Solano Transportation Authority

California State Route 37 Express Bus /TDM Plan

March 2024

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1. CORRIDOR OVERVIEW

California State Route 37 (SR 37) is a 21-mile long state highway that connects Interstate 80 in the Solano County city of Vallejo with U.S. Highway 101 in the Marin County city of Novato. Running along the northern shore of San Pablo Bay, SR 37 is the most direct connection between eastern and western portions of the North Bay, and therefore serves as a vital link for travelers traveling between Solano, Napa, Sonoma, and Marin Counties.

Although the corridor has been proposed to be upgraded to freeway standards since the 1950s, due to various environmental and economic challenges it exists as a two-lane highway for most of its length and consistently suffers from heavy congestion and travel time delays. Resulting from these issues is an interest among North Bay jurisdictions, including the transportation authorities of Solano, Napa, Marin, and Sonoma Counties, to explore the feasibility of an optimized transit solution for the SR 37 corridor that would better enable travelers to connect across the North Bay without a private vehicle and also alleviate the continuing traffic congestion along SR 37 (estimated in 2019 at 13-hours a day). With this plan, the Solano Transportation Authority (STA) is building upon the findings of a previously completed SR 37 Travel Behavior and Transit Feasibility Study (2019) to identify appropriate mobility solutions for the corridor that are both feasible and data informed.

Figure 1: SR 37 Corridor

2. REVIEW OF PREVIOUS CORRIDOR STUDY

A. Demand Estimation

In 2019, the Solano Transportation Authority (STA), the Napa Valley Transportation Authority (NVTA), the Transportation Authority of Marin (TAM), and the Sonoma County Transportation Authority (SCTA) sponsored the development of an SR 37 Travel Behavior and Transit Feasibility Study. Delivered in response to concerns about traffic congestion and sea level rise along the corridor, the Study involved a quantitative analysis of relevant, corridor-wide baseline data to determine how the corridor was being used by auto traffic. Specifically, data from various sources was evaluated to determine the SR 37 corridor's existing auto travel demands, the typical origin-destination pairs for trips being made along the corridor, and the demographic characteristics of corridor drivers.

Overall, the pre-pandemic Study determined that corridor travel is dominated by travel to lower-density, dispersed destinations, primarily by Solano County residents making long-distance commute trips to access employment centers in Marin and Sonoma Counties. Additionally, the three cities that serve as the point of origin for most trips along the corridor are Vallejo, Fairfield, and Novato, which, based on their socioeconomic and demographic characteristics, each indicate a high propensity for transit use along SR 37. Furthermore, ridesharing was indicated as currently being engaged substantially for travel between these cities and utilized moderately but still at a significant rate for travel between smaller communities within the North Bay counties that SR 37 connects.

B. Proposed Service Concept

Based on estimated pre-pandemic demand, travel volumes, overall transit propensity, and potential vehicle miles traveled (VMT) reduction, greenhouse gas emissions (GHG) reduction, and equity-related benefits used as metrics for state funding allocation, the Study determined that a fixed-route transit service concept between Fairfield, Vallejo, and Novato is warranted for further exploration and potential implementation. Specifically, the Study identified two potential express bus routes that would be viable service options for the corridor:

- A line connecting the Fairfield Transportation Center and Downtown Novato, serving Vallejo as an intermediate destination, and
- A line connecting Vallejo and Downtown Novato directly.

While the Study recommended fixed-route options for these major origin-destination pairs, it identified enhanced pooling services as potential solutions for serving the more dispersed locations to which corridor-based trips are made. Furthermore, the Study recommended the addition of a deviated fixed-route minibus service that would connect many of the express bus stops with communities located adjacent, but not directly on, the corridor.

3. POST-PANDEMIC TRAVEL MARKET AND DEMAND

A. Comparing Conditions – Before and After the Onset of COVID-19

While the SR 37 Travel Behavior and Transit Feasibility Study provided a thorough and comprehensive assessment of the SR 37 corridor-based mobility environment, its 2019 delivery date means that its

findings and recommendations predate the onset of the COVID-19 pandemic. Considering the extent to which COVID-19 has affected travel behavior and mobility markets nationwide; a reevaluation of the SR 37 corridor's travel market and related demands is necessary to confirm whether the previous Study's findings and recommendations are still valid.

Important to note is that the assessment methodology employed during this plan's post-pandemic market and travel demand reevaluation differs from the methodology used in the 2019 study, primarily based on its "Big Data" comprehensiveness and the advanced analysis capabilities that have emerged over the past four years. While the 2019 study relied on analysis of various forms of baseline travel data, the updated assessment utilizes the Replica™ tool, which uses advanced modeling techniques based on a wide range of data inputs, including actual traveler cell phone and credit card transaction data. This produces large-scale data outputs that indicate current travel patterns and corridor demand in a way that is more clear, measurable, and comprehensive.

B. Travel Demand Patterns

For purposes of this analysis, weekday travel during the Spring of 2023 between major cities across the SR 37 corridor has been obtained. Furthermore, travel patterns have been split into two groups.

Group 1 accounts for trips that begin in major cities in the eastern part of the corridor:

- American Canyon
- Benicia
- Fairfield
- Napa
- Suisun City
- Vacaville
- Vallejo

Group 2 accounts for trips that begin in major cities in the western part of the corridor:

- Novato
- Petaluma
- Rohnert Park
- San Rafael
- Santa Rosa

The analysis indicates that an average of 15,000 to 16,000 round-trips are made each weekday across the corridor. Travel is most significant between Vallejo and San Rafael, Napa and Santa Rosa, Napa and Petaluma, and Vallejo and Novato – averaging more than 1,000 round-trips in each city pair on weekdays. While travel between Napa and Santa Rosa and Napa and Petaluma is included in this corridor study, Highway 37 is unlikely to be utilized due to the out of direction travel that would be involved. The tables below provide a high-level view of these patterns.

Table 1: Westbound Travel Along SR 37

Travel from Group 1 (Westbound)						
Origin	**Novato**	**Petaluma**	**Rohnert Park**	**San Rafael**	**Santa Rosa**	**Grand Total**
American Canyon	317	213	75	389	138	1,132
Benicia	366	165	15	162	110	818
Fairfield	554	413	139	825	484	2,415
Napa	441	1,371	411	608	1,460	4,291
Suisun City	202	66	41	129	67	505
Vacaville	110	248	152	318	457	1,285
Vallejo	1,258	847	307	2,005	631	5,048

Table 2: Eastbound Travel Along SR 37

Travel from Group 2 (Eastbound)								
Origin	**American Canyon**	**Benicia**	**Fairfield**	**Napa**	**Suisun City**	**Vacaville**	**Vallejo**	**Grand Total**
Novato	322	360	580	416	181	103	1,309	3,271
Petaluma	208	165	424	1,248	63	241	806	3,155
Rohnert Park	94	13	200	470	57	171	373	1,378
San Rafael	386	138	815	571	132	236	2,079	4,357
Santa Rosa	152	122	570	1,500	87	465	737	3,633

A significant portion of these trips occur during peak periods of travel, with westbound travel heaviest during the morning peak hours and eastbound travel heaviest during evening peak hours. These are highlighted in the figures below.

