



Laurel Curve Wildlife Habitat Connectivity Project



Credit Agreement

This Credit Agreement, entered into and effective on April 7, 2017, is between the California Department of Transportation (CALTRANS) and the California Department of Fish and Wildlife (CDFW).

RECITALS

WHEREAS, State Route (Highway) 17 connects the Santa Cruz County coastal area to Silicon Valley via a four-lane conventional highway that traverses the heavily forested Santa Cruz Mountains;

WHEREAS, in 2011, the Land Trust of Santa Cruz County's (LTSC) *Conservation Blueprint* identified Highway 17 near Laurel Road in Santa Cruz County, as a critical area to maintain landscape permeability;

WHEREAS, LTSC has been working with the Santa Cruz County Regional Transportation Commission (SCCRTC), CDFW, and CALTRANS to develop and fund the construction of a wildlife undercrossing near Laurel Road on Highway 17 between 9.4 Post Mile (PM) and 9.6 PM in Santa Cruz County, that will benefit the travelling public, hereinafter "Laurel Curve Wildlife Habitat Connectivity Project";

WHEREAS, in 2015, CALTRANS developed a Project Initiation Document (PID) for the Laurel Curve Wildlife Habitat Connectivity Project to connect two core habitat areas that may assist in the movement of wildlife across Highway 17.

WHEREAS, on October 20, 2016, the California Transportation Commission (CTC) amended the 2016 State Highway Operation and Protection Program (SHOPP) and programmed \$3.115 million of the Advance Mitigation Program fund towards the Laurel Curve Wildlife Habitat Connectivity Project, to be applied to Project Approval and Environmental Document (PA&ED), Right of Way, and Plans, Specification and Estimates (PS&E), per SHOPP Amendment 16H-008;

WHEREAS, in exchange for funding PA&ED, Right of Way and PS&E for the Laurel Curve Wildlife Habitat Connectivity Project using Advance Mitigation Program funds, the CTC required CALTRANS to create compensatory mitigation credits that can be utilized to offset significant California Environmental Quality Act (CEQA) impacts of future transportation projects that impact wildlife connectivity as well as establish the unit cost for each credit;

WHEREAS, CDFW does not currently have a crediting process that would determine the number of credits that would be created by wildlife crossings funded through an advance mitigation program;

WHEREAS, on October 5, 2016, CDFW sent a letter to the California State Transportation Agency, in which

- CDFW requested CALTRANS to collaborate with CDFW to develop a CEQA compensatory mitigation crediting system for advance mitigation that has a basis in, and directly addresses, wildlife connectivity impacts from transportation projects;
- CDFW identified the Wildlife Habitat Connectivity Project at Laurel Curve as having high value for wildlife crossing and as the preferred project for piloting the CEQA compensatory mitigation crediting system;
- CDFW provided assurance that CDFW will recognize credits created by the Laurel Curve wildlife crossing as suitable mitigation to offset fish, wildlife, and habitat resource impacts under CEQA (Public Resources Code 21000 et seq.) for future transportation projects.

WHEREAS, CDFW and CALTRANS now desire to set forth the terms and conditions for the establishment, and use thereof, of the wildlife credits that will be created by CALTRANS contribution to the Laurel Curve Wildlife Habitat Connectivity Project.

NOW THEREFORE, THE PARTIES MUTUALLY AGREE AS FOLLOWS:

1. The Laurel Curve Wildlife Habitat Connectivity Project provides a unique and innovative opportunity to implement a wildlife crossing project as advance mitigation for impacts to wildlife.
2. In exchange for advancing the Laurel Curve Wildlife Connectivity Project, the parties agree that the credits that are created can be utilized to mitigate for significant impacts to wildlife for future projects that a lead agency has determined are significant pursuant to the CEQA.
3. CALTRANS, as a CEQA lead agency, will make the determination of significance for impacts and the application of credits to offset those significant impacts to wildlife for its future transportation projects.
4. CALTRANS' \$3.115 million dollar contribution towards the project equates to 92 credits. The number of credits was determined using the methodology set forth in **Attachment A**, attached hereto and made part of this Credit Agreement.
5. CALTRANS' 92 credits will be released and available for use as follows:
 - 46 wildlife credits will be available for use when the PA&ED phase of the Laurel Curve Wildlife Habitat Connectivity Project is completed.

