County Connection

Agenda Item #6

To: Marketing, Planning, & Legislative Committee **Date:** January 29, 2026

From: Pranjal Dixit, Manager of Planning **Reviewed by:** AMS

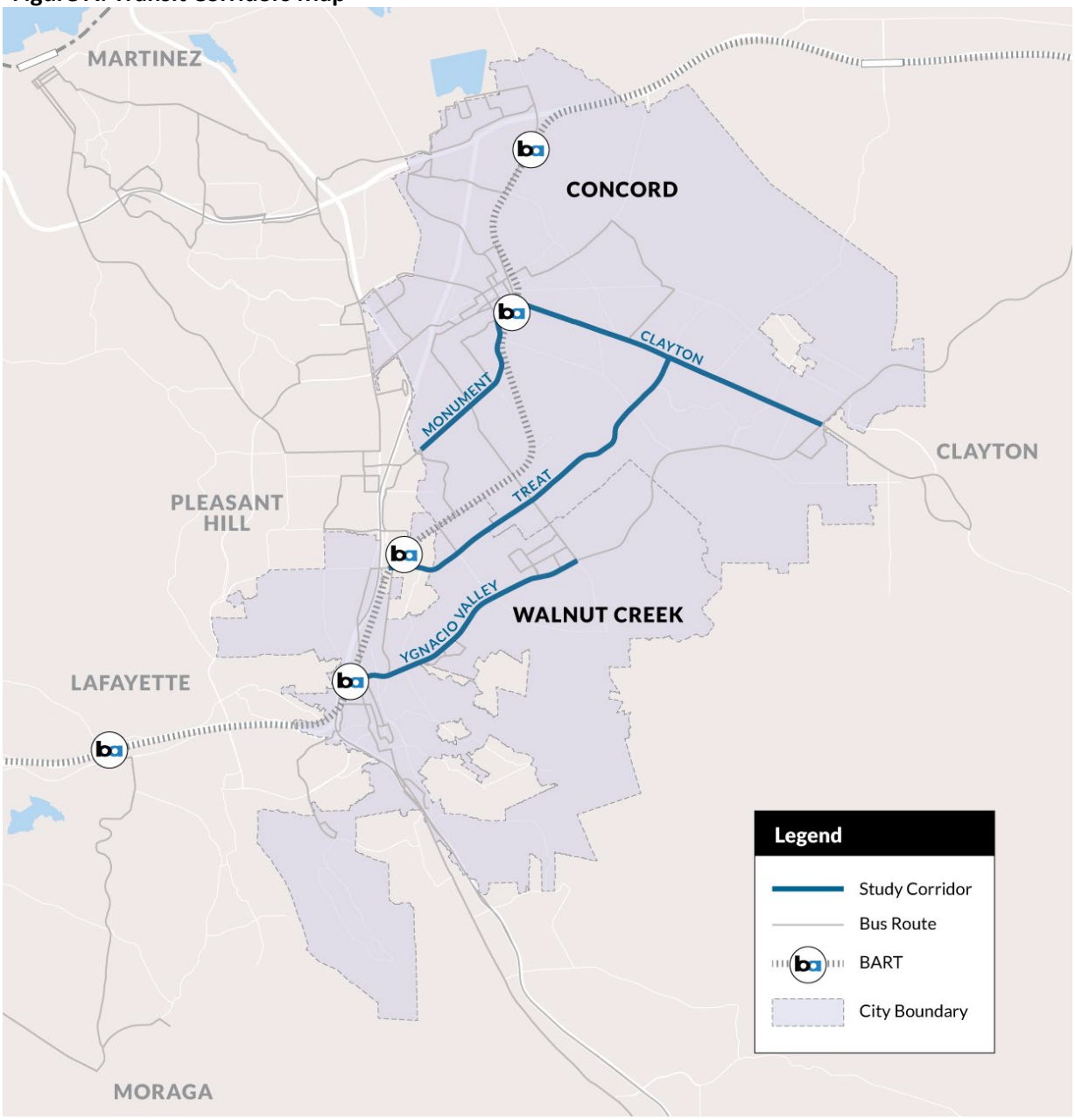
SUBJECT: Adoption of Transit Corridor Study

Background:
In October 2022, the Metropolitan Transportation Commission (MTC) announced the FY 2022-23 Transit Performance Initiative (TPI) grant program, which funds low-cost capital investments to improve transit operations and customer experience on major corridors and systems. The program prioritizes improvements that increase bus speed and reliability, particularly on high-ridership, high-frequency routes experiencing traffic delays. County Connection submitted a successful application for a study analyzing four major corridors within its service area to identify such improvements. MTC approved the full funding request of $400,000 on March 22, 2023, and the Board approved the use of these funds in April 2023. In October 2024, staff and County Connection's on-call planning consultants, Transportation Management & Design, Inc. (TMD), launched the Transit Corridor Study, a comprehensive analysis of four key corridors:

- **Clayton Road (Routes 10, 310):** Served by the second-highest ridership route.
- **Monument Boulevard (Routes 14, 16, 314):** High transit propensity, serving an Equity Priority Community and an SB 535 Disadvantaged Community.
- **Treat Boulevard (Routes 7, 11, 14, 15, 311):** Serves multiple schools and retail destinations.
- **Ygnacio Valley Road (Routes 1, 92X, 93X, 301):** A congested corridor with healthcare, employment, retail, and some high-density housing, offering strong potential for transit development.

All four corridors are anchored by a BART station: Concord (Clayton Road and Monument Boulevard), Pleasant Hill/Contra Costa Centre (Treat Boulevard), and Walnut Creek (Ygnacio Valley Road), as shown on map contained in Figure A on the following page.

Figure A: Transit Corridors Map



Report:

Staff presented the Draft Final Report at the January 2026 Board meeting to gather feedback and ensure that the proposed strategies aligned with improving transit speeds and efficiency along the corridors. This final version incorporates the Board's comments and outlines a prioritized suite of improvements, such as Transit Signal Priority (TSP), queue jumps, bus stop rebalancing, and part-time designated transit lanes.

These recommendations were shaped by technical data and robust community engagement, including a bilingual survey and collaboration with a Technical Advisory Committee representing local cities and transportation authorities.

Next Steps:
Following the adoption of the final report, staff will collaborate with the consulting firm Advanced Mobility Group (AMG) to develop a comprehensive implementation plan. Funded through MTC's Innovative Deployments to Enhance Arterials (IDEA) Program, this phase will focus on detailed engineering designs for Transit Signal Priority (TSP) infrastructure, bus stop enhancements, and potential queue jump lanes identified in the final Transit Corridor Study. Additionally, the team will establish a robust funding strategy to secure the long-term resources necessary for full project realization.

Financial Implications:
None. The study is grant funded by MTC's Transit Performance Initiative grant program.

Recommendation:
Staff recommends the Committee forward the attached plan to the Board for final adoption.

Action Requested:
Staff requests the Committee forward the attached plan to the Board for adoption.

Attachments:
Attachment 1: Final Transit Corridor Study Report

County Connection

Transit Corridor Study | Final Report

DECEMBER 2025

TMD
VISION. PLAN. IMPLEMENT.

MOTT MACDONALD

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Contents

Glossary of Terms

This glossary provides clear definitions for technical terms used in the report. The purpose is to ensure that all stakeholders, including board members and decision-makers, have a shared understanding of key concepts related to traffic analysis, transit performance, and data methodologies.

A

AM Peak (6:00 AM – 8:59 AM): The morning rush hour, when travel demand is possibly at its highest.

B

Bottlenecks: Locations along study corridors that hinder the efficiency of traffic and transit operations, often causing delays, increased emissions, and reduced transit reliability.

Bus Stop Balancing: The process of evaluating and adjusting the spacing and location of bus stops along a route to optimize the trade-off between accessibility and travel time. This may involve consolidating closely spaced stops to reduce dwell time and improve service speed.

C

Corridor Signal Coordination: The synchronization of multiple traffic signals along a roadway or corridor to create progressive movement, allowing vehicles to travel through successive intersections without stopping.

Cross-Traffic: Vehicles moving perpendicularly to the main corridor, often affecting traffic flow at intersections.

Cumulative Passenger Load: The total passenger load calculated at the stop-to-stop segment level, representing the number of passengers along a given segment during a specific period. Since cumulative passenger load accounts for multiple routes, it should not be directly compared to the capacity of an individual bus.

D

Dedicated Bus Lanes: Traffic lanes reserved exclusively for bus use, either full-time or during peak hours.

F

Farside: The location of a bus stop that is after an intersection.

Free-flow Bus Speed: Defined as the 85th percentile of observed bus speeds along a corridor in each direction, this metric represents the speed at which buses can travel with minimal delays. It reflects conditions where buses operate without significant disruptions from congestion, turning vehicles, or other roadway factors that typically slow down service.

N

Nearside: The location of a bus stop that is before an intersection.

P

Passenger Delay (measured in passenger minutes): Calculated as the product of Per-trip Vehicle Delay and the cumulative Passenger Load for a given period, this metric quantifies the total delay experienced by passengers on a corridor or a segment over time.

Per-trip Vehicle Delay (measured in minutes): Calculated using Observed Speed and Free-flow Bus Speed, this metric quantifies delays at the stop-to-stop segment level for a given period. Per-trip vehicle delay is directly proportional to corridor length—longer segments tend to accumulate greater delays within the same timeframe, reflecting the compounded impact of congestion and other disruptions.

PM Peak (3:00 PM – 6:59 PM): The evening rush hour, when travel demand is possibly at its highest.

Q

Queue-Jump: Short sections of roadway that allow buses to move ahead of queued traffic at intersections, typically paired with signal priority.

Queue Length: The average number of vehicles lined up at an intersection during peak congestion times, indicating traffic delays.

R

Re-Striping: The process of repainting or reconfiguring lane markings on a roadway to change lane configuration, width, or usage. This can include adding, removing, or repositioning lane lines to improve traffic flow or accommodate different uses.

S

Signage-Dedicated Right-Turn Lane: A traffic lane designated exclusively for right-turning vehicles through the use of regulatory signs and pavement markings. This separation keeps turning traffic out of through lanes to reduce conflicts and improve overall intersection efficiency.

Signal Optimization: The process of adjusting traffic signal timing parameters (such as cycle length, green time, and phase sequence) at individual intersections to maximize efficiency and minimize delays for vehicles, pedestrians, and transit based on traffic demand patterns.

T

Transit Signal Priority (TSP): A system that modifies traffic signals to give buses and other transit vehicles priority, reducing their wait times at intersections and improving service reliability.

V

Vehicle Delay (measured in vehicle minutes): Calculated as the product of per-trip vehicle Delay and the number of trips within a given period, this metric quantifies the total delay experienced by buses on a corridor or a segment over time.

Introduction

County Connection is undertaking a comprehensive Transit Corridor Study to identify, evaluate, and prioritize transit speed, reliability, and customer experience improvements along four key corridors in Central Contra Costa County: Clayton Road, Monument Boulevard, Treat Boulevard, and Ygnacio Valley Road. These corridors serve as essential east–west mobility links connecting major residential neighborhoods, schools, commercial destinations, and three regional BART stations. As traffic congestion, variability in bus travel times, and pedestrian access challenges have grown in recent years, the need for targeted and data-driven transit priority strategies has become increasingly critical.

The purpose of this report is to present a clear, actionable set of recommendations to improve transit performance across the four study corridors. These recommendations are the culmination of a multi-stage technical effort defined in the project's Scope of Work, including an assessment of existing traffic and transit conditions, Origin-Destination patterns, equity considerations, bus stop accessibility, and multimodal challenges. While this report summarizes the key findings from those intermediate tasks, the emphasis is on identifying priority projects and the strategies most likely to deliver meaningful benefits for County Connection riders, corridor users, and neighboring communities.

The study began with a detailed Existing Conditions Analysis, which examined traffic congestion patterns, bus operating speeds, cumulative passenger and vehicle delay, stop-level amenities and deficiencies, and the distribution of Equity Priority Communities along the corridors. This baseline understanding established where transit experiences the greatest friction—such as high-delay segments near major intersections, nearside stops that contribute to repeated signal delays, and corridors like Monument Boulevard and Ygnacio Valley Road where congestion is most acute.

In parallel with the technical analysis, County Connection conducted a structured communications and community engagement effort that included a bilingual online survey and coordinated messaging across cities, partner agencies, and community-based organizations. Outreach activities were implemented later in the study to share key findings, gather feedback, and communicate the purpose and potential benefits of the proposed operational and infrastructure improvements. The engagement process helped contextualize mobility challenges and highlight corridor-specific community priorities as the study progressed.

Together, these technical and outreach components form the backbone of the Final Recommendations presented in this report. The priority projects ranging from Signal Optimization, Corridor Signal Coordination, Re-Striping/ Signage Dedicated Right Turn Lane, Transit Signal Priority, Transit Queue-Jump, Dedicated Bus Lane, Bus Stop Rebalancing (removal & consolidation), and addition of New Bus Stops are supported by quantified delay analysis, community feedback, and feasibility considerations. These projects seek not only to improve travel time and reliability for transit riders but also to enhance safety, reduce operational costs, and strengthen multimodal connectivity in some of the county's most heavily used transportation corridors.

This Final Report synthesizes the study's major findings and provides:

- A concise summary of key existing conditions that shape corridor performance
- A toolbox of potential speed and reliability strategies
- A prioritization framework for evaluating and ranking improvement concepts
- A set of final, corridor-specific recommendations supported by data and stakeholder input

Through this study, County Connection aims to advance near-term and long-term improvements that will make transit faster, more reliable, and more accessible for the communities served along these four vital corridors.

Existing Conditions

The four study corridors, Clayton Road, Monument Boulevard, Treat Boulevard, and Ygnacio Valley Road (Figure 1), exhibit distinct operational challenges informed by traffic congestion patterns, transit delay data, stop-level conditions, and demographic factors. These existing conditions serve as the analytical foundation for developing transit speed and reliability improvements across the corridor network.

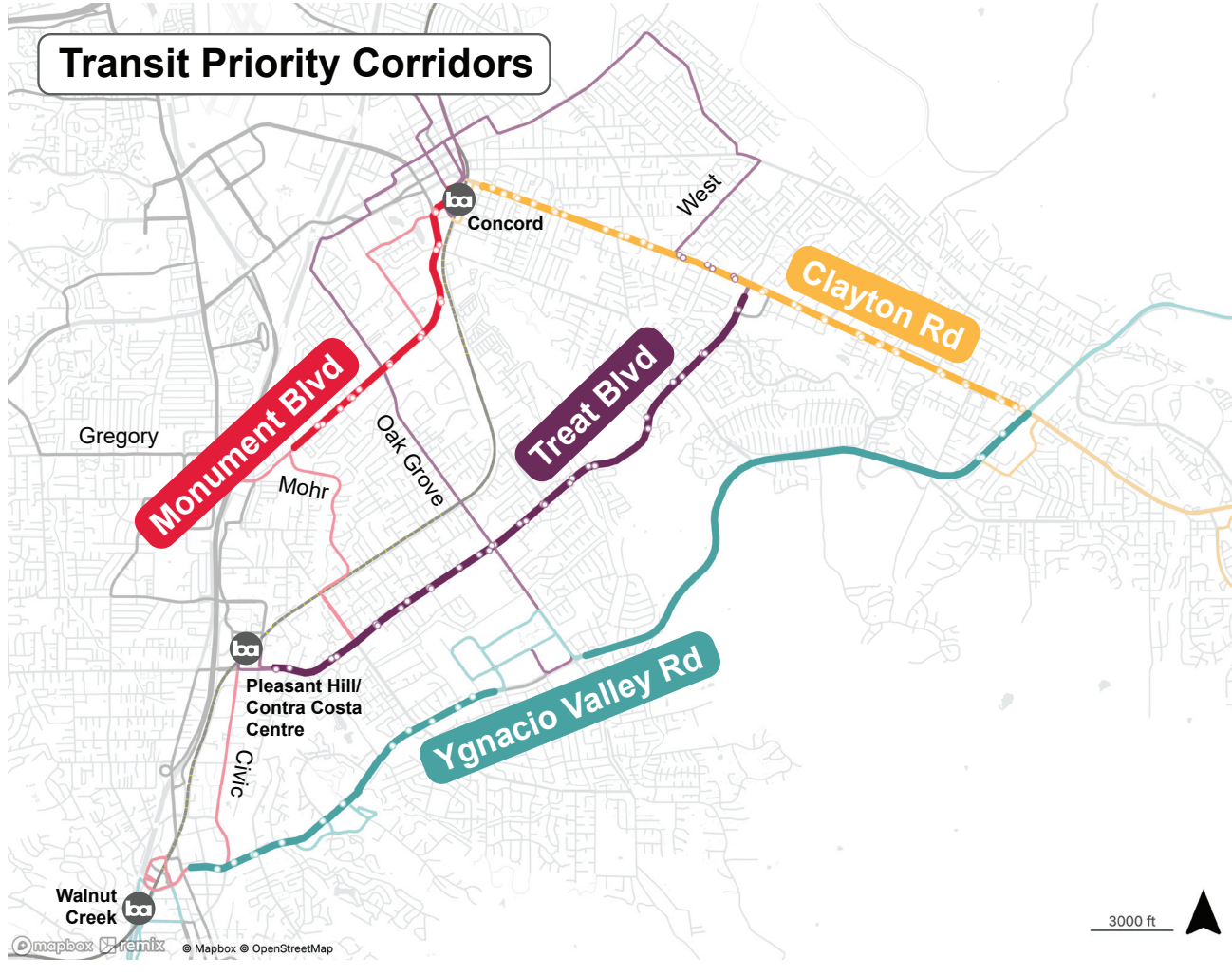


Figure 1: Study Corridors

CORRIDOR TRAFFIC AND CONGESTION CONDITIONS

The traffic analysis incorporated 2019 traffic counts and 2024 cellular-based travel data to evaluate queue lengths, congestion patterns, and intersection bottlenecks. The four corridors exhibit varying levels of congestion.

Clayton Road experiences moderate congestion overall.

- Average queue lengths at key intersections are reported at around 150 feet, making it the least congested of the four corridors.
- The most significant congestion occurs at Clayton Road & Ygnacio Valley Road, where peak-period commuter volumes lead to queues extending onto feeder streets.
- Additional delays occur at Thornwood Drive and Denkinger Road/Treat Boulevard due to turning movements and high vehicle demand.

Monument Boulevard shows consistent congestion throughout the day.

- Average queue lengths reach approx. 200 feet near Oak Grove Road.
- Congestion is also notable at Mohr Lane and Carey Drive/Nursery Lane, where dense residential land uses and cross-traffic contribute to delays.

Treat Boulevard experiences congestion at several intersections:

- The most pronounced delays occur at Bancroft Road, driven primarily by afternoon commuter traffic, with queues impacting Treat Boulevard directly.
- Additional congestion occurs at Cowell Road and San Miguel Road, where turning conflicts contribute to moderate queue lengths.

Ygnacio Valley Road is consistently the most congested corridor.

- Average queues exceed 250 feet at major intersections, including Walnut Boulevard and Oak Grove Road.
- Westbound queues at Walnut Boulevard often extend from Civic Drive in the morning peak, while afternoon eastbound queues can reach Homestead Avenue and beyond.
- Existing transit use in this corridor is low, however the potential for greater transit use is significant if strategies that minimize transit delay are implemented.

TRANSIT DELAY FINDINGS

Transit delay was evaluated using per-trip vehicle delay, cumulative vehicle delay, and cumulative passenger delay; each per weekday.

Per-Trip Vehicle Delay (Both Directions)

- Ygnacio Valley Road has the highest per-trip vehicle delay at 34 minutes.
- Treat Boulevard follows with 21 minutes.

Total Vehicle Delay (Daily Cumulative)

- Clayton Road has the highest total vehicle delay at 764 minutes, reflecting both traffic conditions and a higher number of daily bus trips exposed to these delays.
- Treat Boulevard follows with 607 minutes.

