

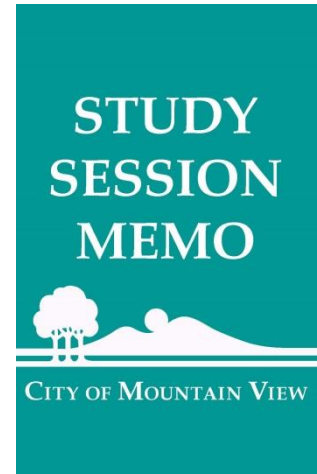
DATE: April 28, 2020

TO: Honorable Mayor and City Council

FROM: Tina S. Tseng, Senior Civil Engineer
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Director/City Engineer
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VIA: Kimbra McCarthy, City Manager

TITLE: **Shoreline Boulevard at Highway 101
Bicycle/Pedestrian Bridge, Project 16-60 –
Preliminary Conceptual Design**



PURPOSE

The purpose of this Study Session memo is to provide preliminary review of the project elements and to receive direction on the proposed Shoreline Boulevard at Highway 101 Bicycle/Pedestrian Bridge, Project 16-60 (Bridge).

BACKGROUND

The need for a pedestrian- and bicycle-friendly connection between the Mountain View Transit Center and the North Bayshore area (known as the Shoreline Corridor) has been identified in a number of the City's plans. These plans include the 2013 Shoreline Transportation Study, the 2014 Shoreline Boulevard Corridor Study (Corridor Study), and the North Bayshore Precise Plan. The Corridor Study provides a conceptual plan for long-term mobility and active transportation improvements to reduce reliance on single-occupant vehicles, encourage use of active transportation, and support the planned growth in the area (Figure 1).

Figure 1: Corridor Study Recommended Transportation Improvements



One of the identified infrastructure improvements in the Corridor Study and a proposed priority transportation improvement in the North Bayshore Precise Plan is the proposed Bridge (Figure 2). The Bridge concept includes a 0.67-mile long off-road bicycle/pedestrian crossing with two 7' lanes for bicyclists and a 6' lane for pedestrians (20' total width) to enhance comfort and unimpeded access separate from the high vehicular volume at the Shoreline Boulevard/Highway 101 interchange. The Bridge would also include supports for the future installation of a 12" recycled water pipeline.

Figure 2: Bicycle and Pedestrian Improvements Near Highway 101



The design of the Bridge project (CIP 16-60) is funded with \$2 million from the Shoreline Regional Park Community (SRPC) Fund. The construction phase of the project (20-38) is funded with \$20 million from the SRPC, North Bayshore Impact Fee, and the 2018 SRPC Bonds. After construction, the City will be responsible for maintenance and operations of the Bridge. The material, style, and design of the proposed bridge will determine the infrastructure maintenance needs and costs, including the future replacement of the bridge.

In August 2018, the City executed a professional services contract with a design firm, Biggs Cardosa Associates (BCA), for preliminary design of a standard bridge. BCA's

design team includes civil engineering, bridge architecture and urban design, geotechnical engineering, environmental permitting, and traffic engineering specialized subconsultants. As the preliminary design was under way, the City initiated a master plan project for the Gateway site to integrate the different property owners' (Google and SyWest) objectives and diverse land uses. Subsequently, the Gateway Master Plan and bridge design teams have coordinated to integrate functional connections between the existing and planned public accessible pedestrian/bicycle network and open space.

During the Study Session for the Gateway Master Plan in November 2019, the City Council reviewed and supported the preliminary bridge alignment shown in Figure 2. The City Council also supported a design that would allow a future connected overcrossing at La Avenida to be added to the proposed Bridge to allow an east/west overcrossing at Shoreline Boulevard to La Avenida. The key consideration for the future connection is to remove the existing at-grade bicycle/pedestrian crossing of Shoreline Boulevard at La Avenida as the crossing would significantly constrain the capacity of Shoreline Boulevard and impact the operations of both the planned Shoreline reversible transit lane and the northbound Shoreline Boulevard off-ramp at Highway 101 (101).

