Plaza Road			0.35	$ 764,767	$ 764,767.34	Trail
T-3	Tier II		With development, add Class I connection between Dublin Boulevard and Central Parkway, just east of Tassajara Road	East of Tassajara approximately 500 ft	Dublin Boulevard	Central Parkway			0.284090909	$ 620,753	$ 620,752.71	Trail
T-4	Tier III		Add trail connection along Dublin Creek along the Zone 7 channel, to connect at San Ramon Road	Dublin Creek Trail	Amador Plaza Road	San Ramon Road			0.706325758	$ 1,543,357	$ 1,543,356.78	Trail
T-5	Tier III		Create connection to Shannon Community Center from the San Ramon Bike Path	San Ramon Bike Path	Shannon Community Center	0			0.01	$ 21,850	$ 21,319.04	Trail
T-6	Tier III		Add Class I facility along east side of Village to connect to the Alamo Canal Trail	Alamo Canal Trail	Dublin High School and Village Parkway	Alamo Canal Trail between Cedar Lane and Ebensburg Lane			1.06	$ 2,316,153	$ 2,259,818.03	Trail
T-7	Tier III		As recommended in the 2014 plan, widen existing sidewalk and add signing and striping treatments to create a shared use path on the south side of Dublin Boulevard.	Dublin Boulevard	Amador Plaza Road	Village Parkway			0.22	$ 586,257	$ 586,256.72	Trail
T-8	Tier III		Add a bicycle and pedestrian bridge over the canal to create Class I connection between Village Parkway/Clark Avenue at Alamo Canal Trail at the Dublin Public Safety Complex Site	Alamo Canal Trail/Civic Plaza	Village Parkway/Clark Avenue	Alamo Canal Trail			0.1	$ 6,318,000	$ 6,318,000.00	Trail
T-9	Tier III		Create Class I connection along the future Dublin Boulevard Extension corridor from Fallon Road to Collier Canyon Parkway (Livermore)	Dublin Boulevard Extension	Fallon Road	Collier Canyon Park (Livermore)			0.98	$ 6,475,500	$ 6,475,500.00	Trail
T-10	Tier III		Through development, add Class I facility on the west side of Brannigan St. from Central Parkway to Gleason Boulevard	Brannigan Street	Central Parkway	Gleason Boulevard			0.19	$ 506,313	$ 506,312.62	Trail
T-11	Tier III		Add Class I connection and street crossing enhancements on the north side of Central Parkway from Emerald Glen Park/Tassajara Road to Brannigan Street	Central Parkway	Emerald Glen Park/Tassajara Road	Brannigan Street			0.18	$ 606,187	$ 606,187.23	Trail
T-12	Tier III		Add Class I connection along the south side of the school grounds and Dublin Swin Center from Iron Horse Trail to Village Parkway	Dublin High School	Iron Horse Trail	Village Parkway			0.59	$ 1,289,179	$ 1,257,823.24	Trail
T-13	Tier III		Study options for gap closure to provide a bicycle and pedestrian overcrossing and shared use path from Tassajara Creek at Dublin Boulevard south over I-580 into Pleasanton	Tassajara Creek	Dublin Boulevard	Pleasanton			0.27	$ 250,000	$ 250,000.00	Trail
T-14	Tier III		Add Class I connection along the southern edge of Nielson Elementary to connect Amarillo Road with the existing path along Mape Memorial Park to san Ramon Road	Nielson Elementary School	Amarillo Road	Mape Memorial Park Path			0.17	$ 371,458	$ 362,423.65	Trail
T-15	Tier III		Add Class I connection along Altamirano Street between the Dublin BART station and Martinelli Way	Altamirano Street	Dublin BART station	Martinelli Way			0.71	$ 1,892,010	$ 1,892,010.33	Trail
T-16	Tier III		Add Class I connections along Croak Road from Dublin Boulevard to Positano Parkway	Croak Road	Dublin Boulevard	Positano Parkway			0.9	$ 2,398,323	$ 2,398,322.96	Trail

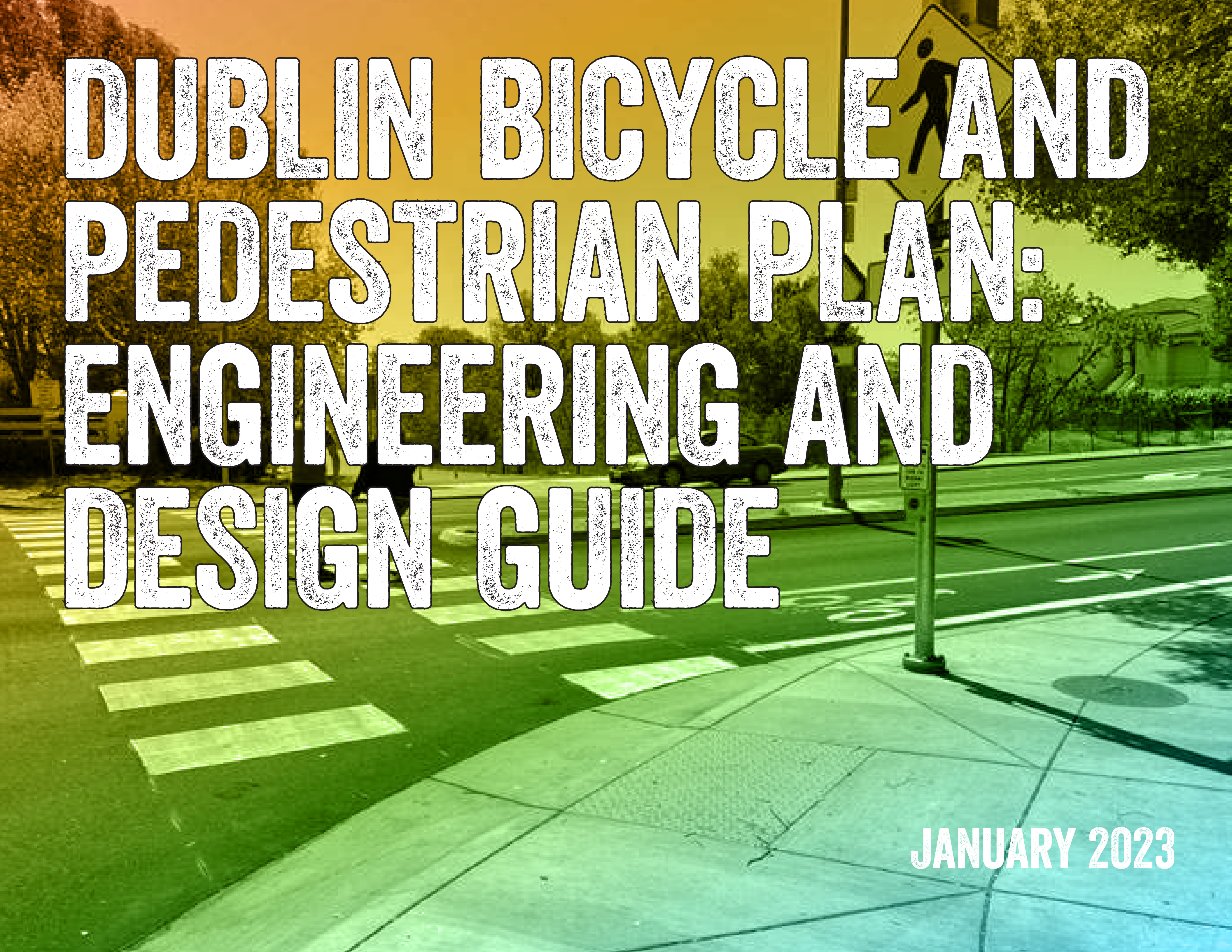
T-17	Tier III		Add or improve trails along Positano Parkway to connect to the trail on Croak Road	Positano Parkway	Croak Road	La Strada Drive			0.76	$ 2,025,250	$ 2,025,250.50	Trail
T-18	Tier III		Add Class I connection between the existing Tassajara Creek trailhead on Tassajara Road and trails in the Wallis Ranch development	Tassajara Creek Trail	Tassajara Road Trailhead	Wallis Ranch development trails			0.46	$ 1,005,123	$ 980,675.75	Trail
Freeway Crossing Projects												
FC-1	Tier III		Redesign interchange ramp terminal to provide safe crossings	San Ramon Road at southbound I-580 westbound ramp entrance						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-2	Tier III		Redesign interchange ramp terminal to provide safe crossings	San Ramon Road at northbound I-580 westbound ramp entrance						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-3	Tier III		Redesign interchange ramp terminal to provide safe crossings	San Ramon Road at I-580 westbound ramp terminal						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-4	Tier III		Redesign interchange ramp terminal to provide safe crossings	St. Patrick Way at I-580 ramp terminal and entrance						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-5	Tier III		Redesign interchange ramp terminal to provide safe crossings	Dougherty Road at I-580 westbound ramp entrance						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-6	Tier III		Redesign interchange ramp terminal to provide safe crossings	Dougherty Road at I-580 westbound ramp terminal						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-7	Tier III		Redesign interchange ramp terminal to provide safe crossings	Dougherty Road at I-580 eastbound ramp entrance						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-8	Tier III		Redesign interchange ramp terminal to provide safe crossings	Hacienda Drive at I-580 westbound ramp terminal						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-9	Tier III		Redesign interchange ramp terminal to provide safe crossings	Hacienda Drive at I-580 eastbound ramp entrance						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-10	Tier III		Redesign interchange ramp terminal to provide safe crossings	Hacienda Drive at I-580 westbound ramp entrance						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-11	Tier III		Redesign interchange ramp terminal to provide safe crossings	Tassajara Road at I-580 westbound ramp entrance						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-12	Tier III		Redesign interchange ramp terminal to provide safe crossings	Tassajara Road at I-580 westbound ramp terminal						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-13	Tier III		Redesign interchange ramp terminal to provide safe crossings	Tassajara Road at I-580 eastbound ramp entrance						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-14	Tier III		Redesign interchange ramp terminal to provide safe crossings	Fallon Road at I-580 westbound ramp terminal and entrance						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-15	Tier III		Redesign interchange ramp terminal to provide safe crossings	Fallon Road at I-580 eastbound ramp entrance						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
FC-16	Tier III		Redesign interchange ramp terminal to provide safe crossings	Village Parkway at I-680 NB ramp entrance						$ 1,115,000	$ 1,115,000.00	Freeway Crossing
Crossing Projects												
C-1	Tier I		Provide mid-block crossing (RRFB or other actuated treatment)	Regional Street between Dublin Boulevard and Amador Valley Boulevard						$ 320,000	$ 320,000.00	Crossing
C-2	Tier I	Existing Iron Horse Trail Crossing project	Provide pedestrian and bicycle overcrossing to connect to Don Biddle Community Park	Dublin Boulevard and Iron Horse Trail						$ 6,318,000	$ 6,318,000.00	Crossing
C-3	Tier II		Add connection from Sierra Court to the Alamo Canal/Iron Horse Trail network	Sierra Court cul-de-sac						$ 2,132,000	$ 2,132,000.00	Trail
C-4	Tier III		Study the feasibility of improving the crossing of Tassajara Creek Trail at Dublin Boulevard by providing better connections to the existing crossing at John Monego Court. Provide wayfinding and signs to direct people biking and walking between the trail and the intersection.	Tassajara Creek Trail and Dublin Boulevard			Impleme nt signal timing,			$ 123,000	$ 123,000.00	Crossing
C-5	Tier III		Improve connections to nearby crossings or add crossing at Tassajara Road and Tassajara Creek Trail (south of Rutherford Drive) to provide access to the trailhead; improve general access to and connectivity from the trail to Tassajara Road and local destinations	Tassajara Creek Trail and Tassajara Road						$ 627,000	$ 627,000.00	Crossing
										$ -	$ -	
Intersection Projects										$ -	$ -	
I-1	Tier I		Provide crossing improvements (RRFB or other actuated treatment) to provide more visibility of people walking/biking, especially to school	Central Parkway/Aspen Street						$ 320,000	$ 320,000.00	Intersection
I-2	Tier I		Provide crossing improvements (RRFB or other actuated treatment) to provide more visibility of people walking/biking, especially to school	Grafton Street/Antone Way						$ 320,000	$ 320,000.00	Intersection
I-3	Tier I		Provide crossing improvements (RRFB or other actuated treatment) to provide more visibility of people walking/biking, especially to school	Amador Valley Boulevard/Burton Street						$ 320,000	$ 320,000.00	Intersection
I-4	Tier II	2-2H	As recommended in the 2014 plan, improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. Remove slip lanes; reduce curb radii on all corners; install curb extensions on the SE and SW corners; install directional curb ramps.	Village Parkway/Amador Valley Boulevard						$ 972,000	$ 123,000.00	Intersection
I-5	Tier II		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Village Parkway/Tamarack Drive						$ 972,000	$ 123,000.00	Intersection
I-6	Tier II		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Village Parkway/Brighton Drive						$ 972,000	$ 123,000.00	Intersection

