



## MEMORANDUM

Date: October 15, 2014

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**Subject:** ECR BRT Phasing Plan – Preferred Alternative

*SF14-0747*

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### OVERVIEW

This memo presents two potential service strategy options for enhancing bus service on the El Camino Corridor in the future (i.e., out to the year 2040). Based on the findings of the Detailed Evaluation Memo, the two options are as follows (Table 1 highlights the pros and cons of each).

1. Option 1 – This is a two-phased option. The near-term phase (Phase 1) starting in 2020 or before calls for a Rapid service overlaid on top of existing ECR Local service. Phase 2 calls for the Rapid service to be upgraded to Bus Rapid Transit service by 2040. ECR Local service will continue to operate on the corridor under Phase 2.
2. Option 2 – This option includes one phase where a future near-term (2020 or before) Hybrid Rapid (referred to as Hybrid) service without complementary local overlay service (i.e., ECR Local service) is implemented. By 2040, the same Hybrid Rapid is operated, without any modifications to service or corridor infrastructure.

Both strategies are feasible options that would enhance bus service along the Corridor. **The decision to pursue either option will be based on a variety of decision factors, outlined at the end of this memo and will be a decision of the SamTrans Board. This memo does not recommend a single approach to pursue at this time.**



**Table 1 – Pros and Cons of Rapid/BRT Service Strategies**

	Description	Service Description	Pros	Cons
<b>Option 1</b>	Phase 1 (2020) Full Rapid overlay with ECR Local Phase 2 (2040) Full BRT overlay with ECR Local	<b>2020 Timeframe</b>	<ul style="list-style-type: none"> <li>• High ridership increase</li> <li>• Improved accessibility and mobility</li> <li>• Reduced wait times</li> <li>• Improved reliability</li> <li>• Operational flexibility</li> <li>• Easy to understand</li> <li>• Natural progression to BRT service in long term</li> </ul>	<ul style="list-style-type: none"> <li>• Higher costs (operating and maintenance (O&amp;M) and capital)</li> <li>• Lower productivity than Option 2</li> <li>• Supportive land use needed to sustain Phase 2 BRT investments</li> </ul>
		<ul style="list-style-type: none"> <li>• ECR Local (Phase 1/2)- 15-minute headways, stopping at existing 102 NB and 104 SB stops</li> <li>• Full Rapid (Phase 1) - 15-minute headways, stopping at 37 stops in each direction from Daly City to Palo Alto</li> </ul>		
		<b>2040 Timeframe</b>		
		<ul style="list-style-type: none"> <li>• ECR Local operated as above</li> <li>• BRT (Phase 2) - 15-minute headways, stopping at 37 enhanced stops in each direction from Daly City to Palo Alto)</li> </ul>		
<b>Option 2</b>	Phase 1 (2020) Hybrid A with no overlay	<b>2020 Timeframe</b>	<ul style="list-style-type: none"> <li>• High ridership increase</li> <li>• Low cost option (O&amp;M and capital)</li> <li>• High productivity</li> <li>• Easy to implement</li> <li>• Improved reliability</li> </ul>	<ul style="list-style-type: none"> <li>• Degraded overall accessibility and mobility</li> <li>• Difficult transition to BRT (i.e., confusing to the public, and requires reinitiating service cut in 2020).</li> </ul>
		<ul style="list-style-type: none"> <li>• Hybrid Rapid - 12-minute headways, stopping at 76 stops between Daly City and Palo Alto</li> </ul>		
		<b>2040 Timeframe</b>		
		<ul style="list-style-type: none"> <li>• Hybrid Rapid operated as above</li> </ul>		

**SUMMARY OF RECOMMEND STRATEGY OPTIONS**

**Option 1** (2020 Full Rapid and 2040 BRT) consists of phased approach that gradually upgrades trunk line transit along the Corridor from the current local service provided by the ECR, to a Rapid overlay on top of the ECR, to an upgraded BRT overlay on top of the ECR. This option has many benefits - increasing ridership, enhancing access, providing a faster, more reliable, brand-distinguished overlay service, operational flexibility, and setting up the corridor for an effective transition to BRT service. It also has its drawbacks, most notably, high operating and capital costs resulting in lower productivity compared to Option 2. Phase 2 Full BRT would require supporting land use (land use mix and higher densities) along the corridor that is far more intensive than today in order to justify the high capital costs (exclusive transit lanes) identified for this option.