Figure 2: Westbound Travel Along SR 37 by Hour

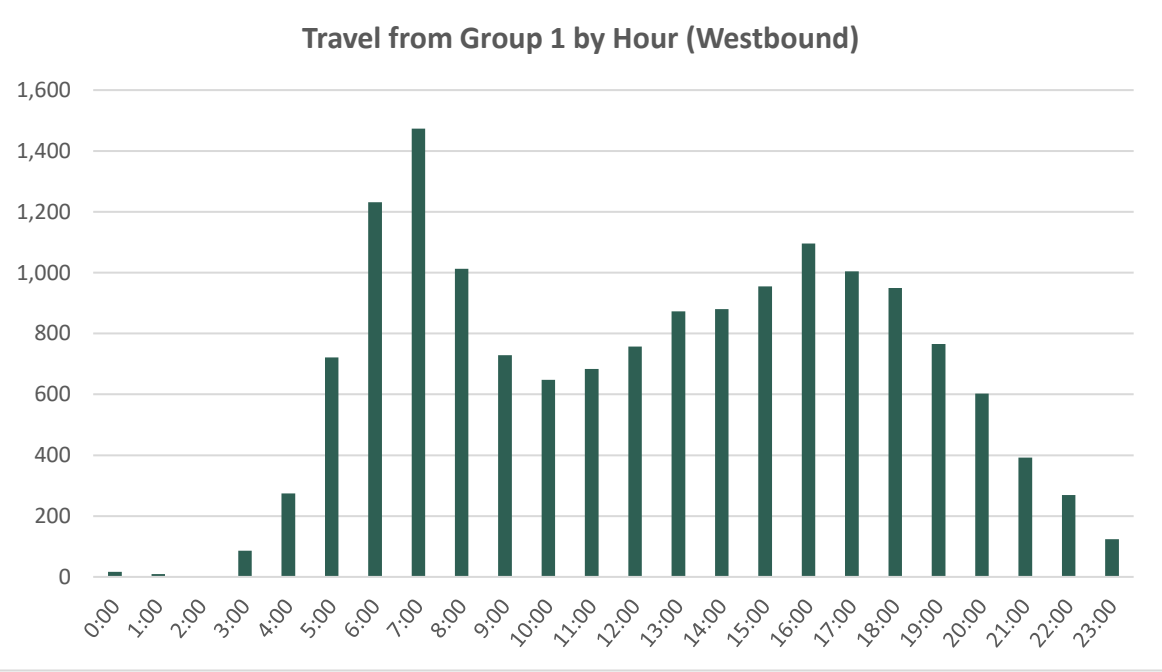


Figure 3: Origin-Destination Pairs with Over 250 Trips (Westbound Travel)