I-7	Tier II		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Dublin Boulevard/Hibernia Drive						$ 972,000	$ 123,000.00	Intersection
I-8	Tier II		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Dublin Boulevard/Arnold Road						$ 972,000	$ 123,000.00	Intersection
I-9	Tier II		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Dublin Boulevard/Hacienda Drive						$ 972,000	$ 123,000.00	Intersection
I-10	Tier II	1-2F	As recommended in the 2014 plan, improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. Reduce width of SB right-turn lane and reduce turning radii; remove NB right-turn slip lane and reduce curb radii; reduce curb radii on NE and SE corners; straighten crosswalks.	Dublin Boulevard/Village Parkway						$ 972,000	$ 123,000.00	Intersection
I-11	Tier III		Provide higher visibility crossing treatments, especially to support access to the school	Grafton Street/Madden Way/Kohnen Way						$ 320,000	$ 627,000.00	Intersection
I-12	Tier III		Provide higher visibility crossing treatments, especially to support access to the school	Antone Way/Bridgepointe Lane						$ 320,000	$ 4,000.00	Intersection
I-13	Tier III		Provide higher visibility crossing treatments, especially to support access to the school	S Dublin Ranch Drive/Woodshire Lane						$ 320,000	$ 4,000.00	Intersection
I-14	Tier III		Add Class I signage, striping, and signal changes to create visibility of people walking and biking across the existing Tassajara Road and Palisades Drive signalized crossing	Tassajara Road and Palisades Drive						$ 123,000	$ 123,000.00	Intersection
I-15	Tier III		Provide Class I facilities on the west side of Silvergate Drive and make intersection changes at Hansen Drive and Bay Laurel Street to provide comfortable connectivity to the existing stop controlled intersection at Hansen Drive	Martin Canyon Creek Trail at Silvergate Drive						$ 2,600,000	$ 2,600,000.00	Intersection
I-16	Tier III		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Gleason Drive/Grafton Street						$ 972,000	$ 123,000.00	Intersection
I-17	Tier III		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Gleason Drive/Brannigan street						$ 972,000	$ 123,000.00	Intersection
I-18	Tier III		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Central Parkway/Brannigan street						$ 972,000	$ 123,000.00	Intersection
I-19	Tier III		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Dublin Boulevard/Brannigan street						$ 972,000	$ 123,000.00	Intersection
I-20	Tier III		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Central Parkway/Hibernia Drive						$ 972,000	$ 123,000.00	Intersection
I-21	Tier III		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Central Parkway/Hacienda Drive						$ 972,000	$ 123,000.00	Intersection
I-22	Tier III		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Dublin Boulevard/Regional Street						$ 972,000	$ 123,000.00	Intersection
I-23	Tier III		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Tassajara Road/Gleason Drive						$ 972,000	$ 123,000.00	Intersection
I-24	Tier III		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Fallon Road /Central Parkway						$ 972,000	$ 123,000.00	Intersection
I-25	Tier III		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Dublin Boulevard/Golden Gate Drive						$ 972,000	$ 123,000.00	Intersection
I-26	Tier III		Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements.	Fallon Road /Dublin Boulevard						$ 972,000	$ 123,000.00	Intersection
I-27	Tier III	1-2E	As recommended in the 2014 plan, reduce curb radii on all corners; install directional curb ramps at all corners Subject to further analysis, remove NB overlap phase; install pedestrian countdown signals and audible warning signs Stripe crosswalk on south leg subject to further analysis	Dublin Boulevard/San Ramon Road						$ 972,000	$ 123,000.00	Intersection
I-28	Tier III	2-2G/2-2E/2-2F	As recommended in the 2014 plan, consider adding leading pedestrian intervals for all approaches; Consider removing slip lanes on NW and NE corners and add curb extensions on SW, NW, and NE corners pending additional engineering analysis; Consider striping crosswalk on south leg pending additional engineering analysis	San Ramon Road/Amador Valley Boulevard						$ 548,000	$ 123,000.00	Intersection
I-29	Tier III	2-2D	As recommended in the 2014 plan, consider modifying signal to include leading pedestrian interval on EB and WB approaches; Consider protected left-turn phasing for NB and SB traffic.	Regional Street/Amador Valley Boulevard						$ 123,000	$ 123,000.00	Intersection
I-30	Tier III	1-1E	As recommended in the 2014 plan, mark crosswalk on east leg of intersection; Widen median and add median tips as feasible to provide 6' pedestrian refuge; Reduce curb radii	Amador Valley Boulevard/Amador Plaza						$ 123,000	$ 123,000.00	Intersection
I-31	Tier III	1-2C	As recommended in the 2014 plan, improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. Reduce curb radii on all corners and install directional curb ramps.	Dublin Boulevard/Amador Plaza Road						$ 123,000	$ 123,000.00	Intersection
I-32	Tier III	2-1A/2-1B	As recommended in the 2014 plan, install wayfinding signage to West Dublin BART; install bulb-outs at all corners; construct directional curb ramps	St. Patrick Way/Golden Gate Drive						$ 123,000	$ 123,000.00	Intersection
I-33	Tier III	2-2B	As recommended in the 2014 plan, reduce curb radii on all corners; widen medians and add median tips; install directional curb ramps on all corners	Amador Valley Boulevard/Donohue Drive						$ 123,000	$ 123,000.00	Intersection

APPENDIX D

ENGINEERING AND DESIGN GUIDE

DUBLIN BICYCLE AND PEDESTRIAN PLAN: ENGINEERING AND DESIGN GUIDE



JANUARY 2023

INTRODUCTION

This guide was developed as a reference document for best practices in planning and designing bicycle and pedestrian facilities. It first provides resources relevant to planning and designing pedestrian and bicycle facilities, including a list of specific design topics and guidance document recommendations to consult. It then provides specific planning and design recommendations for several key topics relevant to developing Dublin's biking and walking infrastructure.

In applying this design guidance, the responsible engineer should use professional judgment and document design decisions. Decisions should be made based on location specific context and the obligation to protect the life, health, and property of the public.

RESOURCES

The following resources should be used as references for best practices in planning and design for pedestrian facilities.

KEY RESOURCES

- *AASHTO Guide for the Development of Bicycle Facilities, Fourth Edition (2012*) – likely to be replaced by the Fifth Edition in 2022
- *NACTO Urban Bikeway Design Guide, Second Edition (2014)*
- *NACTO Urban Street Design Guide (2013)*
- *FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (2018)*
- *CalTrans Highway Design Manual (2018)*
- *FHWA Separated Bike Lane Planning and Design Guide (2015)*
- *FHWA Manual on Uniform Traffic Control Devices (2009)*
- *California Manual on Uniform Traffic Control Devices, Revision 6 (2021)*

SUPPLEMENTAL RESOURCES

- TCRP Report 112/NCHRP Report 562: Improving Pedestrian Safety at Unsignalized Crossings. Washington D.C.: TCRP and NCHRP, 2006.
- *Routine Accommodations of Pedestrians and Bicyclists in the Bay Area,* Metropolitan Transportation Commission, Available: https://mtc.ca.gov/sites/default/files/A-08_RES-3765_complete_streets.pdf 2006.
- *Complete Streets Checklist Guidance Resolution 4493*, Metropolitan Transportation Commission, Available: https://mtc.ca.gov/sites/default/files/documents/2022-05/MTC-Administrative-Guidance-CS-Checklist.pdf (2022)

DESIGN TOPICS AND RELEVANT GUIDANCE

DESIGN TOPIC	DESIGN RESOURCE	RELEVANT PAGES/LOCATION
Sidewalks and Sidewalk Zones	NACTO Urban Street Design Guide (2013) https://nacto.org/publication/urban-street-design-guide/ Guide for the Planning Design and Operation of Pedestrian Facilities (2004) https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07(263)_FR.pdf	Pages 37– 44; https://nacto.org/publication/urban-street-design-guide/street-design-elements/sidewalks/ Chapter 3.2; Pages 54 - 70
Pedestrian Wayfinding	Seamless Seattle Pedestrian Wayfinding Strategy (2019) Global Street Design Guide (2016) Global Street Design Guide | Global Designing Cities Initiative	Wayfinding Strategy_July2019_SDOT Edit.pdf (seattle.gov) 6.3.9; Page 91; https://globaldesigningcities.org/wp-content/uploads/guides/global-street-design-guide-lowres.pdf
Street Furniture	Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-way (2013) https://www.access-board.gov/prowag/preamble-prowag/	Page 70; https://www.access-board.gov/prowag/preamble-prowag/#r212-street-furniture
Pedestrian Scale Lighting	FHWA Pedestrian Lighting Primer (2022) https://safety.fhwa.dot.gov/roadway_dept/night_visib/docs/Pedestrian_Lighting_Primer_Final.pdf	Entire document
	FHWA Lighting Handbook (2012) https://safety.fhwa.dot.gov/roadway_dept/night_visib/lighting_handbook/pdf/fhwa_handbook2012.pdf	Pages 75-78
	Street Design Manual: Lighting Update (2016) https://www.sandiego.gov/sites/default/files/street_design_manual_-_lighting_update_2016_2.pdf	Pages 2-3
	Guide for the Planning Design and Operation of Pedestrian Facilities https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07(263)_FR.pdf	Chapter 3.2.11, Page 65

