Agenda Report

File #: 19-0248

AGENDA REPORT REQUEST FOR CITY COUNCIL ACTION

DATE: 3/20/2019

TO: Honorable Mayor and City Council Members

FROM: McKinley Grade Separation Peer Review Ad Hoc Committee

SUBJECT:

McKinley Grade Separation Peer Review Team Report.

RECOMMENDED ACTION:

That the City Council:

- 1. Receive and file the Independent Review and Assessment Report prepared by the City's McKinley Grade Separation Peer Review Team ("Peer Report").
- 2. Consideration and possible action regarding recommendations from the McKinley Grade Separation Peer Review Ad Hoc Committee based upon the Peer Report.

ANALYSIS:

Background

On January 16, 2019, the City Council consented to the creation of the McKinley Grade Separation Peer Review Ad Hoc Committee ("Ad Hoc Committee"), a temporary advisory council committee consisting of Council Member Jacque Casillas and Council Member Wes Speake. The purpose for the Ad Hoc Committee was to establish a McKinley Grade Separation Peer Review Team ("Peer Review Team") whose overall goal was to take an independent look at the proposed McKinley Grade Separation Project. In particular, to take a look at the "Rail Over Road" alternative and its financial, technical and schedule feasibility, as well as the options thus far studied by staff and its consultants for the "Road Over Rail" alternative to determine whether a reasonable range of feasible alternatives has been studied.

Peer Review Team - Members and Scope

The Ad Hoc Committee identified Mr. Juan M. Diaz and Mr. Viren Shah for the Peer Review Team. Mr. Diaz is a Principal Engineer, has an MBA, and has more than 30 years of experience, including on more than 20 grade separation projects. He is also President and CEO of JMD, Inc., a full service

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transportation planning and civil engineering firm covering highways, land development, traffic and rail projects for local agencies, railroads and private entities in California. The firm has 22 employees in 3 offices (LA, OC & SD). Mr. Viren Shah is an engineer with more than 40 years of experience working on public works and other transportation related projects in both the private and public sectors (including retiring from the City of Corona in 2006).

The Ad Hoc Committee approved the attached Work Plan 01-29-19 for the Peer Review Team. In addition to generally outlining the Scope of Services, Project Meetings and Coordination, and Data Research and Review expectations for the Peer Review Team, the Work Plan posed the following guiding questions for the Peer Review Team's final work product:

Guiding Questions

- 1. Understanding that true cost calculations in advance of design are not possible and that the City's conditions are unique, provide the following:
 - A. Reasonable cost estimates or ranges based on comparable projects for "Road Over Rail" and "Rail Over Road" alternatives.
 - B. An assessment of whether the City has appropriately considered all tangible and intangible cost variables.
- Assuming that the "best" design for the City is the one which meets the City's time and money restrictions while also taking into account safety, aesthetics, and impact to businesses, answer the following:
 - A. Is the City's current "Road Over Rail" preferred alternative the best design?
 - B. If the City had more time and the same amount of money, would it still be our best option?
 - C. If the City had more money and the same amount of time, would it still be our best option?

Peer Review Team - Work and Report

The Peer Review Team met and worked with the Ad Hoc Committee throughout the process, and staff and the design team were consulted to obtain necessary information and documentation. The staff and design team were very cooperative and quickly provided the Peer Review Team with requested information and documentation. You will see in the Peer Report, for instance, that they provided the Peer Review Team with their most recently prepared 35% budget estimate that they had planned to disclose and discuss at the upcoming Study Session, which has unfortunately increased to \$111.9M or 32.5% over the available \$84.45M SB 132 funds. While a modest amount of other funds are currently identified as available (such as the approximately \$5M from other sources mentioned at the November 2018 Study Session) and while other funds may be pursued, the Ad Hoc Committee believes that this most recent budget estimate highlights the importance of its recommendations discussed below.

The Peer Review Team presented the Ad Hoc Committee with its draft report, and the Ad Hoc

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Committee provided feedback with respect to ways in which to present the information in the most appropriate, thorough and understandable fashion. Essentially, the Ad Hoc Committee attempted to ensure that the report would cover all potential alternatives, include the basis for its findings, conclusions and recommendations, and be understandable to people who do not possess an engineering degree. At no time did staff, other than the City Attorney working directly with and at the direction of the Ad Hoc Committee, obtain, see or have an opportunity to comment upon a draft of the report.

Peer Report - Ad Hoc Committee Recommendations

The final Peer Report is attached for your review and consideration. Oral presentations will be made on behalf of the Ad Hoc Committee and the Peer Review Team at the Council meeting. Therefore, the details of the Peer Report will be discussed extensively that evening and we will not summarize them here.

The Ad Hoc Committee would like to highlight, however, that we are making the following recommendations to the City Council based upon the Peer Report:

- 1. <u>Value Engineering (VE) Workshop</u>: Direct staff within thirty (30) calendar days to conduct a VE Workshop which focuses on identifying cost reduction measures and affordable innovation and which:
 - A. <u>Participants</u>: Includes a VE facilitator and staff from other public agencies experienced with grade separation projects (e.g. ACE, OCTA, RCTC and City of Riverside).
 - B. <u>Alternative Screening</u>: Uses proper screening techniques to consider at least the following alternatives: (1) underpass (as directed further below); and (2) trench.
 - C. Underpass: Carefully evaluates underpass the alternative with plan, profile and estimate to formally establish whether this alternative is feasible. Fully evaluate at least the following: (1) whether the City's 7% grade standard can be met with no modifications to the Arlington Channel; (2) whether the City's 7% grade standard can be met with modifications to the Arlington Channel, such as with a flume structure; and (3) whether a higher grade can be justified and accommodated with other design, speed or engineering adjustments.
 - D. <u>Lane Configuration</u>: Consider providing a 4-lane bridge in lieu of a 6-lane bridge and add a reversible 5th lane, if necessary, to meet the desired traffic level of service.
 - E. <u>Frontage Roads</u>: Consider adding frontage roads on each side of the proposed grade separation, with emphasis on the south side.
- 2. <u>Recommendations from VE Workshop</u>: Direct BCA to address the recommendations from the VE Workshop.

