
Subject:	Logistics Strategy – Bethany Reservoir Alternative (Final Draft)
Project feature:	Site Development / Logistics
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1. Introduction

Logistics touch almost every element of the proposed Delta Conveyance Project (project), including people, procurement, commercial, design, and construction. At the earliest stage, logistics can help to shape design and procurement, ensuring the best solutions are developed based on a consultative approach between all disciplines. By being part of the early stage planning, the logistics strategy is well-placed to help influence the definition and development of the required project features.

A construction logistics strategy involves more than simply identifying how materials are to be moved to and from the work sites. It is intended to identify how logistics management can be used to address key constraints and opportunities to ensure the project is delivered in a safe, timely, and cost-effective manner while minimizing impacts to the environment and residents of the Delta. Because the construction of major infrastructure required for this project is highly complex, the logistics strategy needs to show how the aims and aspirations at the planning stage of the project can be delivered during construction, leaving a lasting and positive legacy.

This technical memorandum (TM) focuses on the materials, equipment, and labor access opportunities needed to develop the environmental documents.

1.1 Background

The previous logistics strategy TM focused on two corridors of the proposed project identified by the DWR in its January 2020 Notice of Preparation: Eastern and Central corridors (DWR 2020) (refer to the *Logistics Strategy TM* [DCA 2021a]). DWR also identified the Bethany Reservoir Alternative that would extend from the intakes along the Eastern corridor to Lower Roberts Island, then continue along a tunnel alignment to a new Bethany Reservoir Pumping Plant (BRPP) to be located south of the Clifton Court Forebay. The new pumping plant and associated aqueduct would convey the water to a Bethany Reservoir Discharge Structure along the rim of the existing State Water Project (SWP) Bethany Reservoir. The BRPP, Surge Basin, Bethany Reservoir Aqueduct, and Bethany Reservoir Discharge Structure are referred to as the Bethany Complex. This supplemental TM examines the Bethany Reservoir Alternative from a logistics perspective.

For a detailed background, refer to the *Logistics Strategy TM* (DCA 2021a).

1.2 Purpose

The purpose of this document is to build upon earlier general access studies related to the overall Project area, to identify the logistics-related issues that could prevent or complicate serving each specific planned

work site, and to resolve these challenges at a strategic level. It therefore provides a framework for the development of more detailed logistics strategies for each site as design development evolves. This strategy covers the proposed Bethany Reservoir Alternative alignment and multiple water diversion design capacity options under consideration.

The logistics strategy is primarily intended to accommodate the forecasted movement of bulk materials, such as spoils, borrow material, concrete (either raw materials or ready-mix), tunnel lining segments, etc. and workers during construction. Additionally, one of the goals of this strategy is to determine the best possible transport solution for these materials, considering many factors, and looking at barge, rail, and road systems.

1.3 Organization

This TM includes the following sections:

- Introduction
- General Access, Project Alignment and Road Access
- Material Requirements
- Construction Support Facilities
- Preliminary Logistics Strategy
- References
- Document History and Quality Assurance

2. General Access, Project Alignment, and Road Access

The DCA engineering team has conducted numerous studies and evaluations associated with identifying acceptable work sites and general means of access to these sites by road, rail, and barge for the Central and Eastern Corridors and to the Bethany Reservoir Alternative. Drawing on these general access studies, the team has conducted siting studies to define potential work sites and a conveyance alignment for each of these corridors. The results of these previous investigations are summarized here.

2.1 General Access

The general means of access to the various tracts and islands along both corridors under study were investigated by the DCA and include road, rail, and barge (refer to the *Logistics Strategy TM* [DCA 2021a]). The results of these general access studies are shown on the figures in Attachment 1. These general access assessments were subsequently used to inform the more detailed work site location studies.

2.2 Project Alignment

To establish a proposed conveyance system alignment for the Bethany Reservoir Alternative, the DCA engineering team performed a facility siting analysis (refer to the *Facilities Siting Study – Bethany Reservoir Alternative TM* (DCA 2021b)). The analysis initially focused on locations for the launch shafts followed by a similar analysis to site the reception and maintenance shafts, the pumping plant, and the aqueduct. This involved the following process:

- Methodology was broken out into criteria and sub-criteria
- Sub-criteria were assigned an Importance Factor to reflect their weighting
- Criteria were based generally on design and construction considerations, including existing land uses and other criteria such access to existing roads, rail, and waterways

The result of this analysis is the proposed alignment presented on Figure 1.

2.3 Road Access

Access by road would be required to all work sites. The following general guiding principles were followed in determining the best access to the various work sites:

- No construction traffic would be allowed in Yolo County except for Interstate 80, or for individuals or trucks traveling from homes or businesses in Yolo County.
- No construction traffic would be allowed within Solano County except for Interstate 80 and State Route 12 in Solano County (between Interstate 80 and Sacramento River) or for individuals or trucks traveling from homes or businesses in Solano County.
- No construction traffic would be allowed on State Route 160 between State Route 12 and Cosumnes River Boulevard except for re-alignment of this highway at the intake locations or for individuals or trucks traveling from homes or businesses along the affected routes.
- Maximize use of existing public roads and farm roads for haul roads to minimize changes to agricultural land.
- Prevent construction traffic on levee roads, including State Route 160, except when the highway is re-aligned during intake construction.
- No construction trucks with three or more axles would be allowed on State Route 4 across Victoria Island between the Old River and Middle River bridges.
- All truck routes on public roads would be at least two-lane roads with paved shoulders to park trucks in case of breakdowns, unless widened road located within sensitive habitat areas.
- Store construction vehicles on-site to minimize truck traffic.
- Pave access roads and intake haul road to minimize dust generation and noise.

As described in *Potential Road Access Routes TM* (DCA 2021c), design criteria for proposed new access roads would generally follow the applicable County design requirements. Conceptual drawings of the proposed roads are also presented in *Engineering Project Report | Bethany Reservoir Alternative, Volume 2 of 3 – Engineering Concept Drawings* (DCA 2021d).

To facilitate selection of suitable road access, a Traffic Impact Analysis (TIA) was initially completed for the Central and Eastern Corridors (refer to the *Traffic Impact Analysis TM* [DCA 2021e]). As noted, several project features are common between the Eastern corridor and Bethany Reservoir Alternative; DCA (2021b) describes the traffic impacts for these. A supplementary TIA was carried out to examine specific traffic impacts associated with project features that are unique to the Bethany Reservoir Alternative. This analysis followed the same methodology that was used for the Central and Eastern alignments. The outcome of the Bethany Reservoir Alternative TIA is described in Attachment 2, Bethany Reservoir Alternative Traffic Impacts.



3. Material Requirements

The project's construction would require moving large volumes of various materials. The higher volume materials would include:

- Tunnel liner segments
- Spoil material (unsuitable or excess excavated material)
- Borrow material (needed to raise land, construct levees and fill over aqueduct)
- Raw materials associated with concrete/grout (coarse aggregates, fine aggregates, and cement) and/or ready-mix concrete depending on the location of the batch plants, plus other associated materials such as reinforcing steel
- Large-diameter steel pipe and accessories for the aqueduct

The sources of raw materials would be selected by the contractors that ultimately build the project features. The various materials could be sourced from the region around the Delta or come from much further away as maritime cargo shipments to one of the regional ports or by rail or road. Specialty and manufactured materials may be sourced from further afield and moved to the Delta by one or more of the potential transportation networks, including barge, rail and road.

Based on the conceptual designs for the planned project features, estimates of the quantities of these bulk materials have been developed for the Bethany Reservoir Alternative, as well as to reflect facility sizing for the multiple diversion design capacity options under consideration. In addition, information on soil and reusable tunnel material (RTM) are presented in the *Soil Balance and Reusable Tunnel Material Supplement – Bethany Reservoir Alternative TM* (DCA 2021f).

4. Construction Support Facilities

To support project construction, several ancillary construction support facilities would be developed along the alignment. The primary purpose of these construction support facilities is to reduce traffic going into the Delta on roadways that are not well-suited to handle the additional traffic volume. The planned construction support facilities include the following:

- Lambert Road Concrete Batch Plant Lower Roberts Island Material Depot
- Park & Ride Facilities:
 - Hood Franklin Park & Ride
 - Charter Way Park & Ride

The above facilities are all common with those described for the Central and Eastern Corridors under the *Logistics Strategy TM* (DCA 2021a), except for some changes to the Lower Roberts Island Material Depot. Changes to the Lower Roberts Island Material Depot is further described below under the Lower Roberts Island Double Launch Shaft description.

In addition to the above dedicated construction support facilities, additional construction support facilities are co-located on several of the construction sites. These include two concrete batch plants and worker parking included in the Bethany Complex work areas. Additionally, the project is considering several options for precast concrete plants to manufacture the pre-cast concrete segments of the interior liner of the tunnel system. Refer to the *Preliminary Precast Yard Study TM* (DCA 2021g) for details associated with these construction support facilities.

5. Preliminary Logistics Strategy

The following subsections describe the preliminary logistics strategy associated with serving each of the planned work locations. They are grouped into two categories:

- 1) Common project features
- 2) Bethany Reservoir Alternative specific project features

Where road improvements are noted, further details on the proposed improvements can be found in *Engineering Project Report / Bethany Reservoir Alternative, Volume 2 of 3 – Engineering Concept Drawings* (DCA 2021d).

5.1 Common Project Features

Several project features that are common to both the Eastern Corridor conveyance alignment and the Bethany Reservoir Alternative:

- Intakes C-E-3 and C-E-5
- New Hope Tract Maintenance Shaft
- Canal Ranch Tract Maintenance Shaft
- Terminus Tract Reception Shaft (and associated tunnel reaches)
- King Island Maintenance Shaft

For the logistics strategies associated with these common project features, refer to the *Logistics Strategy TM* (DCA 2021a).

5.2 Bethany Reservoir Alternative Project Features

The Bethany Reservoir Alternative has the following unique project features:

- Twin Cities Double Launch Shaft
- Lower Roberts Island Double Launch Shaft and Material Depot
- Upper Jones Tract Maintenance Shaft
- Union Island Maintenance Shaft
- Bethany Complex Facilities

The following subsections provide the proposed logistics strategy for each feature.

5.2.1 Twin Cities Double Launch Shaft

The Twin Cities Double Launch Shaft site is for the most part functionally the same as described for the Central and Eastern Corridors under the *Logistics Strategy TM* (DCA 2021a). Access to the site is also generally the same as described in this referenced TM. However, since RTM is not required to be sent to the Byron Tract area to build the Southern Forebay, the following changes have been made:

- The RTM storage areas have been increased in size as all of the RTM generated from the double launch shafts will remain at this location.
- Since the RTM is not being removed from the site, a dedicated rail siding is no longer economically justified so it has been removed from the project.
- Since the rail siding is not being constructed, it is no longer necessary to relocate Franklin Boulevard as had been the case under the Central and Eastern alignments.

Refer to Attachment 3, Figure 3-1, for the revised layout of this overall work site. Access to the work site remains as described in the *Logistics Strategy TM* (DCA 2021a).

5.2.2 Lower Roberts Island Double Launch Shaft and Material Depot

The Lower Roberts Island Double Launch Shaft remains located in the north-central portion of Lower Roberts Island as was presented in the *Logistics Strategy TM* (DCA 2021a) (refer to Attachment 3, Figures 3-2 and 3-3). However, under the Bethany Reservoir Alternative, it would be used as a launch shaft for the tunnel reach heading north to the Terminous Tract Reception Shaft and as a launch shaft for the tunnel reach heading south to the Bethany Complex (to the Surge Basin Reception Shaft at the BRPP). As a result, the co-located material depot would be increased in size to manage materials for two tunneling operations and to process and store the additional RTM associated with the dual drives. The site would continue to have the two modes of access as described in the *Logistics Strategy TM* (DCA 2021a):

- Road access via a new haul road extended from West Fyffe Street in the Port of Stockton (Figure 3-3)
- Rail access by extending existing rail lines from the Port of Stockton (Figure 3-4)

Details on the basis for utilizing these access modes is presented in the *Logistics Strategy TM* (DCA 2021a).

5.2.3 Upper Jones Tract Maintenance Shaft

The Upper Jones Maintenance Shaft would be located in the central portion of Upper Jones Tract, just north of South Bacon Island Road (refer to Attachment 3, Figures 3-2 and 3-5). All construction materials would be trucked to this work site on public roads and on a new dedicated haul road stub into the site from South Bacon Island Road, which is the only logical road access to this site. The preferred routing to the site would utilize Tracy Boulevard off Interstate 580/Interstate 205 to State Route 4 and then onto South Bacon Road. An alternate route would be State Route 4 westbound from Stockton off of Interstate 5. Workers would come directly to the site along this same route.

Based on the TIA conducted and summarized in Attachment B, project traffic on State Route 4 would be minor in relation to the background traffic. The level of service (LOS) would be D or better even with the additional project related traffic, which meets the criteria established for the Project. Utilizing Tracy Boulevard from Interstate 580/Interstate 205 to State Route 4 would increase traffic along this route but the LOS would remain at level C, which falls well within the criteria established for the project.

Road improvements to facilitate site access include the following:

- Approximately 3.1 miles of asphalt overlay of South Bacon Island Road from State Route 4 to the site access road
- Construction of a new 400 foot gravel haul road on between South Bacon Island Road and work site (Figure 3-5)

5.2.4 Union Island Maintenance Shaft

The Union Island Maintenance Shaft is in the northern portion of Union Island, just west of Bonetti Road (refer to Attachment 3, Figures 3-2 and 3-6). All construction materials would be trucked to this work site on public roads and on a new dedicated haul road stub into the site from Bonetti Road, which is the only logical road access to this site. The preferred routing to the site would utilize Tracy Boulevard off Interstate 580/Interstate 205 to Clifton Court Road, then west to Bonetti Road. An alternate route would be State Route 4 westbound from Stockton off of Interstate 5 to Tracy Boulevard, then south to Clifton Court Road, then west to Bonetti Road. Workers would come directly to the site along this same route. Based on the TIA conducted and summarized in Attachment B, project traffic would be minor in relation to the

background traffic. The LOS would be C or better even with the additional project related traffic, which falls well within the criteria established for the project.

Road improvements to facilitate site access include the following:

- Approximately 5.45 miles of asphalt overlay of Clifton Court Road and Bonetti Road to the site access road
- Construction of a new 400 foot gravel haul road on between Bonetti Road and work site (Figure 3-6)

5.2.5 Bethany Complex

The Bethany Complex would include large work areas for the following project features (refer to Attachment 3, Figure 3-7):

- Surge Basin Reception Shaft
- Surge Basin
- Bethany Reservoir Pumping Plant (BRPP)
- Bethany Reservoir Aqueduct
- Bethany Reservoir Discharge Structure
- Bethany Complex Batch Plants

The potential exists for five or six major contractors to be working on these sites at one time.

There is no waterway access to this location. Therefore, two modes of transporting bulk materials to and from the overall Bethany Complex were considered, rail and road. Rail access, using the inactive Union Pacific Railroad line along Byron Road, was initially investigated. As this existing rail line is located along the north side of Byron Road, a challenging and expensive elevated crossing would need to be constructed over Byron Road into the Bethany Complex site. This was deemed infeasible due to its configuration relative to Byron Road. Additionally, with the tunnel drive being from Lower Roberts Island to the Bethany Complex, there is no need to transport tunnel liner segments to the site or RTM away from the site so there is limited justification for constructing a dedicated rail siding for this location. Finally, the site has good road access from the south off Interstate 580/Interstate 205. Therefore, the decision was made to provide only road access to this work site.

Following is summary of each project feature associated with the Bethany Complex and the required major materials requirement transport.