DESIGN TOPIC	DESIGN RESOURCE	RELEVANT PAGES/LOCATION
Crosswalk Markings	Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/	https://mutcd.fhwa.dot.gov/htm/2009r1r2/part3/part3b.htm#section3B18
Uncontrolled Crossing Enhancements	NACTO Urban Street Design Guide (2013):" https://nacto.org/publication/urban-street-design-guide/ FHWA Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations (2005) https://www.fhwa.dot.gov/publications/research/safety/04100/04100.pdf	https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/midblock-crosswalks/ Pages 49 - 61
Special Paving Treatments	FHWA Pedestrian Safety Guide and Countermeasure Selection System (2013) http://www.pedbikesafe.org/pedsafe/index.cfm	http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=39
Crossing Islands	NACTO Urban Street Design Guide (2013): https://nacto.org/publication/urban-street-design-guide/	Page 116; https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/pedestrian-safety-islands/
In-Street Pedestrian Crossings Signs	Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/	https://mutcd.fhwa.dot.gov/htm/2009r1r2/part2/part2b.htm#section2B12
Reduced Radii and Sidewalk Corners	NACTO Urban Street Design Guide (2013): https://nacto.org/publication/urban-street-design-guide/	Pages 117-118/ https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/corner-radii/
Curb Extensions, Including Chicanes	NACTO Urban Street Design Guide (2013): https://nacto.org/publication/urban-street-design-guide/ Guide for the Planning Design and Operation of Pedestrian Facilities https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07(263)_FR.pdf	Pages 45- 50; https://nacto.org/publication/urban-street-design-guide/street-design-elements/curb-extensions/ Chapter 2.6.2 Page - 43

DESIGN TOPIC	DESIGN RESOURCE	RELEVANT PAGES/LOCATION
Curb Ramps	Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-way https://www.access-board.gov/prowag/preamble-prowag/	Pages 36 – 37; https://www.access-board.gov/prowag/preamble-prowag/#r304-curb-ramps-and-blended-transitions
Right-Turn Slip Lane	FHWA Pedestrian Safety Guide and Countermeasure Selection System (2013) http://www.pedbikesafe.org/pedsafe/index.cfm	http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=24
Advanced Yield Markings	Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/ California Manual on Uniform Traffic Control Devices (2014) https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/ca-mutcd/rev6/camutcd2014-rev6.pdf	https://mutcd.fhwa.dot.gov/htm/2009r1r2/part2/part2b.htm#section2B11 Section 2B.11
Advanced Warning Signs	Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/	Sign R1-5a
Crossing Types: RRFB, PHB, Grade Separated Crossings,	Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/	Sections 4C.05, 4C.06, 4F.01, 4L.03

DESIGN TOPIC	DESIGN RESOURCE	RELEVANT PAGES/LOCATION
Pedestrian Signal Timing	NACTO Urban Street Design Guide: https://nacto.org/publication/urban-street-design-guide/	NACTO pages 125 – 134; https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/traffic-signals/
	Guide for the Planning Design and Operation of Pedestrian Facilities https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07(263)_FR.pdf	Chapter 4.1.2 – Page 101
	Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/	4E.06; https://mutcd.fhwa.dot.gov/htm/2009/part4/part4e.htm
Leading Pedestrian Intervals	NACTO Urban Street Design Guide: https://nacto.org/publication/urban-street-design-guide/	Page 128; https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/traffic-signals/leading-pedestrian-interval/
Signal Phasing-Protected Left Turns and Split Phasing	FHWA Pedestrian Safety Guide and Countermeasure Selection System (2013) http://www.pedbikesafe.org/pedsafe/index.cfm	http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=51
Bus Stop Accessibility	Toolkit for the Assessment of Bus Stop Accessibility and Safety (2 https://www.nadtc.org/wp-content/uploads/NADTC-Toolkit-for-the-Assessment-of-Bus-Stop-Accessibility.pdf	Page 10
	ADA Accessibility Guidelines (2002): Adaag 1991 2002 (access-board.gov)	Section 10.2; https://www.access-board.gov/adaag-1991-2002.html#tranfac

DESIGN TOPIC	DESIGN RESOURCE	RELEVANT PAGES/LOCATION
Bikeway selection	FHWA Bikeway Selection Guide: https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf Also see supplemental guidance pages XYZ	Pages 22-23
Class I Shared Use Path & Shared Use Path Features	Guide for the Planning Design and Operation of Pedestrian Facilities (2021)	Chapter 3.4
Grade Separation	Guide for the Planning Design and Operation of Pedestrian Facilities (2021)	Section 3.6.4.6
Curb Ramps	Public Right of Way Accessibility Guidelines (PROWAG) (2013) https://www.access-board.gov/files/prowag/PROW-SUP-SNPRM-2013.pdf Guide for the Planning Design and Operations of Pedestrian Facilities (2021)	R304; https://www.access-board.gov/prowag/chapter-r3-technical-requirements/#r304-curb-ramps-and-blended-transitions Section 3.6.4.5
Crossing Treatments	Guide for the Planning Design and Operation of Pedestrian Facilities (2021)	Chapter 3.6
Bicycle Signal Heads	NACTO Urban Bikeway Design Guide: https://nacto.org/publication/urban-bikeway-design-guide/	Page 91; https://nacto.org/publication/urban-bikeway-design-guide/bicycle-signals/
Unsignalized Intersections	NACTO Urban Bikeway Design Guide: https://nacto.org/publication/urban-bikeway-design-guide/	Page 105; https://nacto.org/publication/urban-bikeway-design-guide/bicycle-signals/

DESIGN TOPIC	DESIGN RESOURCE	RELEVANT PAGES/LOCATION
Sidepaths	AASHTO Guide for the Development of Bicycle Facilities (2012)	Chapter 5, Page 8
Sidepath Intersection Design Considerations	AASHTO Guide for the Development of Bicycle Facilities (2012)	Chapter 5, Page 42
Class IIA Bicycle Lanes	California Highway Design Manual https://dot.ca.gov/-/media/dot-media/programs/design/documents/hdm-complete-12312020a11y.pdf	Section 301.2
	AASHTO 2012 Guide for the Development of Bicycle Facilities https://nacto.org/references/aashto-guide-for-the-development-of-bicycle-facilities-2012/	Chapter 4, Pages 11 -22
	Urban Bicycle Design Guide https://nacto.org/publication/urban-bikeway-design-guide/	Pages 1 – 21/https://nacto.org/publication/urban-bikeway-design-guide/bike-lanes/
Bicycle Facility Design	California Highway Design Manual https://dot.ca.gov/-/media/dot-media/programs/design/documents/hdm-complete-12312020a11y.pdf	Sections 301 & 1000
	NACTO Urban Bikeway Design Guide: https://nacto.org/publication/urban-bikeway-design-guide/	Page 119/https://nacto.org/publication/urban-bikeway-design-guide/bikeway-signing-marking/
	Geometric Design of Highways and Streets	Chapter 4 Page 77; Chapter 5 Page 8; Chapter 6 Page 7; Chapter 9 Page 156

DESIGN TOPIC	DESIGN RESOURCE	RELEVANT PAGES/LOCATION
Bicycle Parking	AASHTO 2012 Guide for the Development of Bicycle Facilities https://nacto.org/references/aashto-guide-for-the-development-of-bicycle-facilities-2012/ Transit Street Design Guide https://nacto.org/publication/transit-street-design-guide/transit-streets/	Chapter 6 Chapter 4 Page 105
Bicycle Facility Maintenance	AASHTO 2012 Guide for the Development of Bicycle Facilities https://nacto.org/references/aashto-guide-for-the-development-of-bicycle-facilities-2012/	Chapter 7
Bicycle Signals	AASHTO 2012 Guide for the Development of Bicycle Facilities: https://nacto.org/references/aashto-guide-for-the-development-of-bicycle-facilities-2012/ Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/ NACTO Urban Bikeway Design Guide: https://nacto.org/publication/urban-bikeway-design-guide/	Chapter 4 Page 43 MUTCD Figure 9C-7 (bicycle detector pavement markings); Section 4D.08 through 4D.16 (signal placement) Pages 91 – 111; https://nacto.org/publication/urban-bikeway-design-guide/bicycle-signals/

DESIGN TOPIC	DESIGN RESOURCE	RELEVANT PAGES/LOCATION
Restriping to Add Bicycle Facilities	FHWA: Incorporating On-Road Bicycle Networks into Resurfacing Projects, 2016 https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/resurfacing_workbook.pdf	Entire document
Stormwater Management	NACTO Urban Bikeway Design Guide: https://nacto.org/publication/urban-bikeway-design-guide/ LA Model for Living Streets Design Manual (2011) https://www.cleanwaterprogram.org/resources/resources/la-living-streets-design-manual/download.htmlChapter 11	Pages 65 – 70; https://nacto.org/publication/urban-street-design-guide/street-design-elements/stormwater-management/

SUPPLEMENTAL GUIDANCE

SIDEWALK WIDTH RECOMMENDATIONS

Streets and sidewalks should support the activities and pedestrian levels along the street. Sidewalks should be wide enough to support the expected pedestrian volumes. This Plan recommends a minimum width of six feet for the pedestrian pathway section of a sidewalk, which is wide enough for two people to walk side by side, can be navigated by persons with mobility impairments, and meets current ADA requirements. See Table 1 for recommended sidewalk widths by context. In addition to Table 1, if a specific area plan with recommended cross section widths exists for a project location, refer to the specific area plan guidance.

ADA sidewalk regulations specify that routes with less than 60 inches, or five feet of clear width must provide passing spaces, or wider areas that can accommodate two wheelchairs passing, at least 60 inches wide at reasonable intervals not exceeding 200 feet, and a five feet by five feet turning space should be provided where turning or maneuvering is necessary. If a sidewalk is directly adjacent to moving traffic, 2 feet should be added to the absolute minimum clear path width to provide buffer and space for street furniture and utilities. Based on the Caltrans Highway Design Manual, the minimum width of a sidewalk should be 8 feet between a curb and building when in urban and rural main street place types, 6 feet in all other locations when continuous to a curb, or 5 feet when separated by a planting strip.