- 3. <u>Other Design Requirements</u>: Direct staff to consider the following additional design elements, either during the VE Workshop if appropriate or otherwise:
 - A. <u>Ramp Grade</u>s: Establish the maximum grade for ramps into private property and determine whether they should be less than the 15% currently proposed.
 - B. <u>Sidewalks</u>: Consider providing ADA compliant sidewalks on both sides of McKinley Street.
 - C. <u>Queue Cutter Signal</u>: Consider whether a temporary queue cutter signal may be needed during construction in the northbound direction.
- 4. <u>BNSF Design Exceptions</u>: If the underpass is not viable, direct staff to seek a design exception from BNSF for column supports. The City Council should also select one or two of its members to participate in higher level discussions regarding the design exception request.
- 5. <u>Conventional Bridge Design</u>: Direct staff to return to a conventional bridge design to lower construction costs (e.g. Tustin Avenue-Rose Drive).
- 6. <u>Process</u>: Direct staff to implement the following:
 - A. <u>Project Manager RFP</u>: Expedite an RFP to identify and hire a high level project manager experienced on grade separation projects who shall be primarily focused on this project to ensure that critical elements of the project are handled properly and in a timely manner.
 - B. <u>Emphasize Value & Cost Control</u>: All staff and consultants shall emphasize value and cost control, not just innovation, thus focusing only on value added cost reduction measures.
 - C. <u>BNSF Agreements</u>: Negotiation of important agreements with BNSF must be led by the City with BCA support. The Construction and Maintenance (C&M) Agreement process with BNSF must be started promptly.
 - D. <u>Project Controls</u>: Implement all necessary project controls (cost and schedule) to build the project on time and within budget.
 - E. <u>Design/ROW Team</u>: Take steps to assist Paragon and BCA/Kimley Horn to work closely during regular meetings, via two-way communication, to optimize the design and attempt to reduce costly right of way impacts.

Next Steps - Study Session on March 27, 2019

At the upcoming Study Session, staff will be expected to review, consider and respond to the Peer

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Review Team's final report, as well as address a schedule for compliance with those Ad Hoc Committee recommendations adopted by the City Council.

COMMITTEE ACTION:

This item is recommended for approval by the McKinley Grade Separation Peer Review Ad Hoc Committee (CM Casillas and CM Speake).

STRATEGIC PLAN:

Not applicable.

FISCAL IMPACT:

Any fiscal impacts directly resulting from the Ad Hoc Committee recommendations would be paid from the McKinley Grade Separation Capital Improvement Project (6937) in the Gas Tax Fund 222. As stipulated by Section 3.2.2 in the SB 132 Funding Agreement with the Riverside County Transportation Commission, such costs are ineligible for SB 132 funding and shall be borne solely by the City without reimbursement. Any fiscal impacts associated with the ultimate design and construction of the McKinley Grade Separation Project could be eligible for SB 132 funding.

ENVIRONMENTAL ANALYSIS:

This action is categorically exempt pursuant to Section 15061(b)(3) of the Guidelines for the California Environmental Quality Act (CEQA), which states that a project is exempt from CEQA if the activity is covered by the general rule that CEQA applies only to projects that have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA. This action merely involves possible recommendations related to considering design alternatives and will not result in any significant effect on the environment.

The proposed McKinley Grade Separation Project is also statutorily exempt from CEQA pursuant to Section 21080.13 of the California Public Resources Code, which states that CEQA does not apply to any railroad grade separation project that eliminates an existing grade crossing. If the City determines to carry out the proposed McKinley Grade Separation Project, it would eliminate the existing grade crossing at McKinley Street, south of Sampson Avenue. Therefore, no environmental analysis is required at this time.

PREPARED BY: DEAN DERLETH, CITY ATTORNEY/LRM DIRECTOR

REVIEWED BY: KERRY D. EDEN, ASSISTANT CITY MANAGER/ADMINISTRATIVE SERVICES DIRECTOR

SUBMITTED BY: MICHELE NISSEN, ACTING CITY MANAGER

Attachments:

- 1. Work Plan (01-29-19)
- 2. Peer Report (03-14-19)

CITY OF CORONA MCKINLEY GRADE SEPARATION PEER REVIEW TEAM

WORK PLAN

Oversight

McKinley Grade Separation Peer Review Ad Hoc Committee (CM Casillas and CM Speake)

Scope of Services

Perform professional and independent peer review engineering services to: (1) review the "Rail Over Road" alternative and determine its financial, technical and schedule feasibility; and (2) review the design options thus far studied by staff and its consultants for the "Road Over Rail" alternative to determine whether a reasonable range of feasible alternatives has been studied.

Task 1 – Project Meetings and Coordination

Peer Review Team will attend up to three (3) project coordination meetings (in-person or by video/audio conference) with City and/or design consultant staff to discuss project details, assumptions and rationale related to clearances, design speeds, access during construction, constructability and ability to meet deadline with existing funding.

Task 2 – Data Research and Review

Peer Review Team will be provided available data (e.g., as-built plans, design studies, track charts, conceptual design, etc.) from the City and/or design consultants and conduct an independent review to verify appropriateness of proposed grade separation design elements, such as clearances, design speeds, existing groundwater levels, traffic impacts, etc.

Rail/highway grade separations typically require evaluation of four primary factors:

- 1. Impacts to adjacent properties (right of way, visual, environmental, social justice)
- 2. Cost (right of way, structures, roadway and maintenance)
- 3. Impacts During Construction (staging, traffic, etc.)
- 4. Meeting railroad requirements (meeting clearances, standards like AREMA, etc.)

Task 3 – Findings and Recommendations Memorandum

Peer Review Team will prepare a concise memorandum to present to the City Council in open session. The memo shall document its findings and recommendations while answering the following questions:

- 1. Understanding that true cost calculations in advance of design are not possible and that the City's conditions are unique, provide the following:
 - A. Reasonable cost estimates or ranges based on comparable projects for "Road Over Rail" and "Rail Over Road" alternatives.
 - B. An assessment of whether the City has appropriately considered all tangible and intangible cost variables.
- 2. Assuming that the "best" design for the City is the one which meets the City's time and money restrictions while also taking into account safety, aesthetics, and impact to businesses, answer the following:
 - A. Is the City's current "Road Over Rail" preferred alternative the best design?
 - B. If the City had more time and the same amount of money, would it still be our best option?
 - C. If the City had more money and the same amount of time, would it still be our best option?