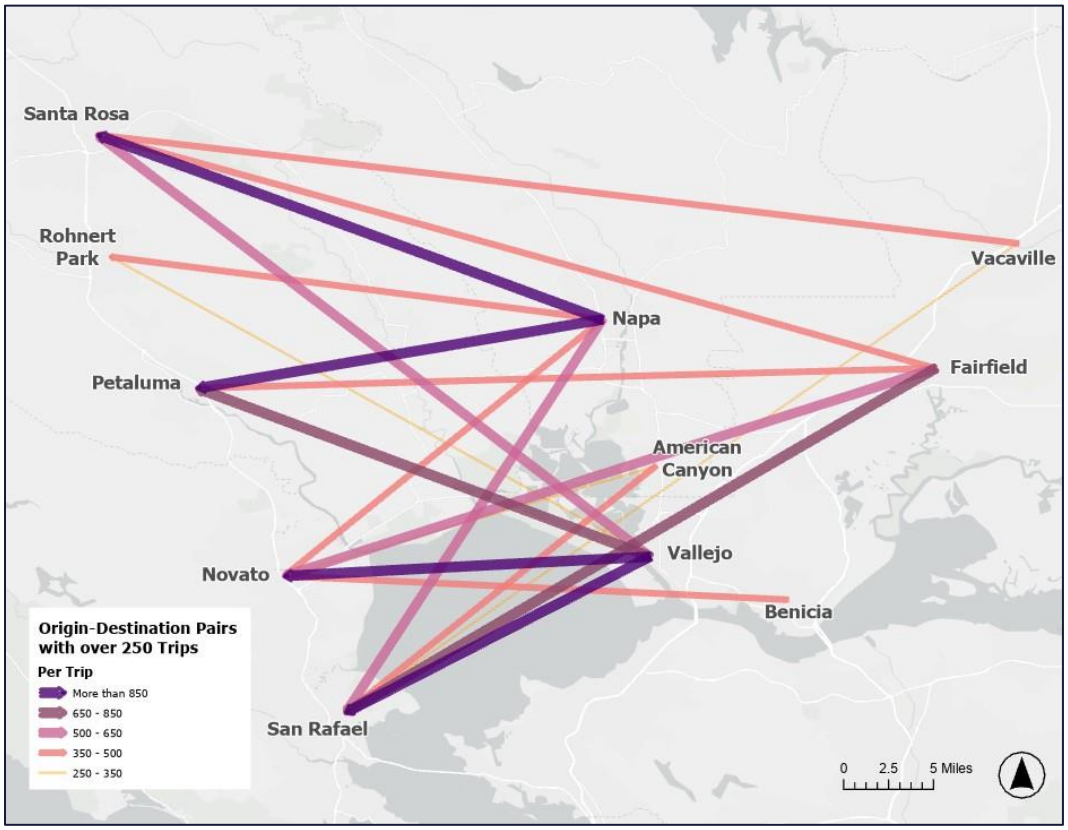


Figure 4: Eastbound Travel Along SR 37 by Hour

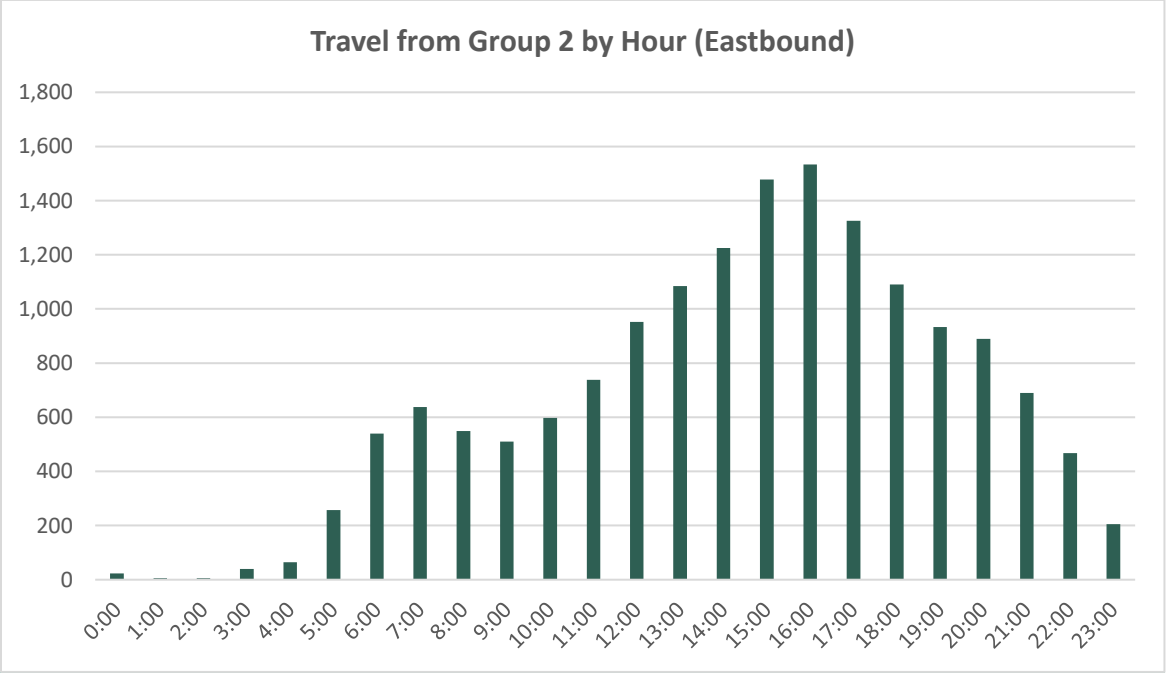
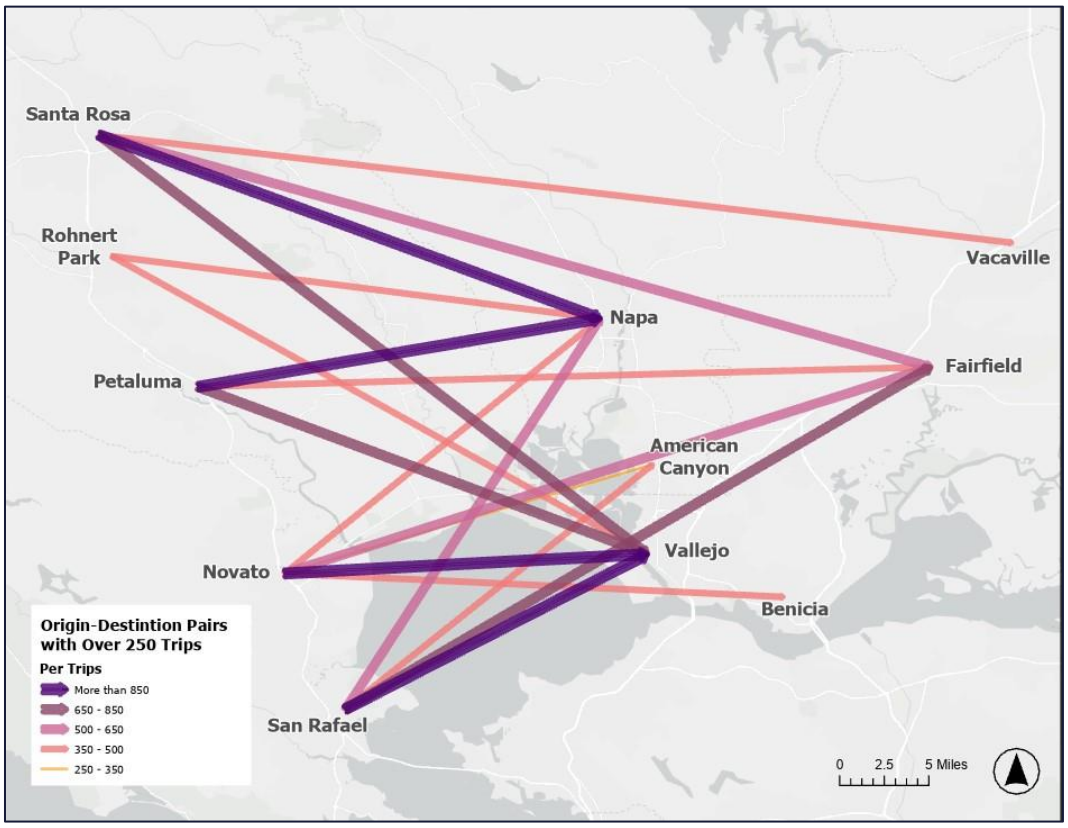


Figure 5: Origin-Destination Pairs with Over 250 Trips (Eastbound Travel)



The design of transit can accommodate approximately five percent of the total travel demand across the corridor. This five percent allows sufficient capacity to ensure that no passengers are left behind and there is space aboard the transit vehicle to accommodate growth. This portion of the analysis covers travel between the major cities with the highest demand and is visualized in the figures below. Overall, **no more than 15 trips by transit per hour would be made** across the SR 37 corridor.