**Option 2** (2020 Hybrid A) would require a minimal operating and capital cost increase while increasing speed, reliability, and ridership along the corridor. Due to the lower capital outlay and operating costs compared to Option 1, Option 2 would be easier to implement. Because it would eliminate lower productivity stops, overall access would decrease compared to existing ECR Local service. At a 12-minute service frequency, customers would see one additional bus per hour (a total of five) over existing service, which is far lower than the 8 buses per hour (4 Rapid, 4 local) that would be provided under Option 1. Option 2 would require a more difficult operational transition to 2040 BRT service, as the station spacing strategy under BRT (typically ½ to 1 mile) would result in a significant loss of local access to/from neighborhoods along the Corridor, unless ECR Local service was reinstated to maintain accessibility along the corridor.

## SUPPORTING ANALYSIS AND DOCUMENTATION

The evaluation framework and performance analysis that led to the selection of the preferred alternative service strategies for consideration is contained in the following document, which presents the quantitative and qualitative evaluation:

- *ECR BRT Phasing Plan – Detailed 2020 Concept Evaluation Memo*

The quantitative evaluation considered criteria such as ridership, station and vehicle improvements, operating costs, capital costs, passenger subsidy, and traffic impacts. The raw data for the quantitative performance analysis were collected and generated through various study activities and is highlighted in the following documents:

- *Operating Plan Memo – Draft v1*
- *ECR BRT Phasing Plan – Capital Costs Memo*
- *ECR BRT Phasing Plan – O&M Costs Memo*
- *ECR BRT Phasing Plan – Ridership and Productivity Memo*

Meanwhile, the qualitative analysis considered a range of criteria including branding, service legibility, safety, pedestrian and bicycle access, jobs and housing accessibility, and reliability improvements.

The following sections make the “case” for each alternative option.



## PREFERRED ALTERNATIVE OPTION 1 – PHASED RAPID & BRT CONCEPT 2: 2020 FULL RAPID & CONCEPT 10: 2040 BRT

This strategic option would introduce Rapid service first in the near term, followed by a transition to BRT service in the long term. This option is financially unconstrained relative to Option 2, but allows for a straightforward conversion to BRT, which is impeded by the service structure of the Hybrid concept.

- Phase 1 - Full Rapid (Concept 2) overlay with ECR Local prior to 2020
- Phase 2 - Full BRT (Concept 10) overlay with ECR Local prior to 2040

Upon introduction, ECR Rapid would provide faster service (model estimated 14.2 mph) than ECR Local (11.0 mph) and make 37 stops, compared to the 102-104 (NB/SB) for ECR Local. From a customer perspective, this is the preferred near term alternative due to:

- **More Frequent Service** – ECR Rapid would effectively double service frequency at high activity stops along the corridor.
- **More Legible Service** – Option 1 would create an easy to understand routing and alignment plan for the Rapid (duplicate routing of ECR Local and nearly the same service hours), while ECR Local service would continue to operate as it does today.
- **More Reliable Service** - Service reliability would also improve through employment of transit signal priority by allowing buses operating behind schedule to obtain additional green time at intersections.