In addition to the typical sidewalk widths, the context should dictate other design feature as well, identified below:

- **Edge/ Curb Zone -** At a minimum, such as in areas with lower pedestrian activity, there should be a 6-inch-wide curb. Other areas, such as downtowns, should have at least an extra foot to accommodate car doors to not conflict with the sidewalk.
- **Furnishing/Landscape Zone -** This area acts as a buffer between the curb and throughway zone. This is the areas where trees should be planted, and benches should be located. Any sidewalk amenities should be located within this area and should not interfere with the throughway zone. A furnishing zone must be a minimum of 3 feet to have the opportunity to include street trees or landscaping. The landscape buffer should increase in width as speeds increase: four feet is the recommended minimum buffer for areas that are 25 mph and the buffer should increase 1 foot for every 5 mph increase in speed.
- **Throughway zone – This area acts as the sidewalk clear zone.** See Table 1 for recommended sidewalk widths for the throughway zones.
- **Frontage Zone -** This area borders the building façade or fence. The primary purpose of this zone is to create a buffer between pedestrians walking in the throughway zone from people entering and exiting buildings. It provides opportunities for shops to place signs, planters, or chairs that do not encroach into the throughway zone.

Table 1: Recommended Sidewalk Widths by Context

LAND USE CONTEXT	RECOMMENDED SIDEWALK WIDTH	RECOMMENDED GREENSCAPE/ FURNISHING ZONE WIDTH
Residential and industrial areas	8 feet – 5 feet	6 feet – 3 feet
Downtown or commercial areas	12 feet – 8 feet	8 feet – 3 feet
Schools	10 feet – 8 feet	8 feet – 3 feet

BIKEWAY SELECTION

CLASS IA: BIKE PATHS OR SHARED USE PATHS

DESCRIPTION:

Bike paths provide a completely separated facility designed for the exclusive use of bicyclists and pedestrians with minimal or no conflicting motor vehicle traffic. Generally, these corridors are not served by streets, and the path may be along a river, converted rail right-of-way, or powerline, or other car-free corridors.

TYPICAL APPLICATION:

Class IA paths may provide connectivity between neighborhoods or communities, to parks or recreational areas, along or to rivers or streams, or to other destinations without travelling along a roadway corridor.

COST ESTIMATE:

$2.2M per mile, including design and construction for the path, assuming the inclusion of two high visibility actuated crossings

DESIGN CONSIDERATIONS:

- The width of a shared-use path may vary based on expected bicyclist and pedestrian volume and right-of-way constraints. For accessibility purposes, trails should be limited to 5% grade.
- Where right-of-way or other physical constraints exist, sidepaths may be provided adjacent to the roadway. Information about these facilities, Class IB facilities, are provided on the next page.

Iron Horse Regional Trail, Dublin, California Source: Kittelson & Associates, Inc.

PREFERRED DESIGN AND ELEMENTS:

- A 10 ft wide path with 2 ft shoulders on each side is preferable (14 ft total). The higher the anticipated volumes of users, the greater the width should be to accommodate these users comfortably.
- Pedestrian-scale lighting improves visibility, particularly at intersection crossings, tunnels, underpasses, trail heads, and rest areas.
- A shy distance of at least one foot allows adequate lateral clearance for the placement of signs or other vertical objects. If objects are shorter than 3 feet tall, they may not present an obstruction for cyclists.

REQUIRED ELEMENTS:

- While the width may vary along a path, a path should be at least 10 feet wide except in rare cases and for short distances.
- Path must include at least 2 feet (3 feet preferred) horizontal clearance between the paved edge of path and obstructions.
- Path crossings may be designed with yield, signal, or stop control for either motorists or path users depending on path volume and traffic volume on the crossing street.

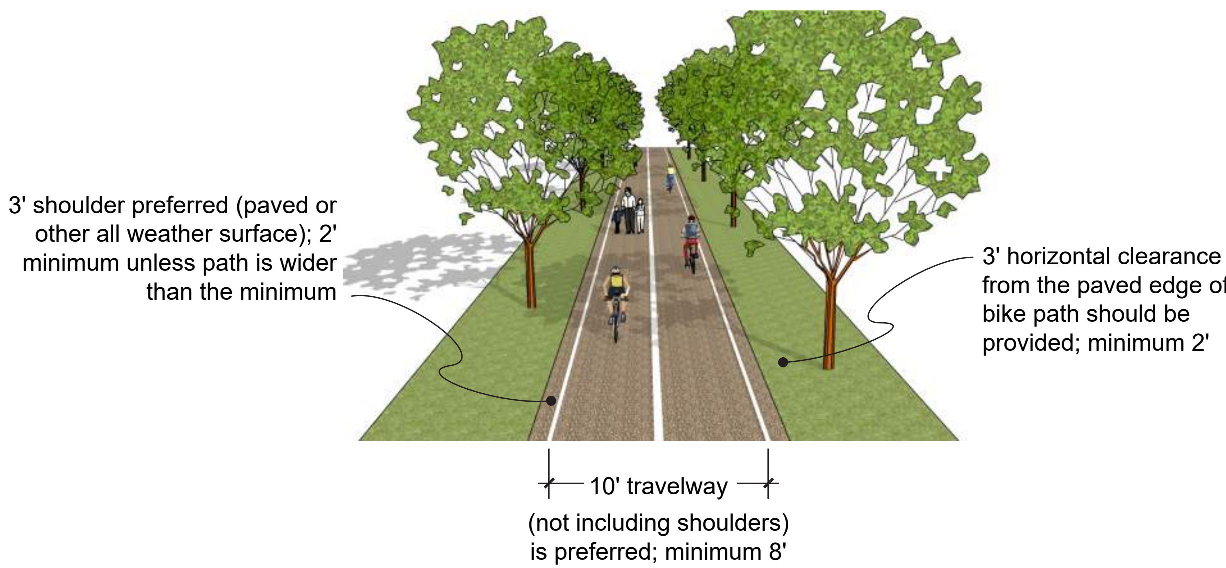


Exhibit 1: Class 1A–Shared Use Path

CLASS IB: SIDEPATHS

DESCRIPTION:

Sidepaths are shared use paths that exist within a roadway corridor. They provide dedicated space for bidirectional travel for people walking, biking, using mobility devices, or using scooters or other micromobility devices.

TYPICAL APPLICATION:

Sidepaths are applicable in areas with few motor vehicle driveways or access points on roadways with operating speeds above 35 miles per hour and serving above 6,500 vehicles per day, but other treatments (generally sidewalks and Class IV facilities) are typically preferred for safety and comfort. Sidepaths can be used along high speed and/or volume roadways to provide a completely separated space outside of the roadway for people walking and biking.

COST ESTIMATE:

$2.6M per mile , including design and construction for the path and a planted buffer

DESIGN CONSIDERATIONS:

- In many situations, especially urban areas or denser or destination focused suburban areas, providing dedicated walking and biking facilities that are separate from each other is preferred to combining these modes on a sidepath.
- As motor vehicle speeds and volumes increase, providing more separation between the roadway and the path will provide higher comfort for those using the path.

Dougherty Road, Dublin, California   Source: Kittelson and Associates, Inc

- One key concern with providing sidepaths instead of directional bicycle facilities is the lack of driver awareness about contraflow bicycle traffic (higher speed traffic than pedestrians, which are expected to travel bidirectionally) at intersections and access points. If a motor vehicle is turning left, they are more likely to be aware of or look for traffic traveling toward them. Skip striping and signs that indicate two-way bicycle travel through crossings at intersections is key to creating awareness of the birdirectional traffic. Exhibit 2 shows a sign used by Colorado DOT to increase awareness of sidepath users. At signalized intersections, consider detection that activates No Right Turn On Red signs and/or Yield To Pedestrians In Crosswalk signs when sidepath users are present.

- At intersections, treatments like leading pedestrian and bicycle intervals can also help increase the visibility of crossings bicyclists. Sidepaths must be appropriately designed at access points or intersections.
- At intersections, divert the sidepath away from the parallel roadway at conflict points so that it functions as a mid-block crossing and there is enough space (25 feet) for at least one vehicle to queue between the crossing and roadway intersection.
- When providing sidepaths, a critical consideration is the connection to other biking facilities. If a sidepath connects to a uni-directional bike lane at an intersection, the design of the intersection should consider the efficiency and safety of connecting bicyclists to the infrastructure they will need to use to continue on their path. Diagonal crossings can reduce the need for two-stage crossings, which can slow bicyclists and increase crossing exposure. Pavement markings and signs can also be effective in guiding bicyclists for how to make the connection and provide continuity and clarity to these transitions, which can otherwise be uncomfortable or unclear, and may encourage crossing in ways or locations that increase exposure or the number of potential conflict points. Striping on the ground to encourage separation between people walking and biking in different directions, especially at intersections or areas with higher volumes can create clarity and decrease conflicts between these modes. The maximum grade of a side path should be 5%, but the grade should generally match the grade of the roadway. Where the roadway grade exceeds 5%, the sidepath grade may as well but it must be less than or equal to the roadway grade.

Exhibit 2: CDOT Sidepath Sign

Note: This sign is not included in the CA MUTCD but may be considered as a candidate to apply for a request for experimentation.

PREFERRED DESIGN AND ELEMENTS:

- A 10 ft wide path with 2 ft shoulders on each side is preferable (14 ft total). The higher the anticipated volumes of users, the greater the width should be to accommodate these users comfortably. Curb ramps should be as wide as the path travelway to allow people walking and biking to use the ramps simultaneously.
- Pedestrian-scale lighting improves visibility for and of the users, and is particularly important at intersection crossings and in areas with access points or driveways.
- A 2 ft or greater shoulder on both sides of the path should be provided. An additional foot of lateral clearance is required by the CAMUTCD for the installation of signage or other furnishings. If objects are shorter than 3 feet tall, they may not present an obstruction for cyclists.
- Biking and walking facilities should be provided on both sides of the street to provide access to destinations along both sides of

a street. Walking facilities should be bi-directional on each side of the street. Bike lanes may be one-way, but a one-way bike path should only be provided in rare situations where there is only need for one direction of travel. If a one-way bike path is provided, adequate signage and striping is necessary to ensure it is used appropriately. A one-way bike path should be at least 5 feet in width and has the same shoulder requirements as a bi-directional path.

REQUIRED ELEMENTS:

- While the width may vary along a path, a path should have at least an 8 feet paved travelway with 2 feet paved or all weather surface shoulders on each side except in rare cases and for short distances.
- A wide separation should be provided between a two-way sidepath and the adjacent roadway to demonstrate to both the bicyclist and the motorist that the path functions as an independent facility for bicyclists and other users. The minimum recommended distance between a path and the roadway curb (i.e., face of curb) or edge of traveled way (where there is no curb) is 5 feet.
- Path crossings may be designed with yield, signal, or stop control for either motorists or path users depending on path volume and traffic volume on the crossing street.