AD HOC COMMITTEE APPROVED: 01-29-19



MEMORANDUM

TO: City of Corona McKinley Grade Separation Peer Review Ad Hoc Committee

FROM: Juan M. Diaz, MBA, PE and Viren Shah, PE (Peer Review Team)

DATE: March 14, 2019

SUBJECT: McKinley Street / BNSF Grade Separation Independent Review and Assessment Report (JMD Project No. 2019.0111.0001.00)

I. INTRODUCTION

Presently, the City of Corona (City) and Riverside County (County), in cooperation with Riverside County Transportation Commission (RCTC) and California Department of Transportation (Caltrans) propose to grade separate the current at-grade crossing of McKinley Street and Burlington Northern Santa Fe Railway Company's (BNSF) San Bernardino Subdivision in Corona, California.

There are several alternatives developed including a track flyover to carry the BNSF tracks over McKinley Street, maintaining the current grade of the roadway and elevating the railroad profile; construct an overcrossing structure, which would span the BNSF mainline right-of-way, but would also elevate the Sampson Avenue profile to meet the elevated profile of McKinley Street; or construct an overcrossing structure, which would span both the BNSF mainline right-of-way, and Sampson Avenue, including a ramp/connector road to re-establish connectivity between the two roadways.

The objectives of the project are to:

- 1) Implement improvements to eliminate the crossing of railroad traffic and vehicular traffic.
- 2) Improve safety at the crossing.
- 3) Provide unimpeded access for emergency, and other vehicles, resulting in the enhancement of traffic operations.
- 4) Reduce existing delay due to traffic congestion in the project area.

This independent review and assessment evaluates, at a high level, past and current design efforts for the grade separation of McKinley Street and Burlington Northern Santa Fe's (BNSF) San Bernardino Subdivision, illustrated in Figure 1 – Vicinity Map below, at railroad milepost 21.18 in the City. The proposed grade separation has been in development since 2004 and is currently at 35% design with current Senate Bill 132 (SB-132) funding of \$84.45 million dollars due to expire June 30, 2023 through construction closeout.

This assessment provides overall findings and recommendations pertaining to grade separation development process, design and construction requirements as well as overall purpose and need of the project.

Figure 1 – Vicinity Map



In completing this assessment, the Ad Hoc Committee asked us to answer the following five overall questions:

- 1. Understanding that true cost calculations in advance of design are not possible and that the City's conditions are unique, provide the following:
 - A. Reasonable cost estimates or ranges based on comparable projects for "Road Over Rail" and "Rail Over Road" alternatives.
 - B. An assessment of whether the City has appropriately considered all tangible cost variables.
- 2. Assuming that the "best" design for the City is the one which meets the City's time and money restriction, while also considering, safety, aesthetics, and impact to businesses, answer the following:
 - A. Is the City's current "Road Over Rail" preferred alternative the best design?
 - B. If the City had more time and the same amount of money, would it still be the best option?
 - C. If the City had more money and the same amount of time, would it still be our best option?

II. BACKGROUND

A. Project History

Delay at the existing highway-rail crossing of McKinley Street and BNSF tracks has been increasing annually due to increased development, traffic and train movements resulting from the expansion of the Ports of Los Angeles and Long Beach. The City has been concerned with this crossing and nominated the project for inclusion in the RCTC Grade Separation Program in 2006. It was selected and became categorized to receive Partial Funding.

This project received the endorsement of the Corona City Council on September 26, 2007 approving the production of a Project Study Report completed in 2011.

B. <u>Community Interaction</u>

The Project Development Team (PDT) for the next phase of the project is expected to include representatives from the City, Caltrans, the BNSF, and representatives of several utility agencies.

The PDT is also expected to meet with several of the local business owners, particularly those located on the northwest, northeast, southwest, and southeast quadrants of the Sampson Avenue/McKinley Road Intersection.

C. Existing Facility

McKinley Street is one of the principal north/south arterials within the City. It connects the south side of the City with State Route 91 (SR-91), and ultimately to the Southern California Region.

Within the Project limits, McKinley Street is currently a four-lane street. Left turn pockets are located in each direction at the intersections with Sampson Avenue, Estelle Street, and Magnolia Avenue; a right turn lane serves southbound McKinley to westbound Sampson traffic.

An existing bridge on McKinley Street crosses the Arlington Channel, a regional flood control channel, which is located parallel to, and between, the railroad tracks and Sampson Avenue.

Within the project area there are two existing signals along Sampson Avenue - one at McKinley Street and one at Corona Life Drive. Along McKinley Street there are five signals within the project area, one at each of the following locations: the SR-91 on and off-ramps; the intersection with Sampson Avenue; the intersection with Estelle Street; the intersection with Magnolia Avenue; and a traffic signal south of the at-grade crossing with the BNSF tracks.

The BNSF track is on a 0.38% downhill grade, from east to west, as shown in Figure 2 – Track Chart on the following page.

Figure 2 – Track Chart



D. Need and Purpose

Problem, Deficiencies, Justification

McKinley Street is one of the principal north/south arterials within the City providing regional access to State Route 91 (SR-91).

Increased vehicular traffic and increased train movements have resulted in increased delays at the existing at-grade crossing of McKinley Street and BNSF's two-track crossing. These delays have not only affected the traveling public but also have impacted the response time and access of emergency vehicles.

Safety at the crossing is a major concern to the City and BNSF. According to the Project Study Report approved by the City in 2011 (2011 PSR) for the project, between 1983 and 2011, there have been six separate incidents at this crossing: three involving motorists being struck by a train; two involving pedestrians (including one fatality); and, one involving a bicyclist who was killed. These accidents are not necessarily due to design of the crossing but instead on traffic operations and congestion, thus justifying the need for grade separation.

In 2009 the California Public Utilities Commission (CPUC) ranked the McKinley Street at-grade crossing as the sixth most in need of grade separation in Southern California. Consequently, the primary project objective is to alleviate traffic congestion and improve the operation and safety of the crossing by constructing a grade separation structure, and retiring the existing highway-rail crossing.

In addition, if the preferred alternative selected from the 2011 PSR is Alternative 1, Alternative 3, or Alternative 4, the project may include a new traffic signal at the newly created intersections.