When considering the performance assessment, Full Rapid (Concept 2) scored highest in a combination of quantitative and qualitative criteria. While it did not exhibit the highest productivity of the service concepts considered and had high operating and capital costs relative to the other options screened, it is expected to generate a significant increase in corridor and system ridership and offers the most robust enhancement to the customer experience of all Rapid concepts. Overlay Rapid service is a natural precursor to more significant investment in a future BRT system with dedicated bus lanes (identified for portions of El Camino) and more robust stations. The Phase 2 recommendation for this option was analyzed using the same, limited 37-stop spacing as the Full Rapid. Future BRT service could reduce the number of stations to improve speed and reliability; increasing the number of stations is not recommended due to the current provision for coverage stops and average half-mile stop spacing. Thus, a local ECR service would



need to be maintained to ensure transit accessibility and mobility on El Camino at the two thirds of stop locations that do not qualify as high ridership stops.

The GBI Corridor Plan also found that with sufficient land use densities, BRT would be feasible on the El Camino Corridor.<sup>1</sup> Full BRT service would complement the GBI Corridor Plan, which proposed El Camino multi-modal improvements that focus on a corridor-wide vision with common pedestrian-, transit-, and bicycle-oriented design elements, and are intended to be consistent with Caltrans, SamTrans, Santa Clara Valley Transportation Authority, and City/County Association of Governments of San Mateo County standards and complete street policies. In order to “prime the pump” for future BRT service, a Full Rapid (Concept 2) should be pursued initially.

Another benefit of Option 1 is its operational flexibility. While Option 1 includes all day Rapid service, it could be phased in via a peak period Rapid (no midday) scenario originally, and then dialed up based on actual demand to all-day service at a later time. It also provides flexibility to increase or decrease headways of the Rapid service while maintaining the 15-minute ECR Local service frequency. Introducing Option 1 as a pilot project (example: one to two years) in order to establish its real-world performance and whether it meets SamTrans performance standards is another possibility. However removing any service, regardless of the level of communication with customers on the temporary nature of a service before implementation and during testing, can be politically challenging.

## PREFERRED ALTERNATIVE OPTION 2 – CONCEPT 5: HYBRID A (76 STOPS)

This option provides an immediate performance improvement to ECR Local service by eliminating unproductive stops, implementing traffic signal priority to improve speed and reliability, and improving service frequency. It is not an overlay service, meaning it replaces rather than complements ECR Local.

- Phase 1 – Hybrid A (Concept 5) with no overlay prior to 2020

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<sup>1</sup> “In San Mateo County, current low densities along many parts of the Corridor will need significant investment to provide the ridership to support BRT. Cities, towns, counties, and other agencies and advocacy groups should continue to promote transit-supportive growth along El Camino Real.” (*Grand Boulevard Multimodal Transportation Corridor Plan*, October 2010)



The elimination of approximately 25% of existing ECR stops under this option results in faster travel times but reduces customer access and mobility within the Corridor. It is projected to have the highest productivity (boardings per revenue hour), lowest incremental cost per new corridor passenger, and the highest ridership increase when compared to increased O&M cost of all build options analyzed. Compared to Option 1, this option is financially constrained – it has lower O&M and capital cost (as it requires minimal increases in vehicle revenue hours and thus O&M costs, and does not require procurement of a large number of new, additional peak vehicles). With a cheaper cost to implement and operate, it may be easier to garner agency support and could be implemented faster than Option 1.

Taking a long-term perspective, however, Option 2 represents a minor change to existing ECR service – essentially creating a “limited stop” ECR and does not align well with plans for a future BRT system with dedicated bus lanes and more robust bus stations, which would have both local and BRT service running in parallel. Conversion to BRT is possible, but it would require a full reconfiguration of service on the Corridor. BRT would further reduce stops (currently 37 are included in the BRT service concept) and access to jobs, housing, and other activities via transit would be limited to high demand areas without reintroduction of a local service. This would also create potential for customer confusion as one service is replaced by two services and does not follow a natural progression towards BRT.

## DECISION TRIGGERS

Both service alternatives are feasible and each would increase ridership on the Corridor. Available funding, customer needs, operational flexibility, ability to transition to BRT service, and complementary land use plans are all factors to be considered by SamTrans decision makers in determining which strategic transit option to pursue for El Camino Real.