DISCUSSION

The Shoreline Boulevard/101 interchange provides a challenging route for bicyclists and pedestrians as conflict points exist at the interchange ramps where pedestrians and bicyclists cross paths with high-speed motorists. A dedicated bicycle and pedestrian overcrossing will provide an improved and more inviting route for pedestrians and bicyclists.

In order to develop an optimal design, the following objectives and key parameters were used to guide the design of the overcrossing that balances lifecycle cost, functionality, and performance:

- Create functional connections for the existing and planned publicly accessible pedestrian/bicycle network between the City's Transit Center and the North Bayshore area;
- Provide unimpeded access and enhance the comfort of bicyclists and pedestrians traversing across 101 at Shoreline;
- Design a fiscally responsible bridge structure that optimizes life cycle costs, which include design, construction, and maintenance;

- Improve intermodal traffic operation in the North Bayshore area;
- Provide required clearances for the bridge for existing and planned infrastructure that includes 101 on- and off-ramps; and
- Minimize right-of-way acquisitions from adjacent neighbors and Caltrans, including impacts to potential Caltrans improvements, such as widening of the on- and off-ramps in the future.

The overall Bridge alignment is developed with these considerations. It is comprised of three distinct components: the Terra Bella Approach, Shoreline Overcrossing, and Pear Approach (Figure 3). Each of the Bridge components has unique surroundings and land use, which are key factors in determining the appropriate structural type that will transition from one component to another seamlessly to present a single cohesive overcrossing.

The purpose of this Study Session is to obtain City Council's comments and directions regarding the design of these three distinct segments.

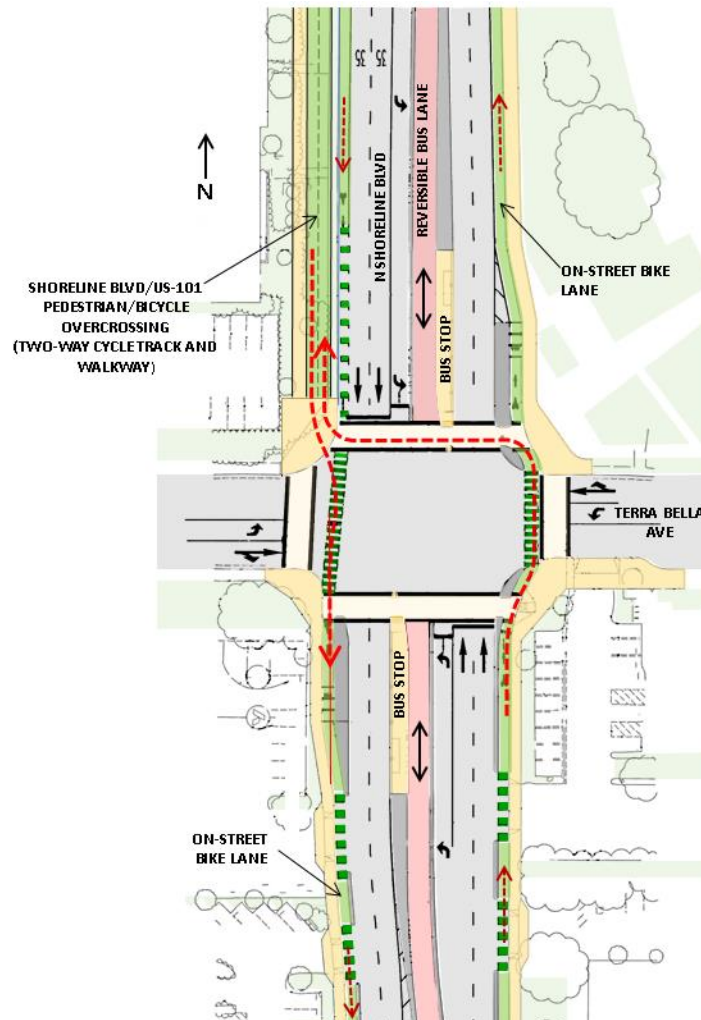
Figure 3: Bridge Components



Terra Bella Approach

The proposed pedestrian and bicycle paths within the Terra Bella Approach begin with a two-way off-street cycle track and sidewalk along the west side of Shoreline Boulevard at Terra Bella Avenue (Figure 4). Pedestrians and bicyclists to and from the Bridge can enter and/or exit at this south connection point and continue on to their destination. An alternative travelway for bicyclists can be the existing on-street bicycle lanes, which would be enhanced with green, high-visibility pavement markings as part of the reversible transit lane project (Project 18-43, Shoreline Boulevard Transit Lane and Utility Improvements). Beyond the Terra Bella Approach, southbound bicyclists can continue their travel to nearby local streets or continue on the on-street bicycle lane on Shoreline Boulevard and Stierlin Road to the Transit Center.