E. Methodology

This independent review and assessment expands the three tasks provided by the Ad Hoc Committee in its Work Plan and presents them as five primary tasks consisting of the following:

- Task 1 Data Review reviewed available project data including past studies and designs.
- Task 2 Alternatives Review examined all alternatives to date.
- Task 3 Cost Review evaluated alternative cost estimates.
- Task 4 Assessment prepared a brief memorandum documenting findings, conclusions and recommendations.
- Task 5 Presentation present the findings, conclusions and recommendations to the City's Ad Hoc Committee prior to presenting to the public.

Figure 3 below illustrates the anticipated schedule for each task.

Figure 3 – Schedule



F. <u>Review Process</u>

The Peer Review Team conducting the independent assessment met with City and design consultant for a concise briefing of project activities and assumptions. BNSF was also contacted to understand the requirements applicable to the project.

III. ANALYSIS

A. <u>Alternatives</u>

The Peer Review Team examined the various alternatives developed for the project and discussed in the 2011 PSR and concepts developed by Biggs Cardosa Associates (BCA) in its Project Concept Report (BCA PCR).

1. Project Study Report Alternatives

The 2011 PSR includes the following alternatives:



• PSR Alternative 1: Elevated McKinley Street and Sampson Avenue

Source: 2011 PSR

Design – This alternative proposes a 6-lane arterial along McKinley Street crossing above the BNSF corridor and Arlington Channel and meeting Sampson Avenue above ground. The overpass includes support columns under Sampson Avenue. Most of the design meets standard requirements except for the ramp at Estelle Street which proposes a 15% grade which is unusually high and may not be acceptable to the City of Corona.

Impacts – There is a significant encroachment into private property to accommodate a ramp from McKinley Street which may impact the future use of private property.

Costs – The cost for this alternative was estimated at \$71.6M in 2011 dollars which, at a 3% escalation per year, is equivalent to \$93.5M in 2020 dollars. This alternative seems to have a high cost for roadway items and a low cost for right of way items. This is due to the proposed frontage road paralleling Sampson Avenue to avoid right of way encroachment. Overall, this 2020 cost is on the higher side of the cost spectrum for an overpass with a conventional bridge.

Risks – The risks associated with this alternative primarily involve right of way impacts and costs which, in this case, focus on adjacent sites. Proposed ramps into private

property are very steep and must avoid changing the use of property after construction. It should be noted that the total cost indicated above may be underestimated due to the low estimate for right of way.



PSR Alternative 2: Elevated Railroad

Design – This alternative proposes to raise the entire 100-ft wide BNSF trackway, in two stages, over McKinley Street. The first stage would provide a two-track shoofly to divert trains south away from the northerly 50 feet of the trackway to be utilized for construction of the north half of the structure. Once the north half of the structure is built, the two-track mainline would be diverted onto the two mainline tracks on the structure to allow construction of the southerly half of the structure.

Impacts – The primary impacts of this project include high cost and visual impact by those who will lose viewshed to the other side of the trackway. In addition, the west end of the track flyover could result in perceived social justice issues due to the loss of viewshed by residential communities adjacent to the trackway.

Costs – The cost for this alternative was estimated at \$78.7M in 2011 dollars which, at a 3% escalation per year, is equivalent to \$102.7M in 2020 dollars. This alternative's cost seems to be very low and appears to be missing several structure costs to account for two-stage construction.

Risks – The risks associated with this alternative primarily involve cost and schedule impacts since the project basically would reconstruct the BNSF corridor in an elevated state and involve earthwork, track, structure and railroad signaling costs. The cost for flagging alone would be about \$1.2 M and the overall schedule would be dictated by the availability of BNSF forces. It should be noted that the total cost indicated above may be underestimated due to the low estimate for right of way.

Also, BNSF had indicated that it will require the City to assume the risk of the structure (this is done via a Construction and Maintenance agreement). Considering the high risk of cost and schedule creep as well as damage to the structure, this alternative, is not be feasible and should be removed from for further consideration.

PSR Alternative 3: Elevated McKinley Street with Loop Road Connection to Sampson Avenue

This alternative was divided into three alternative options, namely, 3A, 3B and 3C as follows:

Source: 2011 PSR



• PSR Alternative 3A – Longest Connector Road

Design – This alternative proposes to raise McKinley Street over Sampson Avenue, Arlington Channel and BNSF tracks. This provides a loop road designed to provide southbound access from Sampson Avenue to southbound McKinley Street.

Impacts – The primary impacts of this project include high cost and visual impact to those facing approach embankment walls north of Sampson Avenue and south of the BNSF corridor.

Costs – The cost for this alternative was not provided in the 2011 PSR. However, the estimated cost for this alternative, as compared to Alternative 1 in the 2011 PSR, ranges between \$95 and \$100 million dollars based on right of way impacts and assumes a conventional bridge with support columns beneath, likely on Sampson Avenue.

Risks – The risks associated with this alternative primarily involve cost and schedule impacts driven by right of way acquisition and the possible need for eminent domain. It should be noted that the total cost indicated above may be underestimated due to the low estimate for right of way.

Source: 2011 PSR



PSR Alternative 3B – Shortest Connector Road 0

Design - This alternative proposes to raise McKinley Street over Sampson Avenue, Arlington Channel and BNSF tracks. This provides a short loop road (compared to Alternative 3A) designed to provide southbound access from Sampson Avenue to southbound McKinley Street. The loop road has a tight curve alignment which does not provide sufficient sight distance and could be a cause of accidents.

Impacts – Like Alternative 3A, the primary impacts of this project include high cost and visual impact to those facing approach embankment walls north of Sampson Avenue and south of the BNSF corridor.

Costs – The cost for this alternative was not provided in the 2011 PSR. However, the estimated cost for this alternative, based on comparison with Alternative 3A, ranges between \$78 and \$90 million dollars based on right of way impacts and assumes a conventional bridge with support columns beneath, likely on Sampson Avenue.

Risks – Like Alternative 3A, the risks associated with this alternative primarily involve cost and schedule impacts driven by right of way acquisition and the possible need for eminent domain. It should be noted that the total cost indicated above may be underestimated due to the low estimate for right of way.