- Surge Basin Reception Shaft – the Surge Basin Reception Shaft would be located at the far northern end of the site adjacent to the BRPP and ultimately beneath the Surge Basin. The mode of transportation used for bulk materials would be as follows:
 - Spoils – conveyor or truck to onsite disposal area
 - Bentonite – truck Ready-mix concrete – truck from concrete batch plant (refer to batch plant description below)
- Bethany Surge Basin – the new Surge Basin would be constructed over the reception shaft and adjacent to the BRPP. The mode of transportation used for bulk materials as follows:
 - Spoils – conveyor or truck to on-site disposal area
 - Fills – onsite reuse or conveyor or truck from onsite disposal area
 - Ready-mix concrete – truck from batch plants (refer to batch plant description below)

- Bethany Reservoir Pumping Plant – the BRPP would be constructed adjacent to and on the southern side of the Surge Basin. The mode of transportation used for bulk materials would be as follows:
 - Spoils – conveyor or truck to on-site disposal area
 - Fills – onsite reuse or conveyor or truck from onsite disposal area
 - Ready-mix concrete – truck from batch plants (refer to batch plant description below)
- Bethany Reservoir Aqueduct – the Bethany Reservoir Aqueduct would include four parallel 15-foot-diameter buried steel pipelines, including two reaches with four parallel tunnels along the aqueduct (crossing the Delta Mendota Canal and conservation easement). The Aqueduct would convey water from the BRPP to the Bethany Reservoir Discharge Structure. The mode of transportation used for bulk materials would be as follows:
 - Spoils – trucks to on-site batch plant for re-use as backfill or to on-site disposal
 - Pipe materials – truck (using specialized trucks and carriers)
 - Pipe bedding (controlled low strength material) – truck from on-site CLSM batch plant (refer to batch plant description below)
 - Ready-mix concrete – truck from concrete batch plant (refer to batch plant description below)
- Bethany Reservoir Discharge Structure – the Bethany Reservoir Discharge Structure is located at the termination of the Aqueduct along the shoreline of the Bethany Reservoir. Given terrain, wetland and conservation easement challenges, multiple route options were considered for the access road to this facility (refer to subsequent discussion on haul road route). The mode of transportation used for bulk materials would be as follows:
 - Spoils – trucks to on-site disposal
 - Fills – onsite reuse or truck from onsite disposal area
 - Ready-mix concrete – truck from concrete batch plant (refer to batch plant description below)
- Bethany Batch Plants – there are two planned batch plants to be included in the Bethany Complex. A concrete batch plant would be set up near the southeast corner of the overall work site. A second concrete plant for processing on-site excavated soils into controlled low strength material (CLSM) would be set up near the center of the Aqueduct alignment with access off Kelso Road. The mode of transportation used for bulk materials would be as follows:
 - Raw materials – truck to batch plant:
 - Sand
 - Aggregate
 - Cement/Flyash

As shown in Attachment 3, Figure 3-7, there are several viable road access options to the Bethany Complex from Byron Road (aka Byron Highway) and from Interstate 205/Interstate 580. In addition to the Byron Road, I 205 and Interstate 580, the following local roads were investigated:

- Mountain House Parkway
- W. Grant Line Road
- Mountain House Road

Given the urban nature of the Mountain House Community adjacent to the Bethany Complex and the already heavy traffic on Byron Road, multiple access routes are needed to minimize overall traffic impacts in the area, especially during peak commute times and to facilitate the ability to deliver materials, equipment, and labor to the work sites on a dependable basis. Following is a discussion of the potential

access routes developed for the Bethany Complex. Development of all these routes as part of the project is considered necessary to facilitate construction and minimize local traffic impacts as noted above.

5.2.5.1 Access from Byron Road

Except for a small stretch between Central Parkway and Mountain House Parkway, Byron Road is a 2-lane roadway. Plans exist to further widen Byron Road westward from Central Parkway to Great Valley Parkway at some point in the future to accommodate the planned Mountain House development north of Byron Road. As shown in Attachment 2, the LOS of Byron Road is already currently F at peak periods so utilizing this roadway without improvement, even with further widening to a project interchange at Lindemann Road, is not a solution for providing access to the Bethany Complex.

To facilitate road access to the Bethany Complex from the north, the following option was developed and modeled (refer to Attachment 3, Figures 3-7 and 3-8):

- Construction traffic exits Interstate 205 onto Mountain House Parkway and travels north to Byron Road
- Byron Road is widened to 4-lanes between Great Valley Parkway to Lindemann Road to accommodate construction traffic (assuming the planned Mountain House Community widening to Great Valley Parkway is complete)
- Construction traffic would exit Byron Road at a new interchange is constructed at Lindemann and Byron Roads (refer to Attachment 3, Figure 3-9)
- A new dedicated 2-lane frontage road along the south side of Byron Road is constructed to allow construction traffic to travel from the Lindemann Road interchange to both the project site and Mountain House Road
- To reduce traffic on Mountain House Road, a new dedicated access road would be constructed east of the Bethany Complex site between the new Byron Road frontage road and Kelso Road (refer to Attachment 3, Figure 3-8)
- Construction of new access roads would also facilitate on-site traffic within the Bethany Complex; these onsite roads would apply to all access approaches described for the Complex (refer to Attachment 3, Figure 3-8)

This option facilitates good access for construction of the Surge Basin, the BRPP and its associated concrete batch plant and avoids use of Mountain House Road. Under this option, traffic would increase on Mountain House Parkway and Byron Road, but with the improvements described above, a LOS of C or greater would be maintained on both roads, even with the project traffic.

5.2.5.2 Access from Interstate 205

As described under Section 5.2.5.1, access from Interstate 205 would start at the Mountain House Parkway exit (refer to Attachment 3, Figure 3-7). Construction traffic would proceed north on Mountain House Parkway to W. Grant Line Road. From there, construction traffic could either proceed north to Byron Road as described above or west on W. Grant Line Road to the intersection with Mountain House Road.

For the latter route, traffic would then proceed north along Mountain House Road to the new Bethany Complex access road south of the complex where it would proceed to the south and east of the complex to avoid going past Mountain House School, which is located along Mountain House Road. Improvements would be made to the intersection of W. Grant Line Road and Mountain House Road, which would be

coordinated with improvement plans under consideration by Contra Costa County (refer to Attachment 3, Figure 3-10). For purposes of this TM, the intersection bypass option improvement is shown in Figure 3-10 as it has greater impacts than the option to just improve the existing interchange, which is under consideration by Contra Costa County. Mountain House Road would also be improved between W. Grant Line Road and the Bethany Complex access roads (widened to 24-foot pavement with 4-foot gravel shoulders on both sides). The new Bethany Complex access road would exit Mountain Road about ½ mile south of Mountain House School and extend to Kelso Road aligned with the east side of the Bethany Complex. At Kelso Road, it would join with the access road along the east side of the complex as described above.

This option facilitates access to all work sites within the Bethany Complex. Under this option, traffic would increase on the current roadways but with the improvements described above, a LOS of C or greater would be maintained even with the project traffic. It would be important for construction traffic to avoid the area of W. Grant Line Road and Mountain House Road during the peak morning and evening commutes. While proposed changes should maintain a suitable level of service, avoidance of these peak commute hours would aid overall traffic flow in the area. Construction traffic could use the Byron Road access routes during those times.

5.2.5.3 Access from Interstate 580

Access from Interstate 580 would start at the W. Grant Line Road exit (refer to Attachment 3, Figure 3-7). Construction traffic would proceed north on W. Grant Line Road to Mountain House Road. Traffic would then proceed north along Mountain House Road to the new Bethany Complex as described above under Section 5.2.5.2. The same improvements would apply at the W. Grant Line Road intersection and to Mountain House Road.

Under this option, traffic would increase on the current roadways but with the improvements described above, a LOS of C or greater would be maintained even with the project traffic.

5.2.5.4 Access to Bethany Reservoir Aqueduct Construction Sites

Access to the construction sites for the Aqueduct would be along an improved Kelso Road from the main Bethany Complex as well as along the open trench construction right-of-way (refer to Attachment 3, Figures 3-7 and 3-8). Kelso Road would be widened to 24-foot pavement with 4-foot gravel shoulders on both sides. Under this option, traffic would increase on Kelso Road but with the improvements described above, a LOS of C or greater would be maintained even with the project traffic.

5.2.5.5 Access to Bethany Reservoir Discharge Structure

The Bethany Reservoir Discharge Structure is located at the termination of the Aqueduct along the shoreline of the Bethany Reservoir. Access to the site would be from a dedicated access road off Mountain House Road (refer to Attachment 3, Figures 7 and 8). The access road would have a 24-foot pavement with 4-foot gravel shoulders on both sides. Given the terrain, wetlands and conservation easement challenges, multiple route options were considered for the access road to this facility (refer to Attachment 3, Figure 3-11). Of the three alignment options investigated, Option 3 was selected based on the following reasons (refer to the *Facilities Siting Study – Bethany Reservoir Alternative TM* (DCA 2021b):

- Avoids all wetland impacts
- Results in the least required cut and fill to maintain an acceptable roadway gradient
- Has the smallest disturbance footprint

Traffic would increase on Mountain House Road but with the improvements described earlier, a LOS of C or greater would be maintained even with the project traffic.

6. References

Delta Conveyance Design and Construction Authority (DCA). 2021a. Central Eastern Corridor Logistics Strategy Technical Memorandum. Final Draft. January 2021.

Delta Conveyance Design and Construction Authority (DCA). 2021b. Facilities Siting Study – Bethany Reservoir Alternative Technical Memorandum. Final Draft. April 2021.

Delta Conveyance Design and Construction Authority (DCA). 2021c. Potential Road Access Routes Technical Memorandum. Final Draft. January 2021.

Delta Conveyance Design and Construction Authority (DCA). 2021d. Engineering Project Report | Bethany Reservoir Alternative, Volume 2 of 3 – Engineering Concept Drawings. Final Draft. February 2021.

Delta Conveyance Design and Construction Authority (DCA). 2021e Central Eastern Corridor Traffic Impact Analysis Technical Memorandum. Final Draft. January 2021.

Delta Conveyance Design and Construction Authority (DCA). 2021f. Soil Balance and Reusable Tunnel Material Supplement – Bethany Reservoir Alternative Technical Memorandum. Final Draft. April 2021.

Delta Conveyance Design and Construction Authority (DCA). 2021g. Central Eastern Corridor Preliminary Precast Yard Study Technical Memorandum. Final Draft. January 29, 2021.

California Department of Water Resources (DWR). 2020. Notice of Preparation of Environmental Impact Report for the Delta Conveyance Project. January 2020.

7. Document History and Quality Assurance

Reviewers listed have completed an internal quality review check and approval process for deliverable documents that is consistent with procedures and directives identified by the Engineering Design Manager (EDM) and the DCA.

Approval Names and Roles			
Prepared by	Internal Quality Control review by	Consistency review by	Approved for submission by
Terry Krause / EDM Project Manager	Bob Cermak, EDM Logistics Team	Gwen Buchholz / DCA Environmental Consultant Phil Ryan / EDM Design Manager	Graham Bradner / DCA Executive Director

This interim document is considered preliminary and was prepared under the responsible charge of Bob Cermak, California Professional Engineering License C31524.