Total Passenger Delay (Daily Cumulative)

- Treat Boulevard has the highest cumulative passenger delay at 4,265 minutes, followed by:
  - Monument Boulevard – 3,800 minutes
  - Clayton Road – 3,503 minutes
- Ygnacio Valley Road has significantly lower passenger delay (1,066 minutes) due to lower onboard loads, despite having the highest per-trip vehicle delay.

High-Delay Stop-to-Stop Segments (Daily Cumulative)

The Existing Conditions report highlights several critical delay segments. A representative example includes:

- Clayton Road & The Alameda → Concord BART
  - Passenger delay: 678 minutes
  - Vehicle delay: 108 minutes
- Monument Boulevard (Victory Lane → Mohr Lane)
  - Passenger delay: 876.9 minutes
  - Vehicle delay: 45.3 minutes

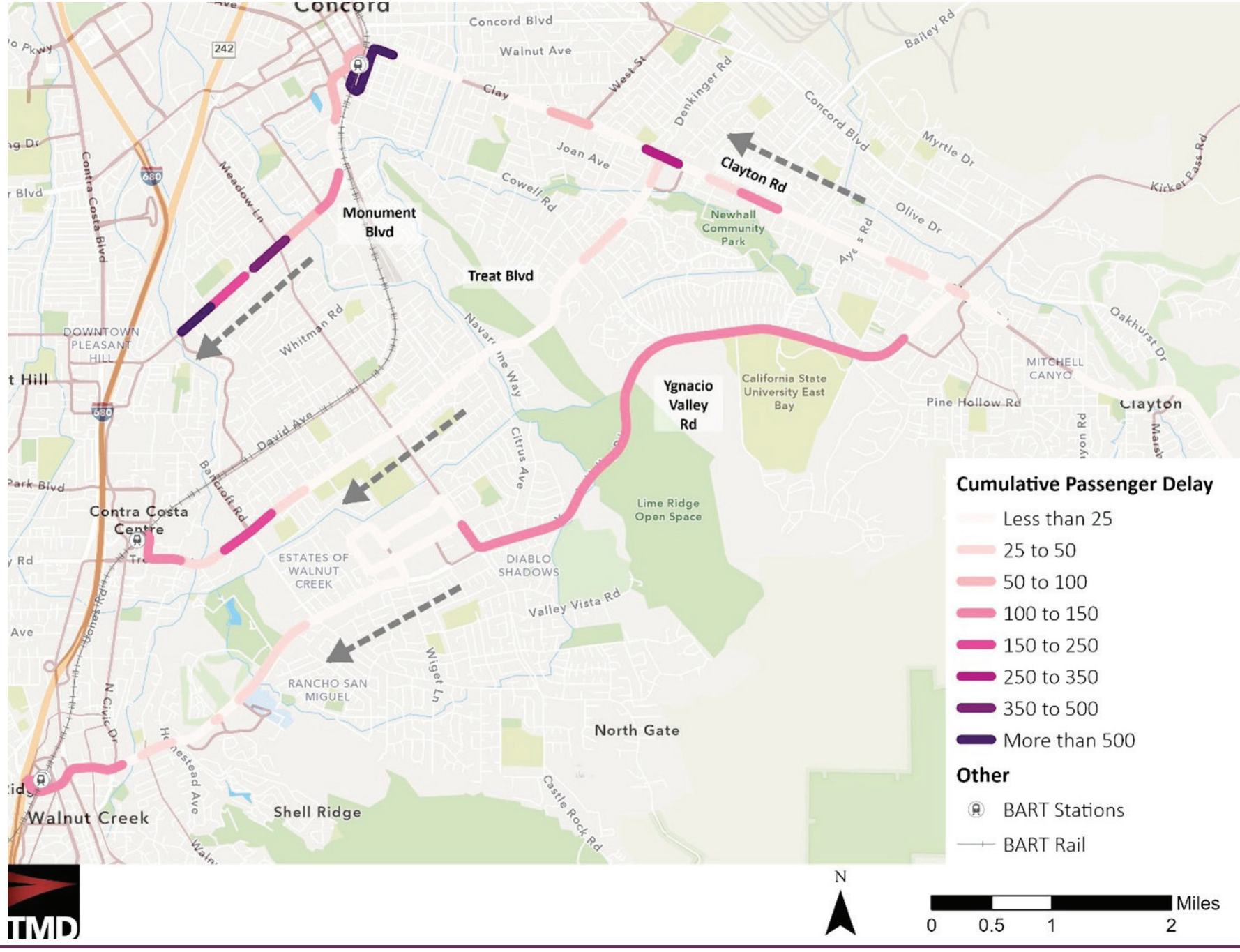


Figure 2: Daily Cumulative Passenger Delay (West)

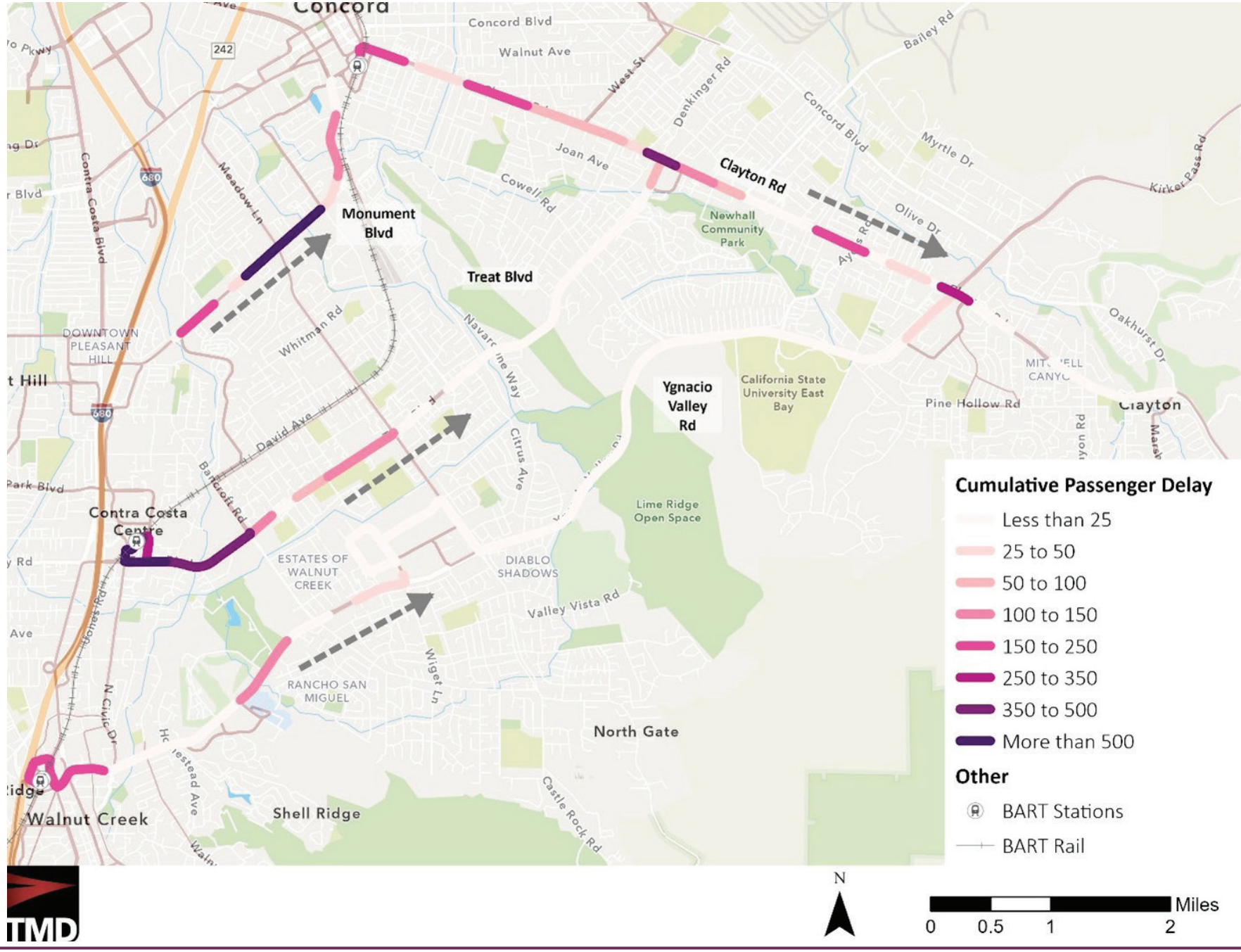


Figure 3: Daily Cumulative Passenger Delay (East)

- Clayton Road has ~150 ft queues; Monument Boulevard ~200 ft; Ygnacio Valley Road >250 ft.
- **Highest per-trip delay:** Ygnacio Valley Road (34 min)
- **Highest vehicle delay:** Clayton Road (764 min)
- **Highest passenger delay (daily cumulative):** Treat Boulevard (4,265 min).
- Several high-delay segments identified in the Existing Conditions Report exceed 600+ minutes of passenger delay (Daily Cumulative) (Figures 2 to 4).
- Monument Boulevard is a major Equity Priority Community corridor.
- Engagement materials must reflect corridor-specific demographics and language needs.

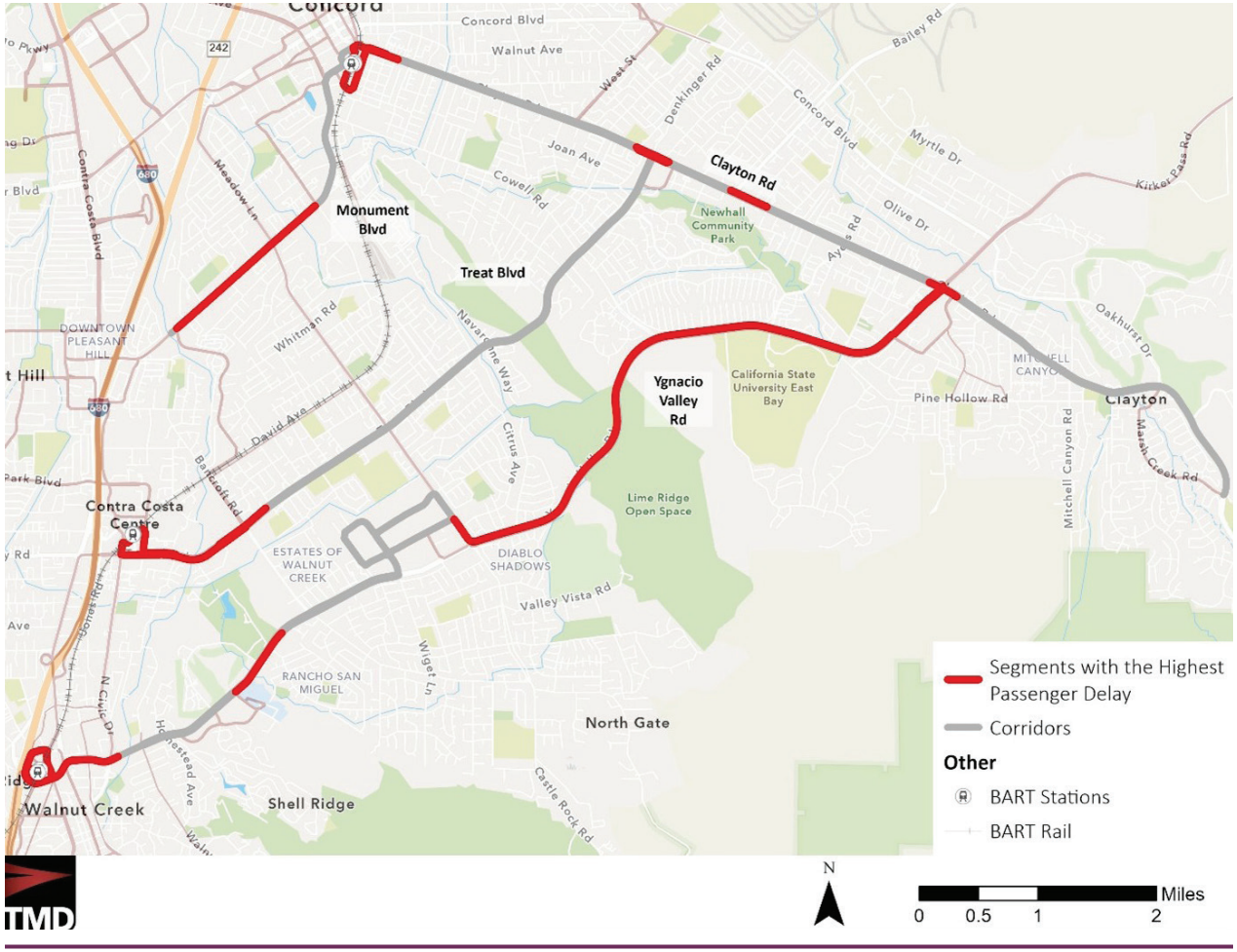


Figure 4: Segments with Highest Passenger Delay (Potential Segments for Improvements)

These segments represent primary candidates for targeted operational or infrastructure solutions, which is the focus of this study.

TAC Meetings

PROCESS

The project team delivered four presentations to the Technical Advisory Committee (TAC) throughout the study. These virtual meetings, held via Microsoft Teams, provided structured opportunities to review interim findings and gather feedback on project direction, evaluation criteria, and proposed outcomes. At each stage, committee members offered input that informed subsequent analyses and refinements, ensuring that TAC feedback was incorporated into the development of the final recommendations.

Meeting 1 - Introduction
December 2024

- Establish a shared understanding of the project.
- Presentation of the project overview and study goals
- Reviewed scope of work and timeline

Meeting 2 - Existing Conditions Analysis
May 2025

- Presentation of key findings
  - Traffic and transit analysis
- Discussion of engagement strategies

Meeting 3 - Prioritization Toolbox
August 2025

- Presentation of the toolbox
  - Speed and reliability improvement strategies

Meeting 4 - Project Packages
October 2025

- Presentation of the prioritized list of projects
- Discussion of the packaging approach

MEETING 1 – INTRODUCTION

The purpose of the first Technical Advisory Committee meeting was to introduce the Transit Corridor Study and establish a shared understanding of the project. Committee members were introduced, followed by a presentation of the project overview and study goals. The meeting concluded with a review of each project task, confirming the scope of work and alignment on the timing and sequence of upcoming discussions.

MEETING 2 – EXISTING CONDITIONS ANALYSIS

The second Technical Advisory Committee meeting focused on presenting key findings from the project team's Existing Conditions analysis and gathering committee feedback. The meeting included a review of results from the traffic and transit analyses, followed by a discussion of proposed engagement strategies, including the online survey, communications toolkit, and public education materials.

MEETING 3 – PRIORITIZATION TOOLBOX

The purpose of the third Technical Advisory Committee meeting was to present the toolbox of speed and reliability improvement strategies and gather feedback on proposed evaluation metrics. The discussion focused on priority locations and key corridor bottlenecks identified in the Existing Conditions analysis, followed by a review of toolbox strategies with targeted examples. The meeting concluded with a discussion of the evaluation and scoring criteria, as well as preliminary results from the initial assessment.

MEETING 4 – PROJECT PACKAGES

The purpose of the fourth and final Technical Advisory Committee meeting was to present the prioritized list of projects, informed by the evaluation metrics and feedback received through the engagement process. The meeting included a discussion of the project packaging approach, with packages developed for each corridor, an overview of the metrics used to measure anticipated benefits, and a review of proposed next steps for advancing the recommended improvements.

PARTICIPANTS

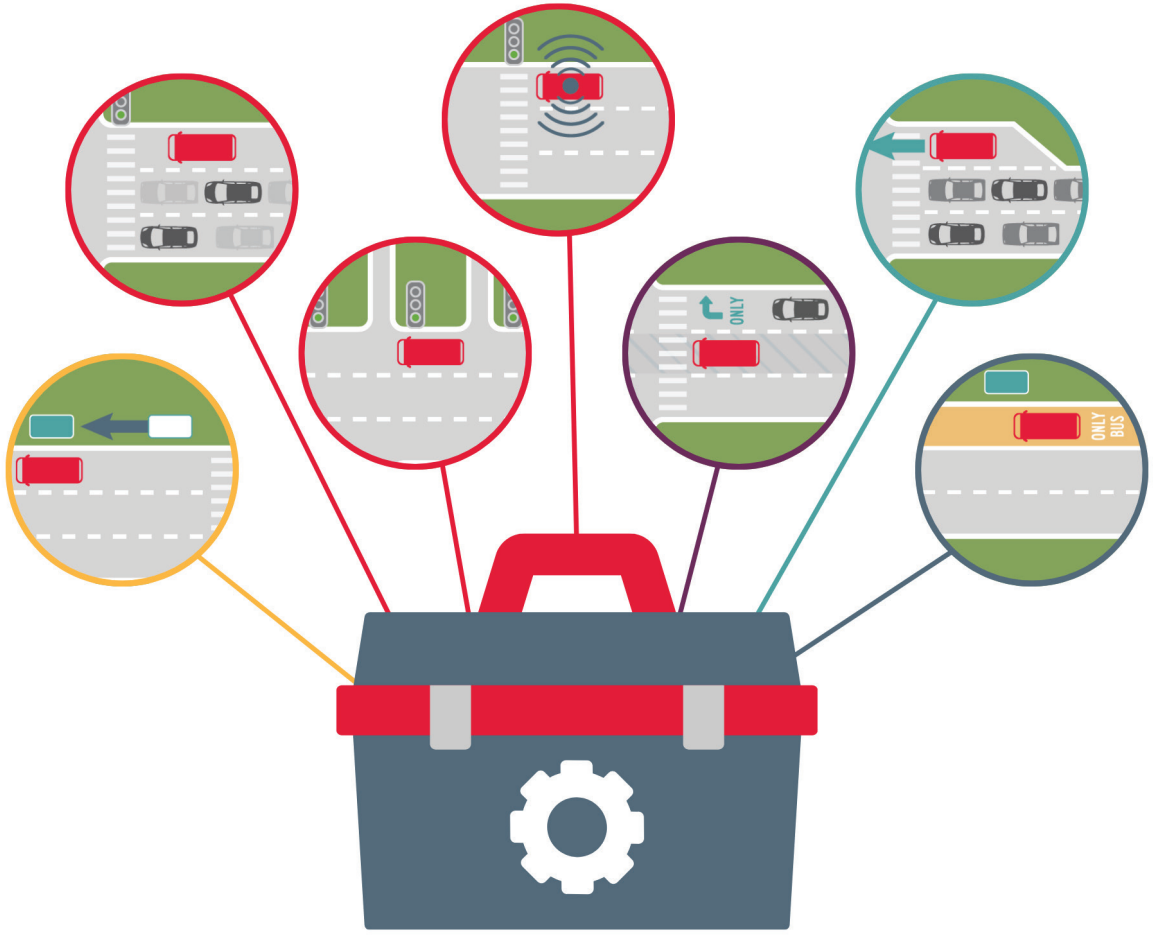
The Technical Advisory Committee is composed of representatives from the Cities of Concord and Walnut Creek, Contra Costa County, the Contra Costa Transportation Authority, along with staff from County Connection and the consultants that formed the project team.

The Meetings held incrementally throughout the project were used to enable the TAC group to shape the final recommendations given in the project as it progressed. Regular communication between the project stakeholders allowed for effective prioritization of projects based on the committee members' feedback, ensuring a range of perspectives were included in the results.

Prioritization Toolbox

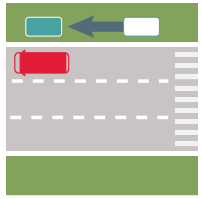
To support the development of final recommendations, the project team established a prioritization toolbox that identifies and evaluates potential transit speed and reliability improvement strategies. The toolbox was developed to reflect both corridor-specific constraints and broader systemwide goals, and it was refined through multiple Technical Advisory Committee (TAC) meetings.

The toolbox includes a range of treatments, from spot improvements at key congestion points to corridor-wide operational enhancements, all intended to improve bus operations, reduce delay, and enhance the passenger experience. These tools were applied to candidate locations across the four study corridors to inform the selection and prioritization of recommended projects.