Source: 2011 PSR





Source: 2011 PSR

Design – This alternative proposes to raise McKinley Street over Sampson Avenue, Arlington Channel and BNSF tracks. This provides an intermediate loop road (compared to Alternatives 3A and 3B) designed to provide southbound access from Sampson Avenue to southbound McKinley Street. The loop road has a curved alignment at the approach to McKinley Street and does not provide ample sight distance and could be a cause of accidents.

Impacts – Like Alternatives 3A and 3B, the primary impacts of this project include high cost and visual impact to those facing approach embankment walls north of Sampson Avenue and south of the BNSF corridor.

Costs – The cost for this alternative was not provided in the 2011 PSR. However, the estimated cost for this alternative, based on comparison with Alternative 3B, ranges between \$83 and \$95 million dollars based on right of way impacts and assumes a conventional bridge with support columns beneath, likely on Sampson Avenue.

Risks – Like Alternatives 3A and 3B, the risks associated with this alternative primarily involve cost and schedule impacts driven by right of way acquisition and the possible need for eminent domain. It should be noted that the total cost indicated above may be underestimated due to the low estimate for right of way.



• PSR Alternative 4: Elevated McKinley Street with Connection to Sampson Avenue

Source: 2011 PSR

Design – Like Alternative 3A, this alternative proposes to raise McKinley Street over Sampson Avenue, Arlington Channel and BNSF tracks. This provides a long loop road to provide southbound access from Sampson Avenue to southbound McKinley Street. The loop road has a milder 90 degree bend far from the approach to McKinley Street and provides ample sight distance to optimize safety.

Impacts – The primary impacts of this project include high cost and visual impact to those facing approach embankment walls north of Sampson Avenue and south of the BNSF corridor.

Costs – The cost for this alternative was not provided in the 2011 PSR. However, the estimated cost for this alternative, based on comparison with Alternative 3B, ranges between \$85 and \$100 million dollars based on right of way impacts and assumes a conventional bridge with support columns beneath, likely on Sampson Avenue.

Risks – Like Alternatives 3A, the risks associated with this alternative primarily involve cost and schedule impacts driven by right of way acquisition and the possible need for eminent domain. It should be noted that the total cost indicated above may be underestimated due to the low estimate for right of way.

Conceptual plans were developed for each alternative above but conceptual cost estimates were only developed for Alternatives 1 and 2 in the 2011 PSR.

2. BCA Alternative Concepts

Presently, the City has retained the services of BCA who, utilizing Alternative 4 from the 2011 PSR as a starting point, has developed the following alternatives as part of its proposal:



• AC-04: Connector Road Option 1 – Outside Loop

Source: BCA PCR, October 2, 2018

Design – Like Alternative 4 in the 2011 PSR which serves as the initial basis of design, this alternative proposes to raise McKinley Street over Sampson Avenue, Arlington Channel and BNSF tracks. This provides a long loop road to provide southbound access from Sampson Avenue to southbound McKinley Street. The loop road has a milder 90-degree bend far from the approach to McKinley Street and provides ample sight distance to optimize safety.

Impacts – The primary impacts of this project include high cost and visual impact to those facing approach embankment walls north of Sampson Avenue and south of the BNSF corridor.

Costs – The cost for this alternative was not provided in BCA's PCR. However, the estimated cost for this alternative, based on comparison with BCA's Alternative 2 (AC-05: Connector Road Option 2 – Inside Loop), shown on page 16, ranges between \$85 and \$100 million dollars based on right of way impacts and assumes an iconic bridge to avoid supports within BNSF right of way, the Arlington Channel and Sampson Avenue.

Risks – Like Alternative 4 in the 2011 PSR, the risks associated with this alternative primarily involve cost and schedule impacts driven by right of way acquisition and the possible need for eminent domain.



• AC-05: Connector Road Option 2 – Inside Loop

Source: BCA PCR, October 2, 2018

Design – Like Alternative 3B in the 2011 PSR, this alternative proposes to raise McKinley Street over Sampson Avenue, Arlington Channel and BNSF tracks. This provides an intermediate loop road to provide southbound access from Sampson Avenue to southbound McKinley Street. The loop road has a tighter curve at the approach to McKinley Street and provides limited sight distance.

Impacts – The primary impacts of this project include high cost and visual impact to those facing approach embankment walls north of Sampson Avenue and south of the BNSF corridor.

Costs – The cost for this alternative was not provided in BCA's PCR. However, the estimated cost for this alternative, based on comparison with BCA's Alternative 2 (AC-05: Connector Road Option 2 – Inside Loop), on page 16, ranges between \$100 and \$111.9 million dollars based on right of way impacts and assumes an iconic bridge to avoid supports within BNSF right of way, the Arlington Channel and Sampson Avenue.

Risks – Like Alternative 4 in the 2011 PSR, the risks associated with this alternative primarily involve cost and schedule impacts driven by right of way acquisition and the possible need for eminent domain.



• AC-06: Connector Road Option 3 – Offset Intersection Loop

Source: BCA PCR, October 2, 2018

Design – This alternative proposes to raise McKinley Street over Sampson Avenue, Arlington Channel and BNSF tracks. This alternative provides an offset intersection to provide southbound access from Sampson Avenue to southbound McKinley Street. The loop road provides better sight distance at the approach to McKinley Street and divides Los Arcos Plaza.

Impacts – The primary impacts of this project include high cost and visual impact to those facing approach embankment walls north of Sampson Avenue and south of the BNSF corridor.

Costs – The cost for this alternative was not provided in the BCA PCR. However, the estimated cost for this alternative, based on comparison with BCA's Alternative 2 (AC-05: Connector Road Option 2 – Inside Loop), on page 16, ranges between \$100 and \$110 million dollars based on right of way impacts and assumes an iconic bridge to avoid supports within BNSF right of way, the Arlington Channel and Sampson Avenue.

Risks – Like Alternative 4 in the 2011 PSR, the risks associated with this alternative primarily involve cost and schedule impacts driven by right of way acquisition and the possible need for eminent domain.



• AC-07: Connector Road Option 4 – Roundabout Loop

Source: BCA PCR, October 2, 2018

Design – This alternative proposes to raise McKinley Street over Sampson Avenue, Arlington Channel and BNSF tracks. This alternative provides a roundabout at the SR-91 eastbound on-ramp to provide southbound access from Sampson Avenue to southbound McKinley Street. The roundabout alternative avoids impacting Los Arcos Plaza.