Figure 4: Shoreline Boulevard/Terra Bella Avenue Intersection Diagram



Design Context

The Terra Bella Approach between the Shoreline Boulevard/Terra Bella Avenue intersection and the southbound 101 off-ramp is in an area designated for General Industrial land use. It permits industrial uses, including manufacturing and storage, research and development, administrative offices, and ancillary commercial uses. The Terra Bella Approach proposes two pavement color treatments to provide a distinction of usage visually (Figure 5). With this urban-industrial context, staff recommends adding street trees, landscaping, and street lighting for an attractive, enjoyable, and sustainable urban environment.

Figure 5: Northwest View of the Terra Bella Approach



Question 1: Does the City Council support the recommended concept of the two-way off-street cycle track and sidewalk, including installation of street trees, landscape, and streetlights along the west side of Shoreline Boulevard within the Terra Bella Approach?

Shoreline Overcrossing

The Shoreline Overcrossing is the main Bridge span structure and is parallel and to the west of existing Shoreline Boulevard. It begins at the 101 southbound off-ramp exit at Shoreline Boulevard, ramps upward, and curves adjacent to the 101 southbound off-ramp. The Bridge then turns north and straightens as it crosses over 101 to the 101 northbound off-ramp at Shoreline Boulevard.

Geographic Setting and Limitation

Due to its location, the view of the proposed Bridge from 101 is limited (Figure 6). From 101 northbound, the Bridge is obscured by the Shoreline Boulevard overpass (Figure 7). From 101 southbound, the Bridge view is blocked by the Old Middlefield Way flyover (Figure 8). A full view of the Bridge is only available for 101 southbound motorists after passing the Old Middlefield Way flyover (Figure 9).

