

If applicable, describe any of the project's areas of controversy known to the Lead Agency, including issues raised by agencies and the public.

Public meeting comments are anticipated to focus on traffic operations during construction and after construction, noise impacts, air quality/greenhouse gas emissions, visual impacts, impacts to the movement of of native resident wildlife species within migratory wildlife corridors, and possibly impacts to streambed and riparian habitat.

Provide a list of the responsible or trustee agencies for the project.

Responsible agencies may include:

1. California Department of Fish and Wildlife (Region 1)
2. Central Valley Regional Water Quality Control Board
3. California Air Resources Board
4. Shasta County Air Quality Management District
5. California Department of Toxic Substances Control
6. NOAA Fisheries
7. U.S. Army Corps of Engineers
8. United States Fish and Wildlife Service
9. California Highway Patrol
10. CAL FIRE
11. Native American Heritage Commission
12. Tehama County Air Pollution Control District

Project Description

The California Department of Transportation (Caltrans) in partnership with the Shasta Regional Transportation Agency (SRTA) and using state and federal funding, is proposing the Fix 5 Cascade Gateway Project (EA 02-0H920)/Cascade State Highway Operation and Protection Program (SHOPP) Project (EA 02-1J380) which would make improvements to Interstate 5 (I-5) in Shasta County from the Hartnell Avenue OC (PM R13.9) to 0.8-mile north of Union School Road (PM R23.2) and in Tehama County at the California Highway Patrol Cottonwood Commercial Vehicle Enforcement Facility (PM 40.7). This is the PM range for the Fix 5 Cascade Gateway Project and includes the PM range for the Cascade SHOPP Project, which is from R14.8 to R20.0. Both projects would be combined at construction.

FIX 5 CASCADE GATEWAY PROJECT (EA 02-0H920)

The Fix 5 Cascade Gateway Project would make the following improvements to I-5:

- The project would reconstruct and widen the existing four-lane freeway into a six-lane freeway with two multi-use lanes and a truck only lane in the NB direction of travel from the Hilltop Drive OC to the Route 151 Junction and in the SB direction of travel from the Route 151 Junction to the Hartnell Avenue OC. The project would add a truck only lane in each direction of travel on I-5 (6.00 miles in the NB direction of travel and 8.19 miles in the SB direction of travel). The addition of a truck only lane in each direction of travel would be accomplished through a combination of constructing new lanes (2.64 miles in the NB direction of travel and 3.29 miles in the SB direction of travel) and converting existing multi-use lanes (3.36 miles in the NB direction of travel and 4.90 miles in the SB direction of travel). Each truck only lane would be 12 feet wide with 10-foot-wide inside and outside shoulders. The truck only lane would be used exclusively by trucks 24 hours per day, seven days per week. In the event of emergencies, the truck only lane may be temporarily opened to use by all vehicles. The location of the truck only lane in the NB and SB directions of travel is provided below.

- NB
 - NB Truck Only Lane:
Begin PM R16.14 (Hilltop OC)
End PM R22.14 (Route 151 Junction)
 - NB New 3rd Lane 2.64 miles

Project Description

Begin PM R16.14 (Hilltop OC)

End PM R18.78 (Route 273 On-ramp)

- NB: 6.00 (total) – 2.64 (new) = 3.36 miles (converted)
- SB
 - SB Truck Only Lane:
Begin PM R13.95 (Hartnell Avenue OC)
End PM R22.14 (Route 151 Junction)
 - SB New 3rd Lane 3.29 miles
Begin PM R18.73 (Route 273 Off-ramp)
End PM R15.44 (Route 44 Junction)
 - SB: 8.19 (total) – 3.29 (new) = 4.90 miles (converted)

To accommodate a new truck only lane in the NB and SB directions of travel, widening would occur at the following locations:

- SB widening in the median from PM R15.4 to R18.6.
- NB widening in the median from PM R16.5 to R18.6.
- NB widening to the outside from PM R18.6 to R19.2.
- Four-strand high tension cable barrier will be placed in the unpaved median sections when the median width is greater than 36 feet.
- Concrete barrier will be placed in the paved median sections when the median width is 36 feet or less.
- Four auxiliary lanes will be constructed/extended in the following locations:
 - SB PM R16.0/R16.7 – From I-5/SR 44 WB off-ramp terminating at the I-5/SR 299 on-ramp. Widening will be within the median.
 - NB PM R16.1/R17.0 – From I-5/SR 44 WB on-ramp terminating at the I-5/SR 299 off-ramp. Widening will be in the median, while utilizing existing pavement and reconfiguring existing pavement

Project Description

delineation. In addition, it will include a two-lane off ramp at SR 299.