Impacts – The primary impacts of this project include high cost and visual impact to those facing approach embankment walls north of Sampson Avenue and south of the BNSF corridor.

Costs – The cost for this alternative in BCA's PCR, based on comparison with BCA's Alternative 1 (AC-07: Connector Road Option 4 – Roundabout Loop), on page 16, ranges between \$90 and \$105 million dollars based on right of way impacts and assumes an iconic bridge to avoid supports within BNSF right of way, the Arlington Channel and Sampson Avenue. It also includes parking lot and parking structure improvements within the KPC site as well as freeway embankment improvements including retaining walls.

Risks – Unlike Alternative 4 in the 2011 PSR, the risks associated with this alternative primarily involve cost and schedule impacts driven by structure costs while avoiding eminent domain.

3. Remaining Road over Rail Alternatives

The BCA PCR qualitatively screened out the underpass, track flyover and trench alternatives thus resulting in two remaining alternatives listed below:

 Alternative 1 – Roundabout Alternative (AC-07: Connector Road Option 4 – Roundabout Loop)



Source: BCA PCR, October 2, 2018

Alternative 2 – Inner Loop Alternative (AC-05: Connector Road Option 2 – Inside Loop)



Source: BCA PCR, October 2, 2018

Based on review of alternatives developed to date by the 2011 PSR and BCA PCR, the Peer Review Team agrees that the likely feasible alternatives are those which focus on the underpass and overpass. The underpass, track flyover and trench were apparently disqualified by BCA in the PCR based on the presence of Arlington Channel, excessive cost in railroad right of way and drainage challenges to BNSF, respectively. No plans or estimates, however, were provided supporting the rationale to eliminate these alternatives.

The Peer Review Team believes that the underpass is a viable alternative that should be considered in greater detail than has been provided. Considering the McKinley Street profile, Arlington Channel depth and flat alignment as well as the viability of a flume structure is essential to verify the feasibility of the underpass option which, if viable, would provide various benefits that the overpass does not provide. In fact, the underpass is the most popular alternative in Southern California based on its typical shorter limits and avoidance of visual impacts.

The current overpass alternative, referred to as Alternative 2 - Inner Loop Alternative (AC-05: Connector Road Option 2 – Inside Loop), illustrated on page 16, which has been designed to a 35% level by BCA, consists of an overpass with the inside loop connector road which resembles Alternative 4 in the 2011 PSR. The current estimate of this alternative is \$111.9 million dollars.

A. Cost Comparison (Road Over Rail vs Rail Over Road)

The Peer Review Team examined costs for the alternatives in the 2011 PSR and BCA PCR. In general, the Peer Review Team concurred that the estimated costs are within the expected range of costs for overpass alternatives but are closer to the higher limits. Table 1 below outlines the cost estimates for the Overpass Alternative beginning with the 2011 PSR Estimate in Column A, BCA's 35% Estimate in Column B and the adjusted 2020 PSR Cost Estimate based on an escalation cost of 3% per year. Column D represents the range in costs anticipated by the Peer Review Team for the Overpass Alternative based on industry costs for rail/highway grade separations and assuming a conventional bridge with frontage roads and including Peer Review Team recommendations (e.g., 4-lane bridge with sidewalk on each side, etc.).

	(A)	(B) (C)		(D)	
Project Element	PSR Alt. 1	BCA PCR Alt. 2	PSR Alt.1	Peer Team	
	2011 PSR Cost	BCA 35% Cost	2020 PSR Cost	Projected Cost	
Roadway	\$35.4	\$20.4	\$46.2	\$22	
Structures	\$14.1	\$26.2	\$18.4	\$18-\$22	
Right of Way	\$1.5	\$35.0	\$2.0	\$15-\$24	
Third Party Utilities	None	\$1.9	None	\$1.9	
Admin/Design	\$10.7	\$18.0	\$14.0	\$14.2-\$17.5	
Contingency	\$9.9	\$8.8	\$12.9	\$8.5-\$10.5	
Escalation	None	\$1.6	None	\$1.0	
Total	\$71.6	\$111.9	\$93.5	\$80.6-\$98.9	

Table 1 – Overpass (Road over Rail) – Comparative Cost Estimates

All values in millions.

The Peer Review Team did not concur with the estimate for Alternative 2 – Elevated Railroad or Track Flyover in the 2011 PSR. Such cost is projected to be between \$174 and \$206 million

dollars, as shown in Table 2 in column (D) on the following page, and not be \$226.5 million in accordance with CNC's Independent Cost Estimate, dated December 20, 2017. This estimated cost is due to the fact that BNSF requires raising the entire 100-ft wide trackway, flattening the proposed track grades to near 0.5% as well as relocating the current track crossovers and Control Point May (CP May), while maintaining the integrity of the Arlington Channel.

Project Element	(A) PSR Alt. 2	(B) (C) BCA 35% Cost PSR Alt. 2		(D) Peer Team	
	2011 PSR Cost		2020 PSR Cost	Projected Cost	
Roadway	\$30.5	N/A	\$39.8	\$40	
Structures	\$25.1	N/A	\$32.8	\$64.3-\$87.1	
Right of Way	\$0.0	N/A	\$0.0	\$10	
Third Party Utilities	None	N/A	None	\$10	
Admin/Design	\$12.0	N/A	\$12.0	\$31.1-\$36.8	
Contingency	\$11.1	N/A	\$11.1	\$18.6-\$22.1	
Escalation	None	N/A	None	None	
Total	\$78.7	N/A	\$102.7	\$174-\$206	

Table 2 – Alternative 2 Track Flyover (Rail over Road) – Comparative Cost Estimates

All values in millions.

B. Existing Conditions

Analysis of existing conditions focused on four primary elements, namely, alignment, accident history, traffic conditions and right of way acquisition.

1. Alignment

The current horizontal and vertical alignment of McKinley Street, Sampson Avenue and Magnolia Avenue combined with mostly commercial land uses are a logical fit for underpass and overpass alternatives. Of these two, the underpass is usually the preferred alternative because it has shorter limits due to the shorter height differential (top of proposed street to top of rail) of approximately 22 feet. In the case of McKinley Street, this differential is greater due to the presence of the Arlington Channel which raises the differential to about 33.5 feet and which is greater than the 30-ft differential for an overpass, as shown in Figure 4 below.