- 46 wildlife credits will be available for use when the PS&E phase for the Laurel Curve Wildlife Habitat Connectivity Project is completed.
6. Upon completion of each phase identified in provision 5, CALTRANS' will provide written notification to CDFW that the credits are available and will now be utilized. Within 60 days of receipt of CALTRANS' written notification, CDFW Headquarters (HQ) will provide a written acknowledgment of the notification. CALTRANS will track credit usage and will annually provide CDFW HQ with written notification of credit usage. Within 60 days of receipt of CALTRANS' written notification of credit usage, CDFW HQ will provide a written acknowledgment of the annual usage. When all credits have been expended, CALTRANS will provide a close-out letter to CDFW HQ within 60 days. Within 60 days of receipt, CDFW HQ will provide written acknowledgement of the close-out letter. The guidelines for the use and tracking of the credits is set forth in **Attachment B**, attached hereto and incorporated herein.
 7. The service area for using the credits is shown in **Attachment C**, attached hereto and incorporated herein, hereinafter referred to as "Service Area". It includes, but is not limited to, the Santa Cruz Mountains Ecoregion Subsection boundaries, as defined by the USDA, which includes all of Santa Cruz County.
 8. To replenish its Advance Mitigation Program fund, CALTRANS may sell or transfer the credits to other parties who have transportation projects located within the Service Area for which a lead agency requires mitigation to offset a significant impact to wildlife under CEQA. If CALTRANS sells or transfers any credits, CALTRANS will enter into a separate agreement with the other party to document the terms and conditions of the sale. Credits sold and used by other parties and the associated transportation project's name will be included in CALTRANS annual notification of credit usage to CDFW HQ, per provision 6.
 9. CALTRANS and CDFW recognize that disagreements concerning implementation or interpretation of this Credit Agreement may arise from time to time and agree to work together in good faith. In the event of such a disagreement, it is in the best interest of each agency to resolve the issue at the lowest possible level of each organization. The first level will involve the CALTRANS District Supervising Environmental Planner and the CDFW Habitat Conservation Planning Branch's Environmental Program Manager (Landscape Conservation Planning Program). If resolution cannot be reached at that level, the next level will involve the CALTRANS District Director and CDFW Habitat Conservation Planning Branch's Chief. If resolution cannot be reached at that level, the next level will involve the CALTRANS State Director or Deputy Director and CDFW Director or Chief Deputy Director. Both agencies agree to make the appropriate individual or their representatives available within 45 days to discuss the disagreement.
 10. This Credit Agreement does not obligate any funds from CALTRANS or CDFW.

11. The Agreement can be modified or extended at any time by the mutual written agreement of the Caltrans and CDFW. Modifications will be in writing, approved and signed by the parties identified herein.

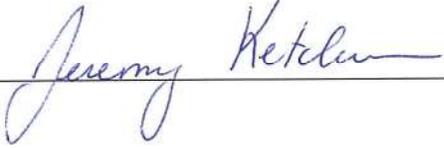
12. This Credit Agreement shall remain in effect until the 92 Wildlife Crossing Credits have been utilized and CALTRANS receives CDFW's written acknowledgement of the close-out letter.