Attachment 1
General Access Figures

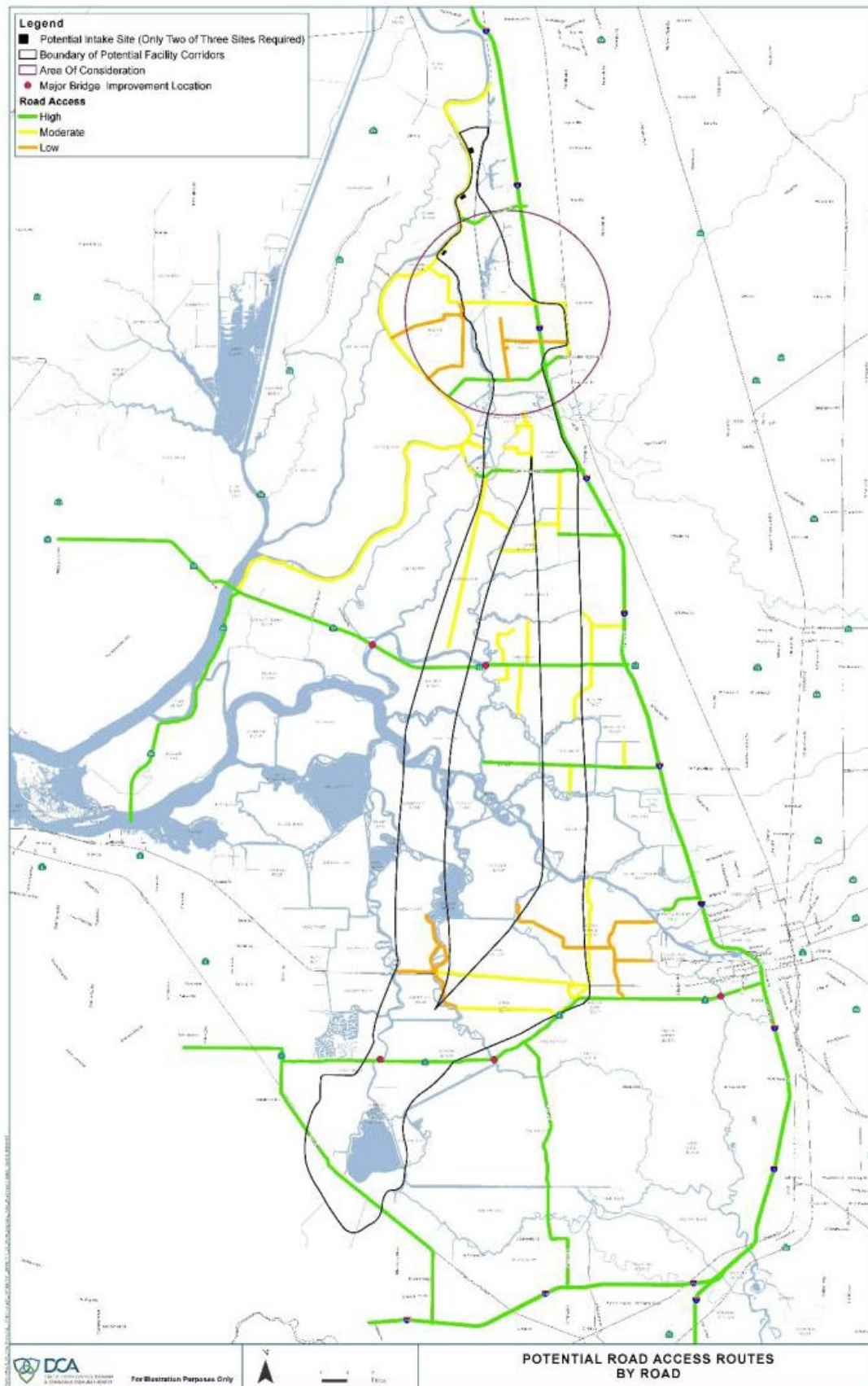


Figure 1-1. Proposed Road Access Routes

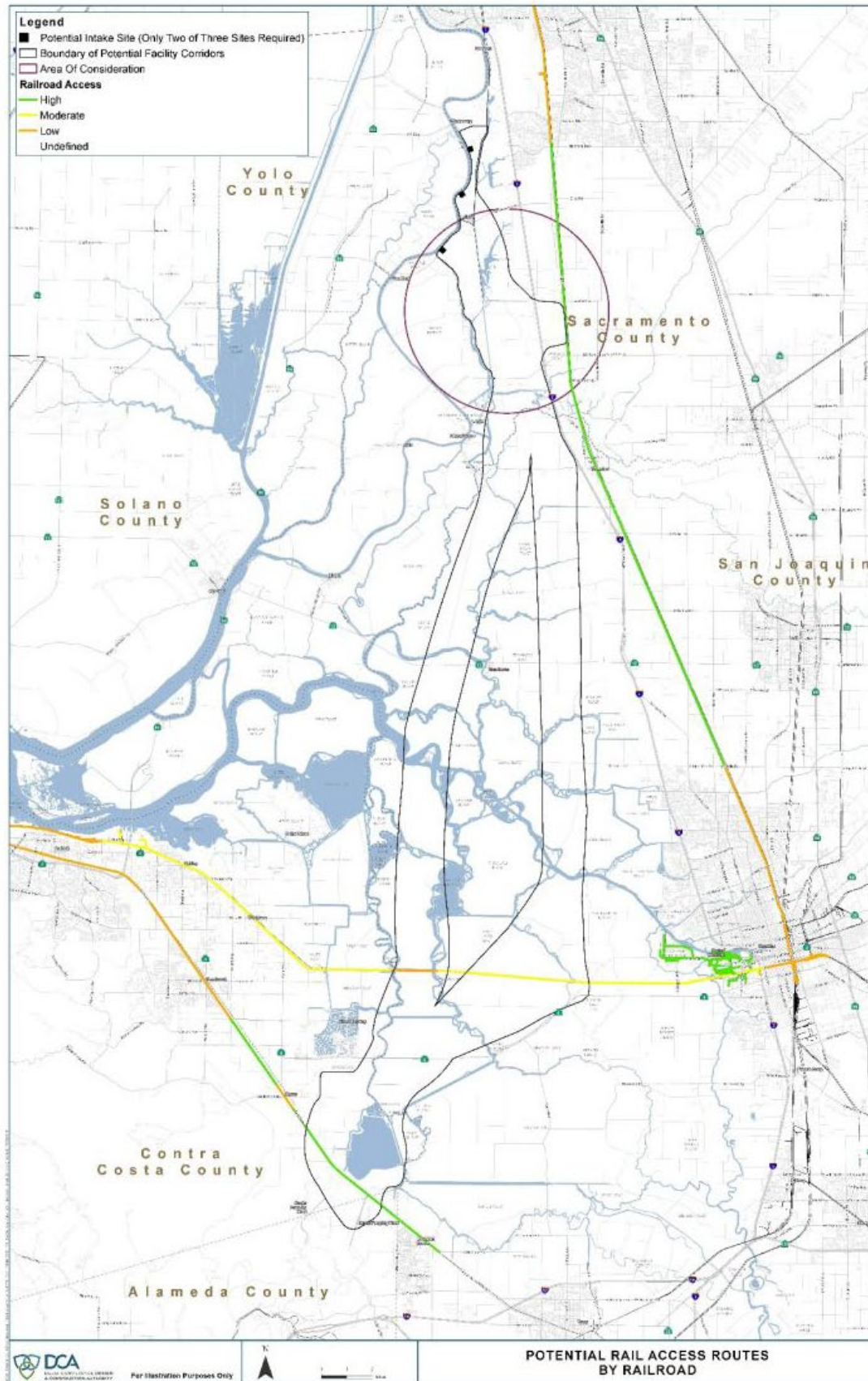


Figure 1-2. Proposed Rail Access Routes

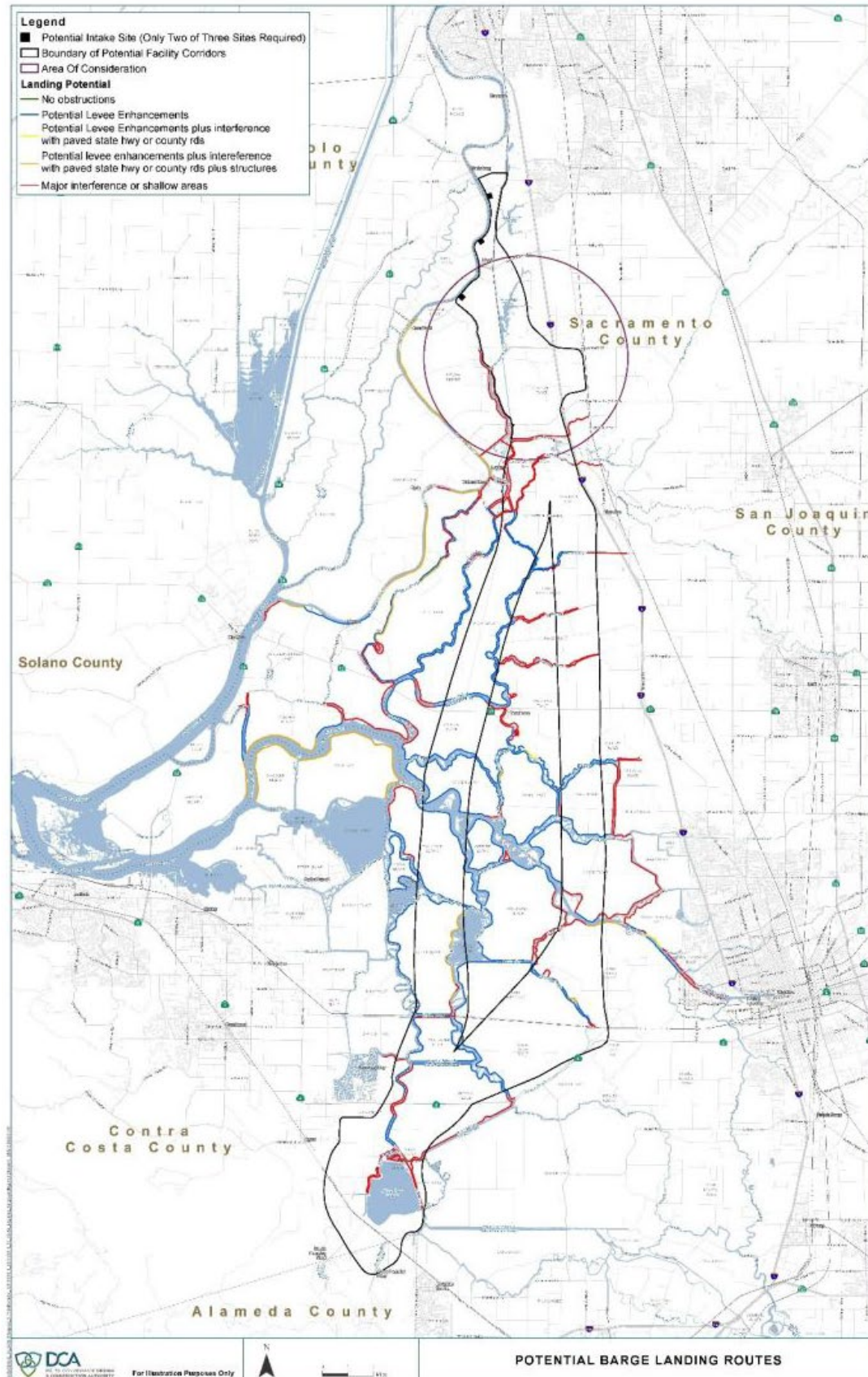


Figure 1-3. Potential Barge Access Routes Considered

Attachment 2
Bethany Reservoir Alternative Traffic Impacts Analysis

Bethany Reservoir Alternative Traffic Impact Analysis

Introduction

Previously, a Traffic Impact Analysis (TIA) was completed for the Central and Eastern corridors (refer to the *Traffic Impact Analysis TM* [DCA 2021e]). Several project features are common between the Eastern corridor and Bethany Reservoir Alternative. The prior *Traffic Impact Analysis TM* (DCA 2021e) describes the traffic impacts for these common features.

A supplementary TIA was carried out to examine specific traffic impacts associated with project features that are unique to the Bethany Reservoir Alternative. This TIA followed the same methodology that was used for the Central and Eastern Corridors. Details of traffic studies by various regional authorities that were referred to during development of the traffic assessment are listed below under References. This attachment contains a series of figures illustrating the results of the traffic analysis.

Analysis and Findings

The key points raised in the analysis were:

- Two approaches would be used for the Roberts Island and Upper Jones Tract sites (refer to Figure 2-2). The route following State Route 4 from Interstate 5 in Stockton would carry the majority of project-related truck traffic. This route was selected over an alternative route via the Ort J. Lofthus Freeway because the latter route would require project traffic to cut through secured parts of the Port of Stockton while the selected route bypasses those areas.
- The analysis found that State Route 4 is already operating at level of service (LOS) E at an existing bottleneck (a narrow bridge) and that the addition of project traffic would result LOS F in the afternoon peak period (refer to left side of Figure 2-4). Since the majority of project-related traffic in the peak period would be workers' commute trips, a decision was made to site a mandatory park-and-ride lot to capture worker trips east of the bottleneck on State Route 4 at Charter Way and bring workers to the site on shuttle buses. This reduced the project's effects to an acceptable level (refer to right side of Figure 2-4).
- With incorporation of the planned access routes to the Lower Roberts Island, Upper Jones Tract and Union Island work sites, no other project-related issues were found on State Route 4 or Tracy Boulevard (refer to Figures 2-5 through 2-9).
- Project-related traffic to the Bethany Complex, including the Bethany Reservoir Aqueduct, and Bethany Reservoir Discharge Structure, would take three routes to the work sites (refer to Figure 2-10):
 - From Interstate 205, north on Mountain House Parkway, then west on Byron Road, then exit to a new haul road at a new interchange at Lindemann Road.
 - From Interstate 205, north on Mountain House Parkway, then west on West Grant Line Road, then use a new roundabout and bypass to Mountain House Road
 - From Interstate 580, north on West Grant Line, then use a new roundabout and bypass to Mountain House Road
- Project trucks were assigned a route depending on the origin of the cargo and its destination among the project sites.

- Existing traffic conditions on Byron Road are already very poor (refer to left side of Figure 2-15). If project traffic were routed on Byron Road as it currently exists, it would exacerbate an already bad situation, especially since the project's westbound traffic would have to turn left against heavy eastbound flows.
- These impacts necessitated two corrective measures:
 - Widening Byron Road from 2 to 4 lanes between Central Parkway and Lindemann Road (refer to Figure 2-10). This would be a westward extension of a current developer-funded project to widen Byron Road from Mountain House Parkway to Central Parkway and possibly Grand Central Parkway (depending on growth patterns).
 - Building a new interchange at Lindemann Road to allow project traffic to enter and leave the new dedicated access road without conflicting with east-west traffic on Byron Road (refer to Figure 2-12).

These two measures would result in an improvement over project conditions without the project (refer to right side of Figure 2-15).

- The large volume of truck traffic associated with the project would raise safety concerns at two locations with incompatible land uses, namely at the hamlet where West Grant Line Road meets Mountain House Road, and in front of Mountain House School. In both cases a new bypass road would be constructed to route around the incompatible uses (refer to Figures 2-13 and 2-14).
- The remainder of the routes were analyzed, and no other traffic problems were found that would necessitate remedial action (refer to Figures 2-16 through 2-20).

Conclusions

Bases on the traffic impact analysis conducted, the following conclusions can be drawn:

- The additional traffic resulting from the project would worsen traffic to unacceptable levels at two locations:
 - State Route 4 at Swing Bridge would move to LOS F. Capturing worker trips with the park and ride lot in Stockton would alleviate this problem.
 - Byron Road is already heavily congested and project traffic to the Bethany Complex would exacerbate the problem unless improvements are incorporated into the project. Extending the current widening work to the proposed Lindemann Interchange would enable project traffic to use this section while maintaining an acceptable LOS.
- The project LOS on other roads serving the Bethany Complex would meet the LOS targets with the minor improvements noted in the body of the TM.
- Although planned improvements at the intersection of West Grant Line Road and Mountain Road would provide a suitable LOS, peak commuter traffic is expected to be quite heavy and avoidance of this intersection during the peak commute hours is recommended to help avoid additional congestion in the area.

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FINAL DRAFT

Figures



Figure 2-1. Sites Covered under Traffic Impact Analysis

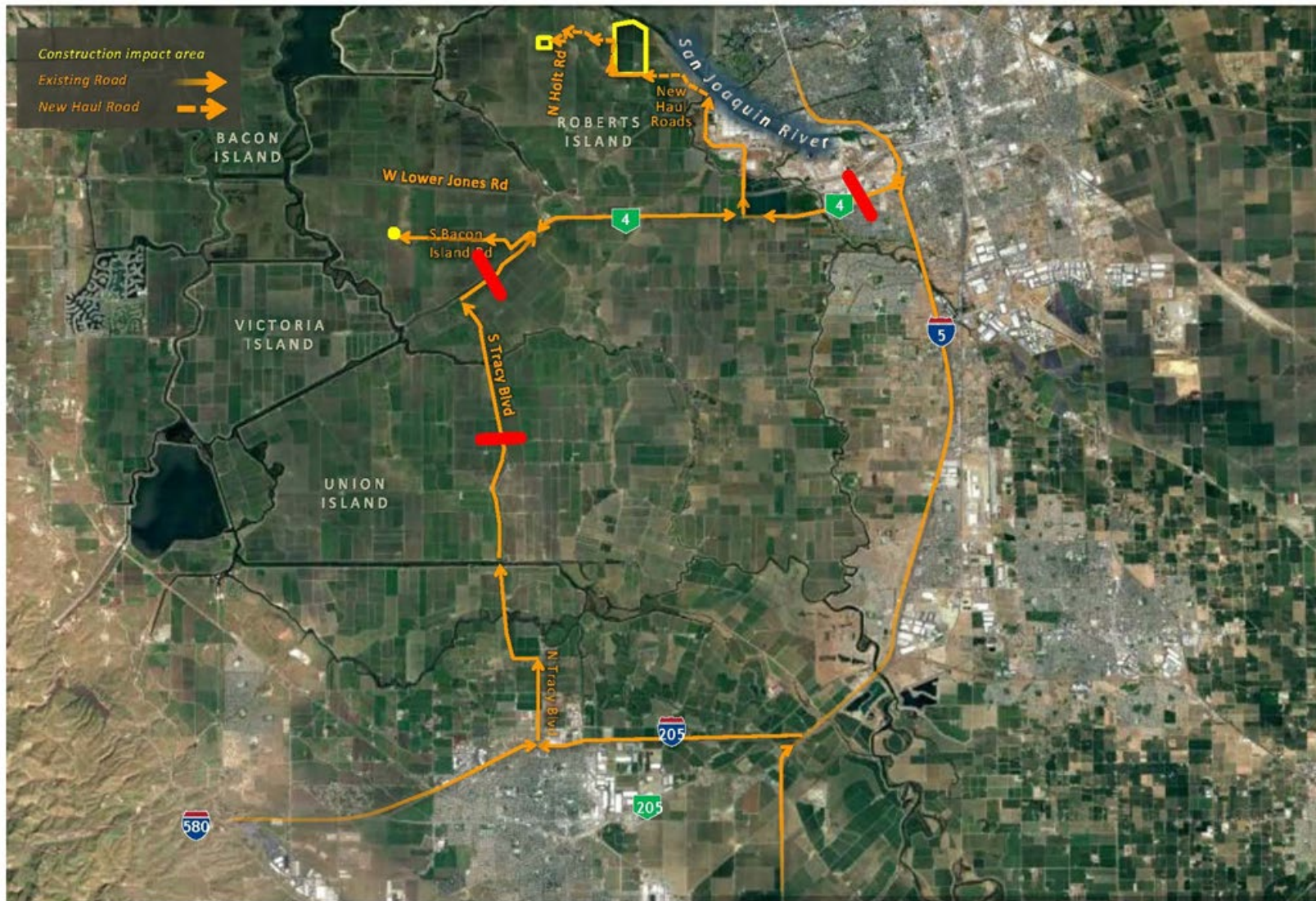
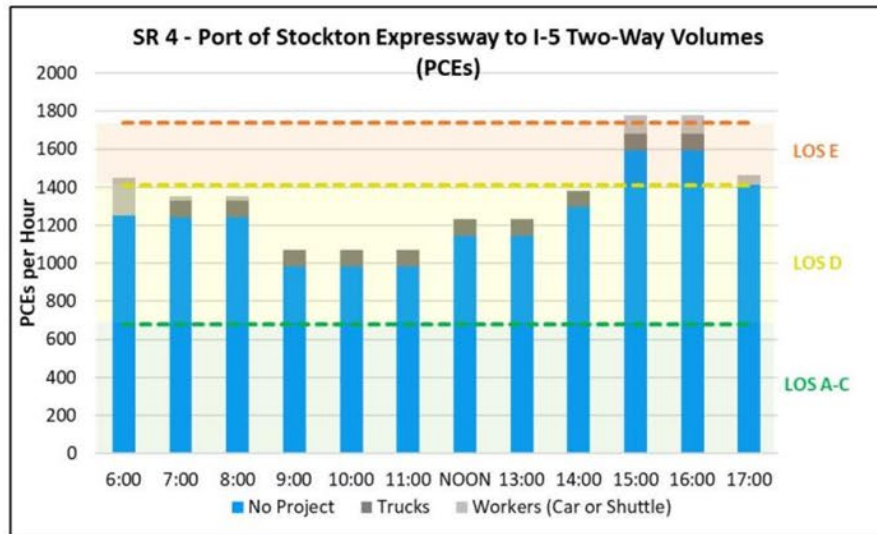
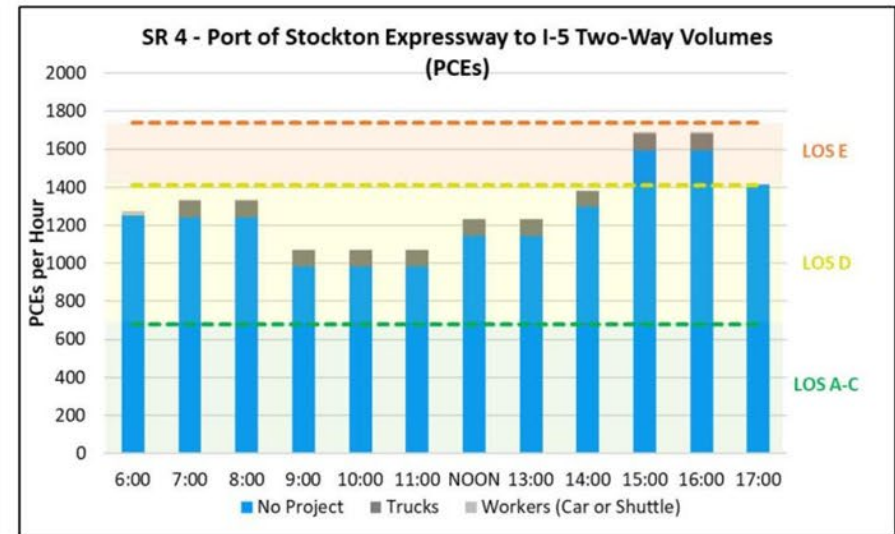


Figure 2-2. State Route 4 Impacts from Lower Roberts Island and Upper Jones Tract





LOS "F" in the AM & PM peak.
Project would temporarily add 16%.