Figure 6: Proposed Bridge in Relation to Other Existing Bridge/Flyover

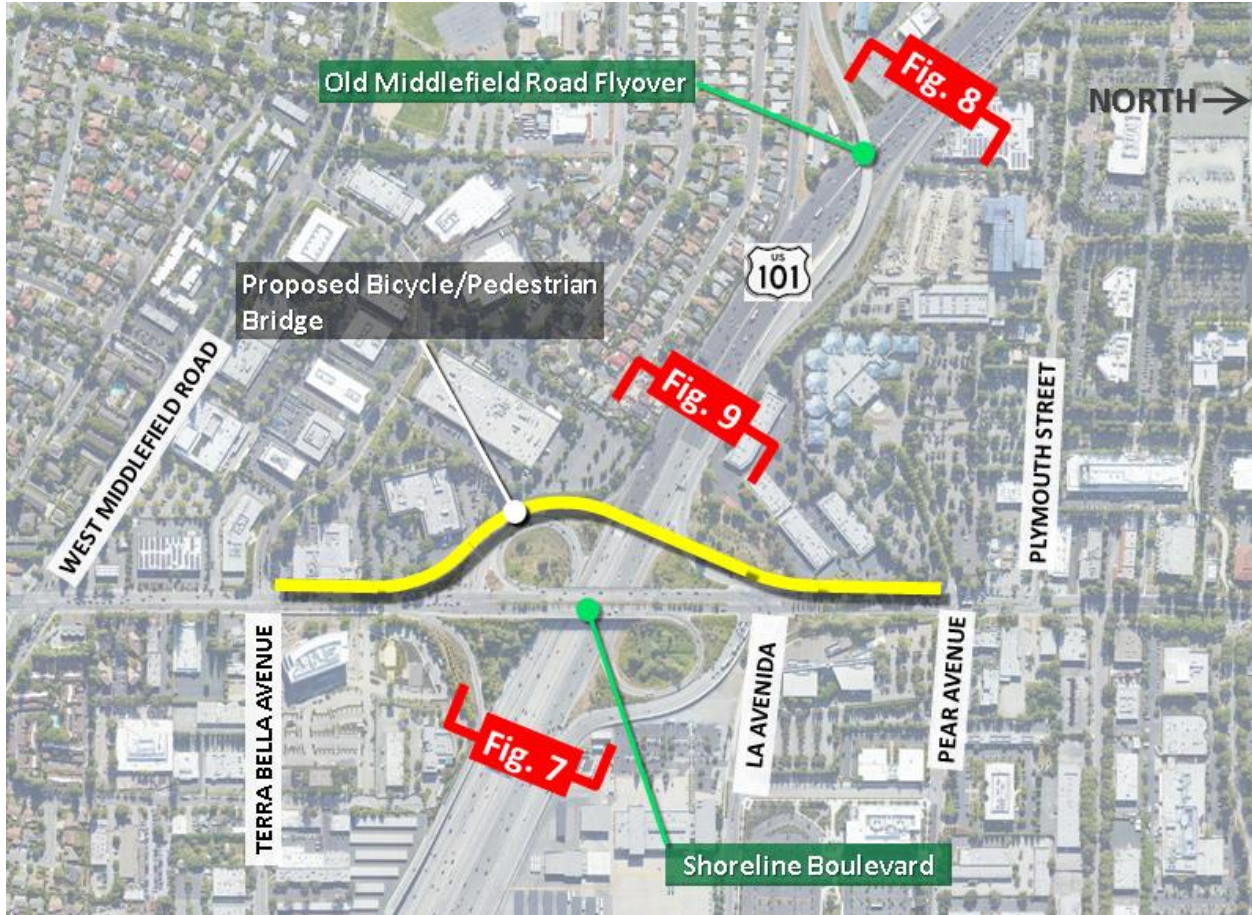


Figure 7: Street View Northbound Highway 101 Approaching Shoreline Boulevard



Figure 8: Street View Southbound Highway 101 Approaching the Middlefield Road Flyover



Figure 9: Street View Southbound Highway 101 Approaching Shoreline Boulevard



Bridge Type

In light of the visibility constraints, the Bridge section over 101 is not well positioned to be a gateway feature. Staff recommends a standard concrete box girder bridge with optional enhancements for the railings, fence mesh, barriers, wayfinding signage, and lighting. A standard bridge with appropriate and well thought-out enhancements will result in an attractive, bird-friendly, and environmentally suitable design.

Figures 10 and 11 illustrate schematics of potential enhancement opportunities that may provide aesthetic contributors while serving other functional, structural, and economical purposes.

