

PROJECT ASSURANCE SERVICES



R O A D S A F E T Y



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RSA SERVICES OVERVIEW

Why use P360 for Road Safety Assurance?

We assure that your project and programs have acceptable levels of safety, protecting the value and continuity of your capital and operational investments.

We apply RSA (Road Safety Analysis) singularly, or in combination, with other project assurance services.

P360 Road Safety Assurance Services Overview

There are a variety of tools and techniques to assess road safety, but the trend is towards **more road safety quantification** to enhance the quality of design choices on modern roads and highways. Road safety, typically is expressed in terms of frequency and severity of collisions. We quantify the level of safety need and safety benefit using the right tool at the right time.

Road Safety Analysis is logically separated into 3 key areas:

1. Road safety need assessment of the study area
2. Development of countermeasures (safety treatments)
3. Road safety benefit assessment of the countermeasures applied



Levels of Road Safety Analysis

There are 3 general levels of Road Safety Analysis we can apply to your project/program:

1. **Quantitative Road Safety Analysis** – identifies safety with multiple lines of evidence applied & supported with quantitative tools such as the AASHTO Highway Safety Manual, the FHWA's Collision Modification Factor Clearing-

house, the Interactive Highway Design Module (IHSDM), Surrogate Safety Assessments Model (SSAM) and other quantitative road safety tools & techniques.

Quantitative Road Safety provides a comparison of the safety need, for either an existing or planned roadway, to the safety benefit achieved by applying proposed countermeasures..

2. **Semi-Quantitative Road Safety Analysis** – the application of both quantitative and qualitative tools. For safety benefit these studies rely mainly on a safety of collision data and a risk-based evaluation of safety performance.
3. **Qualitative Road Safety Analysis** – relies heavily on the documentation of field observations and the assessment of collision data. This technique identifies safety need, but with fewer lines of evidence. Potential countermeasures are identified, but with little safety benefit quantification.



We can help you apply the appropriate level of road safety analysis for your project/ program to provide a level of assessment adequate for your facility needs.

RSA EXPERIENCE RECORD

P360 has worked with the following clients.

- U.S. State Departments of Transportation DOTs (California, Connecticut, Georgia, Maryland, Minnesota, Michigan, Mississippi, New York, Ohio, Washington and Wyoming)
- California Local Transportation Agencies (Los Angeles County, San Joaquin County, Sacramento County, San Bernardino County, Riverside County, Kern County & others)
- Canada- Ministry of Transportation, Ontario
- Canada- Nova Scotia Transportation and Infrastructure Renewal
- City of Bakersfield, California
- Port of Los Angeles, California
- City of Sacramento, California
- Pima County, Arizona
- FHWA – Federal Lands Central Region
- U.S. Municipal Public Works Departments (City of San Diego, Detroit, New York, etc)
- Brazil– Ministry of Transportation
- Brazil- DOTs (Minas Gerais, Santa Catarina, Rio Grande do Sul, Pernambuco, Paraíba, Rio Grande do Norte)



EXPERIENCE RECORD

P360 staff have led a variety of road safety project assurance reviews for the California Department of Transportation (Caltrans) and the Ministry of Transportation Ontario (MTO) :