### Funding<sup>2</sup>

Transit operating budgets traditionally do not leave room for significant increases in operating costs. Capital needs can be obtained through a variety of federal, state, regional, and local funding sources but operating fund sources are traditionally more limited and finite. Option 1 would increase SamTrans ECR operating budget by approximately 60% (current year costs). Option 2, which is financially constrained, would increase SamTrans ECR operating budget by

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<sup>2</sup> Note: current year (2014) costs have been assumed for this comparison.



approximately 20%, which may be more feasible from a budgeting perspective. In terms of annual system wide O&M costs (\$107M), Option 1 would result in a 12.4% increase (\$13.3M) compared to 4.1% for Option 2.

### **Customer Needs / User Cost**

Option 2 provides the corridor with an enhanced bus service with lower capital and operating cost expenditures and an overall net benefit in terms of attracting new ridership, reducing wait time and in-vehicle travel time, and improving reliability. Its primary drawback is that it reduces access for a wide range of customers, including those with potentially limited mobility by eliminating low productivity stops south of Redwood City and north of San Bruno. Option 2 has far lower agency costs than Option 1, but generates user costs, which Option 1 does not.

### **Operational Flexibility**

Option 1 offers greater flexibility to modify service compared to Option 2. With ECR Local operating the same in the future as it is today, SamTrans has the ability to introduce Full Rapid service as a tiered approach (peak period first, all day second, etc.), increase or decrease Rapid service frequencies, or truncate Rapid service to meet demand. Option 2 would likely be limited to minor service adjustments such as frequency or stop relocation, with the absence of a local ECR.

### **BRT Need and Transition**

Option 2 would preclude eventual conversion of Rapid service to BRT without the reintroduction of ECR Local, whereas Option 1 would provide a natural transition to BRT. Determination of the long-term goal for transit in the Corridor, including fusion with planned GBI Corridor complete street enhancements, should factor into the decision of which service strategy to pursue in the near term. Corridor traffic congestion should also be a factor in the decision making process. Model forecasts show worsening traffic congestion in the County and along the Corridor. BRT would provide exclusive ROW on continuous segments of the Corridor that would allow buses to bypass congestion, improve speed, and enhance reliability. Another factor in considering the need for BRT in the long term and the decision to pursue Option 1 versus Option 2 is Caltrain service. Upon electrification (planned for 2020), Caltrain is proposing to improve off-peak headways to 30 minutes and add one additional train per hour per direction during the peak periods (from 5 trains per hour per direction to 6). Since ECR parallels a majority of the Corridor from Palo Alto to San Bruno, Corridor trips can be taken via Caltrain. While 2040 model runs showed a significant increase in ridership with BRT, the cost to implement BRT should be considered in the context of



planned and funded improvements to Caltrain. Conversely, Caltrain ridership demand has continued to increase, and BRT could be an effective strategy to offer faster, more reliable, and more frequent parallel service along the Caltrain Corridor to reduce potential overcrowding.

### **Local Land Use and Commitments**

In order to justify BRT (Phase 2 of Option 1), densities should be increased and a wider range of transit supportive land uses must be realized along the corridor.<sup>3</sup> Will the projected development, called for in GBI and Corridor cities' General Plans actually occur? Will communities (city leaders and residents) tolerate on-street parking loss, potential reduction in the number of general purpose lanes (never less than 2 per direction), and loss of medians to implement exclusive transit lanes, enhanced stations and the complete streets improvements (wider sidewalks, narrower crossings) called for in the GBI Corridor Plan? These questions about the long term are difficult to answer, especially considering the array of individual jurisdictions that line the Corridor, yet a certain degree of confidence is needed before pursuing BRT (notwithstanding the ability of BRT to induce development itself).

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<sup>3</sup> GBI travel demand modeling and analysis found that BRT shows great potential along the GBI corridor, but would require significant financial investment and supporting land uses. (*Grand Boulevard Multimodal Transportation Corridor Plan*, October 2010).