Figure 6: Transit Travel Between Vallejo and San Rafael by Hour

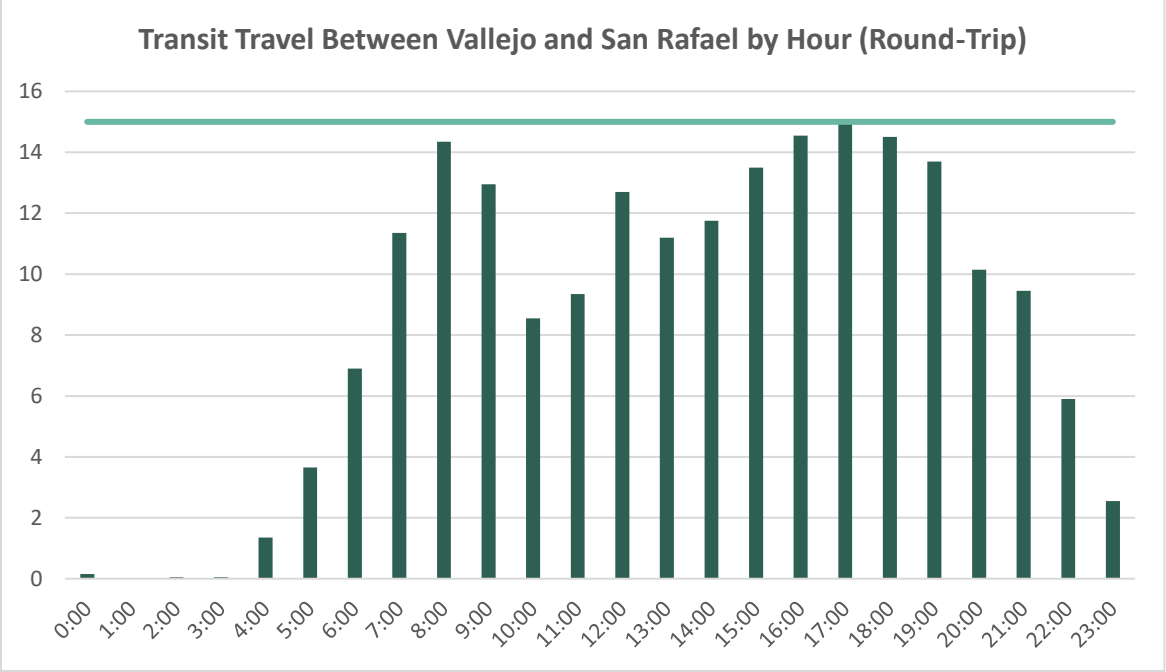
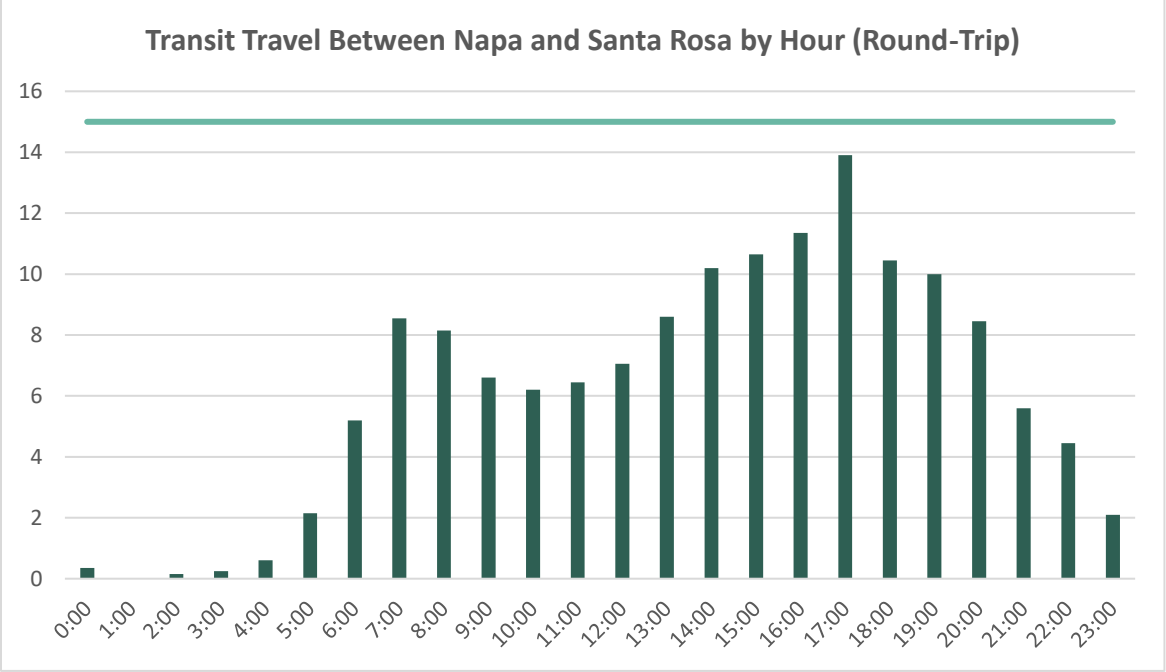


Figure 7: Transit Travel Between Napa and Santa Rosa by Hour



4. KEY FINDINGS AND GUIDING PRINCIPLES

The comprehensive review of the 2019 SR 37 Travel Behavior and Transit Feasibility Study, in correspondence with the thorough post-pandemic reevaluation of the SR 37 travel market and related demands, has produced key findings that help identify how shared ride and transit service can be feasibly and effectively oriented across the corridor. These findings represent the guiding principles that focus recommendations and target proposals to address the specific needs, opportunities, and challenges that the SR 37 corridor comprises. Key findings/guiding principles include:

- Balanced Mobility Options. Fixed-route and ridesharing solutions should be balanced across the corridor to represent a connected mobility solution, and both should operate in priority HOV/HOT lanes to provide a competitive travel time and reliability advantage over single-occupancy vehicles.
- Connected Mobility. Transit solutions implemented along the SR 37 corridor should integrate with and connect to existing transit networks in Solano, Sonoma, and Marin Counties. Particular focus should be placed on connections to Marin County, where travel demand is substantially higher and more concentrated along U.S. 101, and on connections for access to Sonoma County via connections with Golden Gate Transit and SMART Rail Service.
- Competitive Transit. Transit route alignments should prioritize directness and minimize deviations or out-of-direction movements, utilize HOV/HOT lanes to maximum advantage, supported by targeted infrastructural investment that helps promote *Connected Mobility* at key points along the corridor.
- Competitive Ridesharing. Complete the move from preplanned ridesharing to on-demand with the full deployment of common apps like RideAmigos, which is already available in the four counties that SR 37 traverses.
- Mobility Hubs. *Connected Mobility* hubs coordinated with park & ride locations, either existing, currently planned, or proposed here should be prioritized for implementation along the corridor and in coordination with other regional and local transit while providing good ridesharing intercept points.
- Home Access. Transit access for home-end trip origins should be oriented around accessing park & ride facilities or mobility hubs, engaging direct access modes like community-based transit, microtransit on-demand service, bicycles, scooters, etc. Park & ride facilities should serve both fixed-route services and ridesharing options wherever possible to maximize transit access and minimize single-occupancy-vehicle (SOV) trip-making.
- Destination Access. Transit access for the destination end of trips should be oriented around mobility hubs, with connections to community-based transit or bicycles, as well as microtransit and station cars offered as a last-mile solutions.