California Department of Transportation

- **Niles Canyon Rd Corridor Quantitative Safety Analysis** – a state-of-the-art corridor study showcasing the application of quantitative road safety analysis. Corridor safety need was studied with multiple lines of evidence; safety need was addressed using a long list of countermeasures and applying quantitative safety analysis modelling techniques. The study justified reducing the original scope while maintaining a statewide average level of safety and significantly reducing environmental impacts to the corridor. As a result of the study 3 Niles Canyon corridor projects were reactivated that had been interrupted by a court injunction.
- **Yolo 16** – this study employed a qualitative road safety analysis, as part of a FHWA/ Caltrans pilot program using a combined Road Safety Analysis/ Value Engineering study approach featuring FHWA’s road safety audit process melded into 6-step value process. The project was a rural highway traversing agricultural lands in Yolo County in the vicinity of a tribal casino. The study led to a project re-scoping that reduced environmental impact to the study area.
- **US-101 Road Safety Improvements for the Smith River Rancheria** – this study employed a qualitative road safety analysis, as part of a pilot program by the FHWA/ Caltrans using a combined Road Safety/ Value Analysis study approach featuring. The application of the FHWA’s road safety audit process was applied initially, followed by the development of countermeasures developed in a value analysis study. The project, in Del Norte County, was a portion of US-101 that traversed through the Smith River Rancheria tribal homestead and casino . The study resulted in the implementation of a Federal Tiger Grant based on the study countermeasures.

Ministry of Transportation- Ontario (MTO)

For the MTO we carry out integrated project assurance reviews using these four processes: *value engineering*, *risk analysis*, *constructability reviews* and *road safety analysis*. The following MTO high cost, high profile projects: have benefitted from these project reviews:

- Highway 403/Queen Elizabeth Way (QEW) Freeway - Freeway Interchange Improvements, Mississauga, ON
- Highway 417 Drainage Rehabilitation Project (8th Line to OC Road 26), Ottawa, ON
- Queen Elizabeth Way (QEW) - Credit River Bridge Replacement Project, Mississauga, ON
- 427 Transitway from Highway 407 to Highway 7, Cities of Toronto and Vaughn, ON
- Highway 17 Realignment Project , Mattawa, ON
- QEW Interchange Improvements (Evans Avenue to Cawthra Road), Mississauga, ON



SAMPLE PROJECT

Niles Canyon Road Quantitative Road Safety Analysis

A 7.1 mile long project, located in Alameda County, CA—a natural habitat and recreational area enclave surrounded by urban development. Key environmental resources include: drinking water source, hillside and riparian habitat, a historical railroad and 2 historical aqueducts. The corridor, a designated scenic highway, has been experiencing substantial growth in bicycle usage.



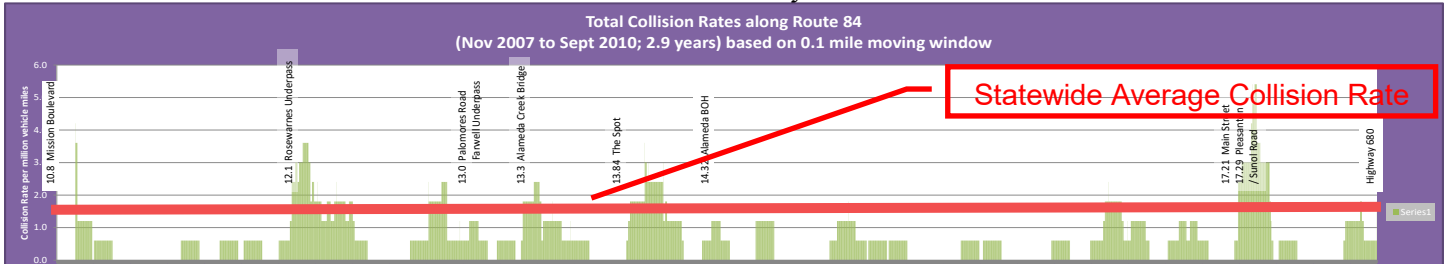
Original Project

Full standards widths were applied to the lanes, shoulders and the roadside (CRZ), leading to opposition from the local community. The Niles Canyon 1 construction contract, the 1st of 3 corridor contracts, was stopped by a court injunction that cited the need for more alternative analysis that might reduce the high environmental impacts. A Quantitative Road Safety Analysis study (QRSA) was requested by Caltrans Executive staff to resolve the impasse.

Study Findings

The QRSA study revealed that only 9 spot locations needed safety improvement— this was demonstrated by applying four lines of evidence: collision severity, collision rates, safety performance functions and the AustRoads prioritization system, as summarized in Chart 1, below.