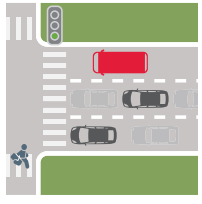
TOOLBOX ELEMENTS

BUS STOP BALANCING



Bus stop balancing involves strategically removing, relocating, or consolidating bus stops to improve spacing and reduce excessive dwell time. This strategy seeks to balance access and speed by maintaining reasonable walking distances while improving travel time and reliability.

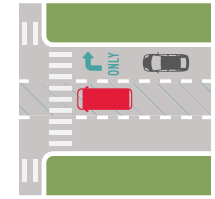
SIGNAL OPTIMIZATION, CORRIDOR SIGNAL COORDINATION & TRANSIT SIGNAL PRIORITY (TSP)



Signal-based strategies are designed to improve bus travel time and reliability by reducing delay at signalized intersections and along coordinated corridors. Signal optimization focuses on adjusting signal timing parameters—such as cycle lengths, splits, and offsets—to better reflect current traffic and transit conditions, improving overall intersection performance. Corridor signal coordination aligns signal timing across multiple intersections to create smoother progression along a corridor, reducing stop-and-go conditions that contribute to bus delay and travel time variability.

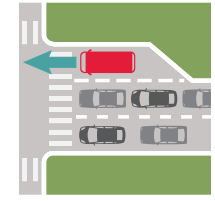
Transit Signal Priority (TSP) builds on these strategies by enabling buses to communicate directly with traffic signals using optical, GPS, or radio-based technology. When a bus approaches a signalized intersection, the system can request temporary adjustments, such as extending a green phase or shortening a red phase, to reduce stopping time. When implemented alongside signal optimization and corridor coordination, TSP can significantly improve bus reliability and on-time performance by minimizing signal-related delay while maintaining overall traffic operations.

RE-STRIPING/SIGNAGE-DEDICATED RIGHT-TURN LANE



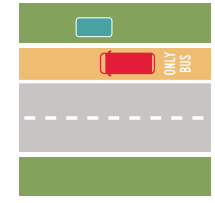
Re-striping and signage improvements involve modifying existing roadway markings and signage to better allocate space and clarify turning movements, including the designation of dedicated right-turn lanes. These treatments can reduce conflicts between buses and turning vehicles, improve intersection operations, and minimize delay caused by blocked travel lanes. By clearly separating right-turn movements from through bus movements, re-striping and signage can improve bus reliability and safety while supporting more efficient traffic flow, often with minimal construction and lower implementation costs compared to more capital-intensive improvements.

QUEUE-JUMPS/BYPASS LANES



Queue-Jumps and bypass lanes are roadway geometric treatments that provide transit-only approaches at signalized intersections, typically paired with transit signal priority. These treatments allow buses to bypass queued traffic and receive an advanced or extended green signal. Intersections with significant queuing and existing right-turn-only lanes are particularly well-suited for this intervention.

DEDICATED BUS LANES



Dedicated bus lanes involve reallocating an existing general-purpose travel lane for transit-only use. Bus lanes may operate full-time or during specific periods, such as peak hours. By providing buses with an exclusive travel path, this treatment enables buses to bypass congestion and improves corridor efficiency by prioritizing higher-capacity transit vehicles.

EVALUATION CRITERIA AND SCORING FRAMEWORK

Once the toolbox strategies were identified, an evaluation framework was developed to prioritize candidate projects. The scoring criteria were developed by Mott MacDonald and presented to the TAC for review, feedback, and refinement.

Each proposed stop- or corridor-level intervention was evaluated against a set of defined criteria. For each evaluation factor, a score of 1, 2, or 3 was assigned to reflect how well the intervention met that criterion. Evaluation factors were then weighted based on their relative importance, with each factor contributing a defined percentage to the total score.

Evaluation Factors	Indicator	Importance	Contribution to Total Score
Effectiveness	Expected level of impact to address traffic congestion/transit performance (1, 2, 3)	10	25%
Equity	Proximity to an EPC (1, 3)	9	21%
Safety	Reduces likelihood of collisions and/or improves safety for vulnerable road users (1, 3)	8	17%
Constructability and Implementation	Challenges associated with implementing the tool (e.g. timing of construction, traffic interruptions) (1, 2, 3)	7	13%
Cost	Cost of introducing the tool (1, 2, 3) - (**Note**: Cost assumes total project cost escalated to 2028 Dollars)	6	8%
Funding	Funding feasibility/availability for introducing the tool (1, 2, 3)	6	8%
Compounding Project Benefits	Alignment with other projects (1, 3)	5	4%
Community/Stakeholder Support	Level of community/stakeholder/political support (1, 2, 3)	5	4%

Table 1: Evaluation and Weights

FINAL PRIORITIZATION OF PROJECTS

Using the evaluation framework and incorporating feedback from the TAC, each proposed bus stop or corridor improvement was scored and ranked based on its weighted total score. The resulting prioritization reflects both technical performance and policy considerations, including equity, safety, and feasibility.

HOW TO READ THE PRIORITIZATION SCORES

The prioritization scores presented in this report represent a relative comparison of proposed transit improvements across the four study corridors. Each score reflects how well a specific project or improvement performs when evaluated against multiple criteria related to effectiveness, equity, safety, feasibility, and community considerations.

SCORING METHODOLOGY OVERVIEW

Each proposed improvement was evaluated using a standardized scoring framework developed by the project team and refined through feedback from the Technical Advisory Committee (TAC). For each evaluation factor, a score of 1, 2, or 3 was assigned to indicate how strongly the improvement met that criterion. Higher values indicate a stronger alignment with the evaluation factor.

Each evaluation factor was also assigned a weight to reflect its relative importance. The weighted scores across all factors were then combined to produce a single weighted score for each improvement.

Prioritization scores reflect a relative comparison of projects across all four corridors. Higher scores indicate greater expected benefits relative to cost, feasibility, and equity; but small score differences can still represent meaningful distinctions in effectiveness or implementability.

INTERPRETING THE SCORES

- Higher weighted scores indicate higher overall priority.
  - Projects with higher scores are expected to deliver greater benefits relative to their cost, feasibility, and equity considerations.
- Scores are comparative, not absolute.
  - The scores are intended to compare projects against one another within the study and should not be interpreted as stand-alone performance ratings.
- Small score differences still matter.
  - Because multiple weighted factors contribute to the total score, relatively small numerical differences can reflect meaningful differences in effectiveness, equity benefit, or implementability.
- Projects may have similar scores for different reasons.
  - Two projects with similar overall scores may perform differently across individual criteria. For example, one project may score higher on equity, while another may score higher on constructability or cost.

USING THE SCORES IN DECISION-MAKING

The prioritization scores are designed to support informed decision-making by:

- Identifying high-value improvements that balance operational benefit, equity outcomes, and feasibility.
- Highlighting projects that align most closely with County Connection's goals for speed, reliability, and accessibility.
- Supporting phased implementation by distinguishing near-term opportunities from longer-term investments.

Final project selection should consider the prioritization scores alongside funding availability, coordination opportunities, jurisdictional constraints, and policy direction.

PRIORITIZATION SCORES BY CORRIDOR SEGMENTS

CLAYTON ROAD

Corridor Segments/ Intersections	Elements	Improvement Solution	Weighted Score
Treat Blvd and Clayton Rd	Intersection	Signal Optimization & Re-Striping/ Signage	2.09
Treat Blvd and Clayton Rd	Intersection	Transit Q-Jump/ TSP & Re-Striping/ Signage	1.96
Treat Blvd and Clayton Rd	Intersection	Transit Q-Jump/ TSP & Signal Optimization & Re-Striping/Signage	1.96
Treat Blvd and Clayton Rd	Intersection	Transit Q-Jump/ TSP & Signal Optimization	1.96
Treat Blvd and Clayton Rd	Intersection	Signal Optimization	1.83
YVR and Clayton Rd	Intersection	Signal Optimization	1.83
Treat Blvd to YVR	Segment	Corridor Signal Coordination	1.83
Treat Blvd and Clayton Rd	Intersection	Transit Q-Jump/TSP	1.61
Treat Blvd and Clayton Rd	Intersection	Re-striping/Signage	1.57
Concord BART to Marsh Creek Rd	Segment	Bus Stop Balancing	1.35

Table 2: Clayton Road - Prioritization Scores

MONUMENT BOULEVARD

Corridor Segments/ Intersections	Elements	Improvement Solution	Weighted Score
Oak Grove Rd and Monument Blvd	Intersection	Signal Optimization & Re-Striping/ Signage	2.48
Oak Grove Rd and Monument Blvd	Intersection	Transit Q-Jump/ TSP & Signal Optimization	2.48
Oak Grove Rd and Monument Blvd	Intersection	Transit Q-Jump/ TSP & Re-Striping/ Signage	2.48
Oak Grove Rd and Monument Blvd	Intersection	Transit Q-Jump/ TSP & Signal Optimization & Re-Striping/ Signage	2.48
Oak Grove Rd and Monument Blvd	Intersection	Signal Optimization	2.30
Oak Grove Rd and Monument Blvd	Intersection	Transit Q-Jump/TSP	2.13
Detroit Ave to Mohr Ln	Segment	Bus Stop Balancing & TSP	2.09
Carey Dr to Detroit Ave	Segment	Designated Bus Lane	2.04
Detroit Ave to Mohr Ln	Segment	Corridor Signal Coordination	1.96
Detroit Ave to Mohr Ln	Segment	TSP	1.96
Detroit Ave and Monument Blvd	Intersection	Transit Q-Jump/TSP	1.87
Oak Grove Rd and Monument Blvd	Intersection	Re-striping/ Signage	1.78
Detroit Ave to Mohr Ln	Segment	Bus Stop Balancing	1.57

Table 3: Monument Boulevard - Prioritization Scores

TREAT BOULEVARD

Corridor Segments/ Intersections	Elements	Improvement Solution	Weighted Score
Oak Rd to Oak Grove Rd	Segment	Corridor Signal Coordination	2.09
Oak Rd and Treat Blvd	Intersection	Signal Optimization	2.09
Bancroft Rd and Treat Blvd	Intersection	Signal Optimization	2.09
Oak Rd and Treat Blvd	Intersection	Signal Optimization & Re-Striping/ Signage	2.09
Oak Grove Rd to Bancroft Rd	Segment	Designated Bus Lane & Corridor Signal Coordination	2.00
Navaronne Way to Bancroft Rd	Segment	Designated Bus Lane	1.83
Oak Rd and Treat Blvd	Intersection	Re-striping/Signage	1.57

Table 4: Treat Boulevard - Prioritization Scores

YGNACIO VALLEY ROAD

Corridor Segments/ Intersections	Elements	Improvement Solution	Weighted Score
Walnut Blvd and YVR	Intersection	Signal Optimization & Re-Striping/ Signage	2.09
N California Blvd and YVR	Intersection	Signal Optimization	2.09
Walnut Blvd and YVR	Intersection	Transit Q-Jump/ TSP & Re-Striping/ Signage	1.96
Walnut Blvd and YVR	Intersection	Transit Q-Jump/ TSP & Signal Optimization & Re-Striping/Signage	1.96
North Broadway and YVR	Intersection	Signal Optimization	1.83
Walnut Blvd and YVR	Intersection	Signal Optimization	1.83
Oakland Blvd to Oak Grove Rd	Segment	Corridor Signal Coordination	1.83
Oak Grove Rd and YVR	Intersection	Signal Optimization	1.83
Oak Grove Rd and YVR	Intersection	Signal Optimization & Re-Striping/ Signage	1.83
North Broadway and YVR	Intersection	Transit Q-Jump/ TSP & Signal Optimization	1.70
Walnut Blvd and YVR	Intersection	Transit Q-Jump/ TSP & Signal Optimization	1.70
Cowell Rd and YVR	Intersection	Transit Q-Jump/TSP	1.61
Walnut Blvd and YVR	Intersection	Re-striping/Signage	1.57
Oak Grove Rd and YVR	Intersection	Re-striping/Signage	1.57
North Broadway and YVR	Intersection	Transit Q-Jump/TSP	1.35
Walnut Blvd and YVR	Intersection	Transit Q-Jump/TSP	1.35

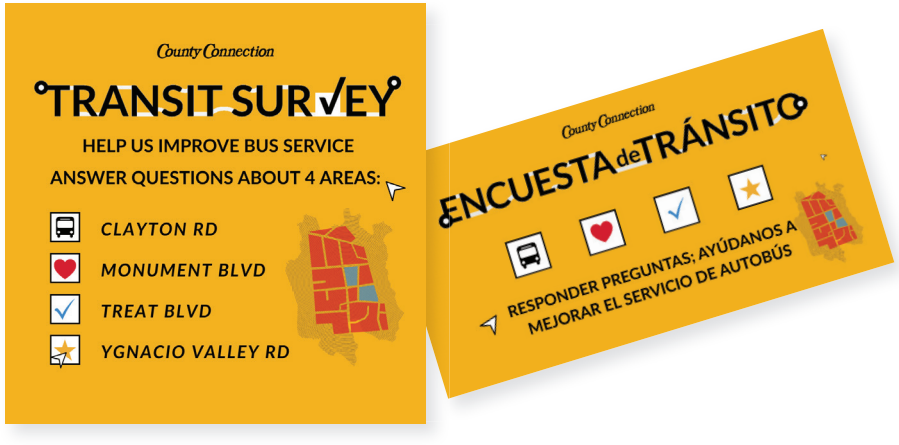
Table 5: Ygnacio Valley Road - Prioritization Scores

Stakeholder Engagement

Circlepoint led stakeholder and community engagement for the Transit Corridor Study. This phase of the project was guided by the **Community Engagement Memo**, which outlined goals, objectives, and strategies to keep stakeholders, riders, and the general public informed throughout the study. The memo documented the overall engagement approach, including public outreach plans, communication materials, and messaging strategies designed to educate the public about the study process and the potential benefits of transit improvements.

Rather than soliciting detailed input on highly technical elements, engagement efforts focused on understanding rider and community experiences along the study corridors and communicating how proposed improvements could affect transit service and the overall customer experience. The engagement strategy was implemented during the later phases of the study, and activities include an online survey and coordinated public education efforts.

To broaden participation, the project team leveraged existing public engagement tools and communication channels across multiple jurisdictions. Engagement efforts targeted a diverse range of stakeholder groups, including public agencies, non-governmental organizations, employers, and existing transit users, to support collaboration and ensure that input reflected a wide range of perspectives across the County Connection service area.



COMMUNICATIONS TOOLKIT OVERVIEW

The Communications Toolkit was developed to support consistent and efficient public education at key milestones throughout the study. The toolkit provided approved, ready-to-use content that County Connection, the Cities of Walnut Creek and Concord, and other partner agencies could easily distribute through their existing communication channels.

Designed to reach diverse audiences across multiple platforms and touchpoints, the toolkit included a comprehensive suite of materials in both English and Spanish tailored to different outreach methods, including:

- **Website content** for posting to County Connection's and City websites.
- **Social media content** for distribution by County Connection and the Cities, including accompanying graphics.
- **E-blast content** for distribution by County Connection and the Cities to send through their existing contact lists.
- **Take-one flyers** for placement on corridor-specific bus routes, featuring a QR code that directed riders to the online survey.
- **Poster content** for display at heavily used bus stops along the four key corridors, featuring QR codes that linked to both the survey and project webpage.

ONLINE SURVEY OVERVIEW

As a key engagement tool, an online survey was conducted to identify and confirm the challenges faced by existing riders and community members along the four study corridors. It enabled the project team to understand rider priorities and align them with the development of recommendations. The survey was open from October 10, 2025, to November 12, 2025, and received 330 responses. The charts supporting this analysis are provided in Appendix A.

The survey was distributed through multiple channels to maximize reach, including social media posts on County Connection's platforms, targeted e-blasts to rider and stakeholder contact lists, and promotional materials placed on buses and at transit facilities. It was also hosted on County Connection's website and promoted across multiple channels. In addition, the Cities of Walnut Creek and Concord actively shared the survey through their own communication platforms, including city websites, social media accounts, and community newsletters. This helped to extend participation beyond County Connection's existing audience.

KEY FINDINGS BY CORRIDOR

- **Clayton Road:** Consists mostly of frequent riders prioritized "integrating bus stops into the surrounding community" and "increasing bus service speeds and reducing delays."
- **Monument Boulevard:** Consists mostly of frequent riders prioritized "making bus stops more convenient, safer, and more efficient" and "integrating bus stops into the surrounding community."
- **Treat Boulevard:** Consists mostly of semi-frequent riders that prioritize "integrating bus stops into the surrounding community for better accessibility" and "increasing bus service speeds and reducing bus delays."
- **Ygnacio Valley Road:** Consists mostly of infrequent riders that prioritize "making bus schedules more reliable" and "integrating bus stops into the surrounding community for better accessibility."

RESPONDENT PROFILE

Of the 330 respondents, 204 (62.6%) identified themselves as current County Connection riders. Among current riders, 177 respondents (88.5%) are considered corridor users as they indicated that they either take the bus along or live near at least one of the four study corridors. These results indicate that the survey successfully captured input from individuals with direct experience using transit service on the study corridors.

CORRIDORS SELECTED FOR FEEDBACK

Respondents were invited to provide input on any of the four study corridors. Monument Boulevard received the highest level of feedback, with 52.9% of riders (92 responses) selecting it. Clayton Road followed closely, with 51.2% (89 responses). Treat Boulevard and Ygnacio Valley Road each received input from 79 riders (45.4%). This distribution reflects broad engagement across all corridors, with particularly strong interest in Monument Boulevard and Clayton Road.

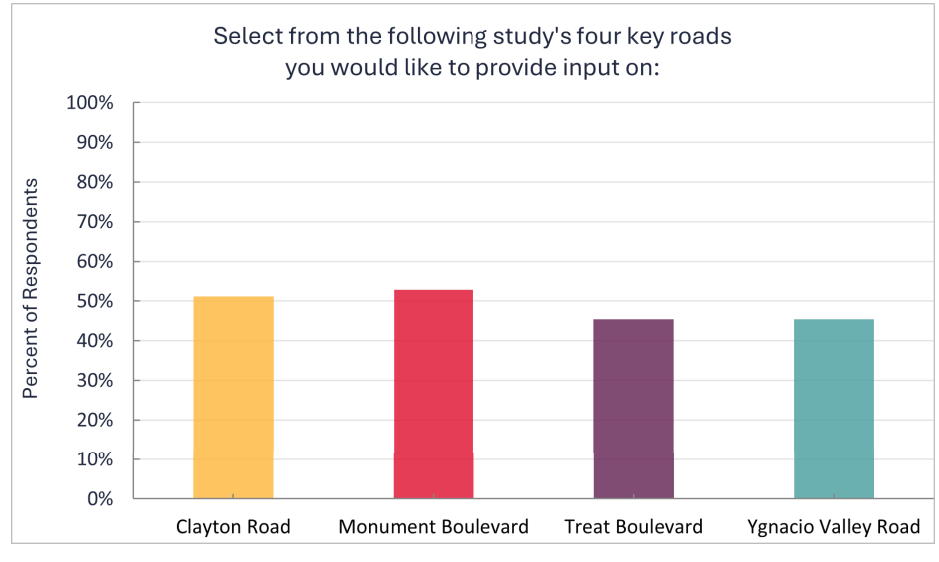


Figure 5: Which of the study's four key roads you would like to provide input on?

PRIORITY IMPROVEMENTS

Respondents were asked to rank potential improvement areas. Rankings were collected separately for users of the study corridors and non-corridor users, those that do not use the corridor or ride at all, with respondents assigning a rank of 1 (most important or appealing) to 4 (least important or appealing). For analysis, these rankings were converted into average scores, where lower scores indicate higher overall importance or appeal.

Overall, all four improvement categories were ranked similarly, with average scores ranging from 2.34 to 2.71, indicating that respondents generally view all improvement types as important. Among non-corridor users, the highest-ranked improvement was making bus stops more convenient, safer, and more efficient. For corridor-specific responses, the most highly ranked improvement for Clayton Road, Treat Boulevard, and Ygnacio Valley Road was integrating bus stops into the surrounding community for better accessibility, while Monument Boulevard exhibited slightly different ranking patterns.