SIGNATURES

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

AA Maedo 4/7/17

CALIFORNIA DEPARTMENT OF TRANSPORTATION



ATTACHMENT A: Methodology for Determining Advance Mitigation CEQA Credits for Highway 17 Wildlife Crossing

This attachment describes a first-of-its-kind, innovative methodology to develop California Environmental Quality Act (CEQA) advance mitigation credits for a wildlife crossing. The credits created by the Laurel Curve Wildlife Habitat Connectivity Project will be used in the future to offset significant impacts to wildlife under CEQA created by transportation projects, examples of which are identified in Attachment B. This methodology was developed specifically for the Highway 17 Laurel Curve Wildlife Habitat Connectivity Project and is intended as a pilot study. Consequently, the methodology should not be applied outside of this pilot study.

A two-step ecological approach was undertaken to calculate the number of CEQA mitigation credits that would be created by the Laurel Curve Wildlife Habitat Connectivity Project:

- Determine road permeability improvement reach dimensions; and
- Calculate the number of CEQA mitigation credits available towards future transportation project impacts to wildlife, where a credit is equal to 0.1 acres, as well as its equivalent in credit per lane mile.

Further, as directed by the California Transportation Commission (CTC) and in anticipation of replenishing the Advance Mitigation Program fund, based on CALTRANS cost and the total number of credits, a unit cost for each credit was calculated.

A. Methodology

The ecologically based steps are described further, below.

Step 1: Road Permeability Improvement Reach Dimensions

The part of Highway 17 that includes Laurel Curve is classified as a four-lane road, with two lanes traveling north and two lanes traveling south. It is located in the named Sugarloaf Mountain - Montara Mountain Essential Connectivity Area, identified in the 2010 *California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California* prepared by CALTRANS and CDFW (Spencer et al 2010). Also, the Bay Area Critical Linkage Project identifies a portion of Highway 17 occurring within a critical linkage called the Santa Cruz Mountains – Gabilan Range Linkage Design (Penrod et al 2013). In total, 290 acres of open space have been purchased, bounding the road.

To determine the length of highway that would be improved for wildlife passage by the creation of a crossing—the “road permeability improvement reach”—CALTRANS examined the Highway 17 corridor, identifying the northern and southern boundaries of the reach of Highway 17 where connectivity would be improved. These boundaries were defined as being either where the next available crossing opportunities are located or where the next potential barriers to crossing, which the proposed crossing would not otherwise remediate, are located.

To get a sense of existing structures along Highway 17 that may currently facilitate wildlife movement, CALTRANS evaluated the existing bridges and culverts including the locations, dimensions, frequency and spacing. For the sake of this exercise, it was assumed existing culverts that would serve as a crossing opportunity for mountain lion and other large mammals was a structure, either a bridge or culvert, with minimum dimension of 8 to 12 feet in height with a minimum openness ratio of 0.75 (Caltrans Wildlife Crossing Manual 2009).

With respect to spacing, literature suggests there is no simple formula to determine the recommended distance between wildlife crossings since siting them is largely landscape and species specific. One source indicates that at least one crossing structure should be located within an individual's home range. Other literature indicates, the spacing interval varies for some wildlife crossings designed for large mammals from one wildlife crossing per 0.9 mi (1.5 kilometer (km)) to one crossing per 3.8 mi (6.0 km) with an average of approximately 1.2 mi (1.9 km) apart (FHWA Central Federal Lands Highway Division 2011). For ungulates (deer, pronghorn antelope, or bighorn sheep) and large carnivores, larger crossing structures such as bridges, viaducts, or overpasses should be located no more than 1.5 km (0.94 mi) apart and inadequate size and insufficient number of crossings are primary causes of poor use by wildlife (Beier et al 2007).

Based upon review of the CALTRANS' Culvert Inspection Program and State Bridges GIS layers, there are no existing bridges or culverts with the characteristics identified above in the Hwy 17 reach area that may provide de facto crossings in the vicinity of the proposed crossing, and the boundaries of the reach are set by the occurrence of potential barriers that the proposed crossing would not remediate. These potential barriers are the Santa Clara (SCI) 35/Summit Road intersection in the north and by the town of Scotts Valley on the south.