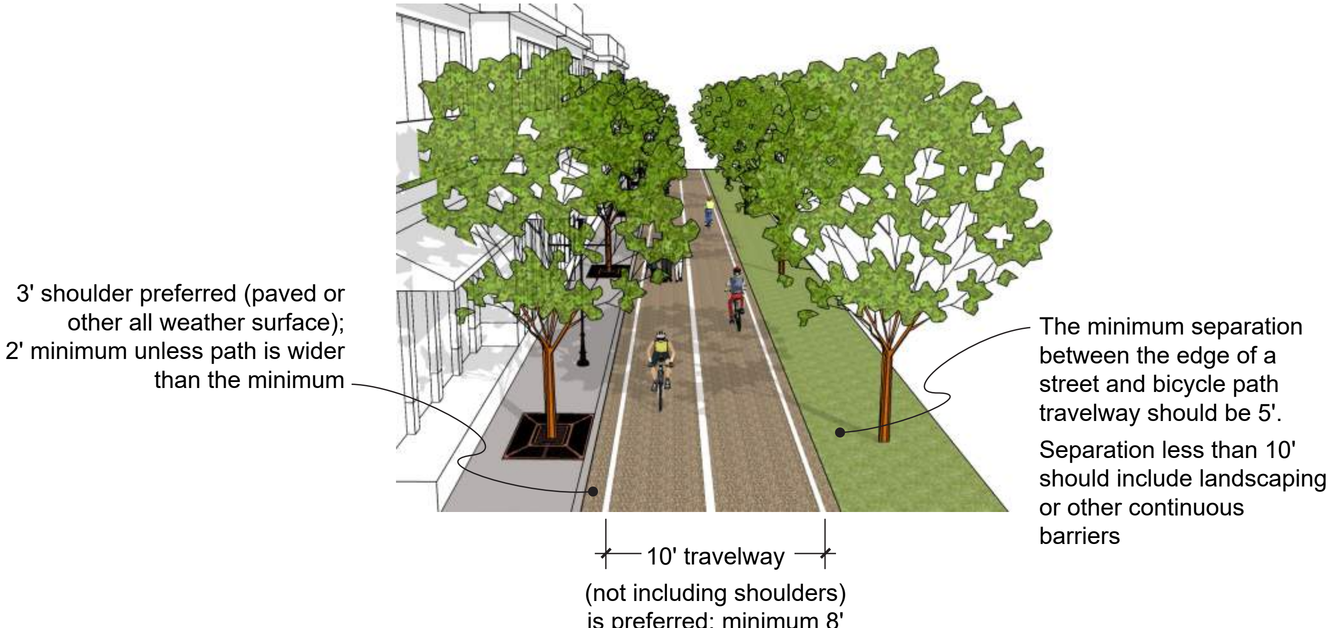


Exhibit 3: Class IB – Shared Use Path

CLASS IIA AND CLASS IIB FACILITIES: BIKE LANES AND BUFFERED BIKE LANES

DESCRIPTION:

Bike lanes are on-street bikeways that provide a designated right-of-way for the exclusive use of bicycles. Through travel by motor vehicles or pedestrians is prohibited, but vehicle parking may be allowed on either side of the bikeway, and drivers may cross through for turning movements. Class IIA facilities are bike lanes without a buffer, while Class IIB facilities include a buffer between motor vehicle traffic and the dedicated bike lane.

TYPICAL APPLICATION:

Bike lanes are appropriate on streets with moderate traffic volumes and speeds: typically between 25-35 mph and 3,000 to 6,500 vehicles per day. Class IIB facilities are preferred for these conditions, but if constraints do not allow for a buffer to be added, Class IIA facilities can be provided.

COST ESTIMATE:

$225,000 – $5,500,000 per mile including design and construction; the lower end of the estimate is based on the ability to restripe existing roadway to add bicycle lanes, while the high end of the estimate is based on the need to widen the roadway to add facilities, including a full reconstruction of a planter strip and sidewalk.

DESIGN CONSIDERATIONS:

A buffer provides a more comfortable facility, so if space is available, a buffer should be provided. A buffer becomes more necessary when speeds and volumes are at the high end of the ranges provided in the "typical application" above.

San Ramon Road, Dublin, California *Source: Kittelson and Associates, Inc*

PREFERRED DESIGN AND ELEMENTS:

When a bike lane is placed next to active street parking, a parking-side buffer is preferred.

When steep grades are present, consider providing the next level of separation uphill (i.e., add a buffer, or physically separate the bike lane). It may be appropriate to mix facilities for opposite directions along a steep grade.

The desired minimum width of a bike lane is 6 feet. When adjacent to parking, the recommended width from curb face to the far edge of the bike lane is 14.5 feet (12 feet minimum). With high bike volumes, a 7-foot travel area width is recommended.

Storm drain catch basin grates along a Class II facility can cause a hazards for people biking. Inlets at the curb instead of on the street-surface are preferred. Grates should have rails perpendicular to the movement of bicycle traffic to keep tires from being caught in the grates. In addition, the slope of the roadway leading to the inlet must not be too severe, and the inlet and accompanying concrete box must not extend far into the bicycle lane.

At intersections with right-turn vehicle lanes, it is recommended that the bike lane transitioned to the left of the lane using dotted white lines, appropriate signage, and colored pavement.

REQUIRED ELEMENTS:

When buffers are used, they shall be marked with 2 solid parallel white lines, at least 18 inches apart. If the buffer is at least 3 feet wide, use diagonal or chevron hatching inside. See CAMUTCD Section 9C.04 for more information.

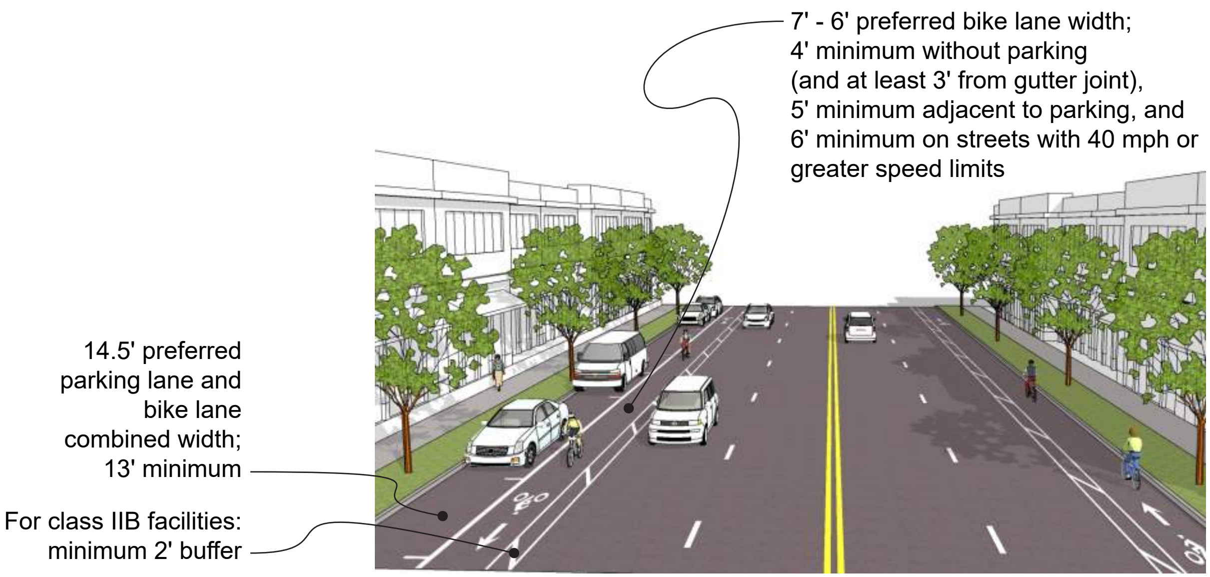


Exhibit 4: Class II Bike Lanes

CLASS III BIKE ROUTES/BICYCLE BOULEVARDS

DESCRIPTION:

Bike routes or bicycle boulevards provide a shared travel lane with motorists. They are designated by signs or permanent markings, which may include shared-lane markings ("sharrows") to alert drivers of the shared roadway environment. Because the right-of-way is shared, vehicle speeds on Class III bikeways should be managed through the use of traffic calming or traffic diversion.

TYPICAL APPLICATION:

Bike routes are appropriate only in the presence of low speeds and low traffic volumes: typically below 25 miles per hour and 3,000 vehicles per day. They are most applicable on streets where no striped centerline is present. Outside of these circumstances, a designated lane or other facility is appropriate.

COST ESTIMATE:

$40,000 – $135,000 per mile including design and construction, depending on the need to add traffic calming elements.

BENEFITS:

On streets that are already low speed and volume, bike routes can provide bike connectivity for people of all ages and abilities at a relatively low cost. Sharrow pavement markings should be placed every 250 feet and after each intersection.

DESIGN CONSIDERATIONS:

To ensure the selected facility retains its low speed and low-volume character, bicycle boulevards should be supported with traffic calming measures and volume management measures (e.g., restricting vehicle access).

Shafter Avenue, Oakland, California Source: Kittelson and Associates, Inc.

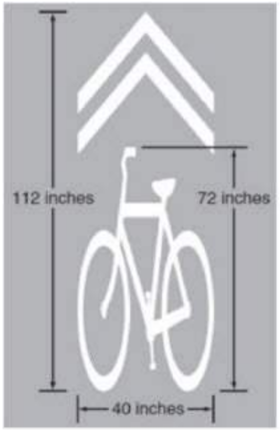


Exhibit 5: California MUTCD (Figure 9C-9)

The level of stress of bicycle boulevards are typically determined by major street crossings, which should be designed to promote the desired level of traffic stress (i.e., controlled).

PREFERRED DESIGN AND ELEMENTS:

Bike routes should be direct, as bicyclists are unlikely to adhere to a path that requires significant out-of-direction travel. Ideally a bicycle boulevard would be parallel and proximate to a major vehicle route.

Signs and pavement markings should be used to identify the bike route. Wayfinding signs are recommended to guide bicyclists to destinations and through any turns in the route (refer to CAMUTCD 9B.20). Chevron pavement markings can guide bicyclists with lateral positioning in lanes that are too narrow for a motor vehicle and bicycle to travel side-by-side within the same traffic lane, and alert road users of their presence.

To create a shared street environment, it is most appropriate to use roadways that do not have a striped centerline as neighborhood bikeways.

Exhibit 6: Class III Bike Routes

Typically, minor streets along the bicycle boulevard should be controlled to minimize delay for bicyclists and encourage use of the bicycle boulevard.

REQUIRED ELEMENTS:

Place sharrow pavement markings at least every 250 feet and after each intersection.