Figure 4 – McKinley Street Underpass and Overpass Profiles

According to Figure 4 above the underpass would require an 8.5% maximum grade to clear the existing bottom of channel and flume structure. Meeting the maximum standard of 7% would require reducing the channel height from 12 feet to 7 feet by reprofiling the Arlington Channel.

2. Accident History

Augmenting CPUC accident data discussed on page 4, accident data gathered from the Federal Railroad Administration's (FRA's) database indicates two (2) total incidents within the last 10 years resulting in two pedestrians killed without vehicle involvement.

Visual observations of the crossing confirm extensive vehicle queues on McKinley Street in the northbound direction which extend near Magnolia Avenue. Such queues are expected to increase during construction activities and could result in accidents. The existing traffic signal serving the Inland Empire Adult Day Care Health Care Center entrance south of the crossing is not designed as a queue cutter signal but as a simple traffic signal with likely railroad preemption. Therefore, proposed construction activities may require a queue cutter signal which cuts the queue south of the crossing to prevent grade crossing accidents during construction activities.

3. Traffic Conditions

The proposed alternatives appear to meet LOS requirements. Refinements are needed to ensure lane configurations at the McKinley Street/SR-91 EB Offramp meet the anticipated future volumes. In addition, the City should consider whether the loop road needs to be refined to avoid providing a road with excess capacity.

4. Right of Way Acquisition

The acquisition of right of way is a very significant element of the project as it currently represents about 31.28% of the total cost of the currently preferred alternative based on BCA's 35% Cost Estimate for the Overpass. This is unusually high and indicative of adjacent land use which requires access which the overpass cannot provide. One potentially viable solution to maintain access and minimize impacts to existing properties is to provide frontage roads on each side of an underpass or overpass which maintains accessibility and offers room for a utility corridor to avoid further encroachments and right of way acquisition. Figure 5 below illustrates a frontage road system in gold color. The frontage road remains at grade and allows counterclockwise circulation beneath the bridges to allow vehicles to make 180 degree turns for return travel. The

tight loop road shown in Figure 5, tries to avoid impacting the largest building structures in private property. In doing so, however, sight distance at the approach to McKinley Street is limited.



Figure 5 – Underpass and Overpass Frontage Road Access Option

C. Procurement Process

The subject project's procurement process provided evaluation criteria with emphasis on innovation (i.e., 40 of 100 points) which, if left unchecked by a cost control requirement, can result in a high cost alternative. Cost control is not directly mentioned in the evaluation criteria.

1. Evaluation Criteria

Consultant/Firm Name:		
Criteria	Max Points	Rating
Understanding of the work to be done and proposed project	20	
approach		
Qualifications of the firm, proposed staffing, relevant	20	
experience with similar kinds of work and availability of the		
Project Manager and key personnel		
Presentation of Innovative and Creative Design that provides	30	
an equal or better solution to the end product absent the		
deviation or concept, as determined by the City, in its sole		
discretion		
Capability of developing innovative or advanced techniques to	10	
providing the services that provide additional efficiencies or		
increased performance capabilities		
Familiarity and experience working with BNSF, Caltrans District	20	
8, Riverside County Flood Control and Water Conservation		
District, U.S. Army Corps of Engineer, Regional Water Quality		
Board and California Department of Fish and Wildlife		
Total	100	

BCA developed a similar project to McKinley Street at Tustin Avenue-Rose Drive in Placentia, Anaheim and Orange County (shown in Figure 6 below), for a total project amount of \$78 million. This project provides a conventional bridge with support columns apparently allowed by BNSF via a design exception. McKinley Street is currently estimated at \$111.9M (about 32.5% over the available SB-132 funding amount) with potential for additional costs due to project footprint and utility corridor impacts to properties south of the BNSF corridor.



Figure 6 – Tustin Avenue – Rose Drive Grade Separation

D. <u>Design Process</u>

1. Screening

Generally, a high-level screening of primary grade separation options (underpass, overpass, track flyover and trench) is ideal to ensure that feasible alternatives are clearly separated from non-feasible alternatives. Each type is described below:

- **Underpass** Depresses the roadway beneath a trackway corridor.
- **Overpass** Raises the street above a trackway corridor.
- **Track Flyover** Raises the track(s) over the street and usually involves multiple streets due to flat railroad grades.
- **Trench** Lowers the track(s) below a street and usually involves multiple streets due to flat railroad grades.

The screening aids local agencies in preparing for right of way activities which may involve eminent domain. The screening should include simple geometric plan and profiles with Rough Order of Magnitude (ROM) estimates for transparency and objectivity. A qualitative screening was discussed in BCA's PCR but lacked plans, profiles and estimates for a complete evaluation by City staff.

In general, a screening evaluates and eliminates alternatives which are not feasible and indicates the reason why they are not feasible. The screening may consider a weighted point system or simply identify impacts which affect the feasibility of the alternative. A typical screening would likely result in a summary shown in Table 2 – Alternatives Screening.

	Impacts					
Alternatives	ROW	Environ.	Construction	Cost	Total	
Underpass	4	3	3	3	13	
Overpass	3	4	4	4	15	
Track Flyover	2	1	2	2	7	
Trench	1	2	1	1	5	

 Table 2 - Alternatives Screening

High Impact = Low Score (1 pt)

Based on the above, an underpass and overpass would be the most logical choices for McKinley Street based on the shorter limits desired. The track flyover and trench, which are more applicable to multiple grade separations adjacent to each other, rank lower because they are too expensive for a single grade separation at McKinley Street. An overpass traditionally has longer project limits than an underpass due to the typical 30 feet height that needs to be reached between top of rail and top of proposed street. The underpass is the logical favorite due to its shorter limits, no visual impact and the need to lower only about 22 feet from top of rail to top of proposed street.

In the case of McKinley Street, the underpass was overlooked and determined not feasible (without plan, profile and estimate) due to the presence of the Arlington Channel which is about 15 feet below top of rail. This would result in depressing the street about 33.5 feet below top of rail. The profile in Figure 7 below indicates a possible profile alignment that can meet a 7% maximum grade without impacting the SR-91 bridge over McKinley Street. It is, therefore, critical that this alternative be properly evaluated before proceeding with design.