Therefore, based on the lack of existing structures for use as a wildlife passage, physical factors of Highway 17 discussed in the Laurel Curve Project Initiation Document (PID) (CALTRANS 2015) and for the purposes of calculating CEQA mitigation credits as part of this pilot methodology, the entire 6.6 road mile (mi) reach of Highway 17 between SCI 35/Summit Road and the town of Scotts Valley was determined to be the length of highway that would be improved for wildlife passage by the creation of this crossing. Its footprint on the landscape covers 36.8 acres (per ArcGIS). The crossing at Laurel Curve falls within the known mountain lion home range and the permeability within this stretch of 6.6 miles is being improved for mountain lions and other large mammals.

Step 2: CEQA Mitigation Credits Calculation

Depending on the type of roadwork, roadwork impacts can be expressed in either acres or miles. Therefore, credits created by the Laurel Curve Wildlife Habitat Connectivity Project should be expressed in both units.

Credits expressed in "acre" units. For the purposes of tracking and accounting, a credit was identified as being 0.1 acre. To determine the total number of credits for the Laurel Curve Wildlife

Habitat Connectivity Project in units of acres, the footprint of the highway reach (36.8 acres) was divided into 0.1 acre credits yielding 368—0.1 acre credits or 10 credits per acre (368 credits/36.8 acres).

Credits expressed in “mile” units. To properly maintain the credit ledger and to assure equivalency between 0.1 acre credits and mile-based credits, the acre-based credits were used as the standard, i.e. it was assumed that the 368 credits are distributed over the total mileage of the permeability improvement reach. Also, for the use of the credits, lane miles were used in preference to linear miles, since as an example a new six-lane highway should not be credited equally as a two lane highway, given that the number of lanes may be inversely proportional to wildlife permeability. Thus, to convert credits from acres to miles:

- The lane miles were calculated, which resulted in a total of 26.4 miles (4 lanes times 6.6 miles); and
- The individual lane mileage for a credit was determined to be 0.072 miles per credit, or 14 credits per mile (26.4 miles divided by 368 credits).

Wildlife Crossing Credits. The Laurel Curve Wildlife Habitat Connectivity Project’s estimated cost is \$12.453 million, of which CALTRANS State Highway Operation and Protection Program (SHOPP) Advance Mitigation Program’s contribution is \$3.115 million dollars, or 25%. Hence, of the calculated credits in terms of acres, CALTRANS’ share would be 92— 0.1 acre credits. An equivalent calculation could be performed to convert the credits from “acre” units to “mile” units.

B. Determining the price of a credit

Given that it is standard practice that the price of a mitigation or conservation bank credit is calculated so that the bank can recoup the cost of establishing the bank, and to be consistent with CTC requirements and SHOPP funding restrictions, the per credit unit price was determined.

As pointed out above, CALTRANS’ \$3.115 million dollar contribution towards the project equates to 92 credits. Consequently, CALTRANS’ total cost (\$3.115 million) divided by the total number of credits (92 credits), results in a price of \$33,819.00 per credit.

As the project is developed, the total cost of the project is likely to change, either support costs or capital construction costs, and the credit price of the 92 credits from CALTRANS’ contribution, may be adjusted to accurately reflect the total cost incurred by developing the credits.

Guidelines for applying these CEQA credits towards transportation projects are provided in Attachment B.

References:

Beier et al. 2007. Conceptual Steps for Designing Wildlife Corridors.

<http://corridordesign.org/downloads>;

CALTRANS 2015. Project Study Report to Request for Programing in the 2016 SHOPP. June 2015;

FHWA Central Federal Lands Highway Division 2011. Wildlife Crossing Structure Handbook. Available at: <https://trid.trb.org/view.aspx?id=915024>;

Meese et al 2009. Wildlife Crossings Guidance Manual;

Penrod et al. 2013. Critical Linkages: Bay Area and Beyond. Produced by Science & Collaboration for Connected Wildlands, Fair Oaks CA. www.scwildlands.org in collaboration with the Bay Area Open Space Council's Conservation Lands Network;

Spencer et al 2010. California Essential Habitat Connectivity Project. Prepared for CALTRANS, CDFW, and FHWA

ATTACHMENT B Application of Wildlife Crossing CEQA Credits towards Transportation Projects

Credits will be debited as compensation for future transportation projects having significant impacts to wildlife under the California Environmental Quality Act (CEQA) as determined by a lead agency. Thus, to define debiting terms, it is necessary to consider the applicable transportation project type, as well as the conditions where significant impacts under CEQA occur (Table B-1).