LOS "E" in the evening without project trips.
Project would temporarily add 6% (Truck & Worker), which is below the threshold triggering remedial action

Figure 2-4. Peak Traffic Conditions on State Route 4 West of Interstate 5

LOS would be "D" or better even with the addition of project traffic.

Project traffic would be minor in relation to background traffic

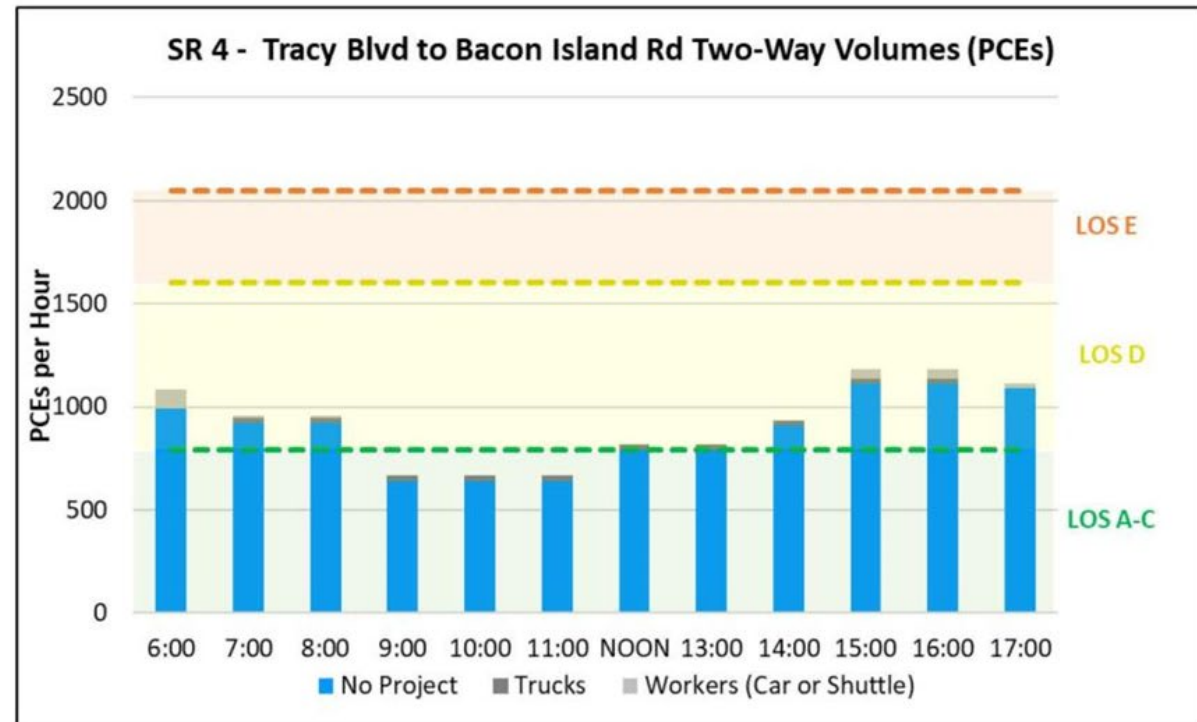


Figure 2-5. Peak Traffic Conditions on State Route 4 West of Bacon Island Road

LOS would be "C" or better even with the addition of project traffic.

Project traffic would be minor in relation to background traffic

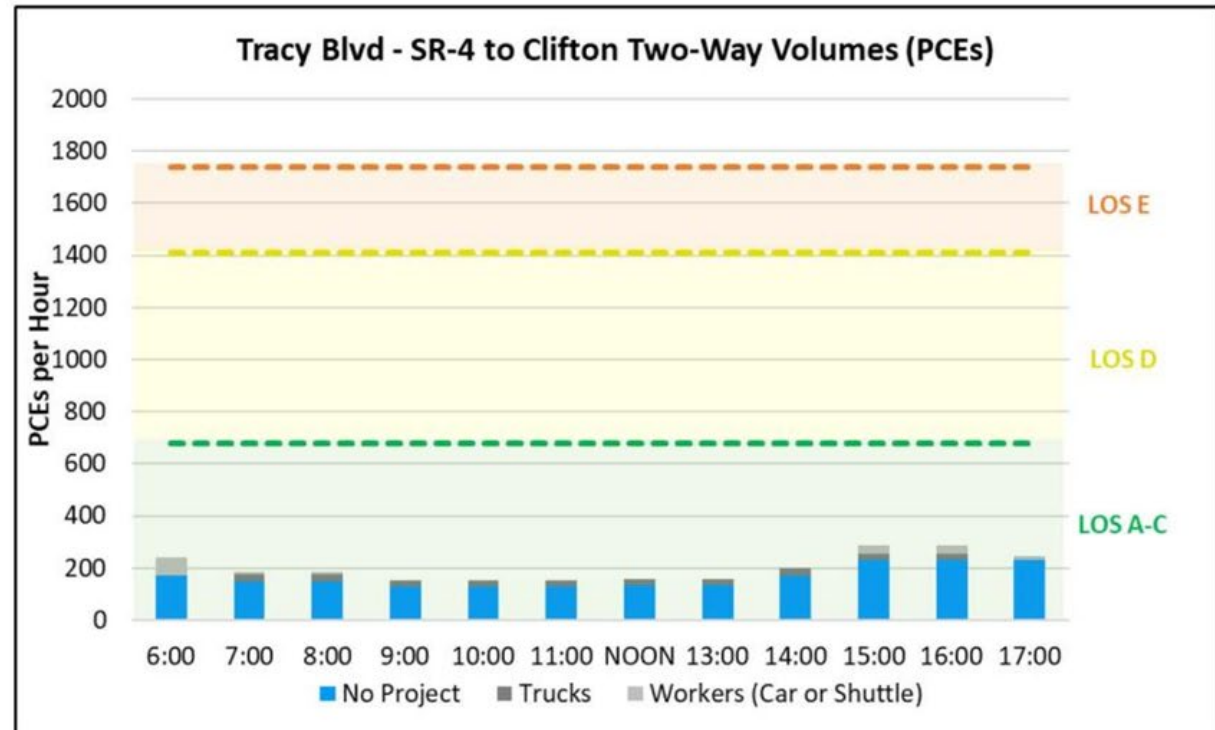


Figure 2-6. Peak Traffic Conditions on Tracy Boulevard Between State Route 4 and Clifton Court Road

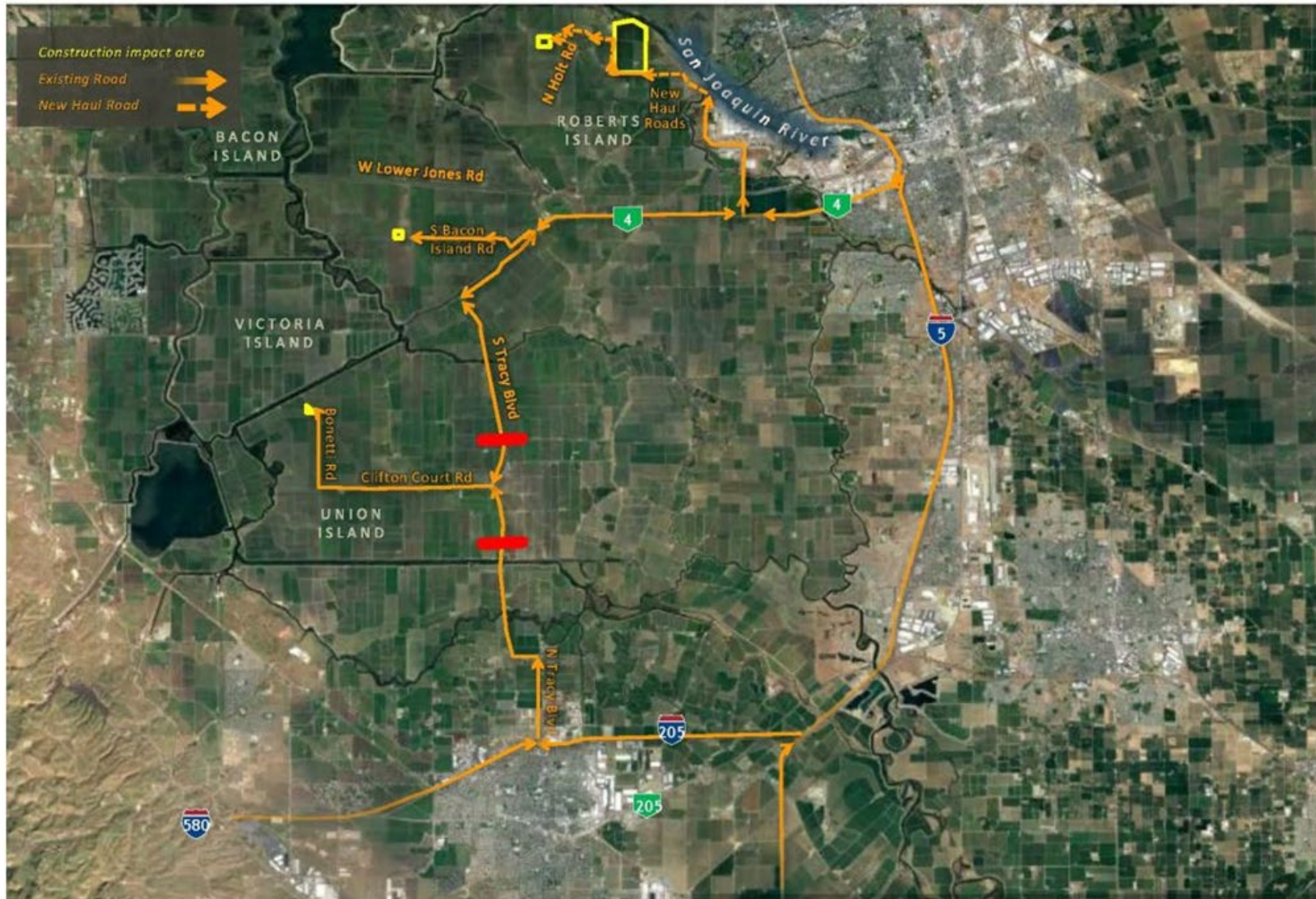


Figure 2-7. Tracy Boulevard Impacts from Lower Roberts Island, Upper Jones Tract and Union Island

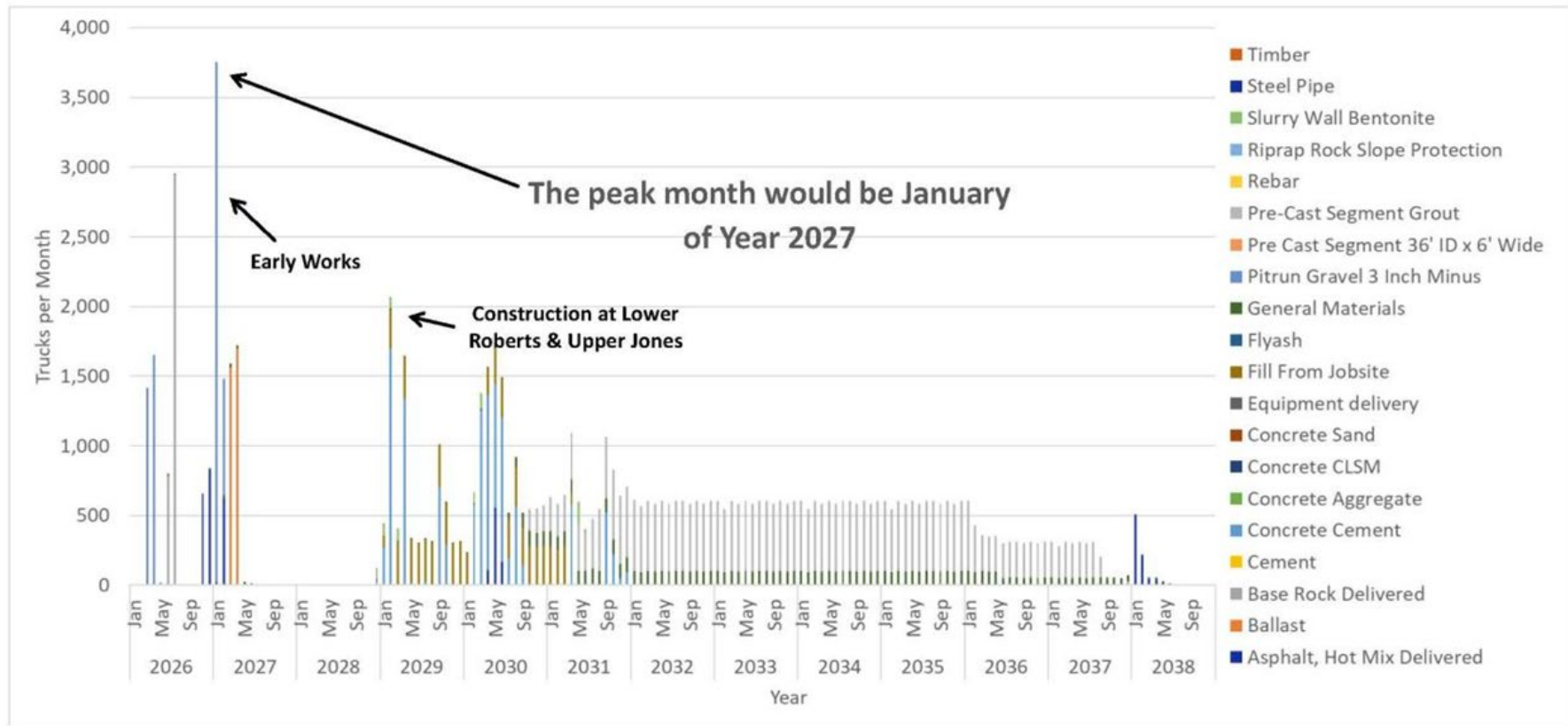


Figure 2-8. Peak Month Material Movement for Lower Roberts Island, Upper Jones Tract and Union Island

Project traffic would be significant in relation to background traffic, but LOS would be "C" or better even with the addition of project traffic.

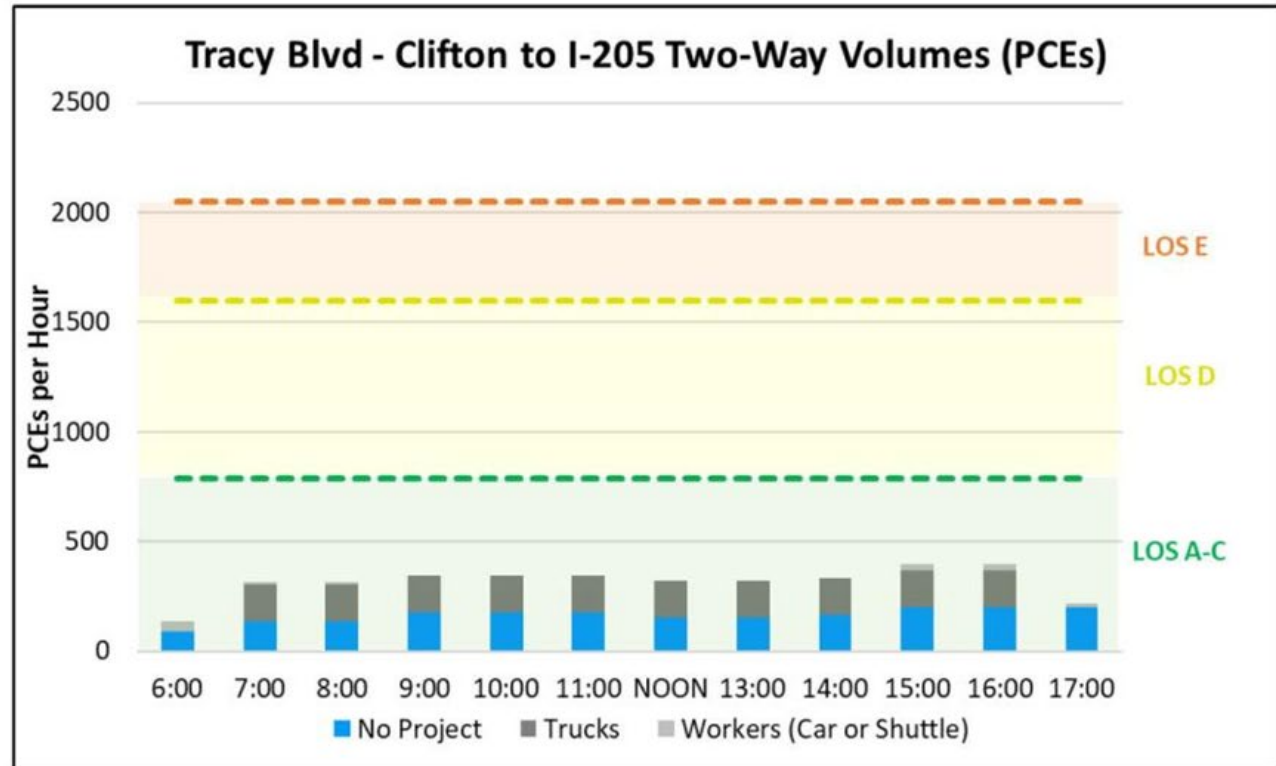


Figure 2-9. Peak Traffic Conditions on Tracy Boulevard Between Interstate 205 and Clifton Court Road