- SB PM R18.7/R19.4 – From I-5/SR 273 SB off-ramp terminating at the Oasis Road on-ramp. The paved median will be reconstructed, the existing concrete barrier will be upgraded and relocated approximately 5 feet to the east, existing pavement delineation will be reconfigured, and the remaining median pavement will be utilized where feasible.
- NB PM R18.7/R19.3 – From I-5/SR 273 NB on-ramp terminating at the Oasis Road off-ramp. Widening will be to the outside. The paved median will be reconstructed, existing pavement delineation will be reconfigured, and the remaining median pavement will be utilized where feasible.
- Seven bridges will be widened, six of which will include a ¾-inch minimum polyester concrete overlay (Table 1):
 - Six bridges will be widened in the median and each will include the polyester overlay.
 - One bridge will be widened to the outside and will include a +/- 3" polyester overlay.
 - Bridge widening at the Churn Creek Bridge would extend three piers, remove/replace wing-walls, add bridge rail, and involve deck construction. The extensions of the piers would be constructed to match existing piers (pier dimensions would be approximately 12 feet long, 1-foot wide, and 4 feet deep on a 2-foot spread footing). Wingwalls on the eastside of the Churn Creek Bridge adjacent to northbound I-5 would be removed/replaced. The new wingwalls would be approximately 25 feet long, 1-foot wide, and 4 feet deep with a 6-foot-3-inch wide spread footing.

Table 1. Structures Within the Project Limits

PM	Bridge (Official Bridge Name)	Bridge Number	Upper Facility	Lower Facility	Replace Median Bridge Rail	Widening Towards (Median/Outside)	Vertical Clearance Work
R15.43	East Redding (5/44) Separation	06-0126L	I-5	Route 44 (freeway)	Yes	Median	No

Project Description

Table 1. Structures Within the Project Limits

PM	Bridge (Official Bridge Name)	Bridge Number	Upper Facility	Lower Facility	Replace Median Bridge Rail	Widening Towards (Median/Outside)	Vertical Clearance Work
R15.43	East Redding (5/44) Separation	06-0126R			N/A	N/A	No
R15.56	NB I-5 to WB SR 44 Connector Undercrossing (UC)	06-0127L	I-5	Route 44 (freeway)	Yes	Median	No
R16.15	Hilltop Drive Overcrossing (OC)	06-0101	Hilltop Drive	I-5	N/A	N/A	No
R17.13	Boulder Creek	06-0167	I-5	Boulder Creek	N/A	N/A	N/A
R17.3	Route (5/299) Separation	06-0129L	I-5	Route 299	Yes	Median	No
R17.3	Route (5/299) Separation	06-0129R			Yes	Median	No
R18.07	Twin View Boulevard UC	06-0143L	I-5	Twin View Boulevard	Yes	Median	Yes (SHOPP)
R18.07	Twin View Boulevard UC	06-0143R			Yes	Median	Yes (SHOPP)
R18.48	NB SR 273-NB I-5 Connector Overcrossing (OC)	06-0137G	Route 273	I-5	N/A	N/A	Yes (SHOPP)
R19.0	Churn Creek	06-0107	I-5	Churn Creek	Yes (Outside Bridge Rail)	Outside	NA
R19.4	Oasis Road OC	06-0155	Oasis Road	I-5	N/A	N/A	No

- Widened bridges will include upgraded bridge rail on both sides. (The outside rail will be funded with Infrastructure Investment and Jobs Act (IIJA) funds as part of the Cascade SHOPP Project. Excluding the Churn Creek Bridge rail which will be replaced as part of the 02-0H920 project.

Project Description

- Vertical clearance under I-5 will be improved by lowering the roadway under Twin View Boulevard by approximately one-foot as part of the Cascade SHOPP Project.
- Vertical clearance on I-5 will be improved to standard under the NB SR 273/NB I-5 Connector OC by reconstructing a portion of the SB profile of I-5 as part of the Cascade SHOPP Project. The roadway would be lowered by approximately one-foot at this location.
- The existing pavement will be cold planed 0.10-foot and a 0.10-foot rubberized hot-mix asphalt (open graded) (RHMA-OG) friction course will be placed from edge of pavement (EP) to EP as a final wearing course for mainline, shoulders, and ramps. The RHMA-OG will reduce the possibility of hydroplaning and provide attenuation of traffic noise. The location of the 0.1' cold plane and repave limits would be from Hartnell OC (PM R13.95) to the 151 OC (PM R22.14) from edge of pavement to edge of pavement.
- Existing ramp configurations will be maintained or improved when feasible.