Across most corridors, increasing bus service speeds and reducing bus delays ranked lower relative to other improvements. The exception was Ygnacio Valley Road, where this improvement ranked as the second-most important. Overall, the results suggest that improvements related to stop access, reliability, and the quality of the stop environment are particularly important to respondents, alongside speed and delay considerations.

SERVICE USAGE PATTERN

Survey responses indicate that respondents were more likely to be frequent riders on Clayton Road and Monument Boulevard, with larger shares reporting use of bus service five to seven days per week or three to four days per week. In comparison, respondents associated with Treat Boulevard and Ygnacio Valley Road were more likely to report less frequent use. Treat Boulevard had the highest share of respondents riding three to four days per week (28.4%), while Ygnacio Valley Road had the highest share of respondents riding one to three days per month (30.5%).

BART CONNECTIVITY

A large share of respondents use BART stations near the study corridors to connect to County Connection services. Approximately 45–46% of respondents for each corridor indicated that they use the nearby BART station for transfers. An additional 32–38% reported transferring to other BART lines, with Clayton Road respondents reporting the highest rate (38.8%). These findings reinforce the importance of reliable bus, BART connections along all four corridors.

Attributes were ranked on a scale of 1 (most important or appealing) to 4 (least important or appealing).

	Non-Corridor User	Clayton Road	Monument Boulevard	Treat Boulevard	Ygnacio Valley Road
Total # of Respondents	93	75	76	64	58
ATTRIBUTE SCORES BREAKDOWN					
Increase bus service speeds and reduce bus delays, thereby reducing travel time for passengers	2.71	2.61	2.59	2.61	2.4
Make bus schedules more reliable	2.42	2.49	2.54	2.56	2.67
Make bus stops more convenient, safer and more efficient	2.39	2.48	2.42	2.48	2.57
Integrate bus stops into the surrounding community for better accessibility	2.48	2.41	2.45	2.34	2.36

Table 6: Attribute Scores Breakdown

DEMOGRAPHICS

Survey respondents represent a diverse cross-section of the County Connection service area. The most frequently reported home zip code was 94521 (41 responses), covering much of the Clayton Road corridor and portions of Treat Boulevard and Ygnacio Valley Road. Over half of respondents (52.6%) identified as female. The majority were 35 years or older, with 56.4% between the ages of 35 and 64 and 20.5% aged 65 or older.

Additionally, 18.0% of respondents reported having a disability, with 58.8% of those individuals identifying a mobility-related disability. In terms of race and ethnicity, 47.9% identified as White, 26.1% as Hispanic or Latino, 19.7% as Asian or Pacific Islander, and 3.7% as Black or African American.

OPEN-ENDED FEEDBACK

At the conclusion of the survey, 178 respondents provided written comments describing what would encourage them to use transit on the key study corridors. The most common theme was improved service frequency and service span, cited by approximately 55 respondents, with many emphasizing the need for later evening service to better align with BART schedules and work hours. The second most frequent theme was improved schedule reliability, noted by 14 respondents, followed by recurring requests for better transfer coordination (particularly with BART), bus stop improvements, access to community destinations (such as parks, hospitals, and libraries), and enhanced cleanliness and safety. Each of these secondary themes was mentioned by approximately 10 respondents.

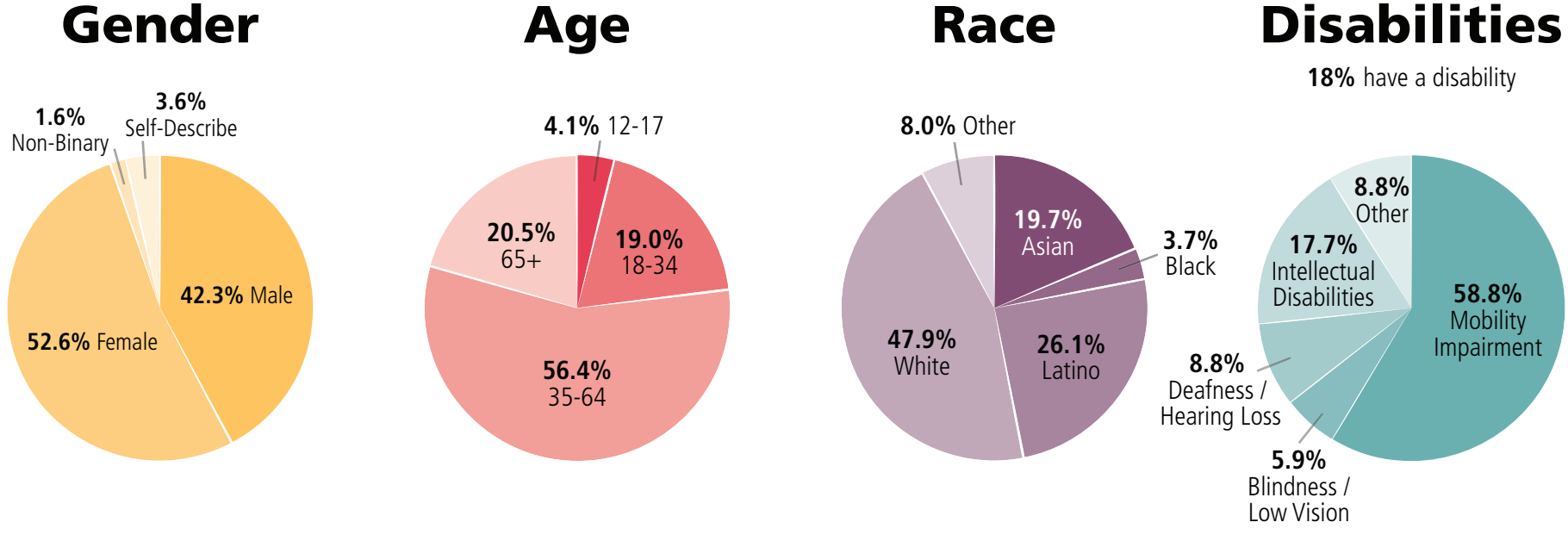
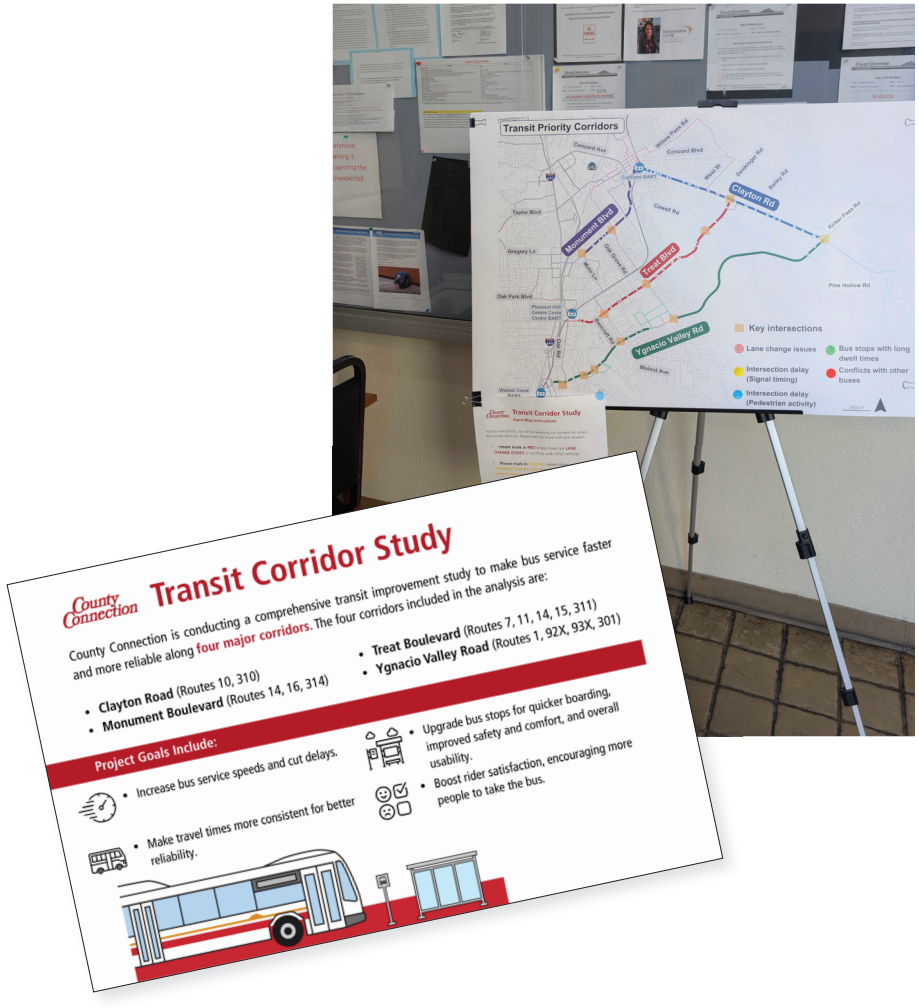


Figure 6: Respondent Demographics

OPERATOR OUTREACH

In addition to public-facing materials, operator outreach materials were distributed in November 2025 to ensure that County Connection bus operators were informed about the study and its outcomes. These materials provided a concise project summary with key bullet points outlining the study's goals, findings, and potential impacts. As frontline representatives of the transit system, operators play an important role in the rider experience, and this outreach helped equip them with consistent information to support rider awareness and understanding.



PUBLIC EDUCATION MATERIALS

As the study nears completion, the project team will develop a suite of public education materials to communicate key findings and final recommendations to the community. These materials will be designed for distribution by County Connection and the Cities of Walnut Creek and Concord and structured to present the study's outcomes in clear, accessible, and user-friendly formats. The goal of these materials is to ensure that diverse audiences can easily understand the study results and the potential benefits of the recommended improvements.

Following the release of the Final Report, the public education materials will be distributed as the concluding phase of the stakeholder and community engagement process. This final outreach effort is intended to ensure that community members remain informed about the study's outcomes and understand how the recommended improvements may enhance their daily transit experience.

MATERIALS PACKAGE

- **Fact sheet** describing key potential operational improvements and explaining how these changes would ultimately improve the rider experience, providing concrete examples of benefits to the community.
- **Bus cards** for placement inside buses, featuring a link and QR code directing passengers to a PDF of the fact sheet hosted on County Connection, City, and CCTA websites, allowing riders to access detailed information during their commute.
- **Press release** for distribution by County Connection and the Cities to local media outlets, announcing the study's completion and highlighting major recommendations to generate broader community awareness.
- **Bus stop posters** strategically placed at high-traffic locations along the four corridors, featuring a link and QR code to the fact sheet to reach potential riders and community members at key transit access points.

Summary of Quantitative Assessment

To quantify the expected benefits of the recommended transit improvements, the project team evaluated a series of improvement packages for each corridor, ranging from targeted stop management strategies to comprehensive, multi-tool investments. The analysis estimates potential travel time savings per trip, per day, and for total passengers by combining expected benefits from individual tools, including signal optimization, corridor signal coordination, transit signal priority (TSP), re-striping and signage, transit queue-jumps, dedicated bus lanes, and bus stop rebalancing.

The anticipated benefits analysis followed a structured, literature-based approach. Existing conditions, including free-flow speeds, delay, segment lengths, passenger volumes, and the number of bus trips, were first analyzed. Recommended tools for each corridor and package were then compiled, and expected time savings per tool were established using ranges derived from peer studies and industry guidance. Time savings were calculated cumulatively for each package and corridor, then applied to existing travel times to estimate adjusted trip times for the AM peak, midday, PM peak, and full day. A "realism rule" was applied to ensure that improved travel times did not exceed free-flow conditions on segments without existing delay.

Feasible Tool Performance Assumptions	Low End (seconds)	High End (seconds)	Unit
Signal Optimization	5	10	Per intersection
Corridor Signal Coordination	5	10	Per intersection
Re-Striping / Signage - Dedicated Right Turn Lane	4	7	Per lane
Re-Striping / Signage - Dedicated Left Turn Lane	5	10	Per lane
Re-Striping / Signage - Extend Turn Pocket	5	10	Per lane
Corridor Signal Coordination with TSP	10	20	Per intersection
Transit Queue-Jump	7	10	Per intersection
Dedicated Bus Lane	15	30	Per mile
Bus Stop Rebalancing - Removal/ Relocation	5	15	Per stop
Bus Stop Rebalancing - Consolidation	10	15	Per stop
New Bus Stop	-5	-15	Per stop

Table 7: Time Savings by Tool

EXPECTED TIME SAVINGS BY TOOL

Expected time savings vary by tool and implementation context. For example, signal optimization and corridor signal coordination were assumed to provide 5 to 10 seconds of savings per intersection, while transit signal priority was assumed to add an additional 5 to 10 seconds per intersection when combined with coordination. Transit queue-jumps were estimated to save 7 to 10 seconds per intersection, and part-time dedicated bus lanes were assumed to save 15 to 30 seconds per mile. Bus stop rebalancing strategies were estimated to save between 5 and 15 seconds per stop, depending on whether stops were removed, relocated, or consolidated.

PER TRIP TIME SAVINGS ASSUMPTIONS & EMPIRICAL EVIDENCE

The analysis of transit improvement tools presented in this section draws upon a comprehensive review of technical literature, case studies, and empirical research from transportation agencies and academic sources. Complete citations for all sources are provided in Appendix B, offering transparency in the analytical framework and enabling verification of the assumptions that inform the recommended transit improvements along the corridor.

TOOL 1: BUS STOP REBALANCING

- For relocation/removal:
  - High end: 15 seconds per stop; Low end: 5 seconds per stop
- For adding a stop:
  - High end: adding15 seconds per stop; Low end: adding 5 seconds per stop
- For consolidation:
  - High end: 15 seconds per stop; Low end: 10 seconds per stop

TOOL 2: SIGNAL OPTIMIZATION

- The performance of optimization heavily depends on the current signal plans. If the plan has not been updated for a few years, optimizing could have better results
- It also depends on the cycle length (e.g., if the cycle length is 120 seconds, the delay time saving could be more compared to a 60-second cycle length)
- For this project, we assume the cycle length of the intersections is 100 seconds, and optimizing them will have 5% - 10% increase in efficiency; thus, we assume the following values:
  - High value: 10 seconds per intersection
  - Low value: 5 seconds per intersection

TOOL 3: CORRIDOR SIGNAL COORDINATION

- A coordinated traffic signal system can greatly improve stability and reduce delays for the buses on the major corridor. It is often used at the same time as TSP
- Projects and research showed a delay reduction of 30% to 60%, but performance highly depends on the existing road geometry and traffic controller settings
- In our project, we will use the following values, assuming that the intersections are not coordinated under existing conditions:
  - High value: 10 seconds per intersection
  - Low value: 5 seconds per intersection

TOOL 4: TRANSIT SIGNAL PRIORITY

- Typical travel time savings: 5% to 12% corridor-wide; some cases report up to 18%
- Per intersection: 5–19 seconds reduction in delay, depending on green extension and red truncation settings
- In our project, we will use the following values, adding to signal coordination benefits, assuming the intersections does not use TSP under existing condition:
  - High value: 10 seconds per intersection
  - Low value: 5 seconds per intersection

TOOL 5: RE-STRIPING/SIGNAGE

- According to HCM, adding a dedicated right-turn lane can reduce the delay of 5-25 seconds on the right turn movement, depending on the factors of volume, control type, delay condition, geometry, and pedestrian.
- We assume the following improvements for adding a dedicated right-turn lane:
- High end: 7 seconds per vehicle for the approach movement
- Low end: 4 seconds per vehicle for the approach movement
- Regarding extending the left-turn pocket lane, if the left-turn vehicle queue is longer than the existing pocket lane length, and the extension solves the problem, it will be greatly beneficial through movement.
- The following improvement value will be used for both extending or installing a dedicated left-turn lane:
  - High end: 10 seconds per intersection
  - Low end: 5 seconds per intersection

TOOL 6: TRANSIT QUEUE-JUMP

- Average savings: ~9 seconds per intersection under favorable conditions (low pedestrian conflicts, adequate geometry).
- Benefits diminish with high right-turn volumes or limited space.
- In our project, we will use the following values for intersections with a dedicated right-turning lane and will use that lane as Queue-Jump lanes:
  - High value: 10 seconds per intersection
  - Low value: 7 seconds per intersection

TOOL 7: DEDICATED BUS LANE

- There are lots of factors that affect the delay savings of the part-time/full-time dedicated bus lane, such as corridor speed, congestion level, stop spacing, boarding policies, cooperating TSP and Queue-Jump existence, etc. For this project, expected time savings for this tool only include dedicated bus lane without any other compounding tools.
- In our project, we will follow the example and use the value as below:
  - High end: 15 seconds per ½ mile – 30 seconds per mile
  - Low end: 7.5 seconds per ½ mile – 15 seconds per mile

PROJECT PACKAGING FRAMEWORK

To support informed decision-making and phased implementation, recommended transit improvements were organized into four project packages based on the type of improvement, relative cost, implementation complexity, and degree of physical or technological change required. This packaging approach allows County Connection and partner agencies to evaluate near-term, lower-cost strategies alongside more comprehensive, longer-term investments, while clearly understanding the tradeoffs between effort and benefit.

The packaging structure is directly informed by the anticipated benefits analysis, which demonstrates that improvements can deliver meaningful travel time savings at multiple investment levels, with benefits increasing as packages incorporate a broader set of tools and corridor-wide treatments.

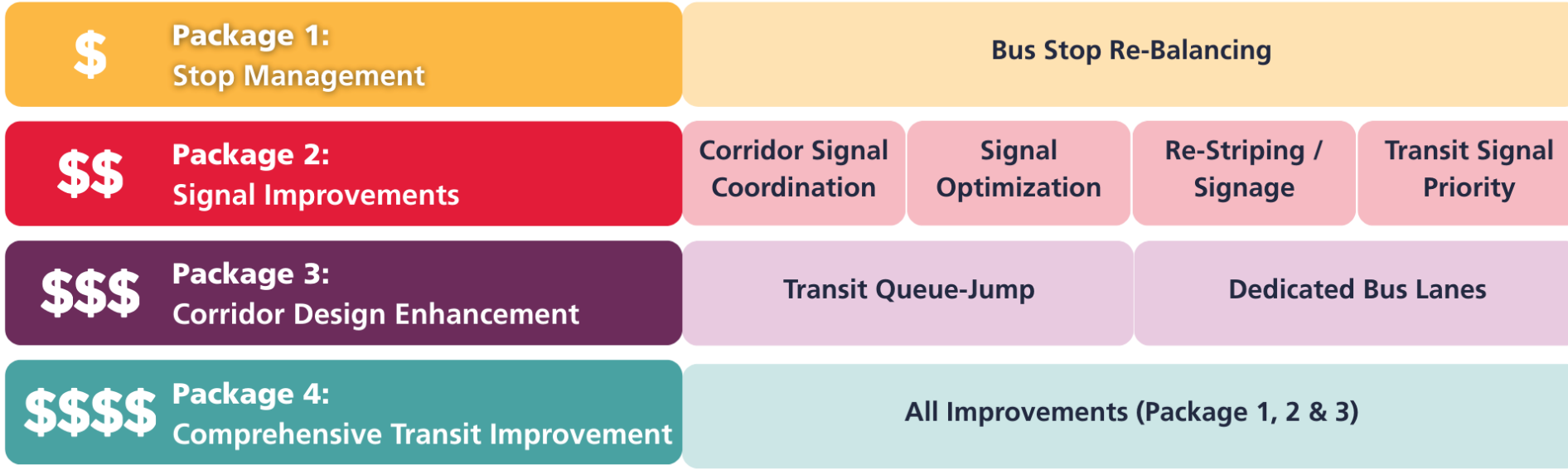


Figure 7: Project Prioritization – Project Packages

Package 1: Stop Management ($)

- Improvement Type:
  - Bus Stop Re-Balancing

Package 1 focuses on bus stop management strategies, including stop consolidation, relocation, and spacing adjustments. These improvements are operational in nature and typically require minimal capital investment, making them well-suited for near-term implementation.