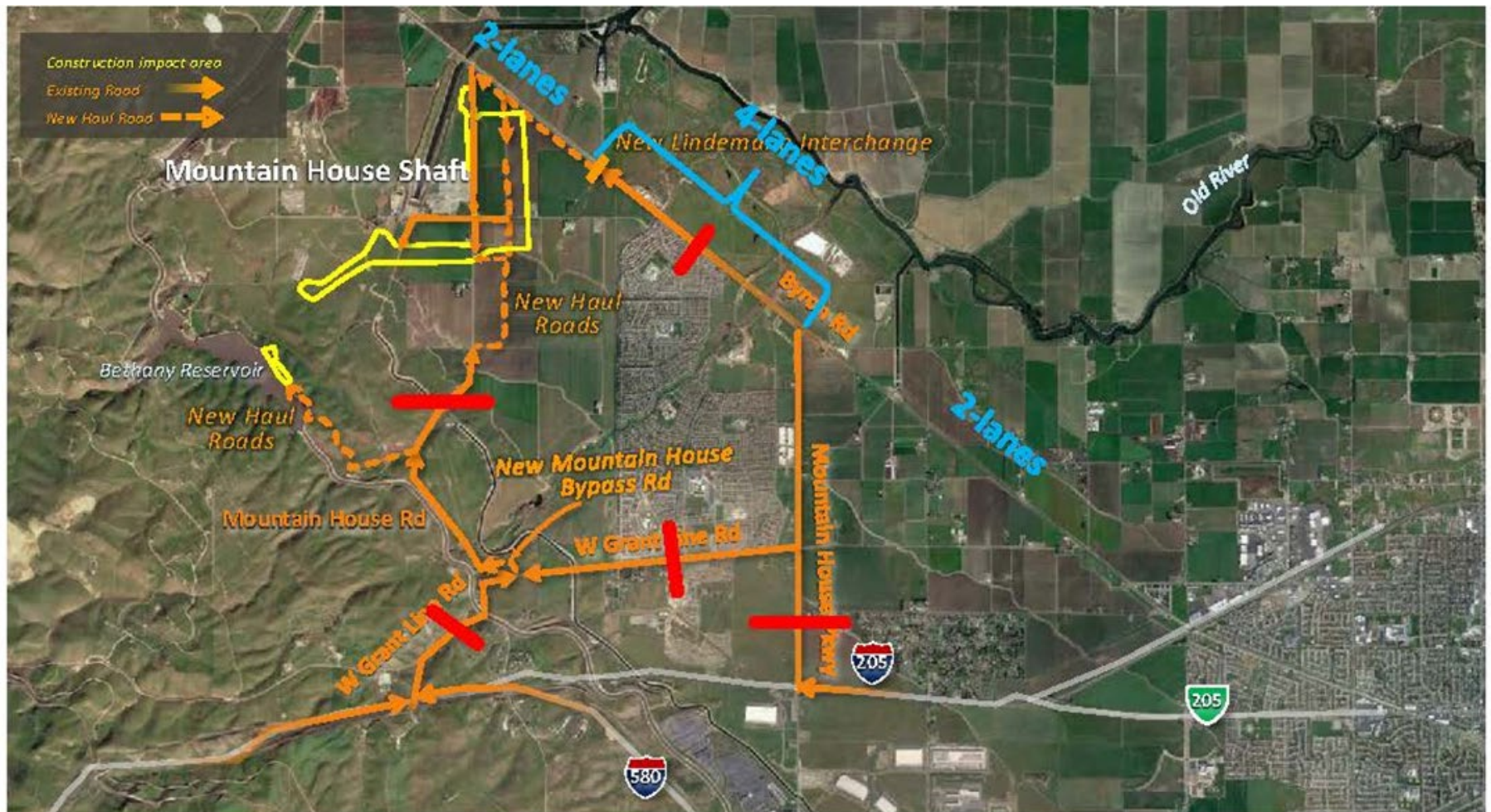


Figure 2-10. Impacts on Major Local Roads from Bethany Complex Work Sites

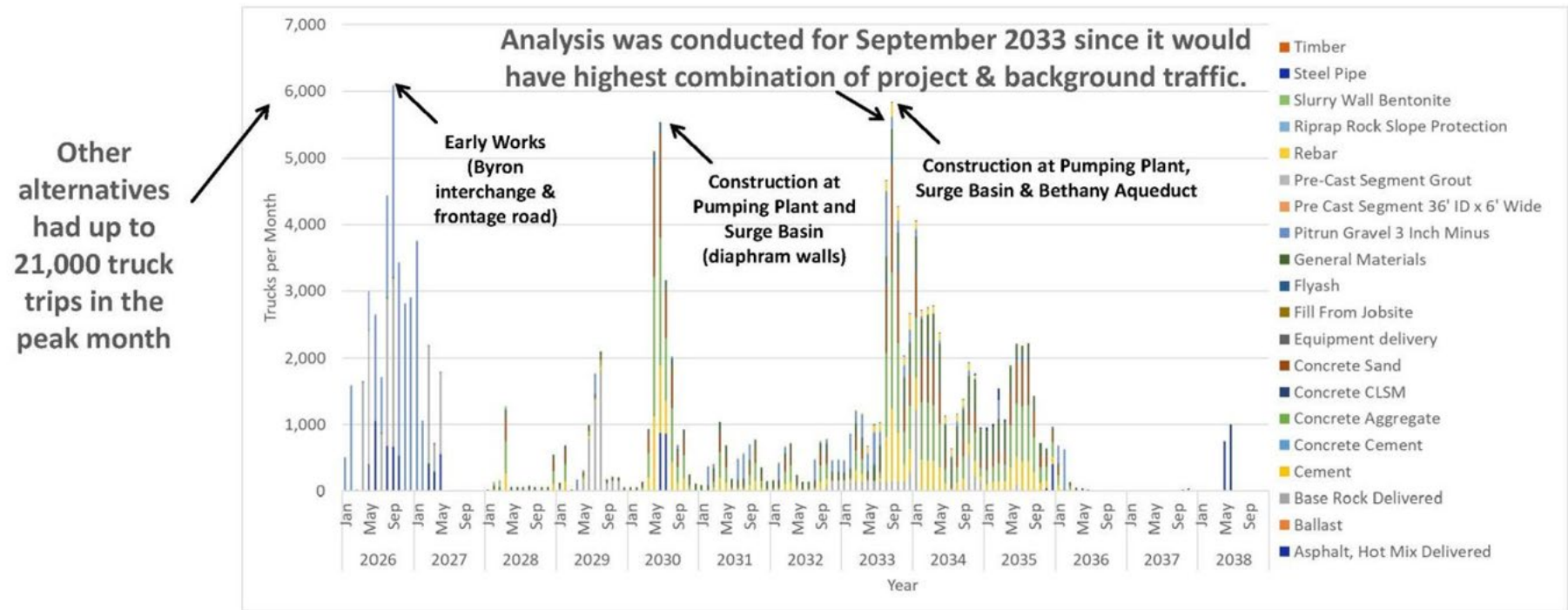


Figure 2-11. Peak Month Material Movement for Bethany Complex Sites

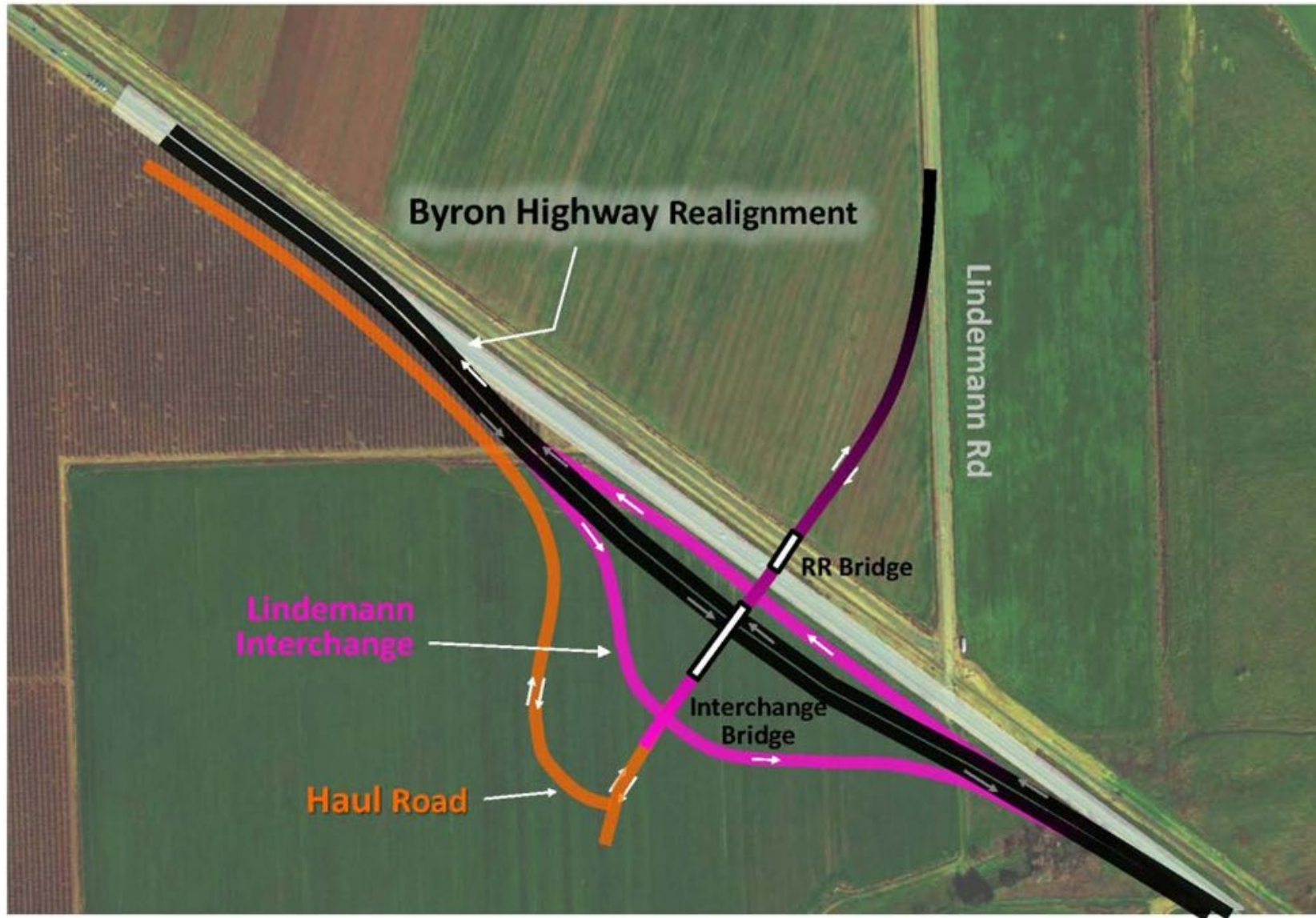


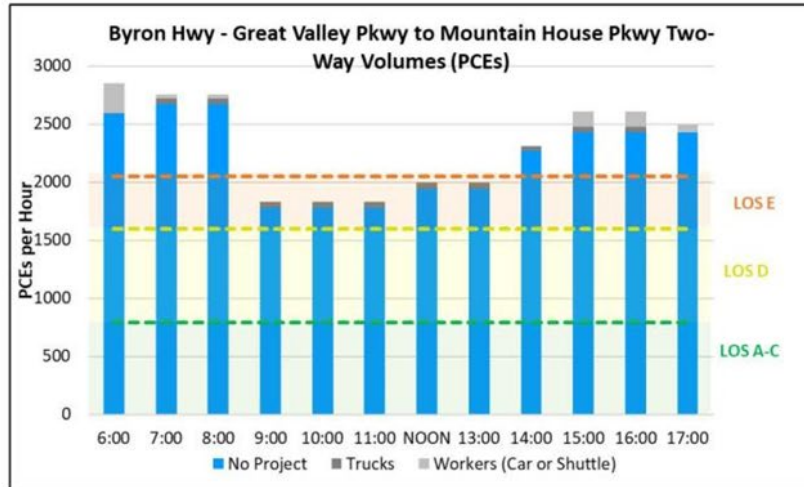
Figure 2-12. Proposed Lindemann Interchange off Byron Road



Figure 2-13. Proposed W. Grant Line Road Roundabout at Mountain House Road

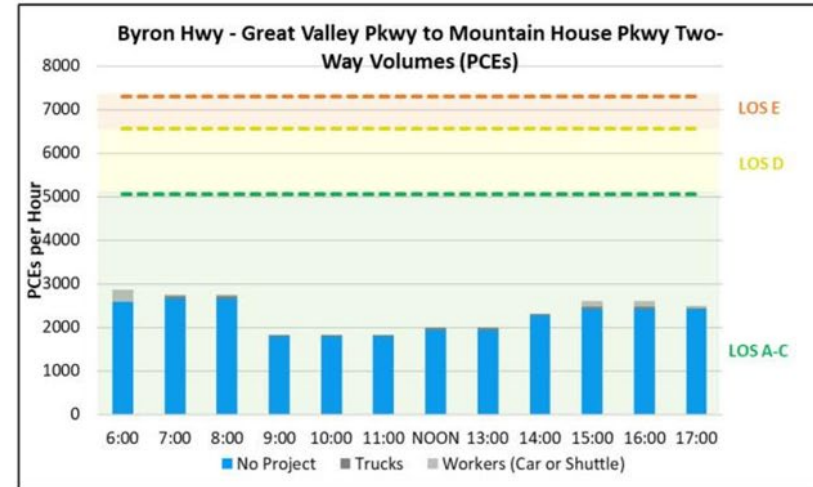


Figure 2-14. Approach to Bypass Mountain House School



Without Widening

LOS is "F" during peak periods and
"E" midday



With Widening

LOS is "C" or better at all times of
the day

Figure 2-15. Peak Traffic Conditions on Byron Road Between Lindemann Road and Mountain House Parkway

LOS would be "C" or better even with the addition of project traffic.

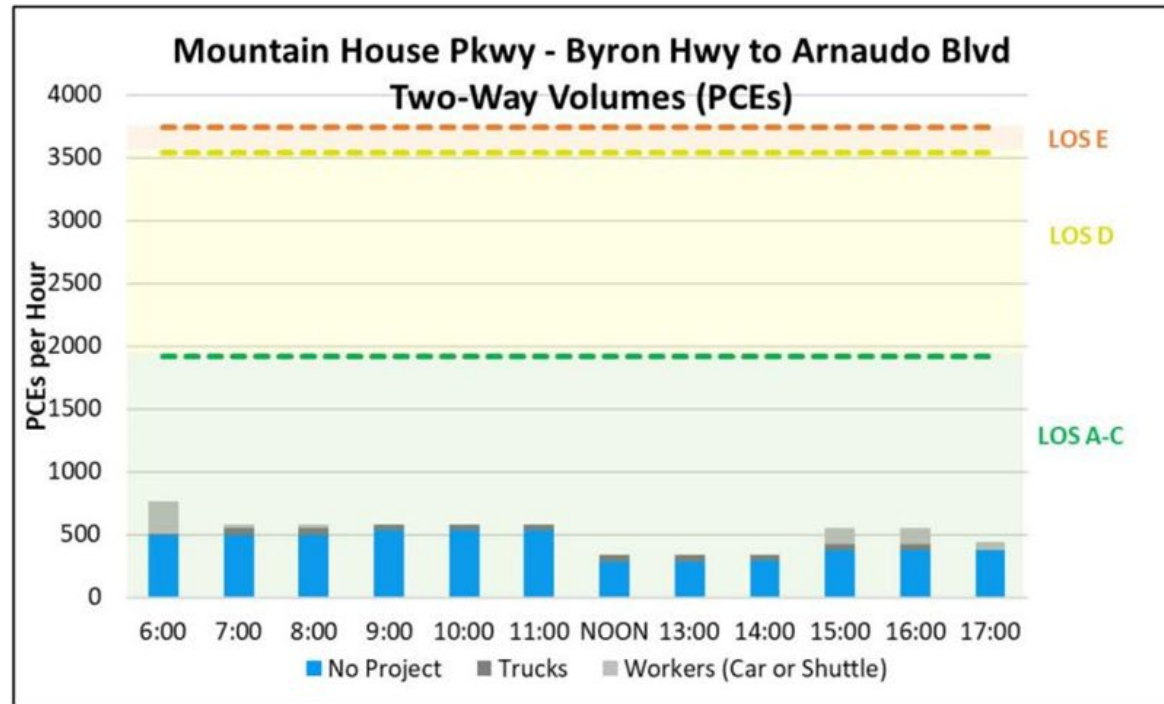


Figure 2-16. Peak Traffic Conditions on Mountain House Parkway Between Byron Road and Arnaudo Boulevard

LOS would be "C" or better even with the addition of project traffic.