5. OUTREACH SUMMARY

In early 2023 to formulate an informed proposal for an effective and responsive SR 37 transit service, coordination was conducted with the transportation agencies and transit service providers that operate within the SR 37 corridor. Framed by the defined guiding principles, a fixed route transit service was presented and the proposal was developed based not only on the updated evaluation of the mobility market and travel demand levels, but also on the valuable qualitative input was received from partner agencies. Specifically, key project coordination was conducted with the following organizations:

- TAM
- SCTA
- Golden Gate Transit
- Marin Transit
- NVTA
- SMART
- Santa Rosa Transit
- SolTrans
- Sonoma County Transit

6. PHASING PLAN (SERVICE OPTIONS)

Due to the dispersed travel and reduction of the daily commute (Replica has shown a two percent decrease in daily work trips from 2019 to 2023 in California) across the SR 37 corridor, it is recommended that STA take a more flexible approach and offer a more integrated vanpool program. Smaller vans that carry around 15 passengers align with the projected volume of transit travel and can be a more expedient way to provide service. Vanpools can accommodate for the corridor's dispersed travel patterns, offer more frequent service, and minimize travel time by making fewer stops. Furthermore, the flexibility of vanpools allows for a multitude of service models. The phasing plan reviews Solano's current vanpool program, presents a more integrated vanpool option, and outlines a future express bus service if more significant travel patterns arise.

This phasing plan considers four separate route alternatives, as shown below. These alternatives connect the upcoming Vallejo Fairgrounds mobility hub with either the mobility hub in San Rafael, the SMART Hamilton station and San Rafael mobility hub, or Novato SMART station. Ultimately, this phased approach creates a service that can meet current demand and can be scalable to grow along with demand through incremental additions of service.

Service for all phases and alternatives would operate all day on weekdays and would connect seamlessly with the rest of the SolanoExpress express intercity bus network, the Golden Gate Transit intercity bus network along the U.S. 101 corridor, and the local transit services in Vallejo, San Rafael, and Novato.

Table 3: Vanpool and Express Bus Service Overview

Weekday Service Only	Frequency	Span
Peak Period	30 minutes	5:00a – 9:00a; 3:00p – 7:00p
Off-Peak Period	60 minutes	9:00a – 3:00p; 7:00p – 9:00p

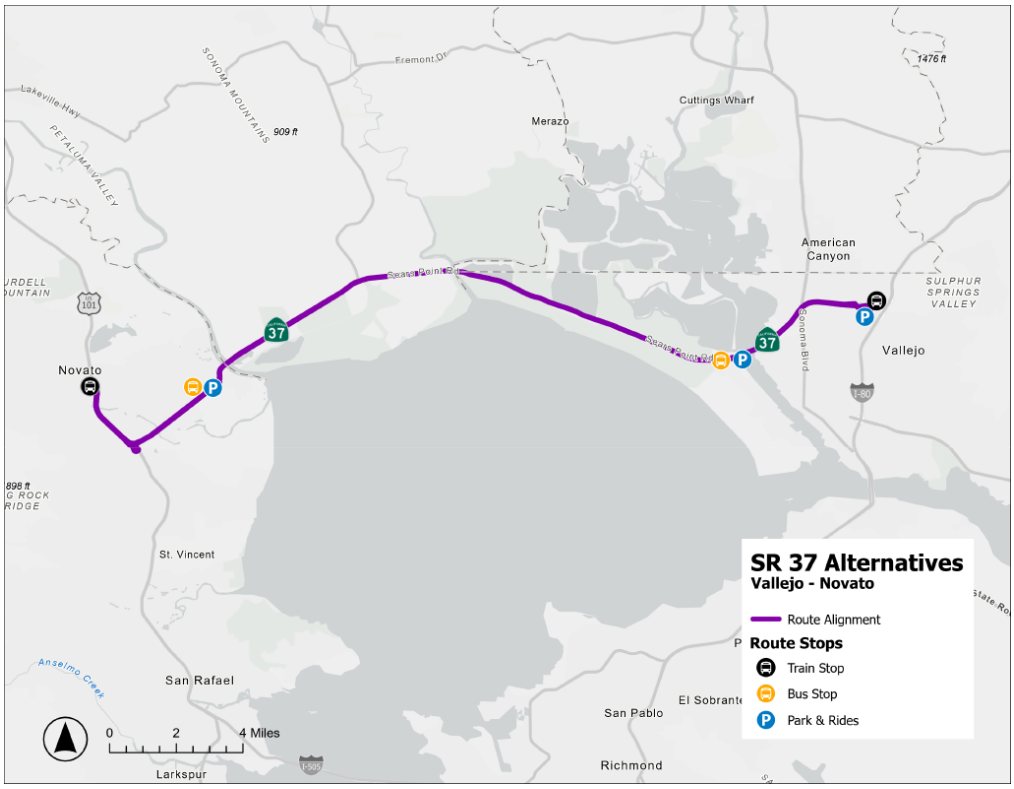
Vanpool would not operate 7p-9p

Figure 8: Routing Between Vallejo and San Rafael

Figure 9: Routing Between Vallejo, Hamilton, and San Rafael

Figure 10: Routing Between Vallejo and Hamilton

Figure 11: Routing Between Vallejo and Novato



A. Conventional Vanpool

Currently, Solano Mobility operates a vanpooling program in partnership with Commute with Enterprise to encourage workers in Solano County to commute via vanpools. Solano offers a $200 subsidy in addition to a $500 subsidy from MTC for the first two years. To be eligible, vanpools must have an origin and destination within Solano County, complete monthly ridership reports and annual surveys, and maintain 50% occupancy each month. Based on another regional peer agency, the typical vanpool lease is $14,400 a year – not including fuel.

Potential riders can start or join a vanpool through services provided by Commute with Enterprise or Solano Mobility. Participants also get to utilize Commute with Enterprise's roadside assistance and maintenance and Solano Mobility's Guaranteed Ride Home program.

This program, while offering participants a variety of resources, places most of the planning and financial burden on them. The process of starting a vanpool, coordinating with others, meeting eligibility standards, and fulfilling financial obligations can be a major disincentive for workers looking to take advantage of vanpools – many might opt for the relative ease of driving a personal vehicle.

B. Phase 1 - Paid Driver Vanpool

The first phase of implementation would be the establishment of a paid vanpool program. This program provides vans which operate on a set route and schedule with a paid driver – similar to Solano Mobility's Express Vanpool Pilot Program that operates between Vacaville and Sacramento. With the increase of remote and hybrid work schedules, most workers no longer commute five days per week, meaning a paid driver may be better suited as depending on volunteer drivers may be challenging.

This phase proposes the use of ZEB vans with an effective range of 150 miles and useful life of five years. Due to the flexibility of this option, vans can hold 19 passengers with no restroom or 14 passengers with two restrooms.