Table B-1. Debiting Guidelines for Future Transportation Projects Utilizing Credits

Type of Potential Impact to Wildlife ¹	Applicable Transportation Project Type ^{2,3}	Application of CEQA Credit(s) ⁴	Notes on Use Applicability ⁵
STATE HIGHWAY OPERATION AND PROTECTION PROGRAM (SHOPP)			
Repair and replacement of existing barriers without wildlife enhancements included.	Collision Severity Reduction, guardrail upgrades, upgrade Median Barriers	Not Applicable	This is an example of maintaining a barrier and this scenario is not applicable to Caltrans projects funded through the SHOPP. When maintaining an existing barrier does not result in additional impacts above baseline conditions, it is not a significant impact under CEQA.
Impacts from improvements of existing State Highway System roads that that may decrease permeability of existing roads. Impacts of less than one acre, such as permanent loss of roadside habitats during road construction.	Safety Improvements (ex. Curve corrections and re-alignments, lane or shoulder widenings); Construction of guardrails, Roadway Rehabilitation (ex. Road stabilization or shoulder rehabilitation) Pavement Preservation Pavement Rehabilitation Drainage System Restoration Major Damage Restoration (Emergency Opening) Major Damage Restoration (Permanent Restoration) Roadside Safety Improvements, Slope stabilization	Credits will be applied on a project-by-project basis. 10 credits per acre impacted OR 14 credits per lane mile impacted (See Attachment A for conversion)	CEQA significance would be determined on a project-by-project basis. Avoidance and minimization measures are still required and determined on a project-by-project basis during transportation project planning and environmental review. When semi-permeable metal beam guardrail and thrie-beam median barriers are replaced with concrete, permeability may decrease. Caltrans may decrease permeability and discourage or redirect wildlife crossing due to adjacent land use(s) and/or road engineering constraints. Credits may be useful to local agencies where, based on a local entity’s significance criteria, permeability has been unavoidably significantly impacted.

Table B-1. (continued)

Type of Potential Impact to Wildlife ¹	Applicable Transportation Project Type ^{2,3}	Application of CEQA Credit(s) ⁴	Notes on Use Applicability ⁵
STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)			
Impacts from improvements to State Highway System roads that would increase traffic speeds or road capacity, resulting in greater danger to wildlife attempting to cross	Construction of express lanes, lane additions, new interchange construction or interchange reconfiguration are examples of STIP projects.	To be determined by separate future agreements	CEQA significance would be determined on a project-by-project basis. Avoidance and minimization measures are still required and determined on a project-by-project basis during transportation project planning and environmental review.
Impacts from new highways or major transportation features			

¹ General categories were excerpted from CDFW letter “Early Mitigation for Wildlife Crossing Over Highway 17 at Laurel Curve” dated October 5, 2016.

² The types of projects listed represent those more likely to impact wildlife.

³ Bridge and culvert projects are not included above since these typically result in a net benefit to wildlife.

⁴ Future transportation projects’ environmental documents will include impact analysis, as well as use of any of the advance mitigation credits created per this agreement.

⁵ When in its role as a CEQA trustee agency, CDFW does not have the authority to either require or approve compensatory mitigation under CEQA.