2. Innovation vs Cost Control

Innovation without requiring cost control can lead to overruns. From the beginning, the project began with a focus on innovation per the selection criteria in the project's Request for Proposal (RFP). Cost control was not directly mentioned in the evaluation criteria. The fact is that, at \$111.9M, the project is currently over the amount of available SB-132 funding of \$84.45M by nearly 32.5%. This appears to be, in part, the result of designing a 6-lane iconic bridge as opposed to a conventional bridge with four lanes.

3. BNSF Coordination/Negotiation

Coordination with BNSF typically results in some form of negotiation so confidentiality is important. It is therefore critical that the City take the lead in negotiations with BNSF and include BCA when discussing design requirements.

BCA acknowledged to the Peer Review Team that BNSF requires all proposed columns be located outside of railroad right of way. This was confirmed by BNSF staff who added that BNSF/UPRR Grade Separation Guidelines require columns outside of railroad right of way. However, design exceptions are allowed, if warranted, taking into account, financial considerations. In the case of McKinley Street, which is similar to the Tustin Avenue-Rose Drive/BNSF grade separation, a design exception should be pursued on the basis that columns will:

- Allow conventional construction without limiting BNSF trackway expansion.
- Allow elimination of the existing crossing with current funding with BNSF's financial participation.

E. Design Requirements

- ADA access is important considering the observed presence of pedestrians walking within local streets such as Sampson Avenue.
- Although the crossing shows visible queuing in the northbound direction which extends near Magnolia Avenue, such queuing could increase during construction and require a queue cutter signal during temporary grade crossing operations.

F. Findings and Conclusions

Based on the analysis, the following are the findings:

1. Design Process

- Design sequence not followed (e.g., PSR estimates missing, screening missing).
- RFP focus on innovation and not cost control.
- Project controls do not appear to be followed.
- Project follows BNSF requirements without question or seeking design exception followed on Tustin Avenue Rose Drive.
- Lack of focus on critical project elements including controlling cost. Focus is on schedule.

- Two-way collaboration between Paragon and BCA/Kimley Horn could help reduce right of way costs.
- Construction and Maintenance (C&M) Agreement must be started immediately.

2. Design Requirements

- Sidewalk one side of McKinley Street does not appear to be adequate for the existing land use in the project area.
- A 15% grade for proposed ramps is excessive.
- The rationale for a 6-lane alternative is pending.

The following are the conclusions reached:

3. Design Alternatives

- The underpass and trench were not sufficiently screened in the 2011 PSR and BCA PCR.
- The underpass needs to be thoroughly screened.
- 2011 PSR Alternatives 1, 3A, 3B, 3C and 4 which propose an overpass are only feasible if the cost is reduced.
- 2011 PSR Alternative 2 is not feasible based on cost, schedule, replacement responsibility and visual impacts to adjacent properties.
- BCA PCR Alternatives AC-04: Connector Road Option 1 Outside Loop, AC-05: Connector Road Option 2 – Inside Loop, AC-06: Connector Road Option 3 – Offset Intersection Loop, AC-07: Connector Road Option 4 – Roundabout Loop are not feasible if they do not meet the proposed budget. The closest alternative to achieve this is Option 2 – Inside Loop but the cost exceeds the available SB-132 funding. A conventional bridge could help meet the budget.

IV. PEER REVIEW TEAM RECOMMENDATIONS

Considering the findings and conclusions, the following are the recommendations of the Peer Review Team:

1. Design Process

- The design process needs to be sequential and should consider proper screening techniques to avoid pitfalls and even a perception of bias towards certain alternatives.
- Carefully evaluate the underpass alternative with plan, profile and estimate to formally establish whether this alternative is feasible. In the Peer Review Team's' opinion, this is a potentially viable option for McKinley Street, if proven to work from an alignment and cost perspective. It is constrained by the Arlington Channel which has a depth of 12 feet with the top of walls being about 3 feet below top of rail. The channel's profile is very flat in this area and channel flume structures may not be common but have been used.

- Screen the trench alternative.
- If the underpass is not viable, seek design exception from BNSF for column supports, and provide a conventional bridge design like Tustin Avenue-Rose Drive.
- The grade separation project needs to be led by the City with emphasis on value and cost control, not just innovation which can result in excessive cost.
- Negotiation of important agreements with BNSF must be led by the City with BCA support.
- Implement project controls (cost and schedule).
- Project oversight must be handled by high level, experienced staff or consultant Project Manager acting on behalf of the City and primarily focused on this project to ensure that critical elements of the project are handled properly and in a timely manner.
- Paragon and BCA/Kimley Horn must work closely during regular meetings, to optimize the design, via two-way communication, and attempt to reduce costly right of way impacts.
- The Construction and Maintenance (C&M) Agreement process with BNSF, which takes a minimum of one year, must be started promptly.

2. <u>Design Requirements</u>

- Consider providing a 4-lane bridge with frontage roads, as appropriate, in lieu of a 6-lane bridge and add a reversible 5th lane, if necessary, to meet the desired traffic level of service and capacity needed. This roadway mainline with frontage road option may better serve local and regional traffic in the project area.
- Establish the maximum grade for ramps into private property which should be less than 15% currently proposed.
- Consider adding frontage roads on each side of the proposed grade separation, with emphasis on the south side, to maintain critical access to businesses, avoid relocated utilities in private property and utilize the frontage roads as utility corridors for better utility access.
- Consider providing ADA compliant sidewalks on both sides of McKinley Street.
- Consider adding a queue cutter signal in the northbound direction at the proposed temporary grade crossing.
- Conduct a Value Engineering (VE) Workshop which focuses on identifying cost reduction measures for the Project. This could be done by seeking a VE facilitator and recruiting agency staff from ACE, OCTA, RCTC and City of Riverside to participate during a 3 to 5day workshop focusing on identifying realistic cost-saving measures that can achieve a grade separation which offers value and affordable innovation.

3. <u>Risks/Impacts</u>

- Possible continued cost creep due to right of way impacts.
- City leadership and direction are key to controlling costs and schedule.

4. <u>Next Steps</u>

- Schedule VE Workshop (focused on cost reduction measures) without delaying the project. Focus on identifying cost saving elements from similar projects.
- Have BCA address the recommendations of the VE Workshop.
- All parties must focus on value added cost reduction measures.

JMD:dd

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