Truck Only Lane/Emergency Operations Sign Package

NB

A truck only lane/emergency operations sign package would be installed at various locations in the NB lane from PM R15.1 to R23.2 (0.8-mile north of Union School Road OC). The sign package would consist of three advance variable message (AVM) signs, two lane management system (LMS) signs, and one panel sign. The AVM signs would be installed at PM R16.15, R16.84, and R22.11. The LMS signs would be installed at PM R18.96 and R21.36. The panel sign would be installed at PM R14.23.

SB

A truck only lane/emergency operations sign package would be installed at various locations in the SB lane from PM R23.2 (0.8-mile north of Union School Road OC) to R13.9 (Hartnell Avenue). The sign package would consist of five

Project Description

panel signs and one LMS sign that would be installed at PM R16.54.

Drainage

The proposed 10-foot inside shoulder will be sloped towards the median for most of the project limits. The number 1 lane (inside lane closest to the median) will typically be sloped towards the median as well except when conforming to the existing six-lane facilities adjacent to the project where the number 1 lanes are sloped to the outside. Several factors were considered in determining the number 1 lane cross slope, including: conforming to existing structures, conforming to existing six-lane sections, paved medians, profile grades paired with geometric configurations, and width of pavement. All the controlling factors will directly or indirectly affect the drainage characteristics.

The existing median drainage will be adjusted, replaced, or extended as needed. Median inlets attached to cross-culverts will be maintained or adjusted to perpetuate the existing connectivity. Additional drainage facilities will be added to meet drainage needs.

From the information provided in the culvert inventory assessment, there are 26 culverts in poor to critical condition or in fair condition requiring some type of repair or replacement or need maintenance or repair (Table 2).

Table 2. Proposed Drainage Work for the Fix 5 Cascade Gateway Project

Location PM (Upstream ETNO ¹ – Downstream ETNO)	Existing Culvert Length (feet)	Existing Diameter	Proposed Culvert	Proposed Work
R15.60 (3-4)	90	18"	18" RCP	Extend to new flowline/DI. Potentially CIPP.
R15.60 (4-8)	159	12" CSP	18" RCP/HDPE	Remove/reconfigure culvert and DI according to new median. Note: Potential to abandon this section if cross slope drains water to outside shoulder as shown on ca002.
R15.60 (4-5)	18	18" HDPE	18" RCP/HDPE	Remove/reconfigure. May eliminate DI box 4.
R15.60 (5-6)	100	18" HDPE	18" RCP/HDPE	Remove/reconfigure DIs and pipe to barrier design.
R15.60 (6-7)	99	18" HDPE	18" RCP/HDPE	Remove/reconfigure DIs and pipe to barrier design.

Project Description

Table 2. Proposed Drainage Work for the Fix 5 Cascade Gateway Project

Location PM (Upstream ETNO ¹ – Downstream ETNO)	Existing Culvert Length (feet)	Existing Diameter	Proposed Culvert	Proposed Work
R15.69 (1-2)	126	18" RCP	18" RCP	Extend to new flowline.
R15.69 (2-3)	55	18" HDPE	18" RCP/HDPE	Remove/reconfigure culvert and DI according to new median. Note: Potential to abandon this section if cross slope drains water to outside shoulder as shown on ca002.
R15.69 (2-4)	22	18" HDPE	18" RCP/HDPE	Remove/reconfigure. May eliminate DI box 2.
R15.69 (4-5)	97	18" HDPE	18" RCP/HDPE	Remove/reconfigure DIs and pipe to barrier design.
R15.82 (1-2)	106	18" RCP	18" RCP	Shorten/lengthen pipe/ Remove/replace DI to new flowline. New DI(s) in NB median per barrier design.
R16.21 (1-2)	103	18" RCP	18" RCP	Replace or adjust median DI. New DIs per barrier design.
R16.21 (2-3)	74	36" HDPE ?	18" (36") RCP/HDPE	Remove/reconfigure. Note: Existing culvert size seems too big.
R16.53 (3-2)	7	24" RCP	24" RCP	Remove/reconfigure. Add DI between 3-4 per barrier design.
R16.53 (2-5)	202	36" HDPE?	24" (36") RCP/HDPE	Remove/reconfigure. Note: Existing culvert size seems too big.
R16.76 (2)	Var	24" RCP	24" RCP	Remove/reconfigure DI. New DI in NB median per barrier design.
R16.94 (2-1)	135	36"	No Change	New DI NB median per barrier design.
R17.06 (2-1)	115	24" RCP	No change	Remove/reconfigure DI. New DI in NB median per barrier design.
R17.17 (2)	NA			Remove/replace DI for ramp widening/rock blanket. Add new DI/culvert to gore area.
R17.17 (2-3)	72	18" RCP	No Change	Remove/reconfigure DI. New DI in NB median per barrier design.
R17.40 (2)	NA	24" RCP	No Change	Reconfigure DI to new FL.
R17.55 (2)	NA	24" RCP	No Change	Reconfigure DI to new FL.
R17.75 (2)	NA	24" RCP	No Change	Reconfigure DI to new FL.
R17.88 (4)	NA	18" RCP		Reconfigure DI to new FL.
R18.29 (2)	NA	24" RCP		Reconfigure DI to new FL.