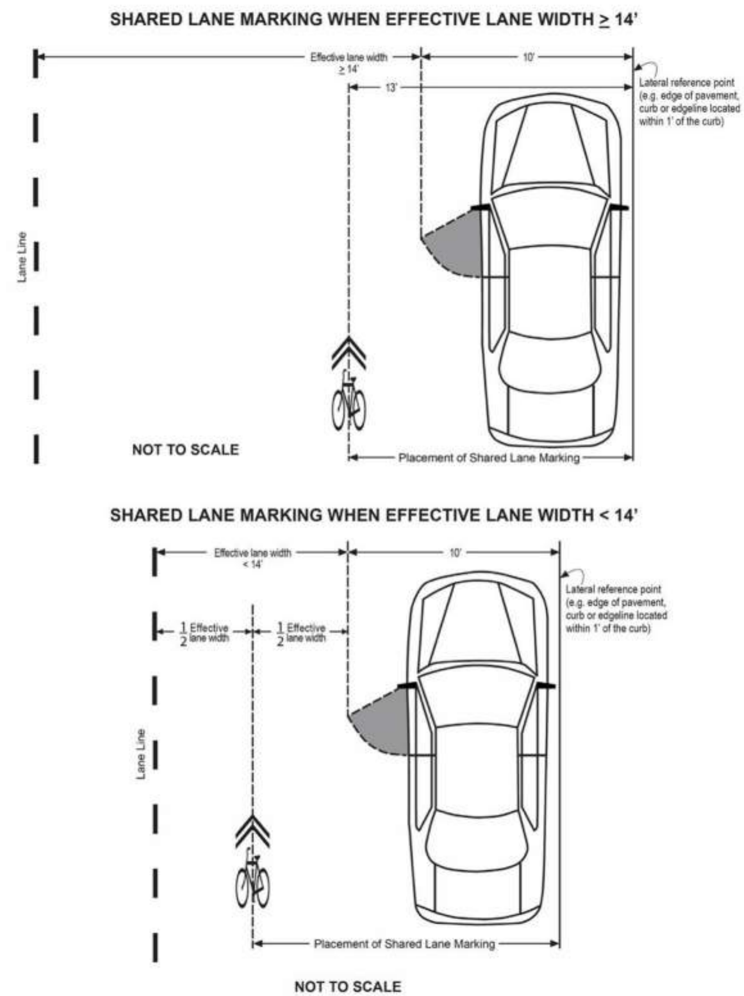


Exhibit 7: California MUTCD 9C-108(CA)

CLASS IV: SEPARATED BIKEWAY/CYCLE TRACK

DESCRIPTION:

Separated bikeways provide physical separation from vehicular traffic. This separation may include grade separation, flexible posts, planters or other inflexible physical barriers, or on-street parking. These bikeways provide bicyclists a greater sense of comfort and security, especially in the context of high-speed roadways. Separated facilities can provide one-way or two-way travel and may be located on either side of a one-way roadway.

TYPICAL APPLICATION:

Separated bikeways are appropriate for higher volume and speed settings including above 35 miles per hour and serving 6,500 or more vehicles per day.

COST ESTIMATE:

$1,100,000 – $5,700,000 per mile including design and construction; the lower end of the estimate is based on the ability to reorganize existing roadway to add separated bike lanes, while the high end of the estimate is based on the need to widen the roadway to add facilities, including a full reconstruction of a planter strip and sidewalk.

San Diego, California Source: Kittelson and Associates, Inc.

Village Parkway, Dublin, California Source: City of Dublin

DESIGN CONSIDERATIONS:

Separated bikeways are appropriate at speeds and volumes where bike lanes or buffered bike lanes do not adequately address the comfort needs of the Interested but Concerned biking population per the FHWA Bikeway Selection Guide. These facilities are more appropriate than shared-use paths if pedestrian and bicyclist volumes are expected to be relatively high or there are significant access points or driveways along a road.

Two-way separated bikeways are appropriate along routes with many destinations on only one-side of the road, incidences of wrong-way riding, along one-way streets, or in locations where they facilitate connection to a shared-use path.

PREFERRED DESIGN AND ELEMENTS:

The type of separator can impact the comfort of bicyclists along a separated bikeway. Elements with higher mass and height can provide higher comfort. Planted separators can also improve the aesthetics along a corridor.

Along separated bikeways, intersections may provide the most exposure to cyclists. Including protected intersection treatments can improve the comfort along the entire route and make the facility more appropriate for people of all ages and abilities.

REQUIRED ELEMENTS:

Physical separation may be provided by flexible delineators, parked cars, bollards, planters, or parking stops. When parked cars provide separation, a buffer width of at least 3 feet should be provided for bicyclists to avoid the "door zone." Delineation should be intentional to discourage people driving from entering the bikeway and to indicate the location of the parking lane.

The riding area for one-way lanes should be at least 5 feet wide (7 feet if along an uphill grade). For two-way bikeways, the preferred width is 12 feet (10 feet minimum).

In constrained environments, consider removing a travel lane, reducing the bike lane width, or reducing the sidewalk buffer width. Sidewalk accessibility requirements must be maintained, and adequate street buffer is essential for the safety of bicyclists.

Exhibit 8: Class IV Cycle Track

ACCESSIBLE PEDESTRIAN SIGNALS

DESCRIPTION:

An accessible pedestrian signal (APS) is a pedestrian signal that uses audible tones or messages and/or vibrotactile surfaces to communicate crossing information (e.g., WALK and DON'T WALK intervals) to those walking who are vision impaired or blind. Section 504 of the Rehabilitation Act requires newly constructed and reconstructed public facilities to be accessible to all members of the public. APS should be installed wherever pedestrian signals are installed.

TYPICAL APPLICATION:

The factors that make crossing at a signalized location difficult for pedestrians who have visual disabilities include: quiet car technology including through electric vehicles, high right turn on red or continuous right-turn movements, complex signal operations, traffic circles, wide streets, or low traffic volumes that make it difficult to discern signal phase changes.

APS should be provided everywhere a signalized crossing opportunity is provided, but should be provided in particular at signalized intersections that may present difficulties for pedestrians who have visual disabilities, including those listed above. Greater consistency can provide more expectations.

COST ESTIMATE:

Costs range from $550 to $1,150 per signal in locations where pedestrian signal poles already exist; up to eight APS units are needed per intersection.

BENEFITS:

Without APS, those with visual disabilities generally determine if they're able to cross a street by initiating a crossing when they hear traffic stop and traffic perpendicular to them move, but this does not always provide sufficient information needed to safely or efficiently cross. When it does provide accurate information, it may require the pedestrian to need to wait an additional signal cycle. APS has been shown to reduce the number of crossings during a DON'T WALK phase, provide more accurate judgements of the WALK phase, and reduce delay of crossing. It can also reduce delay and reduce conflicts due to a misunderstanding of crossing opportunities.

DESIGN CONSIDERATIONS:

When APS cannot be implemented everywhere, it should be prioritized in areas with the following characteristics:

- Very wide crossings,
- Crossings of major streets where minor streets have minimal or intermittent traffic,
- Complex or uncommon intersection types,
- Low volumes of through vehicles,
- High volumes of turning vehicles,
- Split phase signal timing,
- Exclusive pedestrian phasing, Leading pedestrian intervals, and
- Proximity to major pedestrian destinations like BART stations, parks, downtown, etc.

PREFERRED DESIGN AND ELEMENTS:

An alert tone may be used to alert pedestrians to the beginning of the walk interval.

Locator tones should help those with visual impairment find pushbuttons, and APS should be clear to which crossing leg the audible signal is associated. It is preferred for APS pushbutton poles to be at least 10 feet apart to improve clarity for which crossing leg is associated with each audible signal. Including the name of the street to be crossed in an accessible format, such as Braille or raised print on the pushbutton, can help provide clarity for which crossing the APS is associated.

Pushbuttons for accessible pedestrian signals should be located as close as possible to the crosswalk line furthest from the center of the intersection and as close as possible to the curb ramp. In addition to being more useful, the closer to the crossing that it is located, the quieter it can be. It should be within 5 feet of the crosswalk extended or 10 feet of the edge of curb, shoulder, or pavement.

REQUIRED ELEMENTS*:

- Where two accessible pedestrian signals are separated by a distance of at least 10 feet, the audible walk indication shall be a percussive tone. Where two accessible pedestrian signals on one corner are not separated by a distance of at least 10 feet, the audible walk indication shall be a speech walk message.
- If speech walk messages are used to communicate the walk interval, they shall provide a clear message that the walk interval is in effect, as well as to which crossing it applies. Speech walk messages shall be used only at intersections where it is technically infeasible to install two accessible pedestrian signals at one corner separated by a distance of at least 10 feet.
- If two accessible pedestrian pushbuttons are placed less than 10 feet apart or on the same pole, each accessible pedestrian pushbutton shall be provided with the following features: Pushbutton locator tone, tactile arrow, speech walk message, speech pushbutton information message
- If the pedestrian clearance time is sufficient only to cross from the curb or shoulder to a median of sufficient width for pedestrians to wait and accessible pedestrian detectors are used, an additional accessible pedestrian detector shall be provided in the median.

FOR MORE INFORMATION:

NCHRP Web-Only Document 150:
Accessible Pedestrian Signals: A Guide to Best Practices
https://www.trb.org/Publications/Blurbs/164696.aspx

California Manual on Uniform Traffic Control Devices Section 4E.09 https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/ca-mutcd/rev6/camutcd2014-rev6.pdf

* Check the California MUTCD Part 4 for current guidance

CROSSING SELECTION

DESCRIPTION:

Providing visible pedestrian crossings is critical to allowing those who travel by foot or mobility device to have access to their destinations. Uncontrolled pedestrian crossing locations generally correspond to higher pedestrian crash rates than controlled locations, often due to inadequate pedestrian crossing accommodations (FHWA, 2018). The type of crossing provided should be appropriate for the context of the roadway that is being crossed. The higher the speeds, volumes, and number of lanes on the roadway, the greater the need for higher visibility crossing elements. Providing regular crossings with the correct crossing features based on the roadway context supports a safe, convenient, and comfortable walking environment, leading to more people walking to meet everyday needs and thus contributing to the health, sustainability, and vibrancy of a community.

In addition to the crossing countermeasures provided, curb ramps should be provided at all crossings. At intersections, directional curb ramps should be provided, which means providing dual curb ramps at most intersections.

TYPICAL APPLICATION:

Mid-block and unsignalized intersections; crossings should be provided with regular spacing and should especially be provided to access key destinations like transit stops, schools, trailheads, parks, and grocery stores. Different crossing types and countermeasures are appropriate based on the roadway context. Exhibit 9 provides the appropriate crash countermeasures by roadway feature.