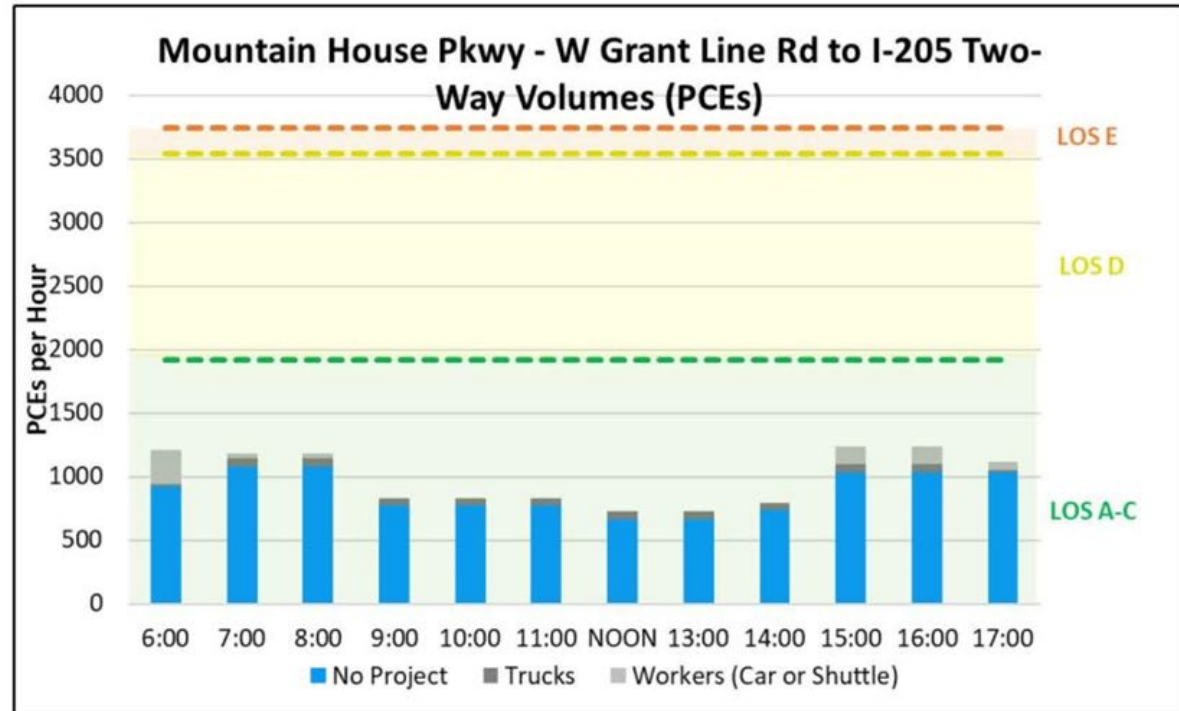


Figure 2-17. Peak Traffic Conditions on Mountain House Parkway Between Interstate 205 and West Grant Line Road

LOS would be "C" or better even with the addition of project traffic.

Project traffic would be minor in relation to background traffic

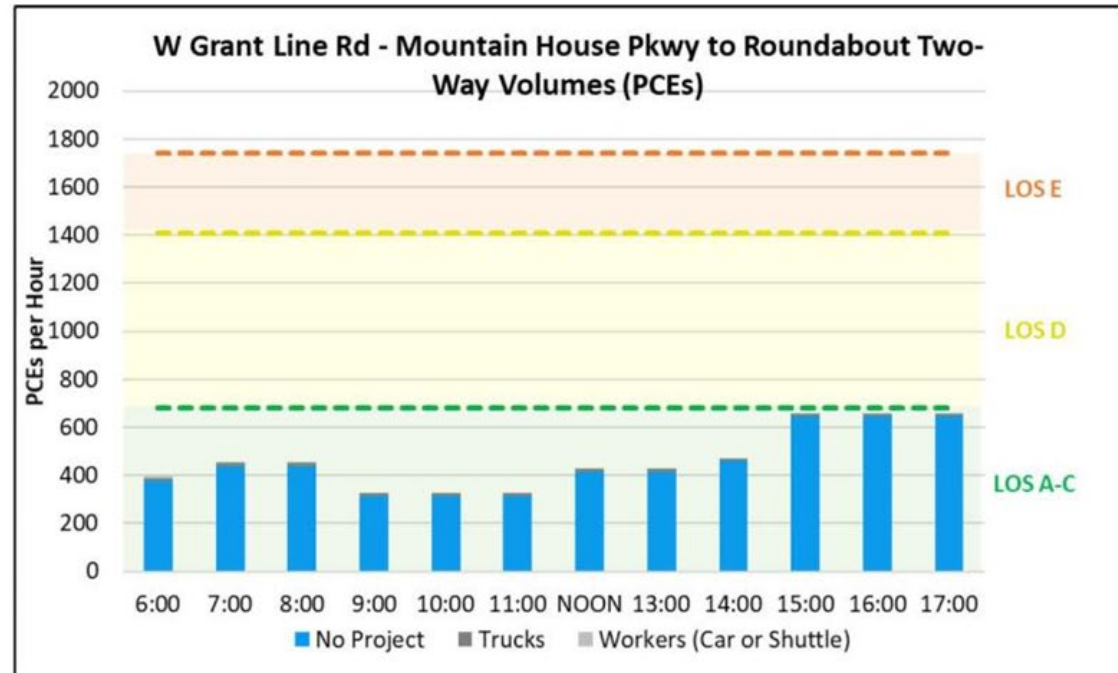


Figure 2-18. Peak Traffic Conditions on West Grant Line Road Between Mountain House Parkway and Mountain House Road

Project traffic would be significant in relation to background traffic, but LOS would be "C" or better even with the addition of project traffic.

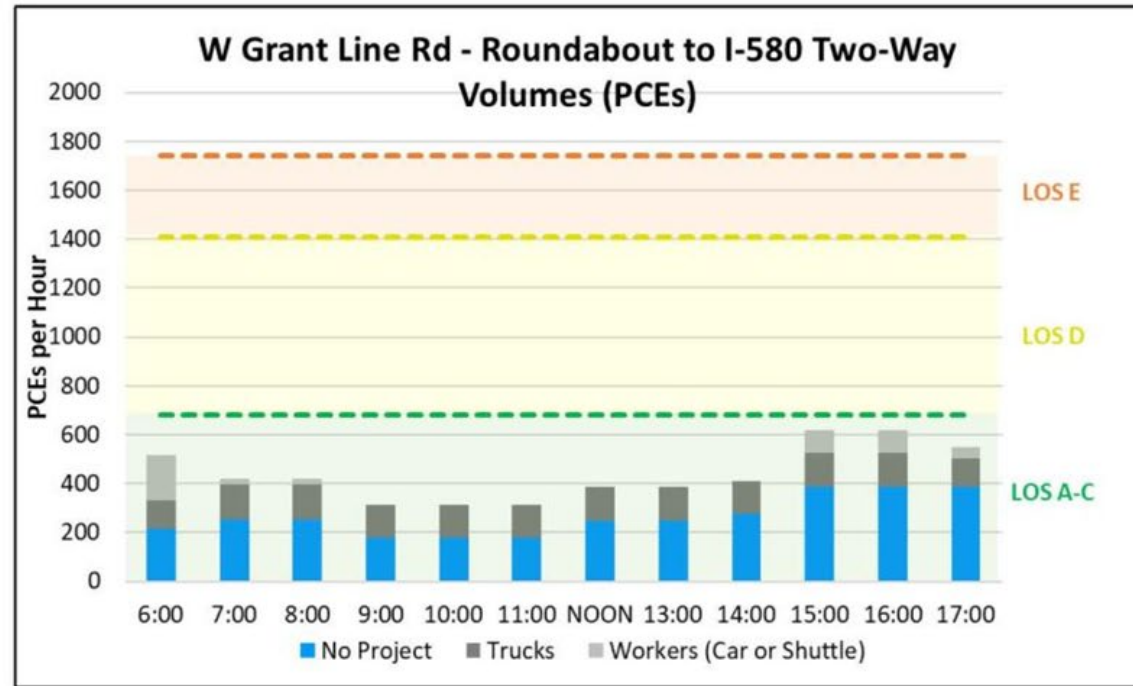


Figure 2-19. Peak Traffic Conditions on West Grant Line Road Between Interstate 580 and Mountain House Road

Project traffic would be significant in relation to background traffic, but LOS would be "C" or better even with the addition of project traffic.

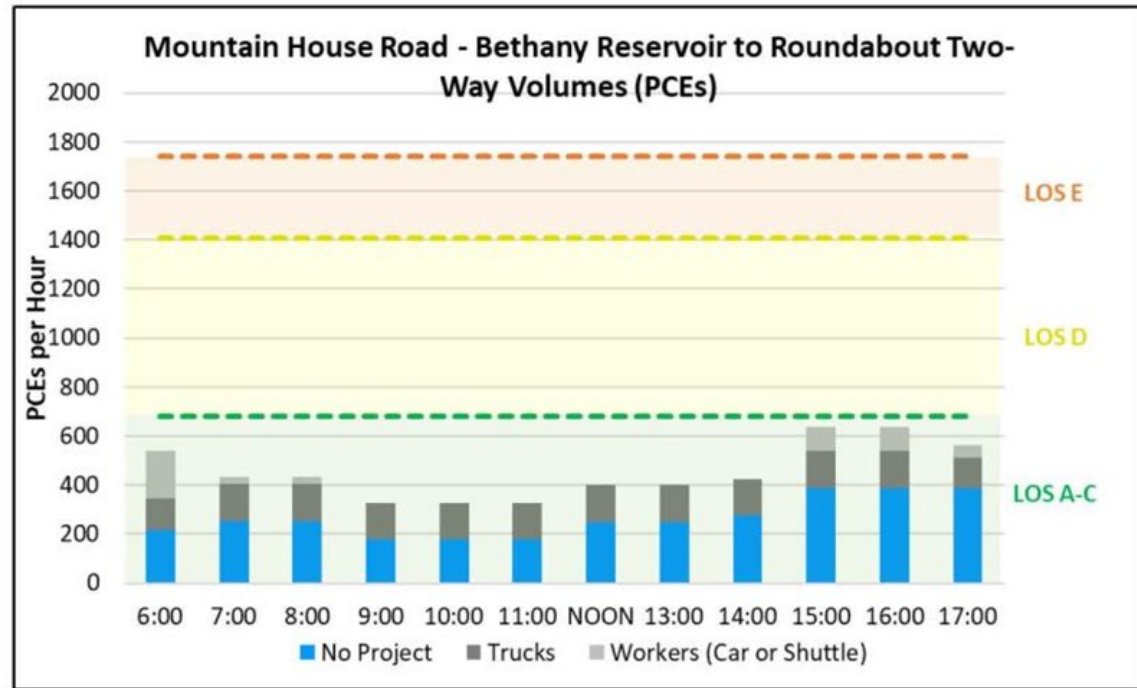


Figure 2-20. Peak Traffic Conditions on Mountain House Road Between Bethany Reservoir and West Grant Line Road