Project Description

Table 2. Proposed Drainage Work for the Fix 5 Cascade Gateway Project

Location PM (Upstream ETNO ¹ – Downstream ETNO)	Existing Culvert Length (feet)	Existing Diameter	Proposed Culvert	Proposed Work
R18.40 (2)	NA	24" RCP		Reconfigure DI to new FL.
R18.72 (3-4)	309	18" CSP	24" RCP	Remove/reconfigure DI and culvert. New DI(s) in NB median per barrier design.
R18.72 (4-5)	345	18" CSP	24" RCP	Remove/reconfigure DI and culvert. New DI in NB median per barrier design.
R18.72 (5-6)	24	18" CSP	24" RCP	Remove culvert and DI. (unless inside shoulder is tipped inboard)
End Treatment Number				

Detention basins, infiltration trenches, and underground detention vaults will be utilized as necessary to attenuate or retain peak flows during storm events. A portion of the project is located adjacent to a flood plain, which is associated with Boulder Creek and Churn Creek. When required, increased stormwater runoff from the additional impervious area will be metered to maintain pre-construction out-flows.

Railroad Involvement

There is no railroad within the project limits, therefore this project requires no railroad involvement.

Transportation Management Systems

There are 34 existing traffic census station locations with 64 loops and six piezoelectric axle sensors (piezos) within the project limits; the six piezos and 45 loops will be replaced, 19 loops will be protected in place, and three new loops will be added.

There are seven existing ITS field elements within the project limits that must be protected in place or replaced if damaged during construction. The existing fiber optic vaults will be adjusted to grade to account for the change in elevation due to the roadway widening in the median.

Two new ITS elements are anticipated as part of this project: A closed-circuit television (CCTV) camera near Hilltop OC at PM R16.15 and

Project Description

placement of fiber optic system from PM R18.6 to R20.0. Additional ITS elements may be considered and included; the ITS element commitments made during the application process will be incorporated into the project scope. As funding sources become available, grant requirements evolve, and technologies advance the items of work for ITS elements could expand or be reduced.

Utilities

Existing utilities within the project limits have been identified and potholed as outlined in the Caltrans utility policy. Several existing utilities cross the roadway where construction activities are expected; however, no conflicts are anticipated, and these utilities will be protected in place. Fiber optic and electrical wiring in conduit that are attached to bridges will need to be relocated to accommodate bridge widening.

Borrow Site, Disposal Site, and Material Storage

No borrow sites will be utilized on this project.

Approximately 70,000 cubic yards of asphalt grindings and other materials will be generated from roadway excavation and cold planing. Grindings and other construction debris will become property of the contractor. Some excavated materials may be reused onsite as embankment and/or disposed of at an optional disposal site located at one of the Shasta County Road Department's disposal yards; the actual location is still to be determined.

Highway Planting and Erosion Control

Disturbed slopes in the median and new embankment slopes will be stabilized with erosion control measures as recommended by the landscape architect. Additional roadway planting and irrigation will be required to adjust, modify, or replace any highway planting disturbed during construction, which is anticipated near the northbound Oasis Road off-ramp.

Storm Water

Project Description

This project will have a total disturbed soil area (DSA) of 32.0 acres. The DSA was calculated as all roadway excavation, widening, embankment areas, and staging areas. This project will be constructed under a Storm Water Pollution Prevention Program (SWPPP) Risk Level 2. The total project area is estimated at 260 acres. The existing impervious area is 53.1 acres. The impervious area after the project is completed is estimated at 69.8 acres. The net new impervious area is estimated at 16.6 acres. The replaced impervious area is estimated at 9.3 acres. The new impervious surface subject to MS4 threshold criteria is estimated at 25.9 acres (including 9.3 acres of replacement area). This project is within the boundary of the City of Redding Phase II Urban MS4 Permit Area.

Treatment best management practices (BMP) will be used within the project limits when feasible and are anticipated to utilize existing and proposed bio-strips, bio-swales, detention basins, and infiltration basins. Areas within the project where treatment BMPs are not feasible are anticipated to use alternative compliance credits established during the development and construction of the Redding to Anderson Six-Lane Project (RASL EA: 02-4C40V). The RASL Project's Storm Water Data Report stated, "The new and existing treatment BMPs will treat 87 acres of pavement area. The additional 43 treatment BMP acres will be documented and used as an alternative compliance credit source for the 02-0H920 North Redding 6 Lane and other future projects in this corridor/watershed, subject to RWQCB concurrence."