Exhibit 9: Application of pedestrian crash countermeasures by roadway feature

	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
Roadway Configuration	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
2 lanes (1 lane in each direction)	❶ 2 4 5 6	❶ 5 6 7 9	① 5 6 ❼ ❾	❶ 4 5 6	❶ 5 6 7 9	① 5 6 ❼ ❾	❶ 4 5 6 7 9	① 5 6 7 9	① 5 6 ❾
3 lanes with raised median (1 lane in each direction)	❶ 2 3 4 5	❶ ❸ 5 7 9	① ❸ 5 ❼ ❾	① 3 4 5 7 9	① ❸ 5 ❼ ❾	① ❸ 5 ❼ ❾	① ❸ 4 5 7 9	① ❸ 5 ❼ ❾	① ❸ 5 ❾
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	❶ 2 3 4 5 6 7 9	❶ ❸ 5 6 7 9	① ❸ 5 6 ❾	① 3 4 5 6 7 9	① ❸ 5 6 ❼ ❾	① ❸ 5 6 ❾	① ❸ 4 5 6 7 9	① ❸ 5 6 ❾	① ❸ 5 6 ❾
4+ lanes with raised median (2 or more lanes in each direction)	❶ ❸ 5 7 8 9	❶ ❸ 5 7 8 9	① ❸ 5 8 ❾	① ❸ 5 7 8 9	① ❸ 5 ❼ 8 ❾	① ❸ 5 8 ❾	① ❸ 5 ❼ 8 ❾	① ❸ 5 8 ❾	① ❸ 5 8 ❾
4+ lanes w/o raised median (2 or more lanes in each direction)	❶ ❸ 5 6 7 8 9	① ❸ 5 ❻ 7 8 9	① ❸ 5 ❻ 8 ❾	① ❸ 5 ❻ 7 8 9	① ❸ 5 ❻ ❼ 8 ❾	① ❸ 5 ❻ 8 ❾	① ❸ 5 ❻ ❼ 8 ❾	① ❸ 5 ❻ 8 ❾	① ❸ 5 ❻ 8 ❾

Given the set of conditions in a cell,

- \# Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- ● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- ○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
2 Raised crosswalk
3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
4 In-Street Pedestrian Crossing sign
5 Curb extension
6 Pedestrian refuge island
7 Rectangular Rapid-Flashing Beacon (RRFB)**
8 Road Diet
9 Pedestrian Hybrid Beacon (PHB)**

**Refer to Chapter 4, 'Using Table 1 and Table 2 to Select Countermeasures,' for more information about using multiple countermeasures.*

***It should be noted that the PHB and RRFB are not both installed at the same crossing location.*

This table was developed using information from: Zegeer, C.V., J.R. Stewart, H.H. Huang, P.A. Lagerwey, J. Feaganes, and B.J. Campbell. (2005). Safety effects of marked versus unmarked crosswalks at uncontrolled locations: Final report and recommended guidelines. FHWA, No. FHWA-HRT-04-100, Washington, D.C.; FHWA. Manual on Uniform Traffic Control Devices, 2009 Edition. (revised 2012). Chapter 4F, Pedestrian Hybrid Beacons. FHWA, Washington, D.C.; FHWA. Crash Modification Factors (CMF) Clearinghouse. http://www.cmfclearinghouse.org/; FHWA. Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE). http://www.pedbikesafe.org/PEDSAFE/; Zegeer, C., R. Srinivasan, B. Lan, D. Carter, S. Smith, C. Sundstrom, N.J. Thirsk, J. Zegeer, C. Lyon, E. Ferguson, and R. Van Houten. (2017). NCHRP Report 841: Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments. Transportation Research Board, Washington, D.C.; Thomas, Thirsk, and Zegeer. (2016). NCHRP Synthesis 498: Application of Pedestrian Crossing Treatments for Streets and Highways. Transportation Research Board, Washington, D.C.; and personal interviews with selected pedestrian safety practitioners.

Source: FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations

HIGH VISIBILITY CROSSWALK MARKINGS, PARKING RESTRICTIONS ON THE CROSSWALK APPROACH, ADEQUATE NIGHTTIME LIGHTING LEVELS, AND CROSSING WARNING SIGNS

HIGH VISIBILITY CROSSWALK

Iron Horse Trail and Amador Valley Boulevard, Dublin, California
Source: Kittelson and Associates, Inc

PEDESTRIAN REFUGE ISLAND

Amador Valley Boulevard and San Ramon Road Dublin, California.
Source: Kittelson and Associates, Inc

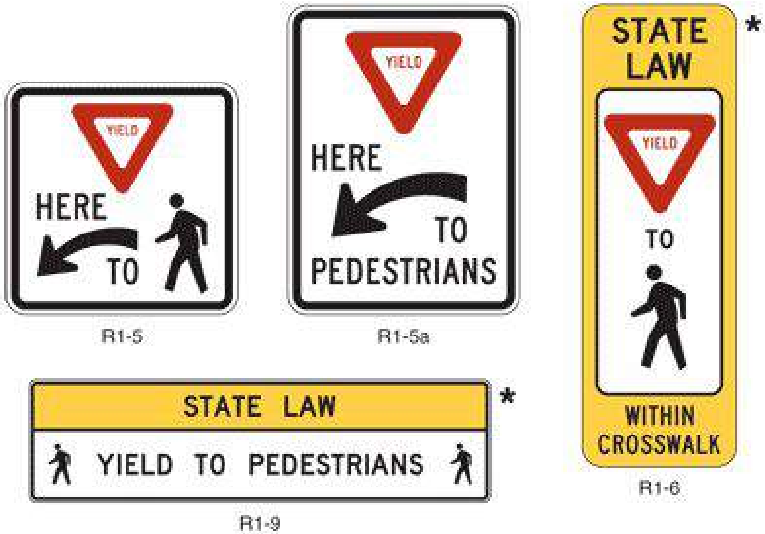
RAISED CROSSWALK

Source: Federal Highway Administration

RECTANGULAR RAPID-FLASHING BEACON

Amador Valley Boulevard and Wildwood Road, Dublin, California
Source: City of Dublin

ADVANCE YIELD HERE TO (STOP HERE FOR) PEDESTRIANS SIGN AND YIELD/STOP



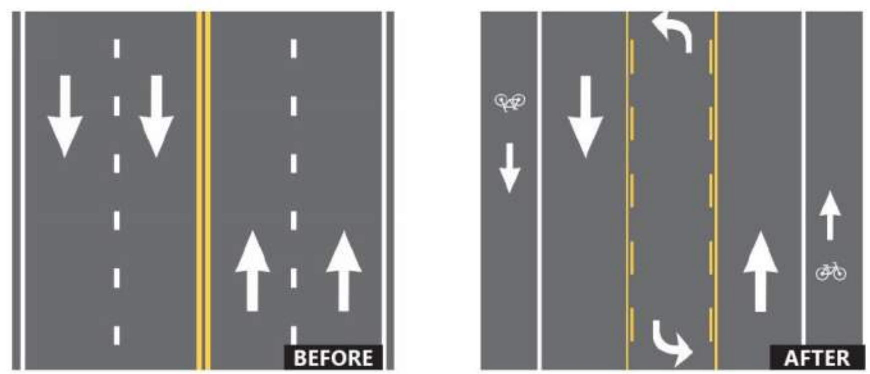
* The legend STATE LAW is optional. A fluorescent yellow-green background color may be used instead of yellow for this sign.

Source: MUTCD

IN STREET PEDESTRIAN CROSSING SIGN

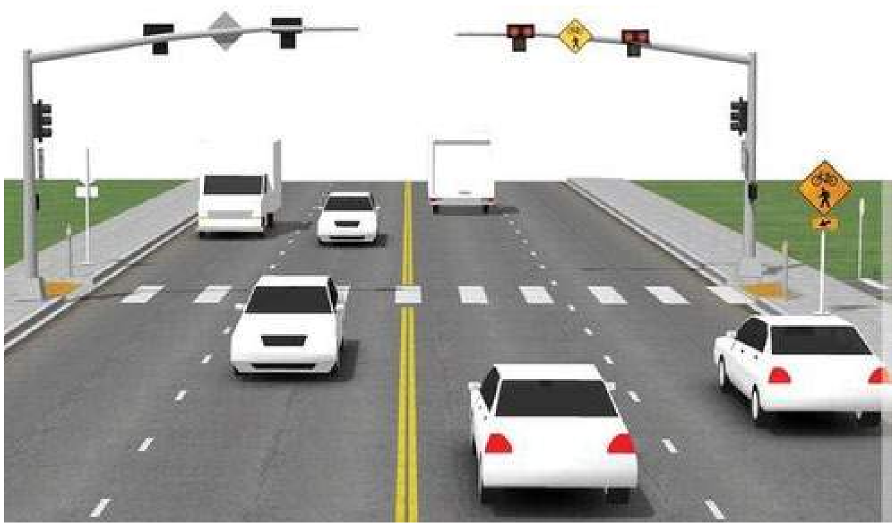
Alcosta Boulevard, San Ramon, California
Source: Google Streetview

ROAD DIET (REALLOCATING SPACE WITHIN THE ROADWAY FOR OTHER USES)



Source: Federal Highway Administration

PEDESTRIAN HYBRID BEACON



Source: NACTO

CURB EXTENSION

Amador Valley Boulevard and Wildwood Road, Dublin, California.
Source: City of Dublin

BICYCLE FACILITIES THROUGH INTERSECTIONS

In locations where there is dedicated space for bicyclists along a roadway, it is important to maintain the bicycle facility through the intersection to clearly provide the intended use of the space, enhance bicyclist comfort, increase motorist yielding behavior, and highlight conflict zones. There are several elements that can support bicyclist movements through intersections including bicycle lane markings, skip striping, green paint, bike boxes, two-stage left turn boxes, protected intersection elements , intersection approach considerations, and traffic control considerations.

2nd Avenue, Seattle, Washington. Source: Kittelson & Associates, Inc.

INTERSECTION CROSSINGS MARKINGS

Dublin Boulevard, Dublin, California. Source: Kittelson and Associates, Inc.

DESCRIPTION:

Intersection crossing markings indicate where a bicyclist will be travelling through an intersection to clearly mark the intended use, enhance cyclist comfort, increase motorist yielding behavior, and highlight conflict zones. They are generally made up of green "skip striping" paint, green bike lane paint, and/or bicycle lane markings.

TYPICAL APPLICATION:

Through intersections or across driveways

COST ESTIMATE:

$1,500 - $4,000 per approach

DESIGN RECOMMENDATIONS:

When colored paint is used for bicycle facilities, it should be green to avoid confusion with other traffic control markings. For more information, see CA MUTCD Section 9C.04 Figure 9C-103(A). , MUTCD Section 3B.08, or https://nacto.org/publication/urban-bikeway-design-guide/intersection-treatments/intersection-crossing-markings/.