The anticipated benefits analysis shows that bus stop re-balancing alone can generate measurable travel time savings by reducing dwell time and unnecessary stopping, particularly on corridors with closely spaced stops and high boarding activity. While Package 1 produces smaller per-trip savings relative to more complex packages, the results demonstrate that stop management provides a cost-effective foundation for improving bus reliability and travel time, especially when applied at high-delay locations.

Additionally, the bus stop rebalancing recommendations are informed by analyses of existing bus stop locations and corridor-specific challenges conducted as part of this study, as well as findings from related studies completed in recent years.

Package 2: Signal Improvements ($$)

- Improvement Types:
  - Corridor Signal Coordination
  - Signal Optimization
  - Re-Striping / Signage
  - Transit Signal Priority (TSP)

Package 2 introduces signal-based and low-cost geometric improvements that target intersection delay—one of the primary contributors to bus travel time variability identified in the Existing Conditions analysis. These strategies generally require moderate investment and coordination with local jurisdictions but can often be implemented without major roadway reconstruction.

Evidence from the anticipated benefits analysis shows that signal optimization and corridor coordination, particularly when paired with Transit Signal Priority, consistently deliver noticeable per-trip and daily travel time savings across all corridors. These benefits are achieved by reducing stopping frequency, improving progression, and minimizing signal delay at congested intersections. Package 2 performs strongly relative to its cost and complexity, making it a critical intermediate step between stop-level improvements and more capital-intensive corridor treatments.

Package 3: Corridor Design Enhancement ($$$)

- Improvement Types:
  - Transit Queue-Jumps
  - Dedicated Bus Lanes

Package 3 includes targeted roadway design changes that provide buses with physical priority in high-congestion areas. These treatments involve higher costs and more complex implementation due to potential impacts on general traffic operations, curb use, and roadway cross-sections.

The anticipated benefits analysis indicates that queue-jumps, and dedicated bus lanes produce larger per-trip travel time savings than signal-only strategies, particularly on corridors with severe congestion and recurring queues. These improvements are especially effective where buses experience sustained delay that cannot be fully addressed through signal timing alone. Package 3 represents a higher-investment option that delivers substantial performance gains at select priority locations.

Package 4: Comprehensive Transit Improvement ($$$$)

- Improvement Type:
  - All Improvements (Packages 1, 2, and 3)

Package 4 combines all strategies from Packages 1 through 3 into a comprehensive corridor improvement approach. This package reflects the highest level of investment and coordination but also produces the largest and most consistent benefits across all performance measures evaluated.

The anticipated benefits analysis shows that Package 4 yields the greatest reductions in per-trip travel time, the highest total daily transit time savings, and the largest passenger time savings on every corridor. These results demonstrate that layered improvements—combining stop management, signal strategies, and physical priority treatments—produce compounding benefits that exceed those of individual tools implemented in isolation.

USING THE PACKAGES

This packaging framework allows County Connection and partner agencies to:

- Align improvements with available funding and implementation capacity
- Phase investments over time, starting with lower-cost, high-return strategies
- Clearly communicate tradeoffs between cost, complexity, and benefit
- Support both near-term operational improvements and long-term corridor transformation

By grounding the packages in quantified anticipated benefits, the framework provides a transparent, evidence-based pathway from incremental improvements to comprehensive transit priority corridors.

CORRIDOR LEVEL RECOMMENDATIONS

CLAYTON ROAD

Package 1: Stop Management

- **Bus Stop Rebalancing** between Concord BART to Marsh Creek Rd
  - Removing eastbound Bus Stop ID 522 (Clayton Rd and Fifth Ave), Bus Stop ID 524 (Clayton Rd and Davis Ave)
  - Removing westbound Bus Stop ID 548 (Clayton Rd and Claycord Ave), Bus Stop ID 558 (Clayton Rd and Barbis Way), and Bus Stop ID 561 (Clayton Rd and Fifth St)
  - Consolidating eastbound Bus Stop ID 541 (Clayton Rd and Ygnacio Valley Rd) and Bus Stop ID 542 (Clayton Rd and Washington Blvd) to a new stop at Clayton Rd and Ygnacio Valley Rd
  - Adding westbound bus stops at Clayton Rd and N Atchinson Stage Rd, and Clayton Rd and N Lydia Ln

Package 2: Signal Improvements

- **Signal Optimization** at Treat Blvd & Clayton Road and Ygnacio Valley Rd & Clayton Road
- **Corridor Signal Coordination** between Treat & Ygnacio
- **Transit Signal Priority** between Treat & Ygnacio

Package 4: Comprehensive Transit Improvements

- **Bus Stop Rebalancing** between Concord BART & Marsh Creek Rd
- **Signal Optimization** at Treat Blvd & Clayton Road and Ygnacio Valley Rd & Clayton Road
- **Signal Coordination** between Treat & Ygnacio
- **Transit Signal Priority** between Treat & Ygnacio

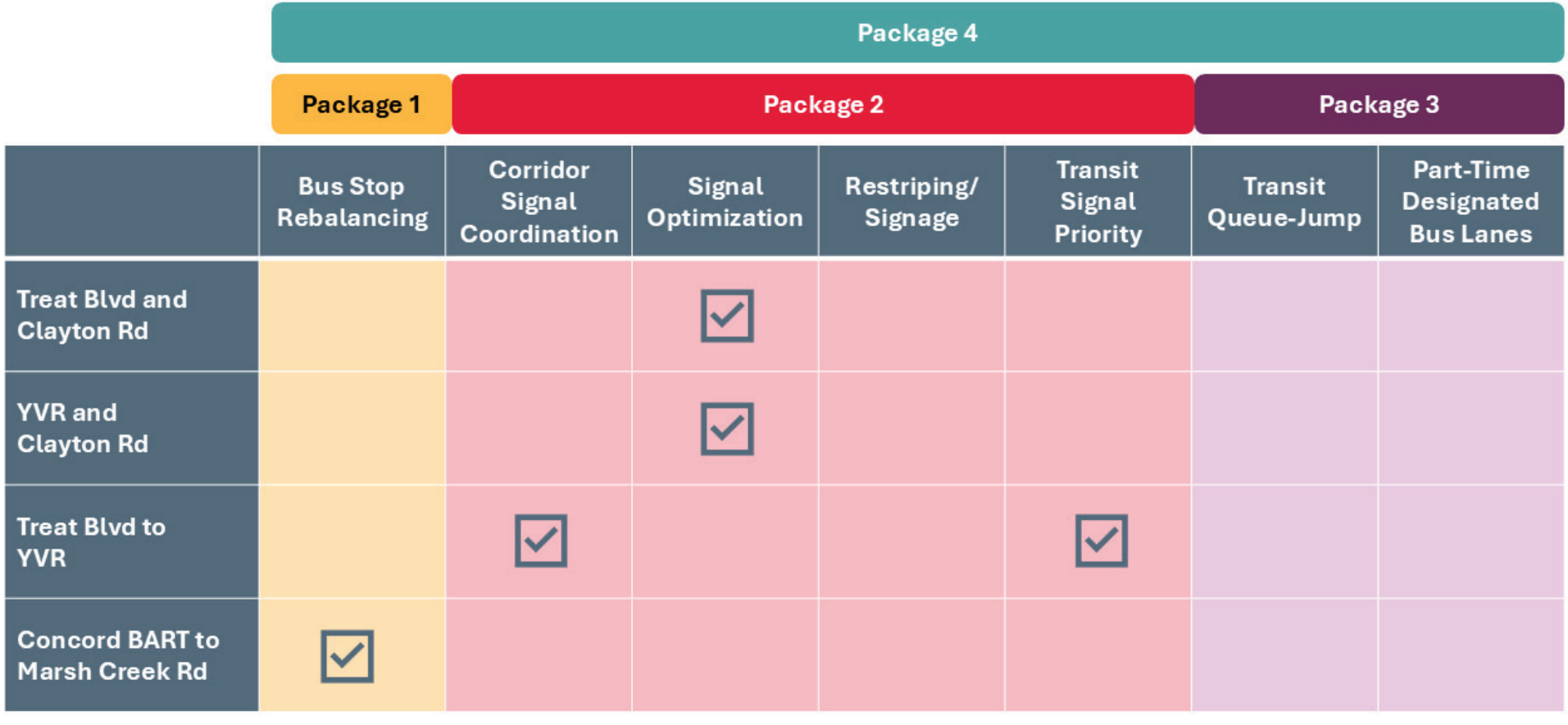


Figure 8: Clayton Road – Project Packages

MONUMENT BOULEVARD

Package 1: Stop Management

- **Bus Stop Rebalancing** between Mohr Ln & Detroit Ave
  - Removing southbound Bus Stop ID 712: Monument Blvd and Lacey Ln

Package 2: Signal Improvements

- **Signal Optimization** at Oak Grove Rd & Monument Blvd
- **Signal Coordination** between Detroit Ave & Mohr Ln
- **Transit Signal Priority** between Detroit Ave & Mohr Ln
- **Re-Striping and Signage** at Oak Grove Rd & Monument Blvd
  - Add a dedicated right-turn lane to prevent through-traffic backup

Package 3: Corridor Design Enhancements

- **Transit Q-Jump** at Oak Grove Rd & Monument Blvd* (only in one direction)
- **Part-time dedicated bus lane** between Detroit Ave & Carey Dr

Package 4: Comprehensive Transit Improvements

- **Bus Stop Rebalancing** between Detroit Ave & Carey Dr
- **Signal Optimization** at Oak Grove Rd & Monument Blvd
- **Signal Coordination** between Detroit Ave & Mohr Ln
- **Transit Signal Priority** between Detroit Ave & Mohr Ln
- **Re-Striping and Signage** at Oak Grove Rd & Monument Blvd
- **Transit Q-Jump** at Oak Grove Rd & Monument Blvd** (in both directions because of the re-striping project)
- **Part-time dedicated bus lane** between Detroit Ave & Carey Dr

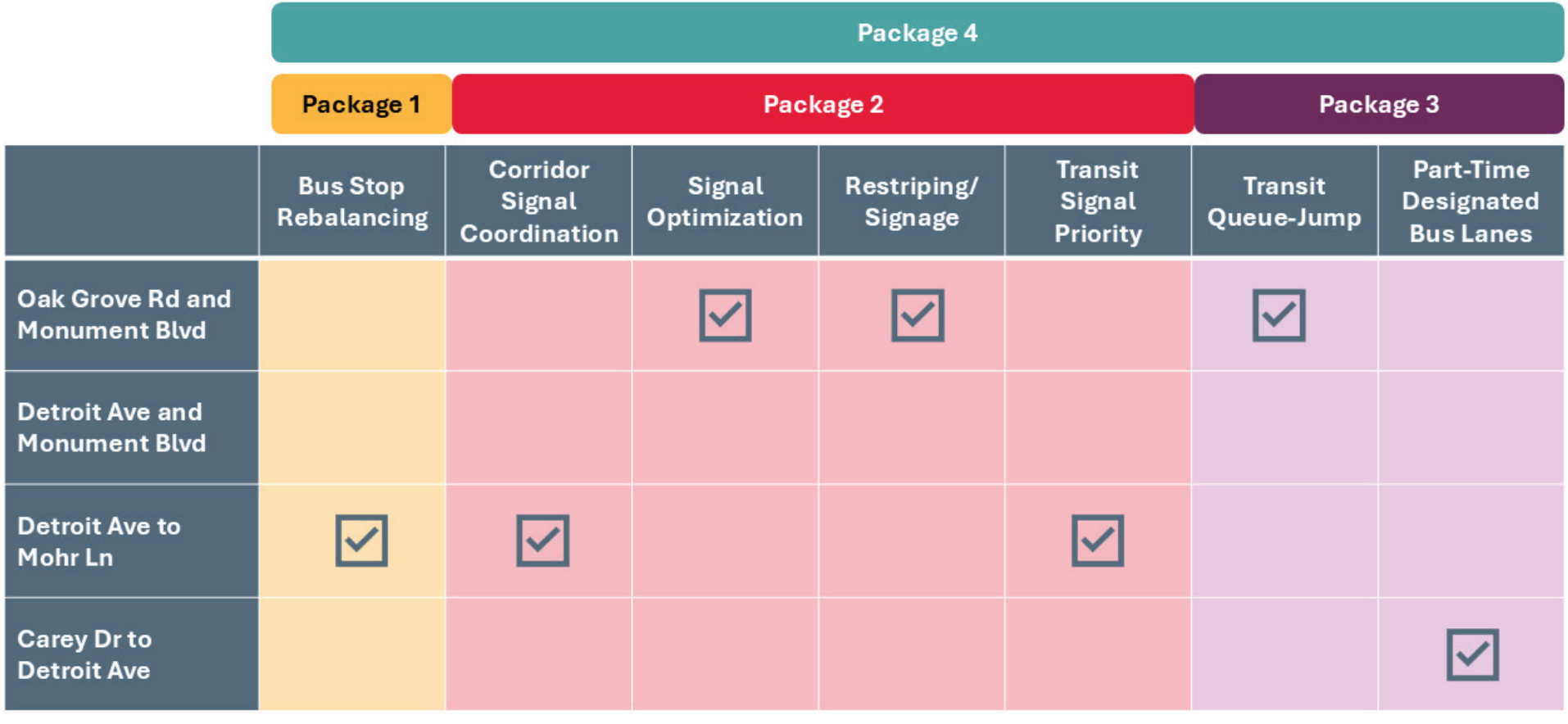


Figure 9: Monument Boulevard – Project Packages

TREAT BOULEVARD

Package 2: Signal Improvements

- **Signal Optimization** at Oak Rd & Bancroft Rd
- **Signal Coordination** between Oak Rd & Oak Grove Rd
- **Transit Signal Priority** between Oak Rd & Oak Grove Rd

Package 3: Corridor Design Enhancements

- **Part-time dedicated bus lane** between Navaronne Way & Bancroft Rd

Package 4: Comprehensive Transit Improvements

- **Signal Optimization** at Oak Rd & Bancroft Rd
- **Signal Coordination** between Oak Rd & Oak Grove Rd
- **Transit Signal Priority** between Oak Rd & Oak Grove Rd
- **Part-time dedicated bus lane** between Navaronne Way & Bancroft Rd

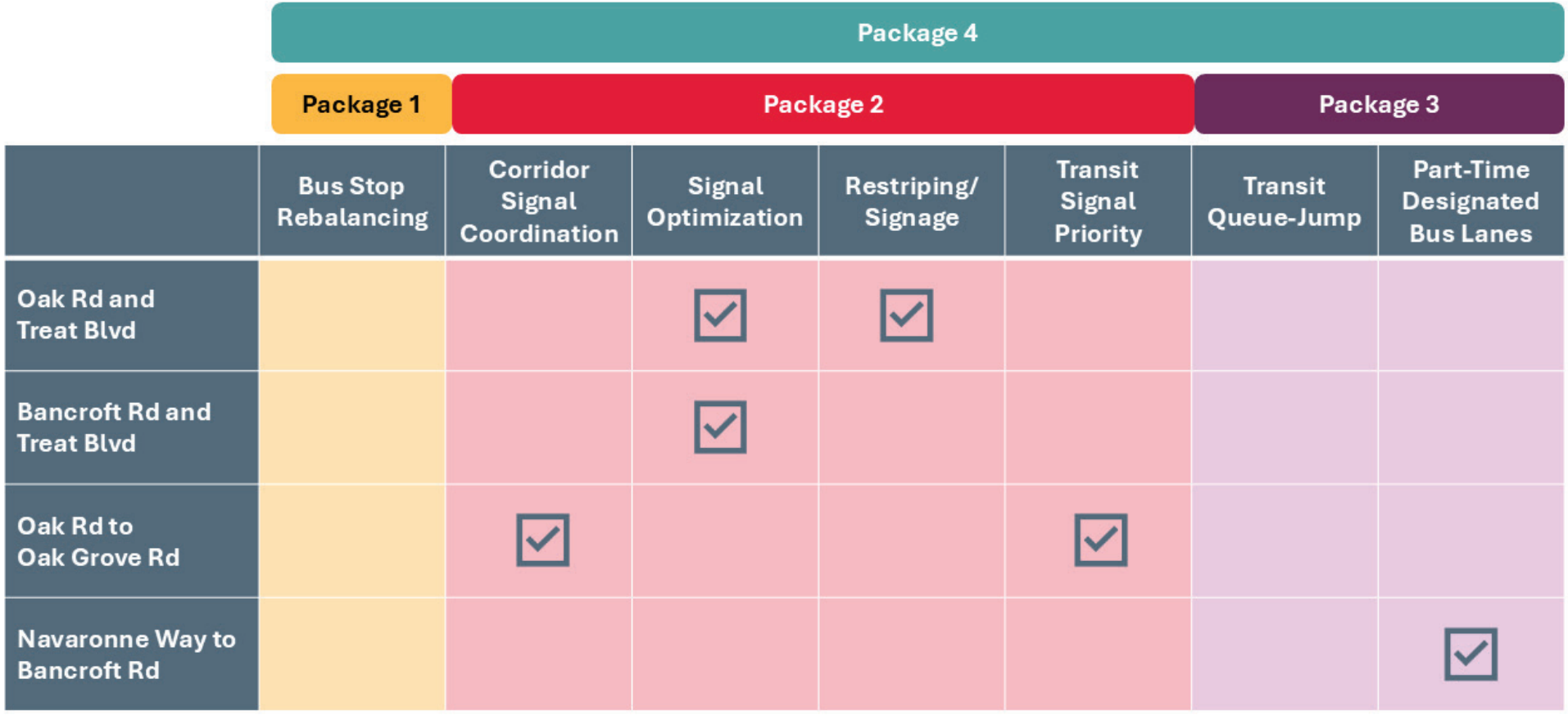


Figure 10: Treat Boulevard – Project Packages

YGNACIO VALLEY ROAD

Package 1: Stop Management

- **Bus Stop Rebalancing** between N Broadway & N San Carlos Dr
  - Relocating westbound Bus Stop ID 1939 from Ygnacio Valley Road and N Civic Dr to Ygnacio Valley Rd and N Broadway
  - Adding a westbound bus stop to Ygnacio Valley Rd and N San Carlos Dr

Package 2: Signal Improvements

- **Signal Optimization** at Ygnacio Valley Rd & Oak Grove Rd, N Civic, N Broadway, N California
- **Signal Coordination** between Oakland Blvd & Oak Grove Rd
- **Transit Signal Priority** between Oakland Blvd & Oak Grove Rd
- **Re-striping and signage** at Walnut Blvd & Ygnacio
  - Extend the left-turn pocket

Package 3: Corridor Design Enhancements

- **Transit Q-Jump** at Cowell & Ygnacio Valley Rd

Package 4: Comprehensive Transit Improvements

- **Signal Optimization** at Ygnacio Valley Rd & Oak Grove Rd, N Civic, N Broadway, N California
- **Corridor Signal Coordination** between Oakland Blvd & Oak Grove Rd
- **Transit Signal Priority** between Oakland Blvd & Oak Grove Rd
- **Re-striping and signage** at Walnut Blvd & Ygnacio Valley Rd
- **Transit Q-Jump** at Cowell & Ygnacio Valley Rd

	Package 4						
	Package 1	Package 2				Package 3	
	Bus Stop Rebalancing	Corridor Signal Coordination	Signal Optimization	Restriping/ Signage	Transit Signal Priority	Transit Queue-Jump	Part-Time Designated Bus Lanes
Walnut Blvd and YVR			☑	☑			
N California Blvd and YVR			☑				
North Broadway and YVR			☑				
Cowell Rd and YVR						☑	
Oak Grove Rd and YVR			☑	☑			
Oakland Blvd to Oak Grove Rd		☑			☑		

Figure 11: Ygnacio Valley Road – Project Packages


11 CONCORD

RECOMMENDATIONS BY PROJECT PACKAGES & ANTICIPATED BENEFITS

This section summarizes the recommended project packages and their anticipated benefits by corridor. It begins by presenting corridor-specific recommendations by project package, using maps and tables to illustrate expected performance changes under different scenarios. Key information highlighted includes potential delay reductions per trip, changes in average travel time, and cumulative passenger delay as measures of customer experience. The section concludes with key observations derived from these results, which inform and support the final conclusions of the report. More tables that supplement this analysis are in **Appendix C**.