In-fill Walls

In-fill walls will be placed on the 6 existing structures being widened towards the median. This will add redundancy during a seismic event. As part of the Cascade SHOPP project infills wall will be placed on the existing NB 44 Separation and Connector.

Charging Station

A new medium and heavy-duty electric vehicle charging facility will be installed at the California Highway Patrol Cottonwood Commercial Vehicle Enforcement Facility along I-5 in Tehama County at PM 40.7 in the NB direction of travel. The charging station will include two truck-zero emission vehicle (ZEV) charging stations and security cameras.

Project Description

Right-of-Way

All work would occur within Caltrans' existing right of way, which is owned in fee. No additional right-of-way would be acquired to complete the work.

CASCADE SHOPP PROJECT (EA 02-1J380)

This alternative proposes to rehabilitate the roadway with the following strategies:

Vertical Clearance Improvements

This project proposes to improve vertical clearance at locations listed in Table 3.

Table 3. Proposed Work at Locations Having Non-Standard Vertical Clearances

Post Mile	Location Name	Existing Vertical Clearance	Proposed Vertical Clearance	Proposed Work
R18.07	Twin View Boulevard UC (06 0143L & 06 0143R)	14 feet 7 inches	15 feet 0 inches	Excavate and reconstruct Twin View Boulevard between ramp intersections. Proposed structural section is 0.6' hot mix asphalt (HMA) and 0.75' class 2 aggregate base. No impact to existing curb and gutter.
R18.48	N273-N5 Connector OC (06 0137G)	15 feet 10 inches	16 feet 6 inches	Excavate existing SB I-5 pavement section, place new structural section from PM R18.43 to R18.53

Project Description

The proposed pavement structural section for the section of I-5 under the N273-N5 Connector OC location is as follows:

- 0.10' Rubberized hot mix asphalt (RHMA) (open-graded)
- 0.20' RHMA (gap-graded)
- 0.45' hot mix asphalt – A
- 1.80' Class 2 aggregate base
- Subgrade enhancement geotextile

Additional work associated with the vertical clearance improvements includes shoulder backing, guardrail replacements, a drainage inlet adjustment and concrete barrier replacement. It is expected that K-rail will be used as a worker safety measure during construction at the N273-N5 Connector location.

Lane Cross Slope Improvement

This alternative includes a variable depth grind and replace with a 0.2' HMA overlay to bring lane cross slopes to 1.5% minimum. It is assumed that 0.1' RHMA-O will be added as part of the non-SHOPP work following the 0.2' HMA overlay.

- Dig-outs will be utilized to repair locations of failed pavement.

Polyester Overlay

This project includes removing the existing polyester overlay, preparing the decks, placing new polyester overlay, replacing joint seals, and replacing barrier rail on the non-widened side of the structure. on the following structures:

- East Redding (5/44) Separation (06 0126L)
- N5-W44 Connector UC (06 0127L)
- Route 5/299 Separation (06 0129L)
- Roue 5/299 Separation (06 0129R)
- Twin View Boulevard UC (06 0143L)
- Twin View Boulevard UC (06 0143R)
- Churn Creek (06 0107)

Bridge Rail

The outside bridge rail replacement will be funded with IIJA funds as part of the Cascade SHOPP Project. Excluding the Churn Creek Bridge rail which will be replaced as part of the 02-0H920 project.

Project Description

In-fill Walls

This project will construct in-fills wall on the existing NB 44 Separation and Connector.

Rock Blanket

Rock blanket in the interchange gore areas will be added to meet Highway Design Manual standards. The rock blanket should match the look of the rock blanket included in the RASL Project.

Drainage

This project includes work on 26 culverts, as shown in Table 4 below.

Table 4. Proposed Drainage Work for the Cascade SHOPP Project

Location PM (Upstream ETNO ¹ – Downstream ETNO)	Existing Culvert Length (feet)	Existing Diameter	Proposed Culvert	Proposed Work
R14.58 (3-6)	667	24"	24" RCP	Partial replacement; then apply cured-in-place pipeliner (CIPP)
R14.58(11)	N/A	24"	24" Concrete Flared End Section (FES)	Replace FES.
R14.96 (16-14)	78	24"	24" Reinforced Concrete Pipe (RCP)	Partial replacement; then CIPP
R14.96 (5-4)	111	24"	No change	CIPP
R14.96 (2-1)	168	24"	24" RCP	Cut and cover replace pipe and inlet/outlet.
R15.50 (3-2)	212	18"	24" RCP)	Cut and cover replace pipe. New DIs according to median design. Note: Potential to abandon SB DIs if cross slope drains water to outside shoulder as shown on ca002. New DIs needed in NB median (guardrail to barrier)
R15.50 (2-1)	98	24"	24" RCP	CIPP.