The first option operates between the upcoming **Vallejo** Fairgrounds mobility hub and the current hub in **San Rafael**. This route will require approximately 34 revenue hours per day – almost 8,600 revenue hours per year. At an estimated cost per hour of $80, the operating cost for this service would be $951,600 per year - including the van leases. Four vans would be needed for peak service, with an additional spare van. While these numbers assume a frequency of 30 minutes during peak periods and 60 minutes during midday, the flexibility of a vanpool service simplifies any adjustments to match evolving demands.

Table 4: Vanpool Service Between Vallejo and San Rafael

Weekday Service Only	AM Peak	Midday	PM Peak
Roundtrip Cycle Time (minutes)	98	75	100
Roundtrip Mileage	59	59	59
Headway (minutes)	30	60	30
Vehicles Required	4	2	4
Number of Trips	8	6	8
Projected Westbound Ridership (1% of total travel demand)	18	12	7
Projected Westbound Ridership (5% of total travel demand)	90	60	33
Projected Eastbound Ridership (1% of total travel demand)	2	15	13
Projected Eastbound Ridership (5% of total travel demand)	12	73	63

The second route option connects the **Vallejo** Fairgrounds mobility hub with the **Hamilton** SMART station, and then ends at the **San Rafael** Mobility Hub. This model would require approximately 9,700 revenue hours per year at an estimated annual cost of $1.03 million. This option also requires four vans and one spare.

Table 5: Vanpool Service Between Vallejo, Hamilton, and San Rafael

Weekday Service Only	AM Peak	Midday	PM Peak
Roundtrip Cycle Time (minutes)	112	87	112
Roundtrip Mileage	61	61	61
Headway (minutes)	30	60	30
Vehicles Required	4	2	4
Number of Trips	8	6	8
Projected Westbound Ridership (1% of total travel demand)	27	21	13
Projected Westbound Ridership (5% of total travel demand)	137	107	66
Projected Eastbound Ridership (1% of total travel demand)	6	25	22
Projected Eastbound Ridership (5% of total travel demand)	32	127	111

The third route option would end at the **Hamilton** SMART station and not go to San Rafael. This results in less revenue hours at 7,400 per year, costing $827,600 annually. Shorter than the previous options, this route requires less vehicles, only needing 3 peak hour vans and one spare.

Table 6: Vanpool Service Between Vallejo and Hamilton

Weekday Service Only	AM Peak	Midday	PM Peak
Roundtrip Cycle Time (minutes)	83	65	88
Roundtrip Mileage	47	47	47
Headway (minutes)	30	60	30
Vehicles Required	3	2	3
Number of Trips	8	6	8
Projected Ridership (1% of total travel demand)	10	10	7
Projected Ridership (5% of total travel demand)	48	48	33
Projected Eastbound Ridership (1% of total travel demand)	4	11	10
Projected Eastbound Ridership (5% of total travel demand)	20	54	49

The final route option deviates from going south and instead goes from the **Vallejo** Fairgrounds and west to the **Novato** SMART station. At 7,100 annual revenue hours, this is the least expensive option at $803,600 per year. Similar to the previous option, this route only requires 3 peak hour vehicles and one spare.

Table 7: Vanpool Service Between Vallejo and Novato

Weekday Service Only	AM Peak	Midday	PM Peak
Roundtrip Cycle Time (minutes)	75	61	90
Roundtrip Mileage	47	47	47
Headway (minutes)	30	60	30
Vehicles Required	3	2	3
Number of Trips	8	6	8
Projected Ridership (1% of total travel demand)	10	10	7
Projected Ridership (5% of total travel demand)	48	48	33
Projected Eastbound Ridership (1% of total travel demand)	4	11	10
Projected Eastbound Ridership (5% of total travel demand)	20	54	49

C. Phase 2 - Express Bus

The second phase will allow for growth in service by implementing an express bus service. If service demand increases and a dominant travel pattern emerges, an express bus is recommended to provide additional transit services within Solano County. Because it is unknown which agency would be contracted to provide this service, two sets of operating costs are presented based on existing potential providers.

While the operator is unknown, a typical ZEB Over-the-Road (OTR) bus would have a range of 170-200 miles and a useful life of 12 years. These buses could hold up to 52 passengers with a restroom.

While the 2019 study proposed two new SolanoExpress routes connecting Vallejo and Fairfield with Marin County, this phase proposes an express bus service with four routing choices. To note, the service would operate within a proposed U.S. 101 bus on shoulder facility and a future SR 37 HOV/HOT system, which would implement expedited-access ramps and priority lanes - improving travel times and reliability.

The first route option would connect the upcoming **Vallejo** Fairgrounds mobility hub (regional/local/community transit, microtransit, park and ride) with the current mobility hub in downtown **San Rafael**. SolanoExpress frequencies along the I-80 corridor and a convenient, reliable connection with the Red Line at a new Fairgrounds Hub in Vallejo will allow for a fast, reliable connection to Fairfield and points beyond. This route option would have 359,800 revenue miles per year and an annual operating cost of $2.67 million. See **Figure 8** above for a map of this route.

Table 8: Vallejo to San Rafael Express Bus Service

Vallejo – San Rafael Weekday Summary	
Revenue Hours	64
Revenue Miles	1,400
Peak Vehicles	5
Round Trips	24

The second route option connects the **Vallejo** Fairgrounds mobility hub with the **Hamilton** SMART station and ends at the San Rafael Mobility Hub. This route option would have 375,100 annual revenue miles and an operating cost of $2.67 million per year. See **Figure 9** above for a map of this route.

Table 9: Vallejo to Hamilton and San Rafael Express Bus Service

Vallejo – Hamilton – San Rafael Weekday Summary	
Revenue Hours	64
Revenue Miles	1,400
Peak Vehicles	5
Round Trips	24

The third route option would end at the **Hamilton** SMART station and not go to San Rafael. As the shortest route, this model decreases revenue miles to 288,800 per year and an operating cost of $2 million annually. See **Figure 10** above for a map of this route.

Table 10: Vallejo to Hamilton Express Bus Service

Vallejo – Hamilton Weekday Summary	
Revenue Hours	48
Revenue Miles	1,100
Peak Vehicles	4
Round Trips	24

The final route option deviates from going south and instead goes from the **Vallejo** Fairgrounds and west to the **Novato** SMART station. This option would have 289,400 revenue miles per year with an annual operating cost of $2 million. See **Figure 11** above for a map of this route.

Table 11: Vallejo to Novato Express Bus Service

Vallejo – Novato Weekday Summary	
Revenue Hours	48
Revenue Miles	1,100
Peak Vehicles	4
Round Trips	24

D. Corridor Access and Integration

To extend the reach of the new paid driver vanpool and phase two SolanoExpress fixed-route service along the SR 37 corridor, various mobility hubs and park & ride facilities are proposed for implementation or enhancement. The service would utilize the planned bus on shoulder transit facilities on U.S. 101 in Marin County as noted above.