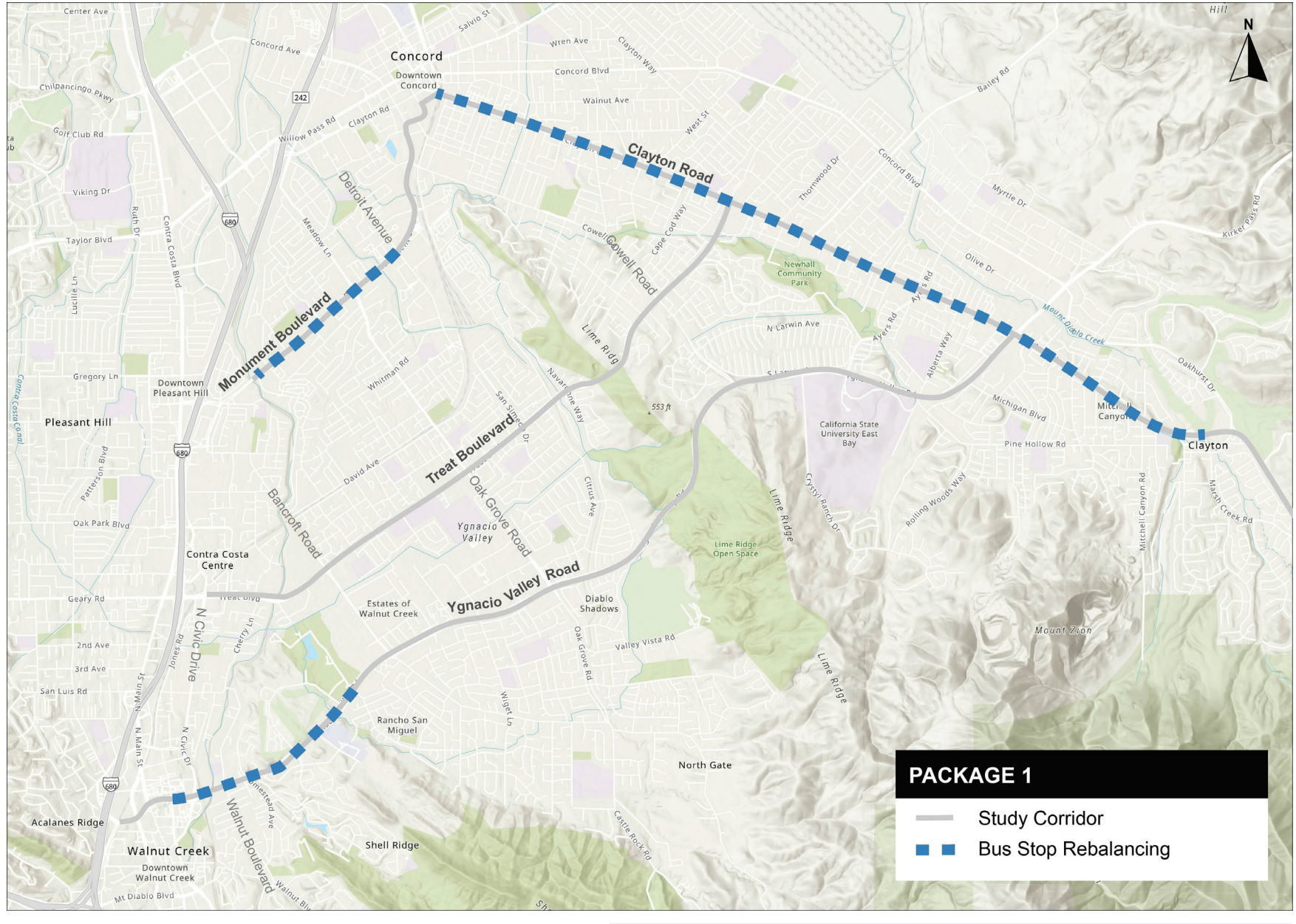


Figure 12: Package 1 Recommendations Map

Package 1 Recommendations by Corridor			Recommendations			Delay Reduction	
Corridor	Approach	# of Stops	Bus Stop Rebalancing/ Removal Relocation	Bus Stop Rebalancing Consolidation	New Bus Stop	Anticipated Benefits per Trip (seconds)	
						Low	High
Clayton Rd	Towards Clayton (EB)	26	3	1	0	25	60
	Towards Concord (WB)	26	3	0	2	5	15
Monument Blvd	Towards Concord (EB)	8	0	0	0	0	0
	Towards Pleasant Hill (WB)	9	1	0	0	5	15
Treat Blvd	Towards Clayton Rd (EB)	21	0	0	0	0	0
	Towards Contra Costa Center (WB)	18	0	0	0	0	0
Ygnacio Valley Rd	Towards Clayton Rd (EB)	12	0	0	0	0	0
	Towards Walnut Creek (WB)	17	1	0	1	0	0

Table 8: Package 1 - Recommendations by Corridors & Anticipated Benefits - Delay Reduction

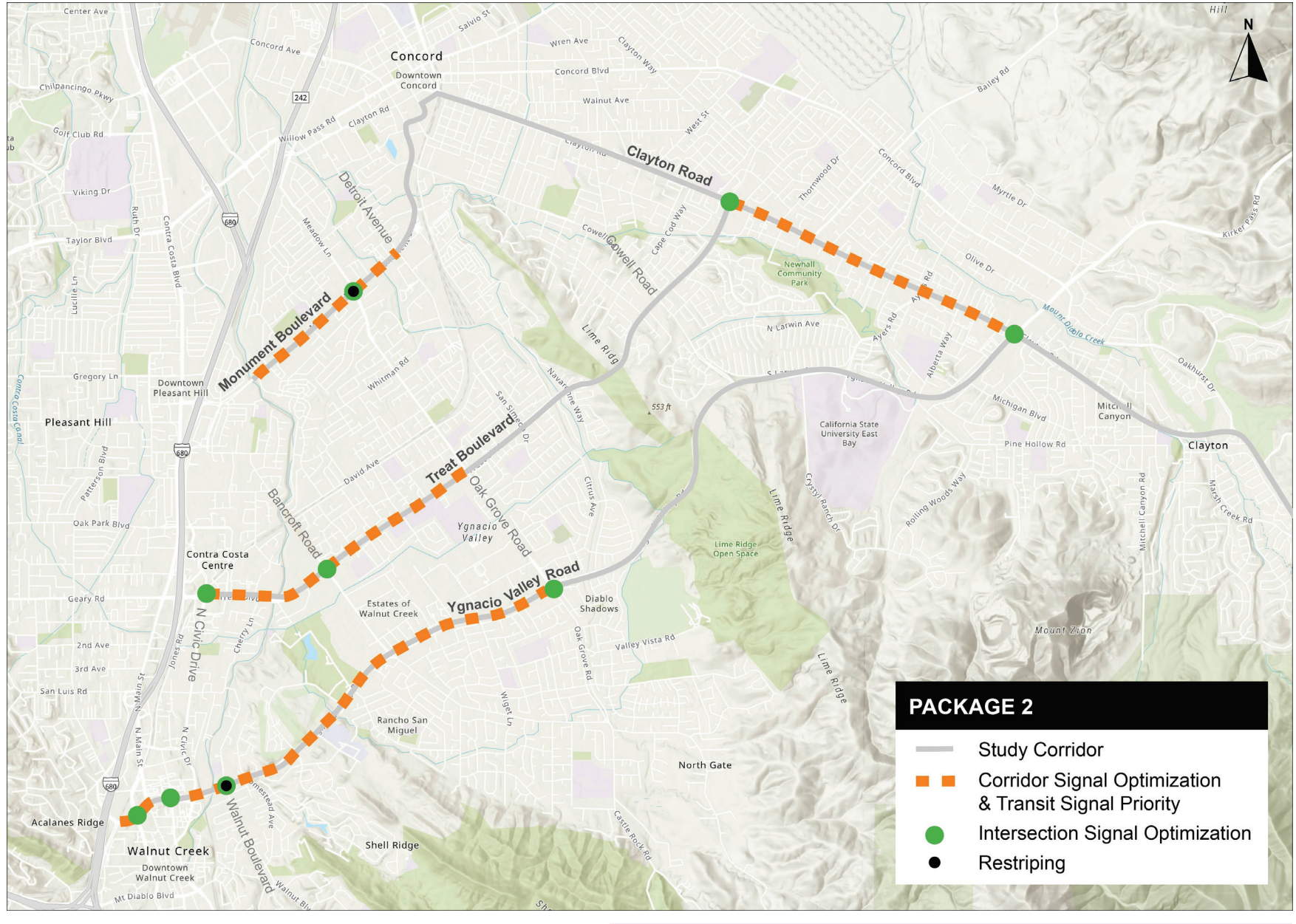


Figure 13: Package 2 Recommendations Map

Package 2 Recommendations by Corridor			Recommendations						Delay Reduction	
Corridor	Approach	# of Stops	Signal Optimization	Corridor Signal Coordination	TSP	Re-Striping / Signage			Anticipated Benefits per Trip (seconds)	
						Dedicated Left Turn Lane	Dedicated Right Turn Lane	Extend Turn Pocket	Low	High
Clayton Rd	Towards Clayton (EB)	26	2	7	7	0	0	0	80	160
	Towards Concord (WB)	26	2	7	7	0	0	0	80	160
Monument Blvd	Towards Concord (EB)	8	1	8	8	0	0	0	85	170
	Towards Pleasant Hill (WB)	9	1	7	7	0	1	0	79	157
Treat Blvd	Towards Clayton Rd (EB)	21	2	7	7	0	0	0	80	160
	Towards Contra Costa Center (WB)	18	2	7	7	0	0	0	80	160
Ygnacio Valley Rd	Towards Clayton Rd (EB)	12	4	12	13	0	0	1	150	300
	Towards Walnut Creek (WB)	17	4	15	15	0	0	1	175	350

Table 9: Package 2 - Recommendations by Corridors & Anticipated Benefits – Delay Reduction

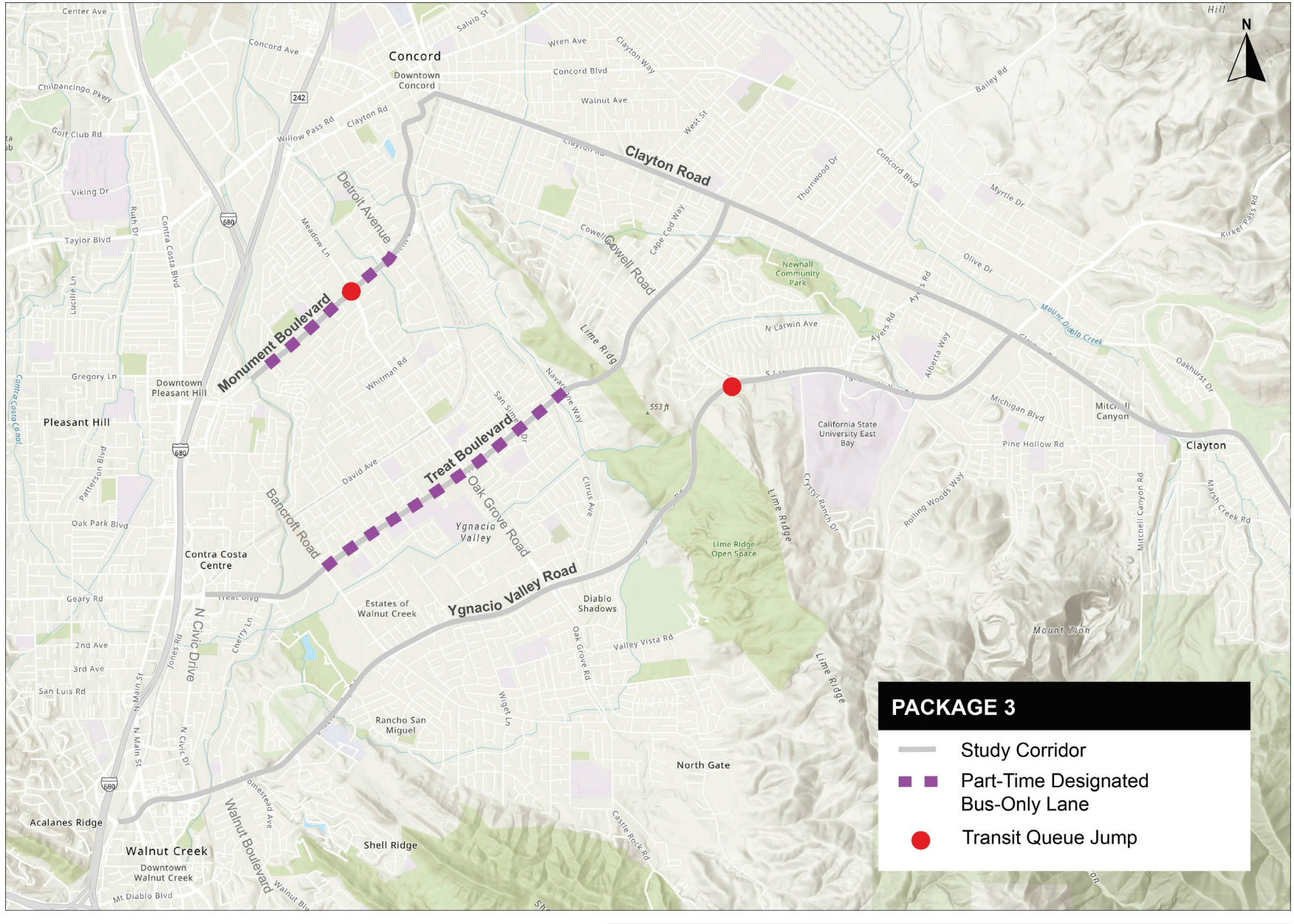


Figure 14: Package 3 Recommendations Map

Package 3 Recommendations by Corridor			Recommendations		Delay Reduction	
Corridor	Approach	# of Stops	Transit Queue-Jump	Dedicated Bus Lane (mile)	Anticipated Benefits per Trip (seconds)	
					Low	High
Clayton Rd	Towards Clayton (EB)	26	0	0.00	0	0
	Towards Concord (WB)	26	0	0.00	0	0
Monument Blvd	Towards Concord (EB)	8	1	1.14	24	44
	Towards Pleasant Hill (WB)	9	0	1.17	18	35
Treat Blvd	Towards Clayton Rd (EB)	21	0	2.16	32	65
	Towards Contra Costa Center (WB)	18	0	1.88	28	56
Ygnacio Valley Rd	Towards Clayton Rd (EB)	12	1	0.00	7	10
	Towards Walnut Creek (WB)	17	1	0.00	7	10

Table 10: Package 3 - Recommendations by Corridors & Anticipated Benefits – Delay Reduction

Average Transit Travel Time Change by Package (Low End)		Existing Scenario	Package 1		Package 2		Package 3		Package 4	
Corridor	Approach	Average Transit Travel Time in minutes	Average Travel Time For Each Corridor Section							
			Average (minutes)	% Change	Average (minutes)	% Change	Average (minutes)	% Change	Average (minutes)	% Change
Clayton Rd	Towards Clayton (EB)	18.5	18.1	-2.2%	17.2	-7.2%	18.5	0.0%	16.8	-9.4%
	Towards Concord (WB)	20.1	20.0	-0.4%	18.8	-6.6%	20.1	0.0%	18.7	-7.1%
Monument Blvd	Towards Concord (EB)	9	8.9	0.0%	7.5	-15.9%	8.5	-4.5%	7.1	-20.5%
	Towards Pleasant Hill (WB)	13.2	13.1	-0.6%	11.9	-10.0%	12.9	-2.2%	11.5	-12.8%
Treat Blvd	Towards Clayton Rd (EB)	22.5	22.5	0.0%	21.2	-5.9%	22.0	-2.4%	20.7	-8.3%
	Towards Contra Costa Center (WB)	18.0	18.0	0.0%	16.6	-7.4%	17.5	-2.6%	16.2	-10.0%
Ygnacio Valley Rd	Towards Clayton Rd (EB)	29.8	29.8	0.0%	27.3	-8.4%	29.7	-0.4%	27.2	-8.8%
	Towards Walnut Creek (WB)	29.8	29.8	0.0%	26.8	-9.8%	29.6	-0.4%	26.7	-10.2%

Table 11: Average Travel Time Change by Recommendation Package (Low End)

Average Transit Travel Time Change by Package (High End)		Existing Scenario	Package 1		Package 2		Package 3		Package 4	
Corridor	Approach	Average Transit Travel Time in minutes	Average Travel Time For Each Corridor Section							
			Average (minutes)	% Change	Average (minutes)	% Change	Average (minutes)	% Change	Average (minutes)	% Change
Clayton Rd	Towards Clayton (EB)	18.5	17.5	-5.4%	15.9	-14.4%	18.5	0.0%	14.9	-19.8%
	Towards Concord (WB)	20.1	19.8	-1.2%	17.4	-13.3%	20.1	0.0%	17.2	-14.5%
Monument Blvd	Towards Concord (EB)	9	8.9	0.0%	6.1	-31.9%	8.2	-8.3%	5.3	-40.2%
	Towards Pleasant Hill (WB)	13.2	13.0	-1.9%	10.6	-19.8%	12.6	-4.4%	9.8	-26.1%
Treat Blvd	Towards Clayton Rd (EB)	22.5	22.5	0.0%	19.9	-11.8%	21.5	-4.8%	18.8	-16.6%
	Towards Contra Costa Center (WB)	18.0	18.0	0.0%	15.3	-14.8%	17.0	-5.2%	14.4	-20.1%
Ygnacio Valley Rd	Towards Clayton Rd (EB)	29.8	29.8	0.0%	24.8	-16.8%	29.6	-0.6%	24.6	-17.3%
	Towards Walnut Creek (WB)	29.8	29.8	0.0%	23.9	-19.6%	29.6	-0.6%	23.8	-20.2%

Table 12: Average Travel Time Change by Recommendation Package (High End)

KEY TAKEAWAYS

Total Transit Time Savings per Trip

Across all corridors, Package 4 (Comprehensive Transit Improvements) yields the greatest per-trip travel time savings. For example:

- On Treat Boulevard, Package 4 is estimated to reduce travel time by approximately 1 minute 48 seconds to 3 minutes 44 seconds per trip, depending on direction and assumed performance range.
- On Monument Boulevard, Package 4 is estimated to save approximately 1 minute 48 seconds to 3 minutes 37 seconds per trip.
- On Clayton Road, Package 4 produces estimated per-trip savings ranging from approximately 1 minute 25 seconds to 3 minutes 40 seconds.
- On Ygnacio Valley Road, Package 4 results in the largest per-trip savings, with estimated reductions ranging from approximately 2 minutes 37 seconds to 6 minutes 00 seconds, reflecting higher baseline congestion and longer corridor lengths.

Adjusted Average Trip Times

Applying the estimated savings to existing conditions shows measurable improvements in average trip times across all corridors and time periods. For example, under Package 4:

- Average full-day trip times on Monument Boulevard are reduced to approximately 5 to 11 minutes, depending on direction and assumed performance.
- On Clayton Road, average full-day trip times decrease to approximately 15 to 18 minutes.
- On Treat Boulevard, average full-day trip times decrease to approximately 14 to 20 minutes.
- On Ygnacio Valley Road, average full-day trip times decrease to approximately 24 to 27 minutes, reflecting the corridor's longer length and higher baseline travel times

PASSENGER DELAY CHANGES BY PACKAGE

The results show a clear progression of benefits as improvement packages become more comprehensive, with important refinements in magnitude and corridor-level performance reflected in the analysis (Table 13 & Table 14).