Project Description

Table 4. Proposed Drainage Work for the Cascade SHOPP Project

Location PM (Upstream ETNO ¹ – Downstream ETNO)	Existing Culvert Length (feet)	Existing Diameter	Proposed Culvert	Proposed Work
				Extend to new flowline/DI to accommodate median design.
R15.98 (3-2)	143	24"	24" RCP	Replace median drainage inlet (DI) and 20 ft of pipe (Not sure if any pipe needs replaced. The joint separation appears to have a band around it.)
R16.94 (3-2)	104	36"	No change	CIPP. Remove/replace DI 2.
R17.30 (2-1)	145	18"	18" CSP	Cut and cover replace pipe and inlet/outlet. Add approximately 10 ft circle of vegetation control (minor concrete) centered on the outlet.
R17.40 (2-1)	114	24"	24" RCP	Replace 8 ft of pipe at outlet.
R17.70 (1)	NA			Repair/replace inlet apron.
R17.75 (1)	NA			RSP at outlet
R17.85 (3-1)	18	N/A	N/A	Remove flume downdrain and replace with 4 ft wide RSP-lined ditch (abandon/remove)
R17.88 (1)	NA			Address scour at FES.
R18.04 (3-2)	189	24"	No change	CIPP
R18.50 (4-3)	95	18"	24" RCP	Cut and cover replace 8' segment of pipe, NOT including the inlet/outlet
R18.50 (3-2)	64	18"	24" RCP	Do NOT Cut and cover replace pipe and inlet/outlet, it just needs cleaning. Reconfigure DI to new FL
R18.72 (3-2)	95	18"	24" RCP	Cut and cover replace pipe and inlet/outlet. Reconfigure DI to new FL
R18.72 (2-1)	71	18"	24" RCP	Cut and cover replace pipe and inlet/outlet Reconfigure DI to new FL
R18.73 (2-1)	273	54"	No change	CIPP. A clear water diversion is likely needed.

Project Description

Table 4. Proposed Drainage Work for the Cascade SHOPP Project

Location PM (Upstream ETNO ¹ – Downstream ETNO)	Existing Culvert Length (feet)	Existing Diameter	Proposed Culvert	Proposed Work
R18.79 (3-2)	151	18"	24" RCP	Cut and cover replace pipe and inlet/outlet. Add 5 new inlets to replace existing slotted drain.
R19.27 (2-1)	50	24"	24" RCP	Cut and cover replace pipe and inlet/outlet
R19.38 (3-2)	13	24"	24" RCP	Cut and cover replace pipe and inlet/outlet
R19.38 (2-1)	159	24"	24" RCP	Cut and cover replace pipe and inlet/outlet
R19.74 (4-3)	161	18"	24" RCP	Cut and cover replace pipe and inlet/outlet. Add 5 new inlets to replace existing slotted drain.

¹End Treatment Number

The District Office of Roadside Maintenance expressed an interest in using a UV-cured CIPP liner for the culvert at PM R18.73.

A change in drainage patterns could result from changing the lane cross slopes. Coordination with the Hydraulics Branch during design is necessary and is already in progress for the Fix 5 Cascade Gateway companion project (02-0H920).

Traffic Management Systems and Census Loops

This project proposes to protect the 29 existing census loops in place or replace if damaged. No impacts to census loops from vertical clearance work are anticipated. Two new census loops are proposed: one at the SR 299/Lake NB on-ramp and one at the SB Twin View on-ramp. Existing and proposed traffic census stations within one mile of the project limits are shown in Table 5.