Attachment 3
Work Site Access Concepts

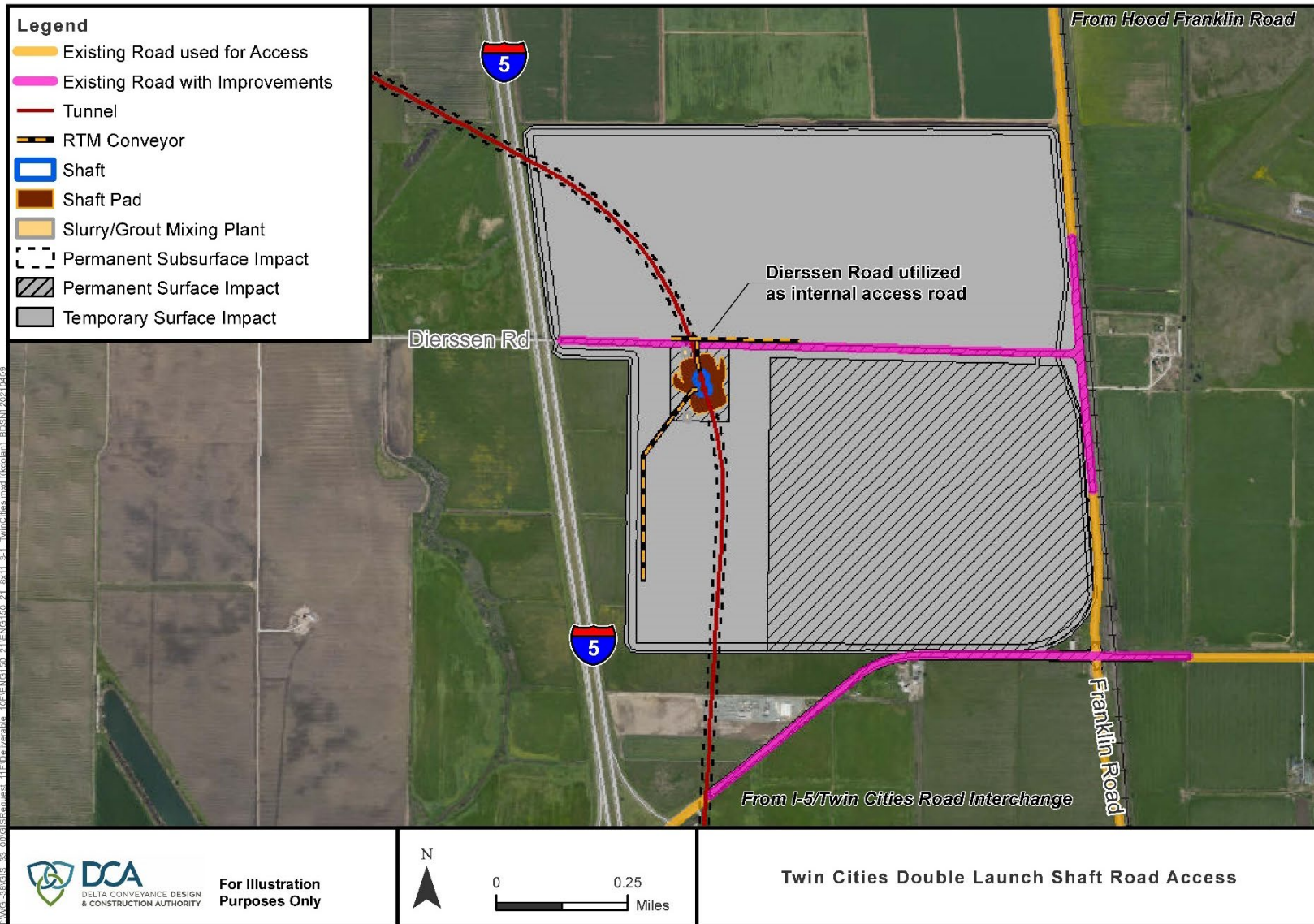


Figure 3-1. Twin Cities Double Launch Shaft Road Access

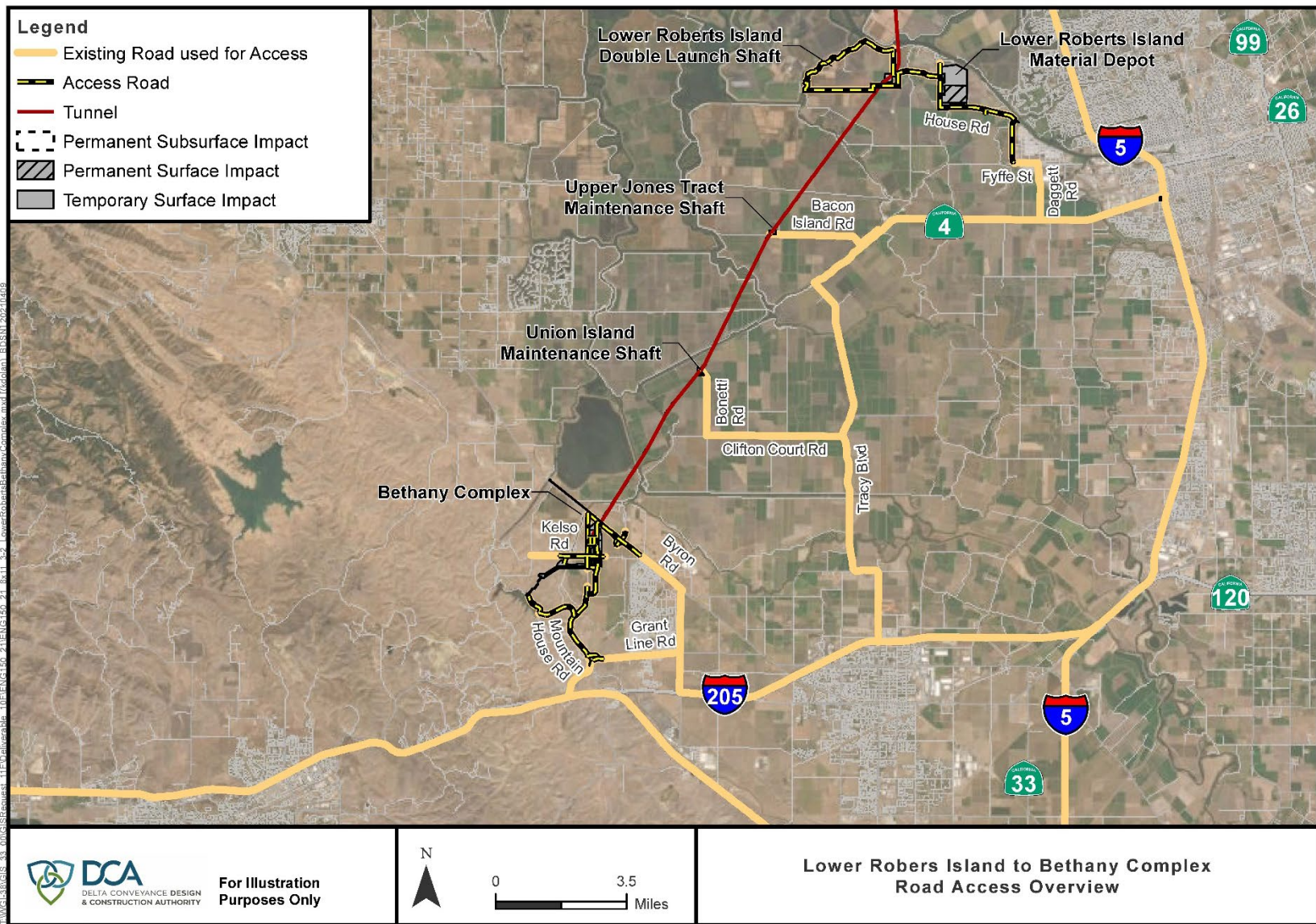


Figure 3-2. Lower Roberts Island to Bethany Complex Road Access

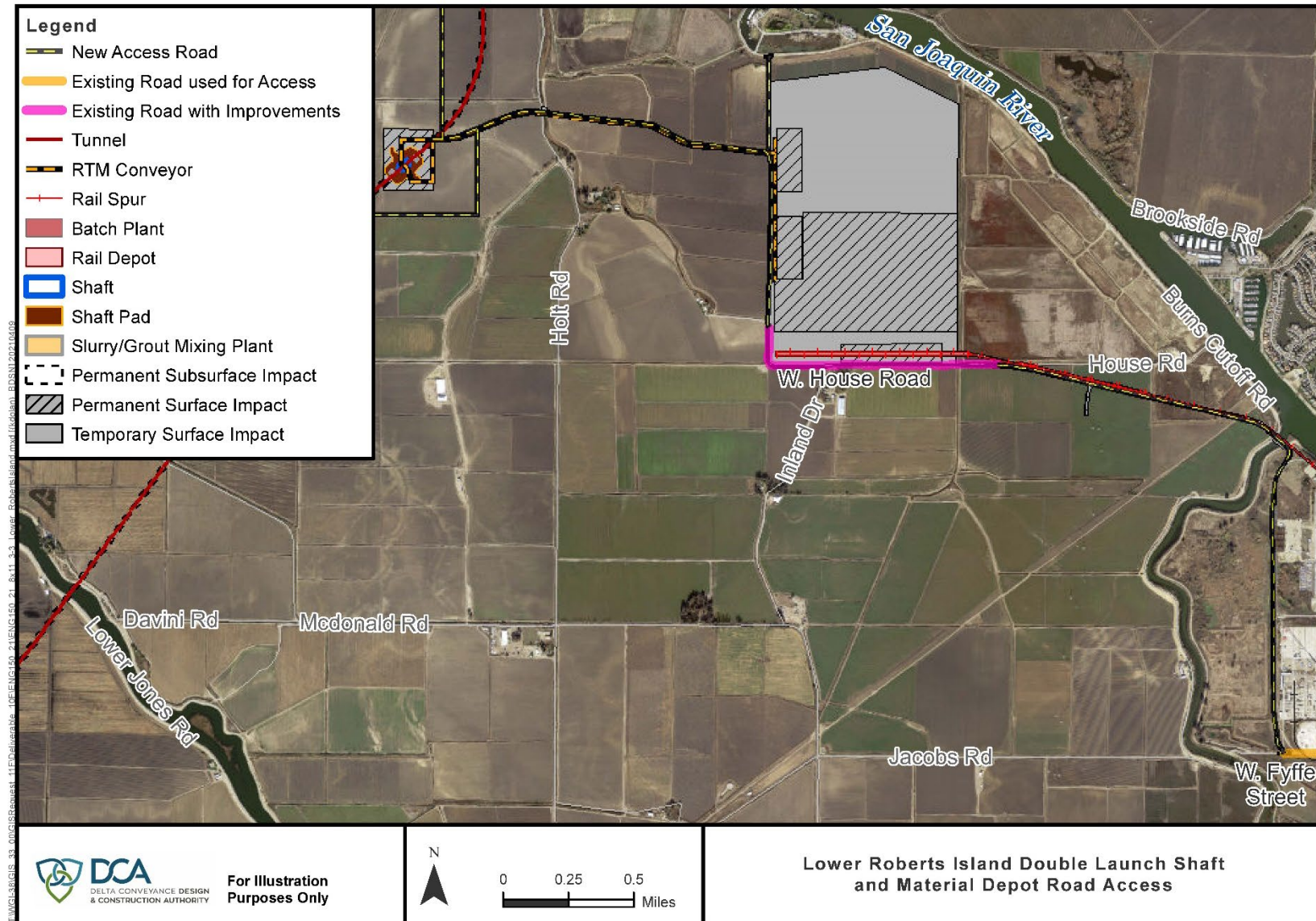


Figure 3-3. Lower Roberts Island Double Launch Shaft and Material Depot Road Access