Passenger Delay Change by Package (Low End)		Existing Scenario	Package 1		Package 2		Package 3		Package 4	
Corridor	Approach	Passenger Delay in Passenger-Minutes	Daily Cumulative Passenger Delay in Passenger-Minutes							
			Passenger Delay	% Change	Passenger Delay	% Change	Passenger Delay	% Change	Passenger Delay	% Change
Clayton Rd	Towards Clayton (EB)	2028	1866	-8.0%	1515	-25.3%	2028	0.0%	1354	-33.2%
	Towards Concord (WB)	1475	1377	-6.6%	1123	-23.9%	1475	0.0%	1025	-30.5%
Monument Blvd	Towards Concord (EB)	1925	1925	0.0%	918	-52.3%	1638	-14.9%	631	-67.2%
	Towards Pleasant Hill (WB)	1875	1814	-3.3%	882	-53.0%	1664	-11.3%	610	-67.5%
Treat Blvd	Towards Clayton Rd (EB)	3431	3431	0.0%	3049	-11.1%	3341	-2.6%	2959	-13.8%
	Towards Contra Costa Center (WB)	833	833	0.0%	288	-65.4%	762	-8.6%	217	-74.0%
Ygnacio Valley Rd	Towards Clayton Rd (EB)	565	565	0.0%	443	-21.6%	562	-0.6%	440	-22.2%
	Towards Walnut Creek (WB)	501	495	-1.2%	317	-36.8%	497	-0.8%	306	-38.8%

Table 13: Change in Passenger Delay by Recommendation Package (Low End)

Passenger Delay Change by Package (High End)		Existing Scenario	Package 1		Package 2		Package 3		Package 4	
Corridor	Approach	Passenger Delay in Passenger-Minutes	Daily Cumulative Passenger Delay in Passenger-Minutes							
			Passenger Delay	% Change	Passenger Delay	% Change	Passenger Delay	% Change	Passenger Delay	% Change
Clayton Rd	Towards Clayton (EB)	2028	1866	-8.0%	1003	-50.6%	2028	0.0%	841	-58.5%
	Towards Concord (WB)	1475	1182	-19.8%	771	-47.7%	1475	0.0%	478	-67.6%
Monument Blvd	Towards Concord (EB)	1925	1925	0.0%	-89	-104.6%*	1396	-27.5%	-618	-132.1%*
	Towards Pleasant Hill (WB)	1875	1692	-9.8%	-99	-105.3%*	1664	-11.3%	-493	-126.3%*
Treat Blvd	Towards Clayton Rd (EB)	3431	3431	0.0%	2667	-22.3%	3251	-5.3%	2487	-27.5%
	Towards Contra Costa Center (WB)	833	833	0.0%	-257	-130.9%*	691	-17.1%	-400	-148.0%*
Ygnacio Valley Rd	Towards Clayton Rd (EB)	565	565	0.0%	321	-43.2%	560	-0.9%	316	-44.0%
	Towards Walnut Creek (WB)	501	483	-3.5%	132	-73.7%	495	-1.2%	108	-78.4%

*Note: Values below -100% indicate potential benefits that not only offset delays but also present opportunities for faster services where applicable.

Table 14: Change in Passenger Delay by Recommendation Package (High End)

Package 1: Stop Management

Package 1 produces limited passenger delay reductions across most corridors and directions. In several cases, passenger delay remains unchanged relative to existing conditions, particularly on Treat Boulevard and Ygnacio Valley Road in the eastbound direction. Where reductions do occur, they are modest, generally ranging from 0% to approximately 8% under the low-end scenario and up to 20% under the high-end scenario in select westbound movements on Clayton Road. These results confirm that stop management alone provides incremental delay reduction benefits.

Package 2: Signal Improvements

Package 2 continues to deliver the most consistent and substantial reductions in passenger delay across all corridors under both scenarios.

- Under the low-end scenario, passenger delay reductions typically range from approximately 11% to 65%, with the largest reductions observed on Treat Boulevard westbound and Monument Boulevard in both directions.
- Under the high-end scenario, reductions are significantly larger, frequently exceeding 50%, and in several cases surpassing 100%, indicating that estimated time savings exceed baseline passenger delay levels.
- These results reinforce the effectiveness of signal optimization, corridor signal coordination, re-striping/signage, and Transit Signal Priority in addressing passenger delay.

Package 3: Corridor Design Enhancements

Package 3 shows relatively modest passenger delay reductions compared to Package 2.

- Under the low-end scenario, reductions are generally limited, often less than 15%, and in several cases passenger delay remains close to existing levels.
- Under the high-end scenario, reductions increase somewhat, reaching up to approximately 28% in select Monument Boulevard movements, but still remain lower than those achieved under signal-focused strategies.
- This pattern indicates that corridor design enhancements alone are less effective at reducing passenger delay without complementary signal improvements.

Package 4: Comprehensive Transit Improvements

Package 4 consistently provides the largest passenger delay reductions across all corridors and directions under the revised data.

- Under the low-end scenario, reductions range from approximately 14% to 74%, with the greatest benefits observed on Treat Boulevard westbound and Monument Boulevard in both directions.
- Under the high-end scenario, reductions are more pronounced, commonly exceeding 40%, and reaching as high as 148% on Treat Boulevard westbound and over 130% on Monument Boulevard, reflecting compounded benefits from layered improvements.

Corridor-Level Observations

- Monument Boulevard exhibits the strongest response to improvement packages, with substantial passenger delay reductions under Packages 2 and 4 in both directions.
- Treat Boulevard shows large westbound benefits, particularly under signal-focused and comprehensive packages.
- Clayton Road experiences moderate reductions, with Package 2 and Package 4 providing the most consistent benefits.
- Ygnacio Valley Road has lower baseline passenger delay values, but it still demonstrates meaningful percentage reductions under Packages 2 and 4, especially under high-end assumptions. This corridor hosts several major destinations and higher density housing, and therefore has significant potential to increase transit ridership if passenger delay is reduced.

VEHICLE DELAY CHANGES BY PACKAGE (PER TRIP DELAY WEIGHTED BY SEGMENT TRIPS)

The vehicle delay analysis evaluates changes in cumulative vehicle delay, measured in vehicle-minutes, across corridors, directions, and two benefit assumptions (low-end and high-end). Overall, the results show a consistent pattern in which vehicle delay reductions increase as improvement packages become more comprehensive, with the most substantial reductions occurring under Packages 2 and 4 (Table 15 & Table 16).

Vehicle Delay Change by Package (Low End)		Existing Scenario	Package 1		Package 2		Package 3		Package 4	
Corridor	Approach	Vehicle Delay in minutes	Vehicle Delay in Minutes							
			Vehicle Delay	% Change	Vehicle Delay	% Change	Vehicle Delay	% Change	Vehicle Delay	% Change
Clayton Rd	Towards Clayton (EB)	418	396	-5.4%	331	-20.9%	418	0.0%	308	-26.3%
	Towards Concord (WB)	346	335	-3.0%	258	-25.3%	346	0.0%	248	-28.4%
Monument Blvd	Towards Concord (EB)	188	188	0.0%	81	-56.8%	156	-16.9%	49	-73.7%
	Towards Pleasant Hill (WB)	219	212	-3.0%	121	-44.7%	196	-10.3%	92	-57.9%
Treat Blvd	Towards Clayton Rd (EB)	452	452	0.0%	363	-19.7%	431	-4.6%	342	-24.3%
	Towards Contra Costa Center (WB)	155	155	0.0%	50	-67.8%	139	-10.5%	34	-78.3%
Ygnacio Valley Rd	Towards Clayton Rd (EB)	268	268	0.0%	208	-22.3%	267	-0.3%	207	-22.6%
	Towards Walnut Creek (WB)	171	169	-0.7%	108	-36.9%	170	-0.4%	106	-38.0%

Table 15: Change in Vehicle Delay by Recommendation Package (Low End)

Vehicle Delay Change by Package (High End)		Existing Scenario	Package 1		Package 2		Package 3		Package 4	
Corridor	Approach	Vehicle Delay in minutes	Vehicle Delay in Minutes							
			Vehicle Delay	% Change	Vehicle Delay	% Change	Vehicle Delay	% Change	Vehicle Delay	% Change
Clayton Rd	Towards Clayton (EB)	418	361	-13.8%	244	-41.8%	418	0.0%	186	-55.6%
	Towards Concord (WB)	346	314	-9.1%	171	-50.6%	346	0.0%	139	-59.7%
Monument Blvd	Towards Concord (EB)	188	188	0.0%	-25	-113.5%*	130	-31.1%	-84	-144.6%*
	Towards Pleasant Hill (WB)	219	199	-8.9%	24	-88.8%	174	-20.5%	-40	-118.3%*
Treat Blvd	Towards Clayton Rd (EB)	452	452	0.0%	274	-39.4%	410	-9.2%	232	-48.6%
	Towards Contra Costa Center (WB)	155	155	0.0%	-55	-135.5%*	122	-21.1%	-88	-156.6%*
Ygnacio Valley Rd	Towards Clayton Rd (EB)	268	268	0.0%	148	-44.6%	267	-0.4%	147	-45.0%
	Towards Walnut Creek (WB)	167	167	-2.1%	45	-73.9%	170	-0.6%	40	-76.5%

*Note: Values below -100% indicate potential benefits that not only offset delays but also present opportunities for faster services where applicable.

Table 16: Change in Vehicle Delay by Recommendation Package (High End)

Package 1: Stop Management

Under both the low-end and high-end scenarios, Package 1 results in limited reductions in vehicle delay. In most corridor–direction combinations, vehicle delay remains unchanged or is reduced by only a small margin. Under the low-end scenario, reductions are generally between 0% and 6%, while under the high-end scenario, reductions increase modestly, reaching up to approximately 14% in select Clayton Road movements. These results indicate that stop management alone has a relatively minor effect on overall vehicle delay.

Package 2: Signal Improvements

Package 2 produces the most consistent and significant reductions in vehicle delay across all corridors.

- Under the low-end scenario, vehicle delay reductions generally range from approximately 20% to nearly 70%, with especially large reductions observed on Treat Boulevard westbound and Monument Boulevard in both directions.
- Under the high-end scenario, reductions are substantially larger, frequently exceeding 40%, and in several cases exceeding 100%, indicating that estimated time savings exceed baseline vehicle delay levels.

These results demonstrate that signal optimization, corridor signal coordination, re-striping/signage, and Transit Signal Priority are highly effective at reducing vehicle delay.

Package 3: Corridor Design Enhancements

Under the revised data, Package 3 provides modest vehicle delay reductions compared to signal-focused strategies.

- Under the low-end scenario, reductions are generally below 17%, and in several cases vehicle delay remains close to existing levels.
- Under the high-end scenario, reductions increase but typically remain below 32%, indicating that corridor design enhancements alone do not consistently address the primary sources of vehicle delay.

This pattern suggests that physical priority treatments are most effective when implemented in combination with signal-based strategies.

Package 4: Comprehensive Transit Improvements

Package 4 consistently yields the largest vehicle delay reductions across all corridors and directions.

- Under the low-end scenario, vehicle delay reductions generally range from approximately 22% to 78%, with the greatest benefits observed on Treat Boulevard westbound and Monument Boulevard.
- Under the high-end scenario, reductions are more pronounced, commonly exceeding 45%, and reaching over 150% in several corridor–direction combinations.

These results reflect the compounding benefits of combining stop management, signal improvements, and corridor design enhancements into a single comprehensive package.

Corridor-Level Observations

- Monument Boulevard and Treat Boulevard experience the strongest vehicle delay reductions under Packages 2 and 4, consistent with their higher baseline congestion levels.
- Clayton Road shows moderate but consistent reductions, particularly under signal-focused and comprehensive packages.
- Ygnacio Valley Road has lower baseline vehicle delay values, but still demonstrates meaningful percentage reductions under Packages 2 and 4, especially under the high-end scenario. This corridor hosts several major destinations and higher density housing, and therefore has significant potential to increase transit ridership if vehicle delay is reduced.

Conclusion

This Transit Corridor Study provides a comprehensive, evidence-based assessment of transit performance, community priorities, and improvement opportunities along Clayton Road, Monument Boulevard, Treat Boulevard, and Ygnacio Valley Road. By integrating technical analyses, stakeholder input, and community engagement, the study establishes a clear and prioritized framework for transit investments.

Transit Delay Is Corridor-Specific and Directional

Existing conditions analysis confirms that both passenger delay and vehicle delay vary by corridor and direction, underscoring the need for targeted, corridor-specific solutions. Monument Boulevard and Treat Boulevard experience the highest cumulative passenger delay, while Ygnacio Valley Road exhibits the highest per-trip vehicle delay. Clayton Road shows moderate but consistent delay across both metrics. These differences highlight that transit challenges are not uniform and must be addressed with location-specific strategies.

Signal-Based Strategies Drive the Largest Reductions in Delay

Across both passenger and vehicle delay analyses, signal-focused improvement packages consistently produce the greatest and most reliable benefits. Packages that include signal optimization, corridor signal coordination, restriping, and Transit Signal Priority (TSP) result in the largest reductions in both cumulative passenger delay and vehicle delay under both low-end and high-end assumptions. In many corridor–direction combinations, these strategies reduce delay by 20 to 70 percent under conservative assumptions, with substantially larger reductions under higher-end benefit scenarios.

Stop Management and Corridor Design Provide Incremental Benefits

Bus stop rebalancing and corridor design enhancements contribute to measurable reductions in delay, but the updated analyses show that these strategies alone yield relatively modest improvements compared to signal-based approaches. Stop management generally produces small reductions in both passenger and vehicle delay, while corridor design enhancements provide moderate benefits that vary by location. These findings indicate that such strategies are most effective when implemented in combination with signal improvements, rather than as standalone solutions.

Comprehensive Packages Deliver Compounding Benefits

The anticipated benefits analysis demonstrates that Package 4 (Comprehensive Transit Improvements)—which combines stop management, signal improvements, and corridor design enhancements—produces the largest and most consistent reductions in both passenger and vehicle delay across all corridors. The results show clear compounding effects, with comprehensive packages outperforming individual strategies under both benefit assumptions. This reinforces the value of integrated, multi-tool approaches for achieving meaningful improvements in transit speed and reliability.

Equity and Community Priorities Align with Technical Findings

Community engagement and survey results reinforce the technical analysis. Respondents identified reliability, safety, and integration with surrounding communities as key priorities. Corridors serving Equity Priority Communities, particularly Monument Boulevard, also experience higher passenger delay and show strong responsiveness to improvement packages. This alignment supports prioritizing investments where both technical need and community benefit are greatest.

A Transparent Framework Supports Informed Decision-Making

The project's prioritization framework—developed and refined through Technical Advisory Committee input—integrates effectiveness, equity, safety, constructability, cost, funding feasibility, and community support. The resulting rankings and project packages provide a transparent, defensible basis for advancing improvements while allowing flexibility to respond to funding availability and implementation constraints.

Next Steps

Based on the study findings, County Connection and partner agencies may consider the following next steps:

- **Advance near-term, signal-focused improvements**, including signal optimization, corridor coordination, and Transit Signal Priority, which consistently demonstrate the strongest reductions in both passenger and vehicle delay.
- **Pursue phased implementation**, beginning with lower-cost, high-impact strategies while planning for more comprehensive corridor investments over time.
- **Coordinate with local jurisdictions** to refine designs, confirm feasibility, and align proposed improvements with planned roadway and signal projects.
- **Use the prioritization framework to guide funding applications**, leveraging quantified benefits related to delay reduction, equity outcomes, and customer experience.
- **Continue stakeholder coordination and public communication** as projects move toward implementation, ensuring transparency and alignment with community expectations.

Together, these steps provide a clear path from analysis to action, supporting data-driven investments that improve transit speed, reliability, and customer experience across the study corridors.

Appendix A: Online Survey Overview

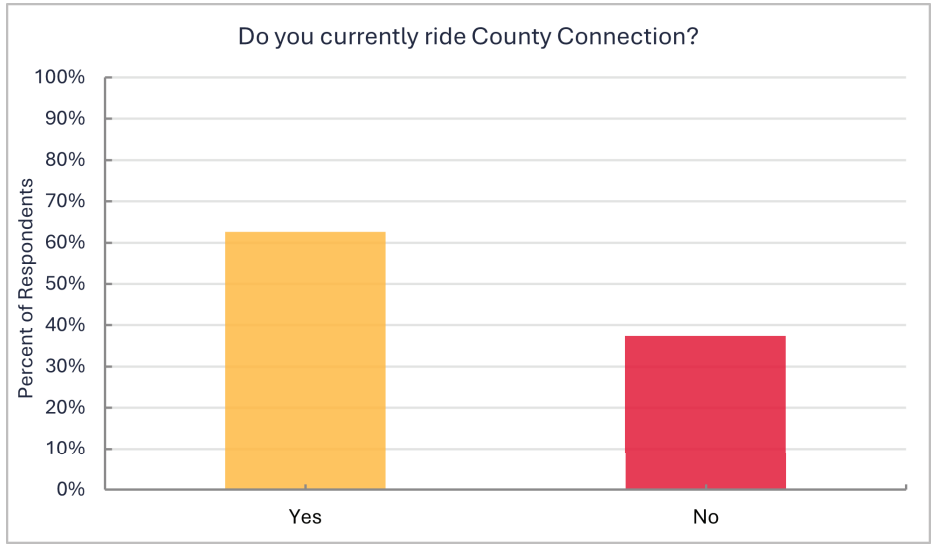


Figure 15: Do you currently ride County Connection?

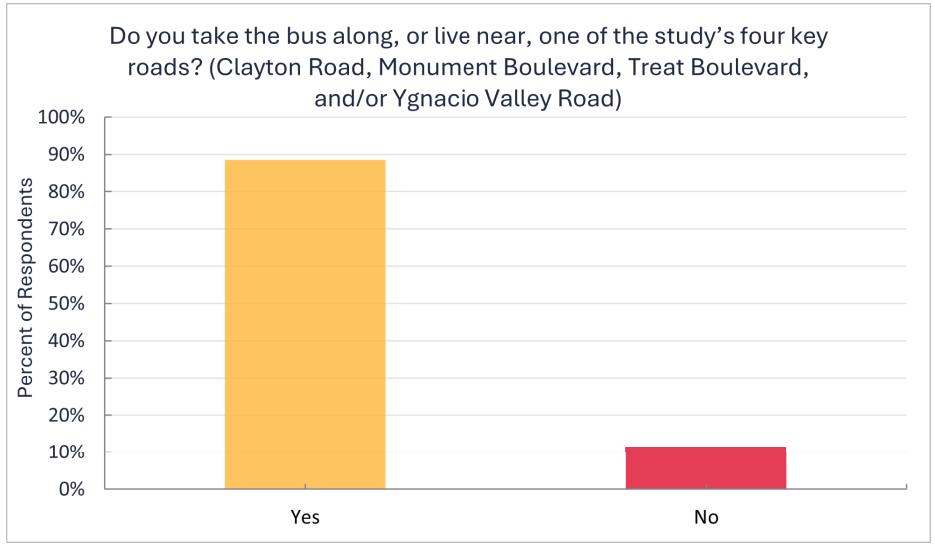


Figure 16: Do you take the bus along, or live near, one of the study's four key roads?

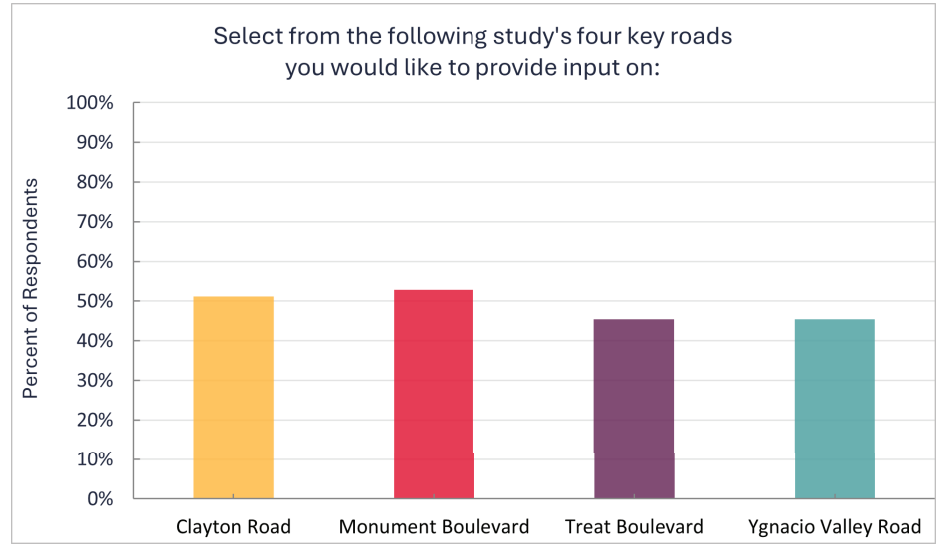


Figure 17: Which of the study's four key roads you would like to provide input on?