Figure 12: Mockup of a Typical Mobility Hub

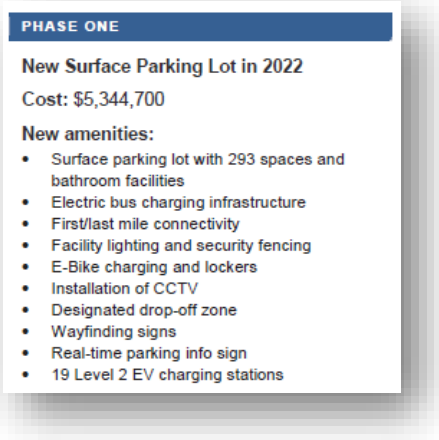
Mobility hubs will be the principal connecting points at the ends of the new express transit corridor where riders can access the SR 37 corridor SolanoExpress transit services. These community passenger facilities should be implemented and enhanced at locations that facilitate interagency connectivity and interregional transit connections. The two principal mobility hubs anchoring the fixed route corridor include:

- Vallejo Fairgrounds Hub, which provides a linkage between SolanoExpress, SolTrans, Napa Vine and First/Last Mile microtransit (currently 80% subsidy Lyft). This hub will also have park & ride facility to further attract potential riders. This hub is part of a major new development repurposing the Fairgrounds. The budget for the Hub is $5.34 million.
- San Rafael Hub, where SolanoExpress would connect with Golden Gate Transit, Marin Transit, SMART, Greyhound, Marin Airporter, and Sonoma County Airport Express. Access and amenity enhancements are planned with an estimated budget of $1 million.

Smaller hubs with First/Last Mile transit and microtransit connections and Park & Ride will be the key to both attracting home-based trips to the corridor's connected mobility and helping riders complete the journeys to their destination. These smaller hub locations, which will need some enhancements, include:

- Mare Island – not existing; to be developed
- Black Point – existing hub and park & ride with legacy SR 37 bus stops
- Enfrente/Ignacio/Bel Marin Keys – existing transit stops
- Alameda del Prado – existing hub and park & ride
- Smith Ranch/Lucas Valley – existing park & ride
- Freitas Parkway – existing transit stops
- North San Pedro Road – existing transit stops

Figure 13: (DKS) Vallejo Fairgrounds Mobility Hub Jan 2022



Mobility on Demand embraces a range of options including traditional Dial-A-Ride and Guaranteed Ride Home to advanced app-based microtransit. These community and locally based services provide expanded access to major transit lines and are often referred to as First/Last Mile service although their reach extends well beyond a mile. A transit corridor like SR 37 with limited opportunities for stops needs Mobility on Demand to reach customers well off the main transit route - especially those without access to personal vehicles. Microtransit allows for connected mobility with other modes through smart phone apps and should be available at all STA SolanoExpress stations/hubs/stops.

Table 12: Mobility Hubs and Services Offered

Mobility Hub Location	Regional Transit Hub	Local Transit Hub	Park & Ride Lot	Mobility on Demand
Vallejo Fairgrounds	SolanoExpress	SolTrans, Vines	Yes	Lyft Subsidy[1], Guaranteed Ride Home
Mare Island	No	No	Yes	Lyft Subsidy, Guaranteed Ride Home
Black Point	No	No	Yes	Novato Dial-A-Ride
Enfrente/Ignacio/ Bel Marin Keys	GGT	Marin Local, Marin Community	No	Novato Dial-A-Ride
Alameda del Prado	GGT	Marin Local, Marin Community	Yes	Novato Dial-A-Ride
Smith Ranch/Lucas Valley	GGT	No	Yes	No
Freitas Parkway	GGT	No	No	No
North San Pedro Road	GGT	Marin Local, Marin Community	No	No
San Rafael SMART	SMART, GGT	Marin Local, Marin Community	No	No

[1] STA subsidizes 80% of Lyft microtransit fares up to $20 for First/Last Mile mobility in Solano County.

The table below outlines the capital costs required to implement the mobility hub and Park & Ride infrastructure.

Table 13: Mobility Hub and Park & Ride Costs

Mobility Hub and Park & Ride Capital Costs	
Vallejo Fairgrounds (New Mobility Hub)	$5,350,000
Downtown San Rafael (Upgraded Access and Amenitites)	$1,000,000

Overall, the proposed SolanoExpress routes will be oriented to link with existing SolanoExpress routes, as well as other local transit services. These linkages will help facilitate interregional trip-making across the North Bay, as well as promote overall Bay Area connected mobility, which is a primary focus of the region's post-pandemic transit recovery strategy. Furthermore, by implementing or enhancing recommended park & ride facilities and mobility hubs, which will facilitate first/last mile connections to transit and ridesharing as well as interagency or intermodal transfers, connected regional mobility will become more feasible and accessible for an increased number of travelers from across the North Bay.

These options present an opportunity for the Bay Area to move from a motley collection of largely unconnected mobility options to a highly integrated network of connected mobility. The ridesharing noted the availability of a new app, RideAmigos, which is much more than just an on-demand carpool/vanpool seat. RideAmigos moves the SR 37 corridor in the direction of *Mobility as a Service* (MaaS) where travelers are presented all of their options – ridesharing, transit, microtransit – and can choose any option, including some that use multiple options in a connected mobility orientation.

7. DRAFT IMPLEMENTATION PLAN

A. Summary of Service Alternatives

The first phase of implementation involves the operation of a paid driver vanpool program to match current travel demand. **Table 14** outlines a paid driver vanpool program that operates all day while **Table 15** covers the program if it operated during peak hours only.

Table 14: Paid Vanpool Options (All Day Service)

	Vallejo – San Rafael	Vallejo – Hamilton – San Rafael	Vallejo – Hamilton	Vallejo – Novato
Hours of Operation	5 AM to 7 PM	5 AM to 7 PM	5 AM to 7 PM	5 AM to 7 PM
Frequency	30 peak/ 60 off-peak	30 peak/ 60 off-peak	30 peak/ 60 off-peak	30 peak/ 60 off-peak
Round Trips	22	22	22	22
Peak Van Requirement	4	4	3	3
Total Van Requirement	5	5	4	4
Annual Van Leasing Cost ($26,400 per Vehicle)	$132,000	$132,000	$105,600	$105,600
Annual Revenue Hours	8,620	9,700	7,400	7,100
Annual Labor Cost ($80 per Hour)[2]	$689,600	$776,000	$592,000	$568,000
Annual Revenue Miles	329,800	343,800	264,700	265,300
Other Annual Operating Costs	$130,000	$130,000	$130,000	$130,000
Annual Operating Cost (Labor & Fuel Cost)	$951,600	$1,038,000	$827,600	$803,600

[2] Annual Labor Cost assumes an extra 5% of hours due to deadhead.