Green pavement is not currently allowed in the extension area through the intersection by MUTCD.

https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/ctcdc/ctcdc-agenda-item-21-22-a11y.pdf

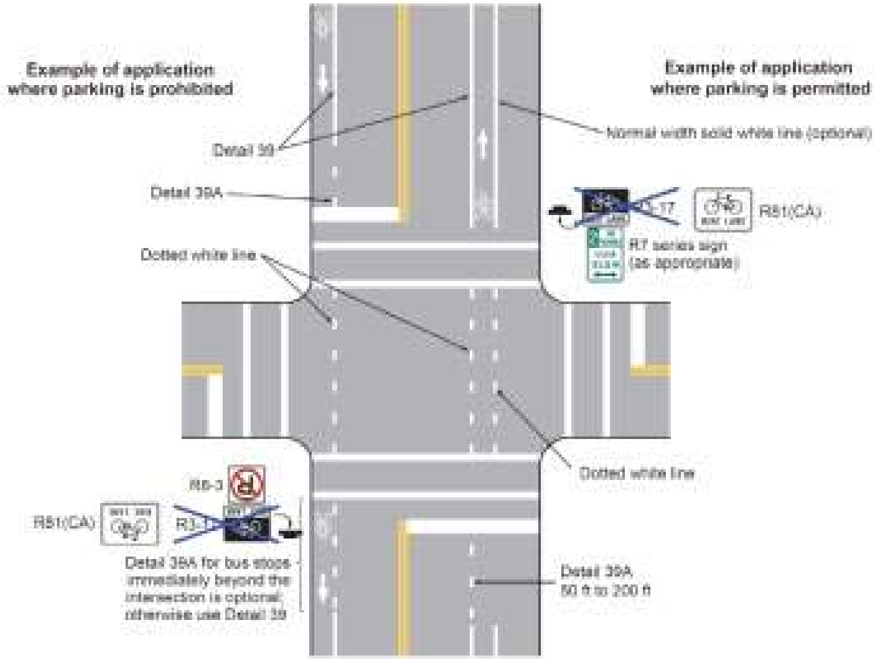


Exhibit 10: CA Traffic Control Devices Committee Editorial Changes to the CA MUTCD

Source: NACTO

BIKE BOXES

DESCRIPTION:

A bike box is a dedicated area at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase.

TYPICAL APPLICATION:

Signalized intersections with higher volumes of bicyclists and right-turning vehicles, typically along Class II or Class III facilities.

COST ESTIMATE:

$1,000 each

DESIGN RECOMMENDATIONS:

- "Wait Here" pavement markings can be placed in advance of the bike box as reinforcement for drivers not to impede the bike box
- A STOP HERE ON RED (MUTCD R10-6 or R10-6a) sign can be used at the advance stop bar, with an EXCEPT BICYCLES (MUTCD R3-7bp) plaque below.
- Green paint highlights bike boxes for visibility.
- Right turn on red and bike boxes are not compatible. Use approved MUTCD "NO RIGHT TURN ON RED" signs shall be used (R10-11).
- A bike box shall include an advance stop line at least 10 feet in advance of the intersection stop line, with at least one bicycle pavement marking in the box.

Flanders Street, Portland, Oregon. Source: Kittelson and Associates, Inc.

FOR MORE INFORMATION:

FHWA's Interim Approval for Optional Use of an Intersection Bicycle Box (IA-18)

TWO STAGE BICYCLE TURN BOXES

DESCRIPTION:

Two-stage bicycle turn boxes offer bicyclists a dedicated space to make left turns at multi-lane signalized intersections from a right side cycle track or bike lane or right turns from a left side cycle track or bike lane.

TYPICAL APPLICATION:

Two-stage bicycle turn boxes are commonly used to facilitate a left turn across multiple lanes of traffic at a signalized intersection. They may also be used for turns at midblock crossing locations, for right turns from a left-side bike lane, or to facilitate a proper angle across tracks (streetcar, train, etc.)

COST ESTIMATE:

$1,000 each

DESIGN RECOMMENDATIONS:

The turn box should be sized to provide room for waiting cyclists, up to 10 feet wide and 6.5 feet deep but not less than 3 feet deep. Appropriate signage may be used to indicate the two-stage turn is provided (MUTCD D11-20L or D11-20R).

The bicycle symbol and left-turn arrow marking shall be provided within the box, which shall be bounded by solid white lines on all sides.

FOR MORE INFORMATION:

FWHA's Interim Approval for Option Use of Two-Stage Bicycle Turn Boxes (IA-20)

Meade Avenue, San Diego, California Source: Kittelson and Associates, Inc.

PROTECTED INTERSECTION TREATMENTS

DESCRIPTION:

A protected intersection provides physical separation for bicyclists and pedestrians up to and through an intersection and provides bicyclists and pedestrians with the right of way over turning vehicles. The physical separation between people driving and people biking or walking creates a setback, which is intended to control speeds, promote visibility, and reduce conflicts among motorists, cyclists, and pedestrians. Protected intersections generally also provide shorter crossing distances for people walking and biking.

TYPICAL APPLICATION:

Intersections with higher speeds and volumes, especially at intersections where Class IV bikeways are present, or a high incidence of bicycle or pedestrian crashes.

COST ESTIMATE:

$1,000,000 per intersection

DESIGN RECOMMENDATIONS:

- Intersection crossing markings for bicyclists and pedestrians provide directional guidance for where each should cross. Green cross bike or skip striping and/or bike markings can provide clear guidance to people biking and allow drivers to anticipate bicyclists in this space.
- Tighter curb return radii (10 feet to 15 feet) should be used to discourage fast turning movements.

Meade Avenue, San Diego, California. Source: Kittelson and Associates, Inc.

- Wider pedestrian islands support higher volumes of people walking and biking. Pedestrian crossing islands should be at least 6 feet wide to provide an accessible waiting area.
- A modified "Turning Vehicles Yield to Bikes and Pedestrians" sign (R10-15) is recommended where a signalized intersection allows right turns with bicycle and pedestrian movements.

FOR MORE INFORMATION:

Reference the following NACTO guidance: https://nacto.org/publication/dont-give-up-at-the-intersection/protected-intersections

INTERSECTION APPROACH CONSIDERATIONS

DESCRIPTION:

A bicycle lane approach to intersections can take different forms depending on the type of lane, existence of turn lanes, and other roadway features. In locations where a right turn lane is added, the roadway can include a mixing zone in the approach to keep bicyclists to the left of the right-turning vehicles. Depending on the geometry of the roadway, the bicycle lane may maintain as a straight line or may transition with a diagonal at the beginning of the turn lane.

TYPICAL APPLICATION:

Intersections with right turn lanes adjacent to a bike lane.

COST ESTIMATE:

$1,500 - $4,000 per approach

DESIGN RECOMMENDATIONS:

- The merge/conflict area can be highlighted with markings, including green paint and skip striping.
- The right turn lane should be as short as practical to encourage slow vehicle speeds when merging across the bike lane. The merge area should also be no more than 100 feet long for the same reasons.
- A through bicycle lane shall not be positioned to the right of a right-turn lane (MUTCD 9C.04) unless the movements are separated by different traffic signal phases.
- Use “BEGIN RIGHT TURN LANE YIELD TO BIKES” (MUTCD R4-4) at the beginning of the right turn lane and merge area.

Source: NACTO

- In cases where space is especially constrained (13 feet is not available for both a right turn lane and bike lane), a shared right turn/through bike lane may be provided.

FOR MORE INFORMATION:

AASHTO Guide for the Development of Bicycle Facilities, 2012, pgs 422 - 427

TRAFFIC SIGNAL CONSIDERATIONS

DESCRIPTION:

Bicycle signals offer a bicycle-exclusive phase at signalized intersections. Bicycle signals can improve safety and operations at intersections by removing bicycle and vehicle time conflicts in time or defining different needs from other road users.

TYPICAL APPLICATION:

Bicycle signals are most appropriate at locations with high bicycle and right-turning vehicle volumes, and often is used to provide a through phase for bicyclists separate from the right-turn phase for motorists. A bicycle signal can be triggered by loop detection, push-buttons, or video detection. Automatic bike detection discourages red-light running.

COST ESTIMATE:

$27,000 - $78,000

DESIGN RECOMMENDATIONS:

- At intersections with right-turning vehicles, right-turns on red should also be prohibited to prevent conflict with the bicycle movement.
- MUTCD Figure 9C-7 provides guidance on bicycle detector pavement markings.
- Some existing bicycle signal designs shields the bicycle signal from drivers' line of sight to avoid potential confusion.
- A bicycle signal face should be separated vertically or horizontally from the nearest motor vehicle traffic signal face for the same approach by at least 3 feet. (IA-16)

Source: NACTO

- Section 4D.105(CA) Bicycle/Motorcycle Detection Standard: 01 All new limit line detector installations and modifications to the existing limit line detection on a public or private road or driveway intersecting a public road shall either provide a Limit Line Detection Zone in which the Reference Bicycle Rider is detected or be placed on permanent recall or fixed time operation. Refer to CVC 21450.5.

FOR MORE INFORMATION:

- FHWA's Interim Approval for Optional Use of Bicycle Signal Faces (IA-16)

BICYCLE PARKING

DESCRIPTION:

Short-term and long-term bicycle parking is an essential part of a successful bicycle system. A lack of secure and convenient bicycle storage can discourage cycling.

CONTEXT:

Short-term bicycle parking is intended to be used for a few hours at most and is provided in public space. Often this is provided along the curb or furniture zone of a street. -

Long-term bicycle parking is intended to be used for longer than several hours. It should be sheltered or indoors to provide greater security.- A bike corral, or multiple bike parking spaces on the street along the curb, can be an efficient use of space. Bike corrals can store up to 12 bicycles in a single vehicle parking space.

TYPICAL APPLICATION:

Bicycle parking should be provided at or near all destinations to allow people to bike to access those destinations. The amount and type of bicycle parking should be dependent upon the type of destination.

COST ESTIMATE:

$27,000 - $78,000

Bike Parking at Dublin Library, Dublin, California. Source: City of Dublin

DESIGN RECOMMENDATIONS:

- Bike racks should be securely fastened to the ground to prevent a bike from being stolen by removing the rack. Adding a crossbar below where the bike would likely be fastened to reduce the ability to remove the bike rack from the ground to slip a lock off and including internal cabling to make it more challenging to cut through can further reduce theft and increase the security of the bike parking system.
- Bike racks should accommodate U-shaped locks and support the bicycle at two points above its center of gravity to allow the frame and both wheels to be locked.
- Long-term parking should be included as a requirement in all buildings where people travel to spend more than several hours, including multi-family housing, places of work, schools, hospitals, and other destinations.
- Long-term parking requirements should be based on household units, trip generation, employees per square footage, and visitation rates. It should be easy to find, direct, and accessible without stairs. It is preferred that it can also be accessed by use of automatic doorways and entryways to limit the need for someone to open a door and hold their bike, which may not be possible.

Long term bicycle parking (BikeLink bike lockers) at the West Dublin BART Station, Dublin, California. Source: City of Dublin

- Long-term parking should consider accommodating e-bike charging by locating electrical outlets near the parking spots and should include spaces for longer bicycles, including cargo bikes or bike trailers. If mounted bicycle parking is provided, there should also be horizontal floor parking available for larger bikes or those that can not lift their bike. For double-decker bicycle racks, a lift-assisted mechanism should be provided to access the upper tier.