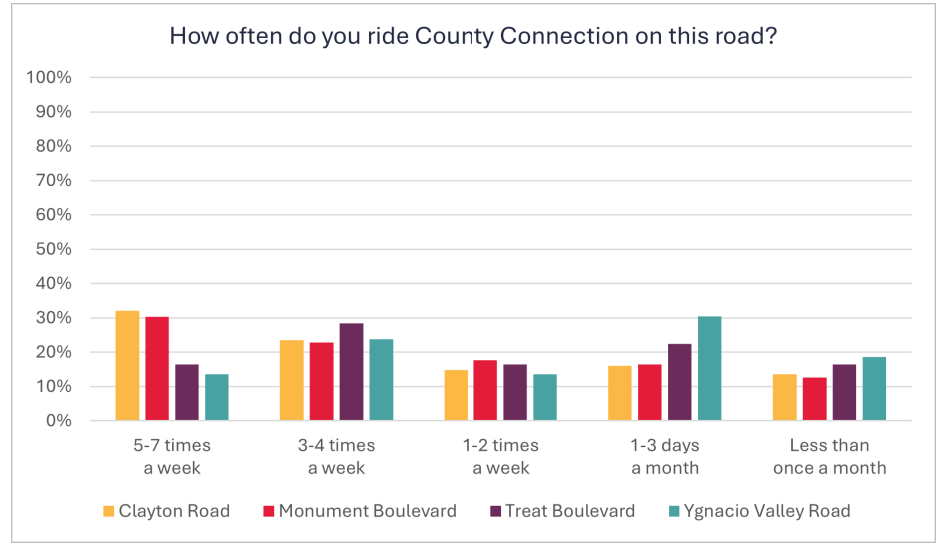


Figure 18: How often do you ride County Connection on this road?

	Non-Corridor User	Clayton Road	Monument Boulevard	Treat Boulevard	Ygnacio Valley Road
Total # of Respondents	93	75	76	64	58
ATTRIBUTE SCORES BREAKDOWN					
Increase bus service speeds and reduce bus delays, thereby reducing travel time for passengers	2.71	2.61	2.59	2.61	2.4
Make bus schedules more reliable	2.42	2.49	2.54	2.56	2.67
Make bus stops more convenient, safer and more efficient	2.39	2.48	2.42	2.48	2.57
Integrate bus stops into the surrounding community for better accessibility	2.48	2.41	2.45	2.34	2.36

Table 17: Attribute Scores Breakdown

ZIP Code	Count	Corridors
94521	41	Clayton Road, Treat Boulevard, Ygnacio Valley Road
94520	25	Clayton Road, Monument Boulevard
94518	22	Monument Boulevard, Treat Boulevard, Ygnacio Valley Road
94519	13	Clayton Road
94598	11	Treat Boulevard, Ygnacio Valley Road

Table 18: What is your home zip code?

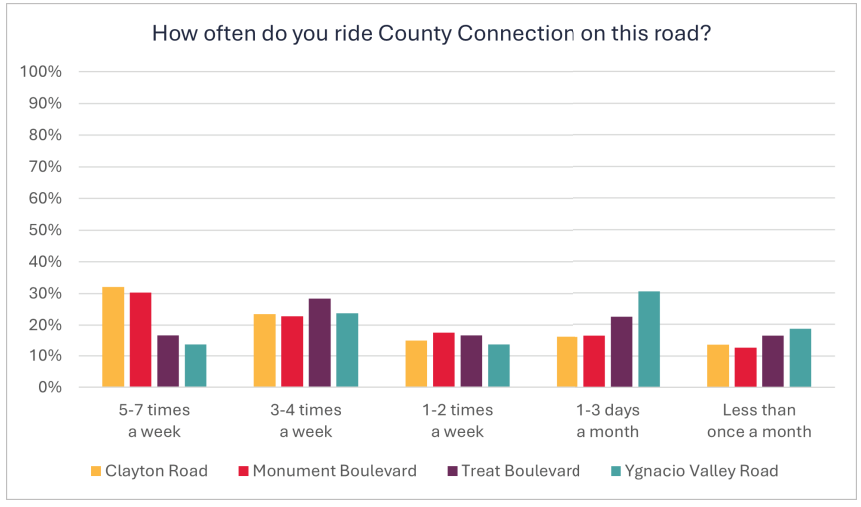


Figure 19: How often do you ride County Connection on this road?

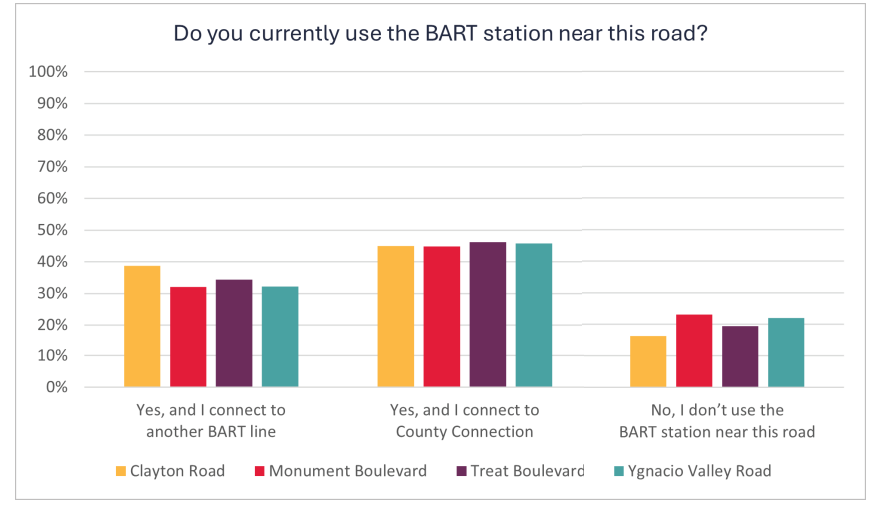


Figure 20: Do you currently use the BART station near this road?

Appendix B:
Per Trip Time Savings Assumptions & Empirical Evidence

Tool 1: Bus Stop Rebalancing

1. North Hollywood to Pasadena BRT Corridor P&E Study (https://www.metro.net/documents/2025/01/appendix-u_growth-inducing-impacts-technical-reportpdf/)
2. Los Angeles County Bus Rapid Transit and Street Design Improvement Study (https://libraryarchives.metro.net/dpgtl/studies/2013-los-angeles-county-bus-rapid-transit-and-street-design-improvement-study-final.pdf)

Tool 2: Signal Optimization

3. North Hollywood to Pasadena BRT Corridor P&E Study (https://www.metro.net/documents/2025/01/appendix-u_growth-inducing-impacts-technical-reportpdf/)
4. Los Angeles County Bus Rapid Transit and Street Design Improvement Study (https://libraryarchives.metro.net/dpgtl/studies/2013-los-angeles-county-bus-rapid-transit-and-street-design-improvement-study-final.pdf)

Tool 3: Corridor Signal Coordination

5. Park, Byungkyu Brian, and Yin Chen. Quantifying the benefits of coordinated actuated traffic signal systems: A case study. No. VTRC 11-CR2. 2010.
6. Al-Hyasat, Esra'A., and Taqwa I. Alhadidi. "Evaluating the performance of implementing regionally coordinating bus priority signals under different control schemes." Computational Urban Science 4.1 (2024): 22.
7. Slavin, Courtney Natasha, Miguel A. Figliozzi, and Wei Feng. "An Evaluation of the Impacts of an Adaptive Coordinated Traffic Signal System on Transit Performance: a case study on Powell Boulevard (Portland, Oregon)." (2012).
8. Alkaissi, Zainab Ahmed. "Effect of signal coordination on the traffic operation of urban corridor." Tikrit Journal of Engineering Sciences 30.1 (2023): 12-24.
9. North Hollywood to Pasadena BRT Corridor P&E Study (https://www.metro.net/documents/2025/01/appendix-u_growth-inducing-impacts-technical-reportpdf/)
10. Los Angeles County Bus Rapid Transit and Street Design Improvement Study (https://libraryarchives.metro.net/dpgtl/studies/2013-los-angeles-county-bus-rapid-transit-and-street-design-improvement-study-final.pdf)

Tool 4: Transit Signal Priority

11. King County Metro TSP Policies and Strategies (tsp-policies-and-strategies-7-22-2021.pdf)
12. ITS Development Evaluation (Transit signal priority reduced average bus travel times by 7.5 and 15 percent along major bus corridors in Los Angeles and Chicago, respectively. | ITS Deployment Evaluation)
13. Queue-Jump Lane, Transit Signal Priority, and Stop Location: Evaluation of Transit Preferential Treatments using Microsimulation (2-5_Cesme-et-al_Queue-Jump-TSP-and-Stop-Location_2014.pdf)

Tool 5: Re-Striping/Signage

14. North Hollywood to Pasadena BRT Corridor P&E Study (https://www.metro.net/documents/2025/01/appendix-u_growth-inducing-impacts-technical-reportpdf/)

15. Los Angeles County Bus Rapid Transit and Street Design Improvement Study (https://libraryarchives.metro.net/dpgtl/studies/2013-los-angeles-county-bus-rapid-transit-and-street-design-improvement-study-final.pdf)

16. Highway Capacity Manual

Tool 6: Transit Queue-Jump

17. King County Metro TSP Policies and Strategies (tsp-policies-and-strategies-7-22-2021.pdf)

18. ITS Development Evaluation (Transit signal priority reduced average bus travel times by 7.5 and 15 percent along major bus corridors in Los Angeles and Chicago, respectively. | ITS Deployment Evaluation)

19. Queue-Jump Lane, Transit Signal Priority, and Stop Location: Evaluation of Transit Preferential Treatments using Microsimulation (2-5_Cesme-et-al_Queue-Jump-TSP-and-Stop-Location_2014.pdf)

Tool 7: Dedicated Bus Lane

20. North Hollywood to Pasadena BRT Corridor P&E Study (https://www.metro.net/documents/2025/01/appendix-u_growth-inducing-impacts-technical-reportpdf/)

21. Los Angeles County Bus Rapid Transit and Street Design Improvement Study (https://libraryarchives.metro.net/dpgtl/studies/2013-los-angeles-county-bus-rapid-transit-and-street-design-improvement-study-final.pdf)

Appendix C:
Recommendations by Project Packages & Anticipated Benefits

Corridor	Direction	Boundary	Package 1 (hr:min:sec)	Package 2 (hr:min:sec)	Package 3 (hr:min:sec)	Package 4 (hr:min:sec)
Clayton Rd	EB	Low	0:00:25	0:01:20	0:00:00	0:01:45
	EB	High	0:01:00	0:02:40	0:00:00	0:03:40
	WB	Low	0:00:05	0:01:20	0:00:00	0:01:25
	WB	High	0:00:15	0:02:40	0:00:00	0:02:55
Monument Blvd	EB	Low	0:00:00	0:01:25	0:00:24	0:01:49
	EB	High	0:00:00	0:02:50	0:00:44	0:03:34
	WB	Low	0:00:05	0:01:19	0:00:17	0:01:48
	WB	High	0:00:15	0:02:37	0:00:35	0:03:37
Treat Blvd	EB	Low	0:00:00	0:01:20	0:00:32	0:01:52
	EB	High	0:00:00	0:02:40	0:01:04	0:03:44
	WB	Low	0:00:00	0:01:20	0:00:28	0:01:48
	WB	High	0:00:00	0:02:40	0:00:56	0:03:36
Ygnacio Valley Rd	EB	Low	0:00:00	0:02:30	0:00:07	0:02:37
	EB	High	0:00:00	0:05:00	0:00:10	0:05:10
	WB	Low	0:00:00	0:02:55	0:00:07	0:03:02
	WB	High	0:00:00	0:05:50	0:00:10	0:06:00

Table 19: Total Transit Time Saving Per Trip for the corridor segments

Corridor	Direction	Boundary	Existing Trip Time (hr:min:sec)	Package 1 (hr:min:sec)	Package 2 (hr:min:sec)	Package 3 (hr:min:sec)	Package 4 (hr:min:sec)
Clayton Rd	EB	Low	0:18:31	0:18:06	0:17:11	0:18:31	0:16:46
	EB	High	0:18:31	0:17:31	0:15:51	0:18:31	0:14:51
	WB	Low	0:20:05	0:20:00	0:18:45	0:20:05	0:18:40
	WB	High	0:20:05	0:19:50	0:17:25	0:20:05	0:17:10
Monument Blvd	EB	Low	0:08:53	0:08:53	0:07:28	0:08:29	0:07:04
	EB	High	0:08:53	0:08:53	0:06:03	0:08:09	0:05:34
	WB	Low	0:13:13	0:13:08	0:11:54	0:12:56	0:11:25
	WB	High	0:13:13	0:12:58	0:10:36	0:12:38	0:09:36
Treat Blvd	EB	Low	0:22:32	0:22:32	0:21:12	0:22:00	0:20:40
	EB	High	0:22:32	0:22:32	0:19:52	0:21:27	0:18:47
	WB	Low	0:17:58	0:17:58	0:16:38	0:17:30	0:16:10
	WB	High	0:17:58	0:17:58	0:15:18	0:17:02	0:14:22
Ygnacio Valley Rd	EB	Low	0:29:47	0:29:47	0:27:17	0:29:40	0:27:10
	EB	High	0:29:47	0:29:47	0:24:47	0:29:37	0:24:37
	WB	Low	0:29:45	0:29:45	0:26:50	0:29:38	0:26:43
	WB	High	0:29:45	0:29:45	0:23:55	0:29:35	0:23:45

Table 20: Average Transit Trip Time for the corridor segments

Corridor	Direction	Boundary	Existing Trip Time (hr:min:sec)	Package 1 (hr:min:sec)	Package 2 (hr:min:sec)	Package 3 (hr:min:sec)	Package 4 (hr:min:sec)
Clayton Rd	EB	Low	0:18:48	0:18:23	0:17:28	0:18:48	0:17:03
	EB	High	0:18:48	0:17:48	0:16:08	0:18:48	0:15:08
	WB	Low	0:21:24	0:21:19	0:20:04	0:21:24	0:19:59
	WB	High	0:21:24	0:21:09	0:18:44	0:21:24	0:18:29
Monument Blvd	EB	Low	0:08:14	0:08:14	0:06:49	0:07:50	0:06:25
	EB	High	0:08:14	0:08:14	0:05:34	0:07:30	0:05:34
	WB	Low	0:13:41	0:13:36	0:12:22	0:13:24	0:11:53
	WB	High	0:13:41	0:13:26	0:11:04	0:13:06	0:10:04
Treat Blvd	EB	Low	0:21:34	0:21:34	0:20:14	0:21:02	0:19:42
	EB	High	0:21:34	0:21:34	0:18:54	0:20:29	0:17:49
	WB	Low	0:20:21	0:20:21	0:19:01	0:19:53	0:18:33
	WB	High	0:20:21	0:20:21	0:17:41	0:19:25	0:16:45
Ygnacio Valley Rd	EB*	Low	0:14:35	0:14:35	0:12:10	0:14:35	0:12:10
	EB*	High	0:14:35	0:14:35	0:09:45	0:14:35	0:09:45
	WB	Low	0:36:04	0:36:04	0:33:09	0:35:57	0:33:02
	WB	High	0:36:04	0:36:04	0:30:14	0:35:54	0:30:04

*Some parts on Ygnacio Valley Rd during AM Peak hour do not have sufficient data. However, segment data is available- Walnut Creek BART to Oak Grove Rd.

Table 21: Average Transit Trip Time for the corridor segments – AM Peak

Corridor	Direction	Boundary	Existing Trip Time (hr:min:sec)	Package 1 (hr:min:sec)	Package 2 (hr:min:sec)	Package 3 (hr:min:sec)	Package 4 (hr:min:sec)
Clayton Rd	EB	Low	0:18:48	0:18:23	0:17:28	0:18:48	0:17:03
	EB	High	0:18:48	0:17:48	0:16:08	0:18:48	0:15:08
	WB	Low	0:20:14	0:20:09	0:18:54	0:20:14	0:18:49
	WB	High	0:20:14	0:19:59	0:17:34	0:20:14	0:17:19
Monument Blvd	EB	Low	0:09:15	0:09:15	0:07:50	0:08:51	0:07:26
	EB	High	0:09:15	0:09:15	0:06:25	0:08:31	0:05:41
	WB	Low	0:13:37	0:13:32	0:12:18	0:13:20	0:11:49
	WB	High	0:13:37	0:13:22	0:11:00	0:13:02	0:10:00
Treat Blvd	EB	Low	0:22:07	0:22:07	0:20:47	0:21:35	0:20:15
	EB	High	0:22:07	0:22:07	0:19:27	0:21:02	0:18:22
	WB	Low	0:17:27	0:17:27	0:16:07	0:16:59	0:15:39
	WB	High	0:17:27	0:17:27	0:14:47	0:16:31	0:13:51
Ygnacio Valley Rd	EB	Low	0:32:35	0:32:35	0:30:05	0:32:28	0:29:58
	EB	High	0:32:35	0:32:35	0:27:35	0:32:25	0:27:25
	WB*	Low	0:17:38	0:17:33	0:14:58	0:17:38	0:14:53
	WB*	High	0:17:38	0:17:23	0:12:18	0:17:38	0:12:03

*Some parts on Ygnacio Valley Rd during Midday hour do not have sufficient data. However, segment data is available- Oak Grove Rd to Walnut Creek BART.

Table 22: Average Transit Trip Time for the corridor segments – Midday

Corridor	Direction	Boundary	Existing Trip Time (hr:min:sec)	Package 1 (hr:min:sec)	Package 2 (hr:min:sec)	Package 3 (hr:min:sec)	Package 4 (hr:min:sec)
Clayton Rd	EB	Low	0:18:58	0:18:33	0:17:38	0:18:58	0:17:13
	EB	High	0:18:58	0:17:58	0:16:18	0:18:58	0:15:18
	WB	Low	0:19:47	0:19:42	0:18:27	0:19:47	0:18:22
	WB	High	0:19:47	0:19:32	0:17:07	0:19:47	0:16:52
Monument Blvd	EB	Low	0:09:24	0:09:24	0:07:59	0:09:00	0:07:35
	EB	High	0:09:24	0:09:24	0:06:34	0:08:40	0:05:50
	WB	Low	0:12:56	0:12:51	0:11:37	0:12:39	0:11:08
	WB	High	0:12:56	0:12:41	0:10:19	0:12:21	0:09:19
Treat Blvd	EB	Low	0:23:57	0:23:57	0:22:37	0:23:24	0:22:04
	EB	High	0:23:57	0:23:57	0:21:17	0:22:52	0:20:12
	WB	Low	0:16:35	0:16:35	0:15:15	0:16:07	0:14:47
	WB	High	0:16:35	0:16:35	0:13:55	0:15:38	0:12:58
Ygnacio Valley Rd	EB	Low	0:29:46	0:29:46	0:27:16	0:29:39	0:27:09
	EB	High	0:29:46	0:29:46	0:24:46	0:29:36	0:24:36
	WB*	Low	0:17:42	0:17:37	0:15:02	0:17:42	0:14:57
	WB*	High	0:17:42	0:17:27	0:12:22	0:17:42	0:12:07

*Some parts on Ygnacio Valley Rd during PM Peak hour do not have sufficient data. However, segment data is available- Oak Grove Rd to Walnut Creek BART.

Table 23: Average Transit Trip Time for the corridor segments – PM Peak