Table 15: Paid Vanpool Options (Peak Period Service)

	Vallejo – San Rafael	Vallejo – Hamilton – San Rafael	Vallejo – Hamilton	Vallejo – Novato
Hours of Operation	5:00a – 9:00a; 3:00p – 7:00p	5:00a – 9:00a; 3:00p – 7:00p	5:00a – 9:00a; 3:00p – 7:00p	5:00a – 9:00a; 3:00p – 7:00p
Frequency	30	30	30	30
Round Trips	16	16	16	16
Peak Van Requirement	4	4	3	3
Total Van Requirement	5	5	4	4
Annual Van Leasing Cost ($26,400 per Vehicle)	$132,000	$132,000	$105,600	$105,600
Annual Revenue Hours	6,715	7,582	5,814	5,600
Annual Labor Cost ($80 per Hour)[3]	$537,200	$606,560	$465,120	$448,000
Annual Revenue Miles	239,904	250,104	192,600	193,000
Other Annual Operating Costs	$130,000	$130,000	$130,000	$130,000
Annual Operating Cost (Labor & Fuel Cost)	$799,200	$868,560	$700,720	$683,600

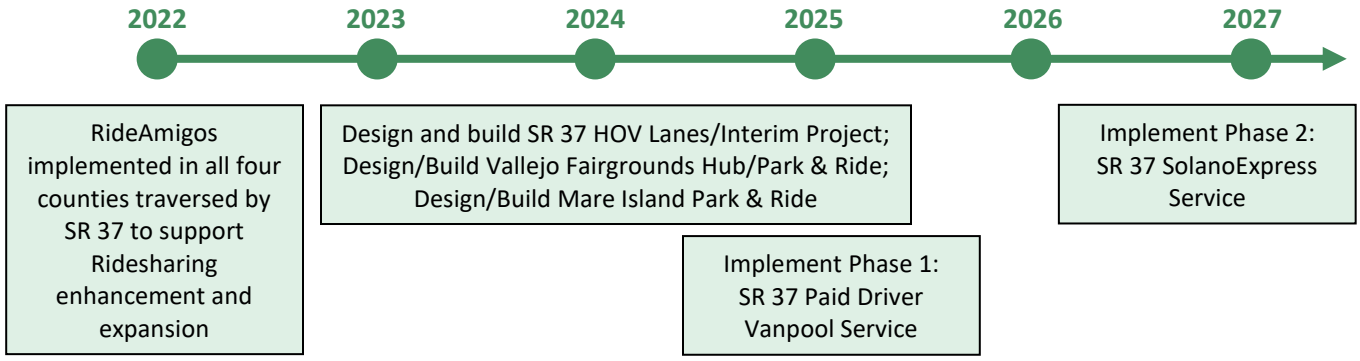
[3] Annual Labor Cost assumes an extra 5% of hours due to deadhead.

The second phase of implementation calls for operation of the proposed fixed route SR 37 transit line once a more dominant travel pattern emerges and the HOV/HOT lanes are complete and in operation. Four routing options are given.

Table 16: Express Bus Options

	Vallejo – San Rafael	Vallejo – Hamilton – San Rafael	Vallejo – Hamilton	Vallejo – Novato
Hours of Operation	5 AM to 9 PM	5 AM to 9 PM	5 AM to 9 PM	5 AM to 9 PM
Frequency	30 peak/ 60 off-peak	30 peak/ 60 off-peak	30 peak/ 60 off-peak	30 peak/ 60 off-peak
Round Trips	24	24	24	24
Peak Bus Requirement	5	5	4	4
Total Vehicle Requirement with 20% Spares	6	6	5	5
Total Capital Cost ($1,311,000 per Vehicle)[4]	$7,866,000	$7,866,000	$6,555,000	$6,555,000
Annual Revenue Hours	16,320	16,320	12,240	12,240
Annual Revenue Miles	359,800	375,100	288,800	289,400
Annual *Low-End* Operating Cost ($163.91 per Revenue Hour)[5]	$2,675,000	$2,675,000	$2,006,200	$2,006,200
Annual *High-End* Operating Cost ($218.55 per Revenue Hour)[6]	$3,566,700	$3,566,700	$2,675,100	$2,675,100

B. Implementation Timeline



[4] Vehicle acquisition cost assumes ZEB equipment using AVTA MCI OTR BEB pricing of $1,200,000 per unit inflated 3% annually for a 2025 procurement.
[5] Cost per hour is based off a lower end rate of $150 in 2023 with a 3% annual adjustment. Assumes an implementation year of 2026.
[6] Cost per hour is based off a higher end rate of $200 in 2023 with a 3% annual adjustment. Assumes an implementation year of 2026.

9. CONCLUSION

The dispersed nature of travel in the SR 37 corridor creates a challenge to designing an effective transit solution. In order to reduce VMT and the resulting GHG emissions, increased use of shared ride options is essential. This requires blending quality shared travel options in the corridor with utilization priority travel lanes to provide competitive travel times and first and last mile access to these services.

Initially van pool options are best suited for this corridor because of the flexibility of reaching multiple destinations. While four alternatives are presented in this paper, other options are possible, and to show all possibilities would be overwhelming. These were chosen based on connectivity to other transit services and first/last mile access and to also illustrate the high end of capital and operating costs for planning purposes. Because of the dispersed nature multiple vanpool routes may operate concurrently and only during peak hours. For example, if **Vallejo** to **San Rafael** and **Vallejo** to **Novato** paid vanpool options both operated concurrently during the peak the annual operating cost would be **$1,482,800**. If these two routes operated with two vans each to start and scaled up as demand warranted the initial annual cost would be **$799,200.**

For an express bus service, operating multiple van pool routes may demonstrate where demand is strongest and how such a route should be designed. The alternatives presented in this paper illustrate the high-end cost for planning purposes, but the actual final design needs to be based on factors that are not fully apparent at this time. For example, this paper is using existing travel demand and is not projecting future demand. Second, the value of an express bus in this corridor is its ability to be a component of a regional network providing a link between regional and local services in Solano County and Marin/Sonoma County. Several different planning efforts are underway or will be taking place in the near future and will form the basis of the regional network in which SR 37 service will be a component.

Therefore, it is recommended to develop a paid driver van pool program, monitor demand and adjust as necessary, and consider express bus service as a component of a regional connect transit network based on future demand.