Figure 10: Shoreline Overcrossing, On-the-Bridge View with Sample Features

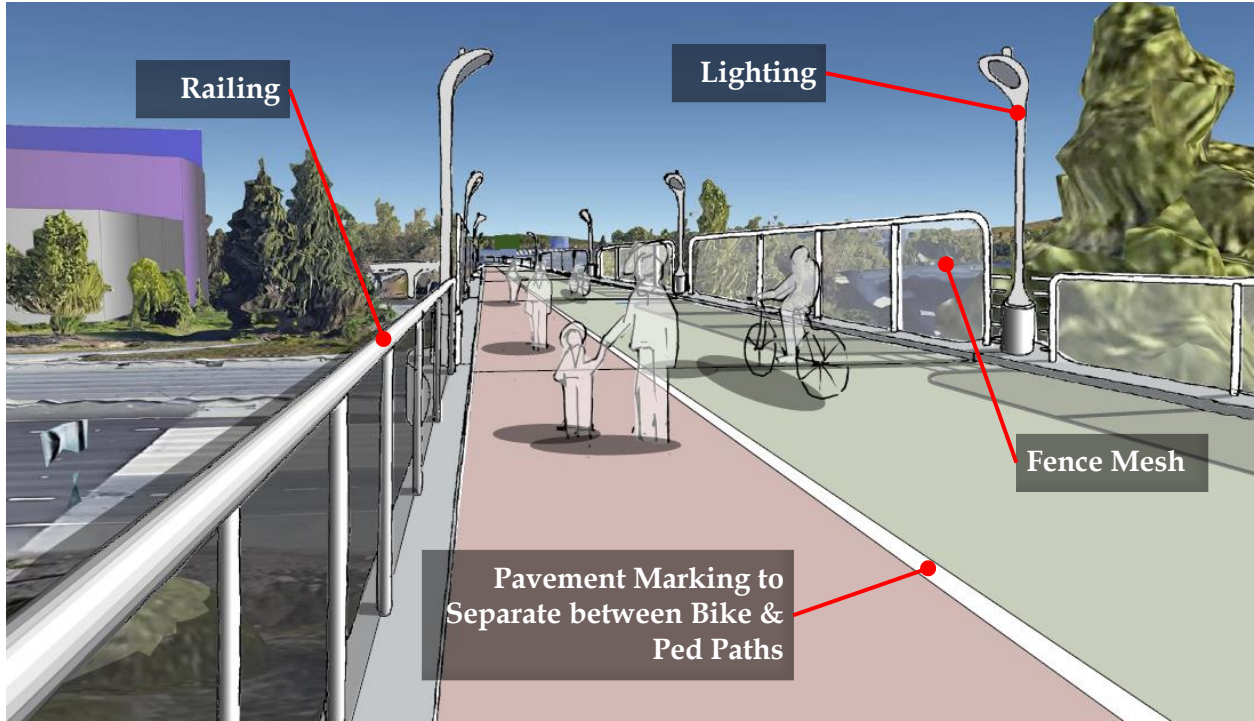
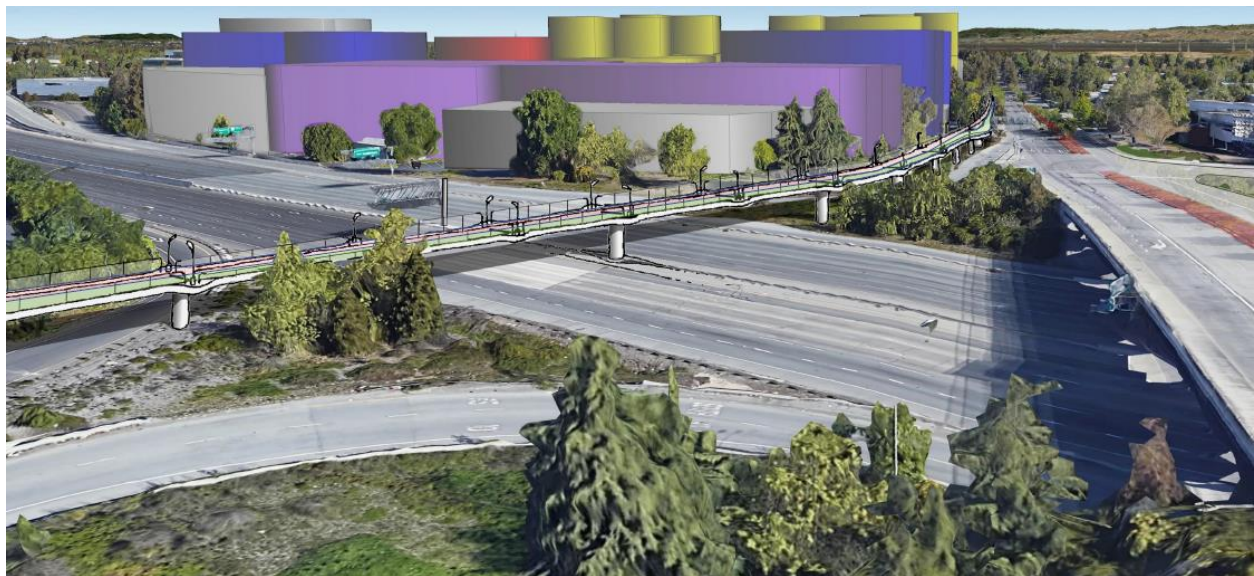


Figure 11: Shoreline Overcrossing, Looking North from Shoreline Boulevard



Figures 12, 13, and 14 are examples of standard bridges (concrete box girder) in the area with various enhancements giving each a unique look.