ATTACHMENT C: Service Area Description and Map

The Service Area defines the area where eligible, future transportation projects would be able to use CEQA credits under this Credit Agreement (Figure 1). Since it is desirable for mitigation to offset impacts appropriately, an ecological basis was sought for determining the Service Area for the road permeability improvement reach¹. To this end, the following data sources were consulted to develop the Service Area shown in Figure 1:

- 1) USDA, U.S. Forest Service Ecoregion map data - Ecoregions developed by the USDA, categorize the landscape by general ecological similarities by the type and quality and quantify landscape features such as geology, soils, hydrology, climate, vegetation, and wildlife species (Omernik and others, 2000) at different scales.

Since the Highway 17 wildlife crossing at Laurel Curve Road in Santa Cruz County lies with a the Santa Cruz Mountains Eco-Region Subsection (Figure 1), it formed the initial basis for the Service Area.

- 2) Wildlife Habitat & Predictive Models - Local information and regional habitat modeling data and model results were also used to delineate the Service Area. The Highway 17 wildlife crossing at Laurel Curve Road in Santa Cruz County lies within the Sugarloaf Mountain - Montara Mountain area, identified in the 2010 *California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California prepared by Caltrans and CDFW* (Spencer et al 2010). Further, the Bay Area Critical Linkage Project model identifies a portion of Highway 17 occurring within a critical linkage called the Santa Cruz Mountains – Gabilan Range Linkage Design (Penrod et al 2013). Information contained in these documents, as well as telemetry data from an UC Santa Cruz Puma Study, camera trap data provided by the Land Trust of Santa Cruz County and Pathways for Wildlife, have been incorporated and/or considered within a predictive model developed for Regional Wildlife Corridor and Habitat Connectivity Plan for the Central Coast Region of California (Huber et al 2014)—a model that does not encompass the entire Santa Cruz Mountains Eco-Region Subsection. The predictive wildlife model identifies the linkage on Highway 17 in addition to linkages on Highway 129 in Santa Cruz County and Highway 101 in Monterey, San Benito and Santa Clara Counties, are within the influence of the Laurel Curve wildlife crossing.

Based on this information, portions of the following counties are also included in the Service Area: Santa Cruz, San Mateo, Santa Clara, San Benito, and Monterey.

- 3) Regional Conservation Blueprints - Other data sources that were used to determine and/or confirm that the Service Area boundaries are ecologically appropriate include the Santa Cruz County

¹ The term “Road Permeability Improvement Reach” was introduced in Attachment A and is defined as the length of highway that would be improved for wildlife passage with creation of the Laurel Curve Wildlife Habitat Connectivity Project.

conservation blueprint (Mackenzie, A. et al 2011) and the Santa Clara Valley greenprint (OSA, 2014).

References:

Huber et al. 2014. Regional Wildlife Corridor and Habitat Connectivity Plan for the Central Coast Region of California. Report for California Department of Transportation, District 5, San Luis Obispo.

Omernik, J.M., Chapman, S.S., Lillie, R.A., and Dumke, R.T., 2000, Ecoregions of Wisconsin: Transactions of the Wisconsin Academy of Sciences, Arts and Letters, v. 88, no. 2000, p. 77–103.

Mackenzie, A., J. JcGraw, and M. Freeman. 2011. *Conservation Blueprint for Santa Cruz County: An Assessment and Recommendations from the Land Trust of Santa Cruz County*. Land Trust of Santa Cruz County. Santa Cruz, CA. May 2011. 180 pages. Available <http://www.landtrustsantacruz.org/blueprint>

Penrod et al. 2013. Critical Linkages: Bay Area and Beyond. Produced by Science & Collaboration for Connected Wildlands, Fair Oaks CA. www.scwildlands.org in collaboration with the Bay Area Open Space Council's Conservation Lands Network;

Santa Clara Open Space Authority. 2014. *The Santa Clara Valley Greenprint: A guide for protecting open space and livable communities*. San Jose, CA;

Spencer et al 2010. California Essential Habitat Connectivity Project. Prepared for Caltrans, CDFW, and FHWA.