Project Description

Table 5. Existing Traffic Census Stations Within One Mile of the Project Limits

No.	Cabinet*	County-Route - Actual PM	Description	Potential Impact	Condition
298	1	Hartnell Avenue Sha-5-R13.97	78' north of Hartnell Overcrossing (OC)	Protect or Replace (12 Loops and 6 Piezos)	Active
R214	0	Cypress NB off Sha-5-R14.37	Pull Box (PB) 12' north of (n/o) RIGHT LANE MUST TURN RIGHT sign.	Protect-in-Place (3 Loops)	Active
R215	0	Cypress SB on Sha-5-R14.39	PB located on Left (Lt) shoulder 288' south of (s/o) Cypress	Protect-in-Place (1 Loop)	Active
304	1	Redding, Cypress Ave Sha-5-R14.94	South of NB off-ramp Central Redding Interchange	Protect or Replace (8 Loops)	Active
R216	0	Cypress Ave SB off Sha-5-R14.64	PB 950' n/o Cypress Ave Centerline (CL), by light standard (LS) #14651	Protect-in-Place (1 Loop)	Active
R217	0	Cypress Ave NB on Sha-5-R14.62	PB 834' n/o Cypress CL, 127' south of Merging Sign	Protect-in-Place (1 Loop)	Active
R1	0	NB off to WB 44 Sha-5-R15.71	Loop 72' south of end of MBGR before gore connecting Dana ramp. Pull box located by MERGING sign between ramp. Loop ends in cabinet with R360/R5	Protect or Replace (1 Loop)	Active
R360	0	Seg WB on from Dana Dr Sha-5-R15.149	Loop 202' west of ramp metering cabinet. Loops end in cabinet with R1/R5 located on south side of Dana on-ramp to WB 44	Protect or Replace (1 Loop)	Active
R2	0	Seg EB on from NB 5 Sha-44-R15.31	285' east of (e/o) Hilltop NB edge of traveled way (etw). PB shared with R94 EB on-ramp from Hilltop	Protect or Replace (1 Loop)	Active
R3	0	Hilltop NB off Sha-5-R15.27	PB 443' s/o Hilltop Dr, 2' behind SIGNAL AHEAD sign	Protect or Replace (1 Loop)	Active
R4	0	SB off to EB 44 Sha-5-R15.39	77' south of paved gore on Lt shoulder by 30 MPH Curve sign	Protect or Replace (1 Loop)	Active
196	1	Redding, Junction Route 44 Sha-5-R15.842	Cabinet on SB shoulder 825' s/o PM R16.0, pullout avail	Protect or Replace (6 Loops)	Active
R5	0	SB off to WB 44 Sha-5-R15.71	Pull box located in gore area by Merging sign between ramps. Loop in conduit with ramp metering loops and terminate in	Protect or Replace (1 Loop)	Active

Project Description

Table 5. Existing Traffic Census Stations Within One Mile of the Project Limits

No.	Cabinet*	County-Route - Actual PM	Description	Potential Impact	Condition
			Ramp Metering side cabinet with R1/R360		
R6	0	Route 299/Lake SB on Sha-5-R17.231	SB On from Route 299 / Lake Boulevard.	Protect or Replace (2 Loops)	Active
R7	0	Route 299/Lake NB off Sha-5-R17.278	PB on W shoulder 178' s/o 299 CL, 11' ETW, loops adjacent PB	Protect or Replace (3 Loops)	Active
R8	0	Route 299/Lake SB off Sha-5-R17.551	PB located on W shoulder 4' s/o LS 17551, 32' n/o edge paved gore	Protect or Replace (1 Loop)	Active
R9	0	Sha-5-R-TBD	Route 299/Lake NB on	1 Proposed Loop	Proposed
R10	0	Sha-5-R-TBD	Twin View SB on	1 Proposed Loop	Proposed
R11	0	Twin View NB off Sha R17.905	114' south of exit sign 681 near right of way fence east side	Protect or Replace (1 Loop)	Active
R12	0	Twin View SB off Sha-5-R18.21	4' south of double post direction sign	Protect or Replace (1 Loop)	Active
R13	0	Twin View NB on Sha-5-R18.02	3' north of PEDESTRIAN PROHIBITED sign	Protect or Replace (1 Loop)	Active
R14	0	Route 273 SB off Sha-273-R20.028	1320' north of Caterpillar Road SB	Protect or Replace (2 Loops)	Active
R15	0	Route 273 NB on Sha-273-R19.91	740' north of Caterpillar Road NB	Protect or Replace (1 Loop)	Active
R16A	0	Oasis Road SB on from EB Oasis Sha-5-R19.374	144' from Oasis Road CL across from PEDESTRIANS PROHIBITED sign.	Protect or Replace (1 Loop)	Active
R17	0	Oasis Road NB off Sha-5-R19.25	196' south of Oasis Road CL near PEDESTRIANS PROHIBITED sign.	Protect or Replace (2 Loops)	Active
312	1	Redding, Oasis Road Sha-5-R19.08 SB	291' north of Churn Creek Bridge	Protect or Replace (12 Loops and 6 Piezos)	Active
R16B	0	Oasis Road SB on from WB Oasis Sha-5-R19.43	PB on W shoulder near beg. MBGR, 60' n/o Lighting Standard 19419	Protect or Replace (1 Loop)	Active
R18	0	Oasis Road NB on Sha-5-R19.53	185' north of Oasis Road CL by PEDESTRIANS PROHIBITED sign	Protect or Replace (1 Loop)	Active
R19	0	Oasis Road SB off Sha-5-R19.45	292' north of Oasis Road CL, 50 s/o Beg. Concrete wall at PEDESTRIANS PROHIBITED sign	Protect or Replace (1 Loop)	Active

Project Description

Table 5. Existing Traffic Census Stations Within One Mile of the Project Limits

No.	Cabinet*	County-Route - Actual PM	Description	Potential Impact	Condition
R20	0	Pine Grove SB on Sha-5-R20.86	173' south of Pine Grove CL at PEDESTRIANS PROHIBITED sign	Protect in Place (1 Loop)	Active
R21	0	Pine Grove NB off Sha-5-R20.86	Pine Grove NB off 186' south of Pine Grove CL at PEDESTRIAN PROHIBITED sign	Protect in Place (1 Loop)	Active

*Cabinet: 0 = A station that does not connect to the Traffic Management Center (TMC) via phone line/wireless modem.
 1 = A station that does connect to the TMC via phone line/wireless modem.