Figure 12: Mountain View Permanente Creek Trail Bridge



Figure 13: Mountain View Stevens Creek Trail Bridge



Figure 14: Belmont O'Neill Slough Trail Pedestrian Overcrossing



Question 2: Does the City Council support the recommended standard bridge structure design (concrete box girder) for the proposed Shoreline Overcrossing with optional enhancements to be reviewed and considered by the City Council in a future meeting?

Pear Approach

Design Context

The Pear Approach of the Bridge is between the northbound 101 on-ramp at Shoreline Boulevard and the Shoreline Boulevard/Pear Avenue intersection adjacent to the Gateway Master Plan site. With Council support of a future bridge crossing of Shoreline Boulevard to La Avenida, staff recommends a concept shown in Figure 15, which provides an example of design considerations for the Pear Approach that

complements the planned Gateway development (buildings in Figure 15 are shown for massing only).

Figure 15: Shoreline Boulevard and La Avenida Intersection Looking into the Gateway



The proposed concept shown in Figure 15 depicts a wider deck to accommodate various travel movements at a future bridge intersection crossing Shoreline Boulevard at La Avenida. An appropriate-sized support column will be investigated and determined in the subsequent design stage based on anticipated use, maneuvering space, potential conflicts between different users, and access needs for maintenance vehicles.

Staff will also continue to coordinate with the Gateway Master Plan team and design the Pear Approach to allow functional connections to the Gateway site in the future. This includes the opportunity to allow additional connections directly into a potential structure into the Gateway site.

With the potential east/west and north/south directional travel, the convergent location at Shoreline Boulevard/La Avenida is a candidate for wayfinding signage and other optional enhancements. In addition, the potential east-west crossing could serve as a future gateway feature into the North Bayshore area.

Enhanced Comfort

The Pear Approach includes the Bridge and street-level bicycle and pedestrian paths. The large width of the Bridge creates a shadow and dark areas underneath the Bridge. The proposed concept includes see-through “skylight features” along the path that creates more lighting for the pedestrians below the Bridge (Figure 16). The pathways are kept straight, avoiding sharp turns to create clear sight lines. As design continues, landscaping, including street trees, will also be carefully selected to enhance user comfort.

Figure 16: Pear Approach Along Southbound Shoreline Boulevard



Question 3: Does the City Council support the recommended design considerations such as the skylight option and a wider deck area to facilitate travels on the proposed and future bridges within the Pear Approach?

Upon receiving direction from the City Council relating to the bridge type, the design team will proceed to complete 15 percent design and return to the City Council to review the design concepts, graphics, and estimated costs for various optional enhancements. Staff will also coordinate with the City’s Visual Arts Committee to identify and collaborate with an artist through a Call for Artists process consistent with Public Art and CIP Projects Policy (City Council Policy K-5). The goal is for the artist to

join the Bridge design team during project design to identify opportunities to incorporate and closely integrate public art elements.

RECOMMENDATION

The design concepts presented are expected to be consistent with the appropriated construction budget and can be maintained without significant costs and effort. Staff seeks Council input and direction regarding the current concept and the questions outlined in this report.

Question 1: Does the City Council support the recommended concept of the two-way off-street cycle track and sidewalk, including installation of street trees, landscape, and streetlights along the west side of Shoreline Boulevard within the Terra Bella Approach?

Question 2: Does the City Council support the recommended standard bridge structure design (concrete box girder) for the proposed Shoreline Overcrossing with optional enhancements to be reviewed and considered by the City Council in a future meeting?

Question 3: Does the City Council support the recommended design considerations such as the skylight option and a wider deck area to facilitate travels on the proposed and future bridges within the Pear Approach?

NEXT STEPS

Based on Council's input, staff will continue with the project design and develop alternatives for the main overcrossing. Staff will also continue coordination with the Gateway Master Plan as well as Caltrans for the encroachment permit that will provide additional input to the design. Staff will present the concept design alternatives to City Council for direction in early 2021.

PUBLIC NOTICING

Agenda posting; postcard notification to adjacent and nearby businesses, North Bayshore residents and property owners; e-mail notification to neighborhood associations and various bicycle and pedestrian associations; and posts on social media and the City's website.