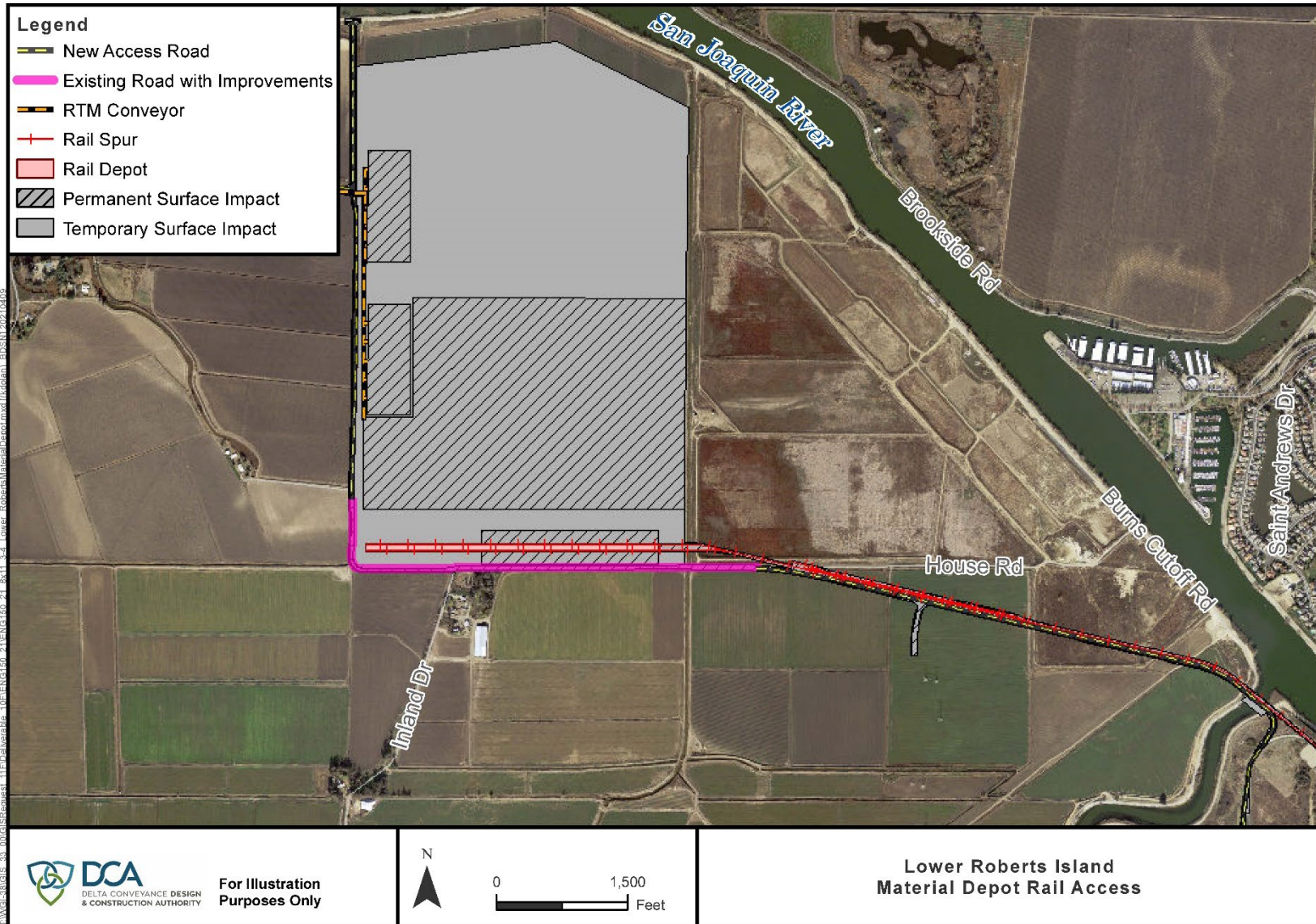


Figure 3-4. Lower Roberts Island Material Depot Rail Access

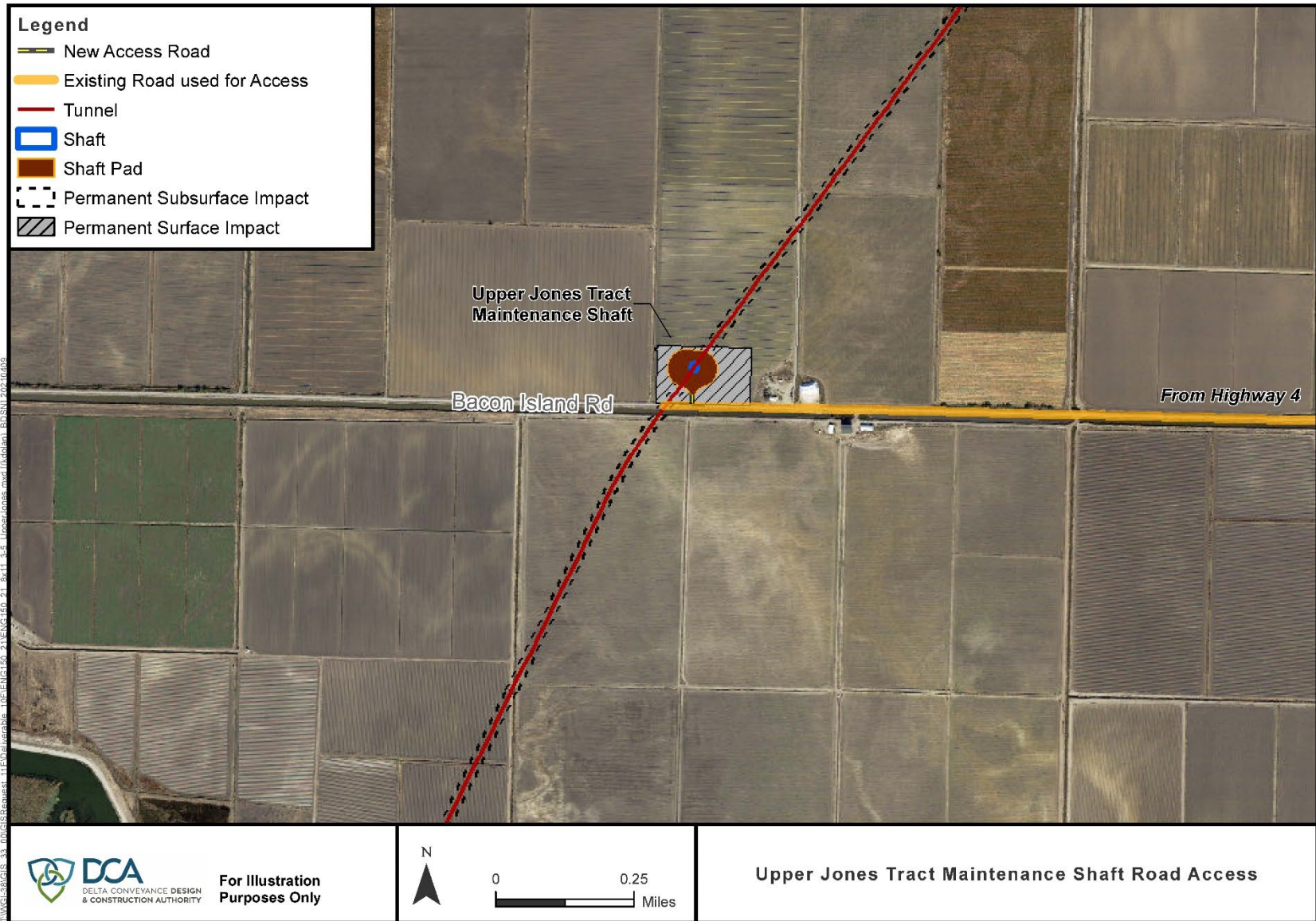


Figure 3-5. Upper Jones Tract Maintenance Shaft Road Access

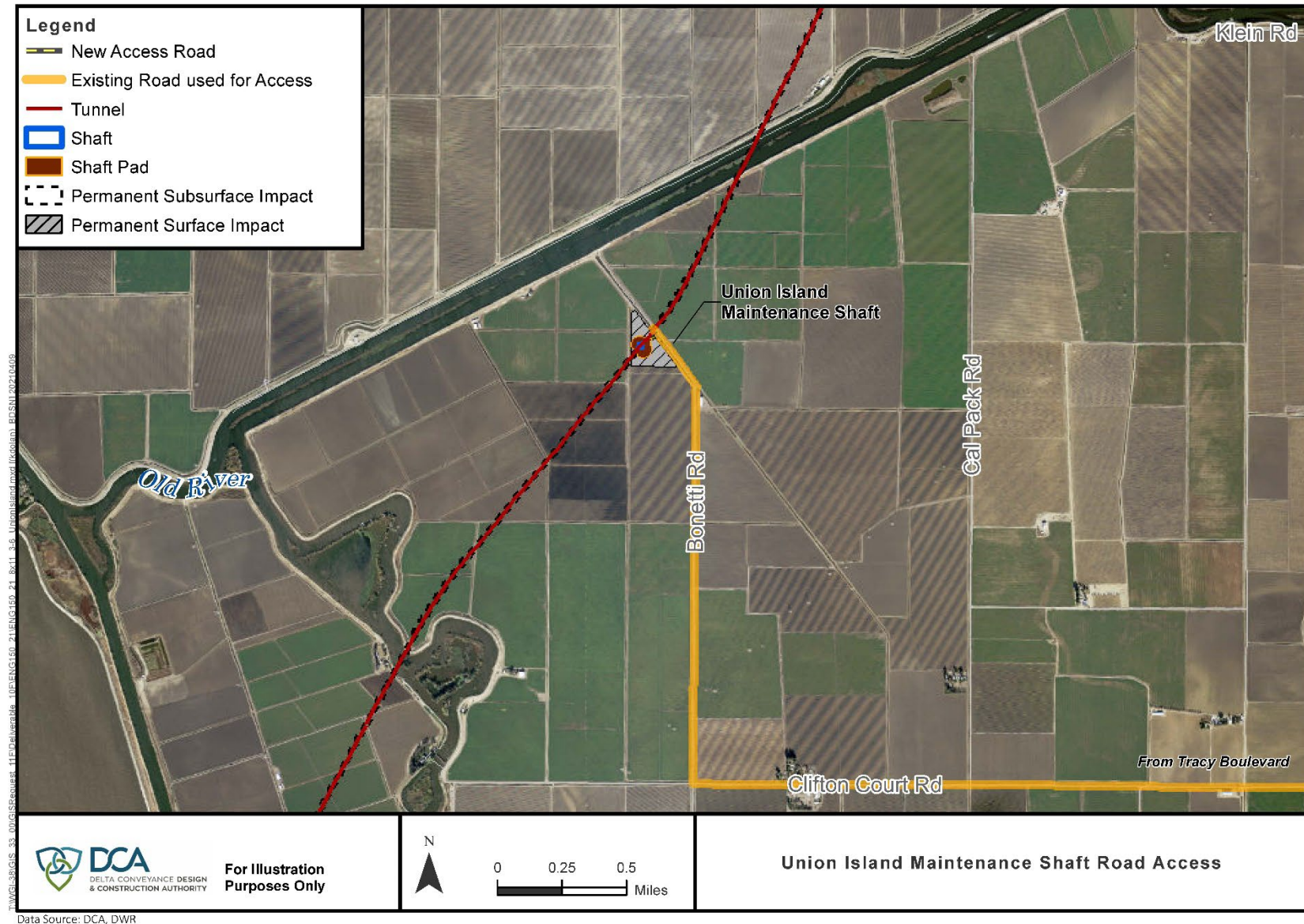


Figure 3-6. Union Island Maintenance Shaft Road Access

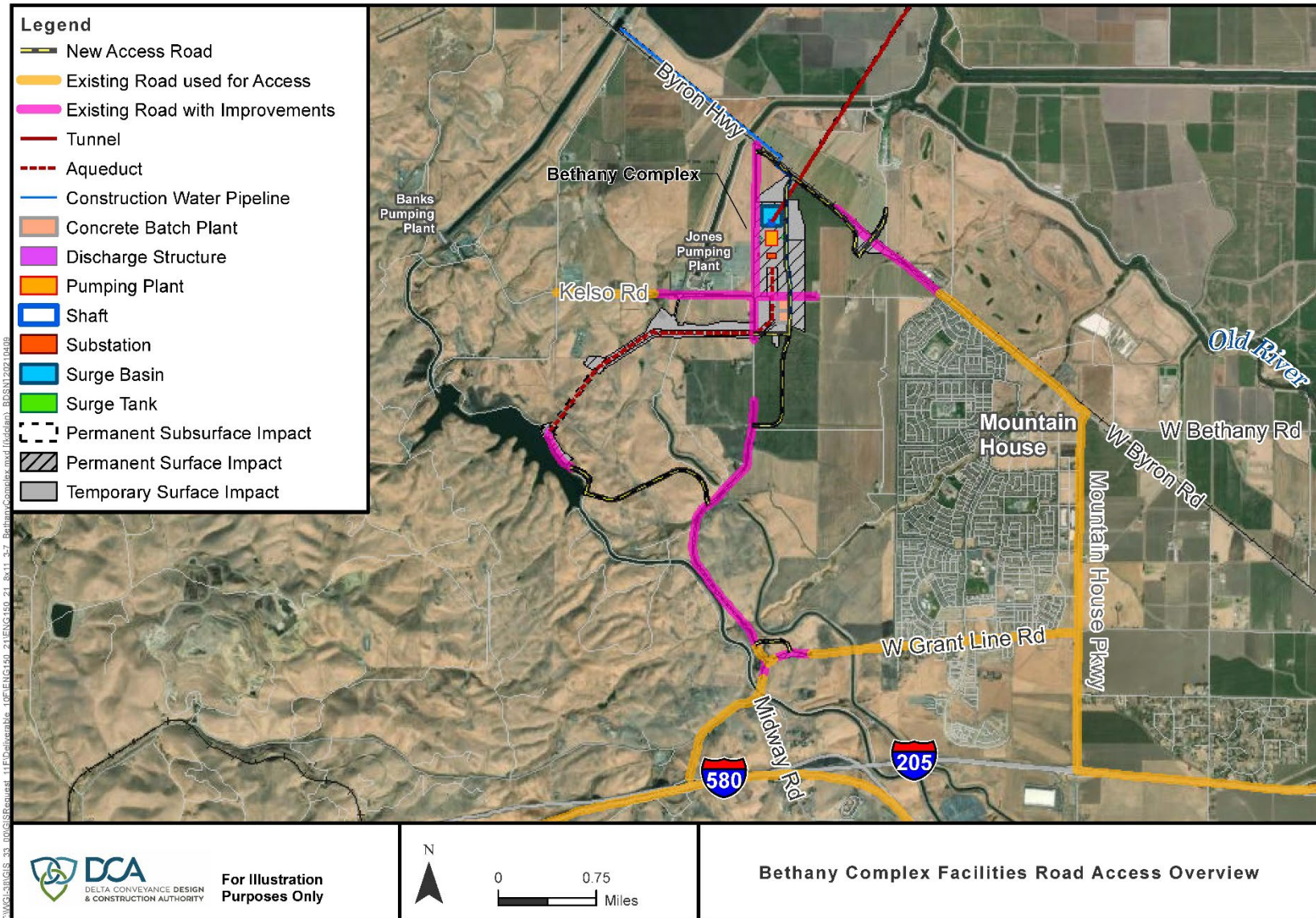


Figure 3-7. Bethany Complex Road Access Overview

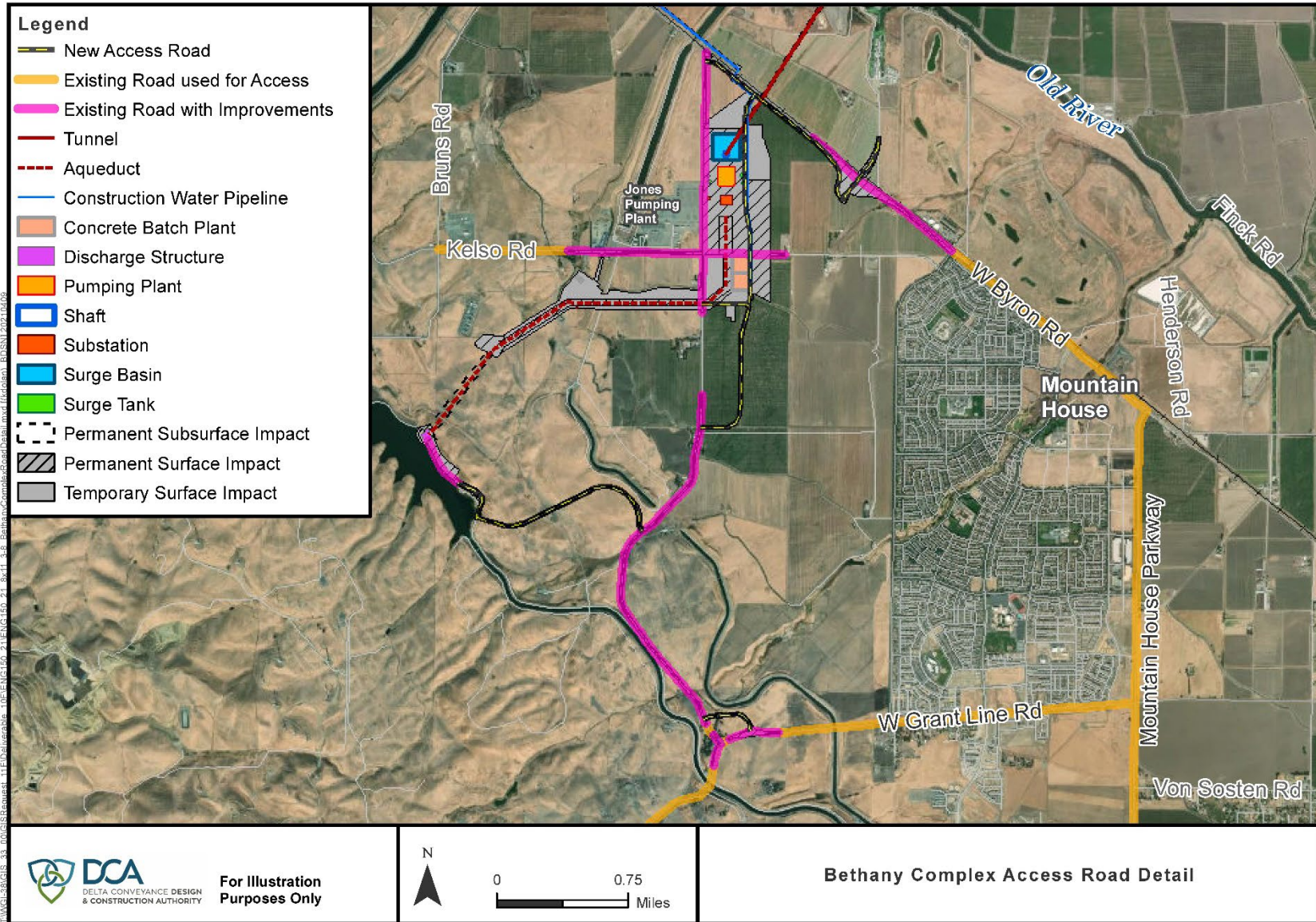


Figure 3-8. Bethany Complex Access Detail

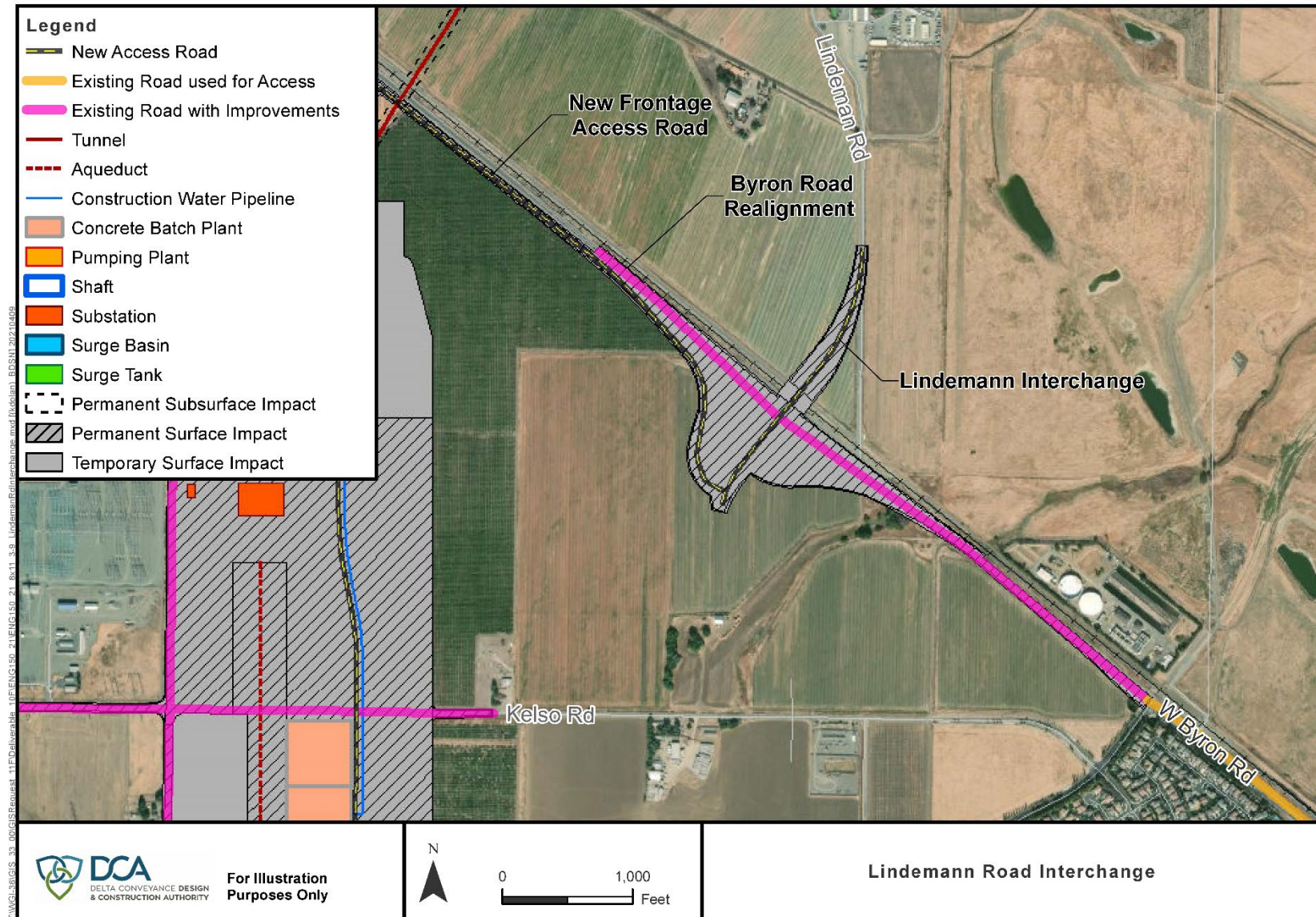


Figure 3-9. Lindemann Road Interchange



Figure 3-10. W. Grant Line Road and Mountain House Road Intersection Improvements

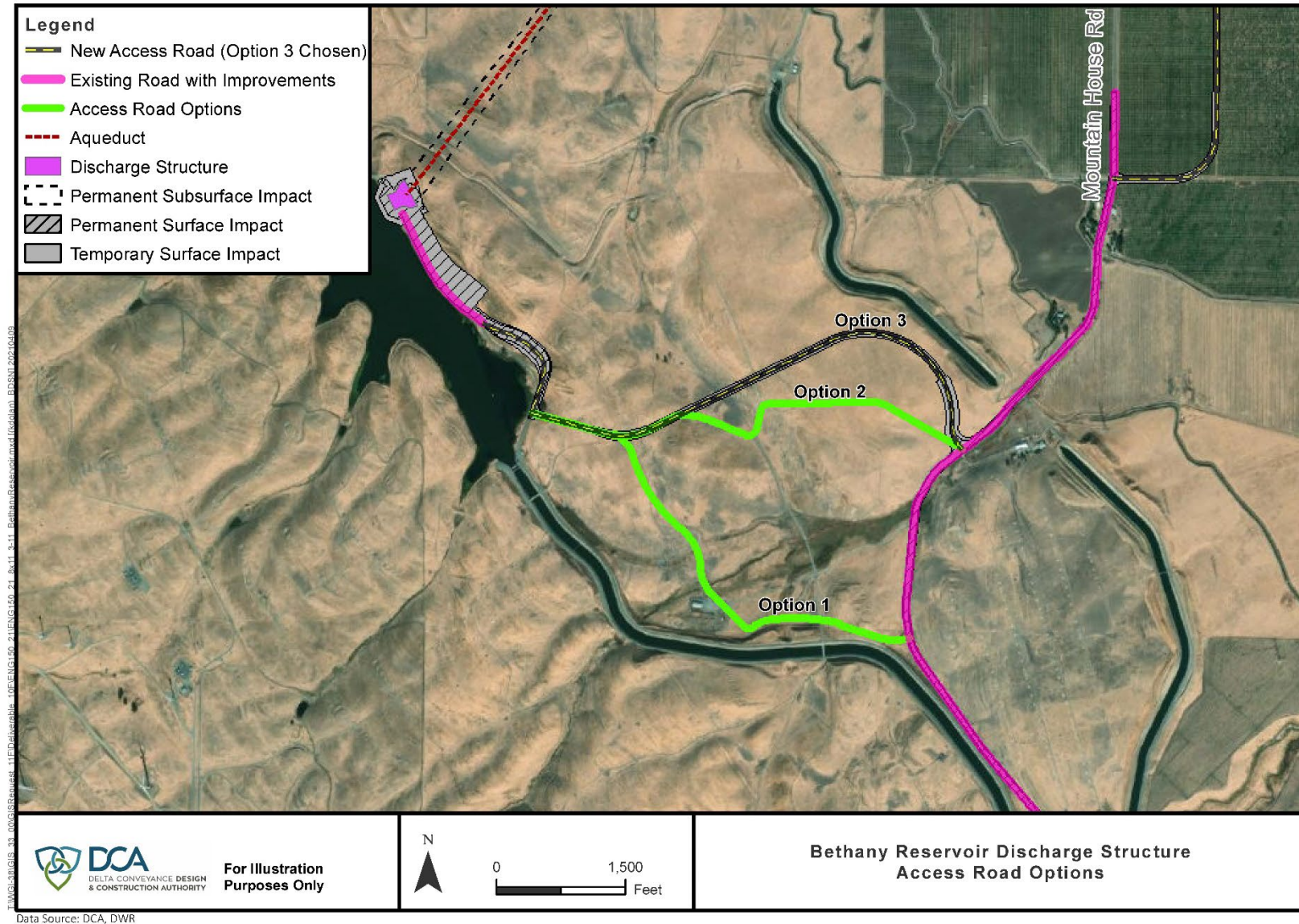


Figure 3-11. Bethany Reservoir Discharge Structure Access Road Options