ITS Elements

This project proposes to upgrade four ITS elements within the project limits, as shown in Table 6.

Table 6: Proposed ITS Upgrades

PM	Location	Element
R16.13	Hilltop Drive	Highway Advisory Radio (HAR)
R18.60	SB 5-SB273 Connector	CCTV
R19.40	Oasis Road OC	CMS, FNBT
R19.40	Oasis Road OC	CMS, FSBT

Other existing ITS elements must be protected in place or replaced if damaged during construction. The changeable message signs (CMS) are currently bridge-mounted and will be replaced with stand-alone overhead (OH) sign structures.

Project Description

Lighting

New and upgraded replacement lighting is included in this alternative. Three light poles along the ramp between SB I-5 to EB SR-44 will be relocated further up the cut slope.

Overhead Signs

This project includes 12 overhead signs. Eleven are new and one is a replacement (PM R18.80). Of the 12 overhead signs, ten will be with foundations, and two will be hung on bridges (Table 7).

Table 7: Proposed Overhead Signs

PM	Location	Notes
R16.10	Hilltop Drive	Bridge-mounted; FNBT
R16.10	Hilltop Drive	Bridge-mounted; FSBT
R16.60	Between Hilltop Drive and Lake Boulevard	FNBT
R17.00	South of Lake Boulevard NB off-ramp	FNBT
R17.40	North of the Route 5/299 Separation	FNBT
R17.70	North of the Lake Boulevard NB on-ramp and SB off-ramp	FNBT
R17.80	South of the NB Twin View Boulevard off-ramp	Facing northbound traffic (FNBT)
R18.00	South of the Twin View Boulevard UC	FNBT and facing southbound traffic (FSBT)
R18.30	North of the Twin View Boulevard SB off-ramp	FSBT
R18.80	North of the SB 5-SB 273 Connector	FSBT; Remove existing OH sign and place new OH sign approximately 270 feet upstream.
R19.20	South of the Oasis Road NB off-ramp	FNBT

Safety Systems

Project Description

Concrete Barrier

This project proposes to replace all existing nonstandard concrete median barrier throughout the project limits.

Cable Barrier

Four-strand cable barrier will be placed as part of this project, replacing some existing three-strand barrier, plus adding some new cable barrier. New cable barrier will be installed in unpaved medians, replacing the existing median earthen berm and in areas where the median width exceeds 36 feet.

Guardrail

Existing MBGR will be replaced with Midwest Guardrail Systems, including transition railings and terminal systems. Guardrail on ramps is included and the new guardrail will have metal posts.

Material Borrow and Disposal

Excess generated material should be used to flatten slopes within the right of way to improve the clear recovery zone (CRZ). The Fix 5 Cascade Gateway Project (02-0H920) will remove the existing earthen median berms. The material could be reused to make the fill slope recoverable at the north end of the NB5- WB44 Connector OC.

Earth Retaining Systems

This project has no effect on any existing earth retaining systems.

Reversible Lanes

This project does not qualify as a capacity increasing or a major street/highway realignment project, therefore reversible lanes have not been considered. However, this project's companion project, the Fix 5 Cascade Gateway Project (02-0H920), would widen the existing freeway to six lanes. Reversible lanes were analyzed during development of the Fix 5 Cascade Gateway Project (02-0H920) and determined not feasible.

Project Description

Highway Planting and Irrigation

Highway planting and irrigation will need to be replaced following the CRZ improvement north of the N5-W44 Connector OC.

Erosion Control

Erosion control is proposed at culvert replacements, in the unpaved median where cable barrier is to be replaced, and in areas with CRZ improvements. It also may be needed around the OH sign work.

Noise Barriers

This project does not involve noise barriers.

Right-of-Way

Most work would occur within Caltrans' existing right of way, which is owned in fee. Two temporary construction easements are expected to be acquired from properties zoned Commercial and Miscellaneous Use for drainage work extending outside the state right of way. No additional right-of-way would be acquired to complete the work.

Construction of the project would start in spring 2025 and be completed by November 2026.