Chart 1: Line of Evidence No 3: Safety Performance Functions



35 safety issues were evaluated using 4 lines of evidence indicating 9 spot locations needing safety improvement. Short, medium and long-term safety countermeasures were developed, and their safety benefits defined in the 9 spot locations. See Table 1, to the below.

Conclusions



A satisfactory level of corridor safety can be achieved by applying only the short and medium-term safety treatments to just 2.7 miles of the 7.1 corridor miles. This approach avoids most of the original project's environmental impacts.

Table 1: Spot Improvements – Project Safety Benefit

Location	Mileage	Collision Rate Reduction (ACC/MVM)	
		Short-Term	Medium-Term
Rosewornes UP & Approaches	0.055	27%	62%
Between Rosewornes UP & Palomares Road	0.300	20%	5%
Palomares Rd / Farwell UP & Approaches	0.132	28%	24%
Between Farwell UP & Alameda Creek Br.	0.273	9%	-
Alameda Creek Bridge	0.300	-	24%
Alameda Creek Bridge to Alameda Creek Bridge BOH	0.956	8%	23%
East of Alameda Creek Bridge (0.2 miles)	0.209	9%	-
Alameda Creek Bridge BOH	0.193		20%
Between Silver Springs UP & Pleasanton-Sunol Intersection	0.318	10%	25%
Aggregating the impact at the Spot Locations	2.74	12%	22%

LEADERSHIP / STRATEGIC PARTNERS

George Hunter, CVS, PMP, PE – Transportation Engineer, Road Safety Specialist



George has 30 years of private/public sector experience in planning, design, construction and oversight of transportation projects. His project assurance services improve the technical scope, schedule, cost and reliability of transportation projects. George has been working with Road Safety Analysis, since the early 2000's, while working for the Ministry of Transportation Ontario (MTO). He has extensive experience applying road safety analyses in combination with value and risk management, decision analysis and performance assessments. He has applied these techniques to over 250 projects in North America, Latin America, Europe and Asia. George is a Registered Engineer in California, Texas and Florida and a former Transportation Engineer, Program Manager with the California Department of Transportation.

Geoff Millen, P. Eng – Transportation Engineer, Road Safety Specialist



Geoff has more than 25 years of experience in road and highway design, roadside design, road safety engineering, value engineering for highways, and applied human factors, with MMM Group Limited. He currently serves as the Senior Road Safety Engineering Specialist and Road Safety Auditor (Team Leader) for their national road safety engineering practice where he brings a valuable road design and constructability experience and perspective, as well as post-university training in collision reconstruction. Geoff has worked on complex and challenging road safety projects across Canada and California specializing in providing quantitative road safety analysis in support of design decisions.

Cesar Queiroz, International Transportation Specialist



Cesar specializes in Procurement Models including Public-Private Partnerships (P3), Performance-Based Contracts and Public Expenditure Reviews. He has extensive global experience; having worked in over 30 countries, from his 20-year tenure World Bank and experience with other Development Banks such as: IADB, IFC, USAID and the EIB. Cesar, a native of Brazil, has extensive experience in the Brazilian transportation public sector. He has a PhD from the University of Texas at Austin, concentrated in transportation and speaks various languages.

Irani de Siqueira, Former Brazilian Ministry of Transportation Director

Irani directs P360's Latin American operations. Irani has 35 years of experience of working with the Brazilian Federal Government, primarily in the Ministry of Transportation. His public sector experience includes tenure as the tariff governance specialist for the Brazilian Port Authority and as Director of the Ministry of Transportation. He concurrently directs a research and development firm matching emerging technology/IT solutions with Brazilian and Latin American government & business needs. His combined public and consultant services rewards P360's clients access to Latin America's marketplace in terms of local, state and federal regulations and business environment. Irani has a degree in Economics.



BUSINESS DESCRIPTION

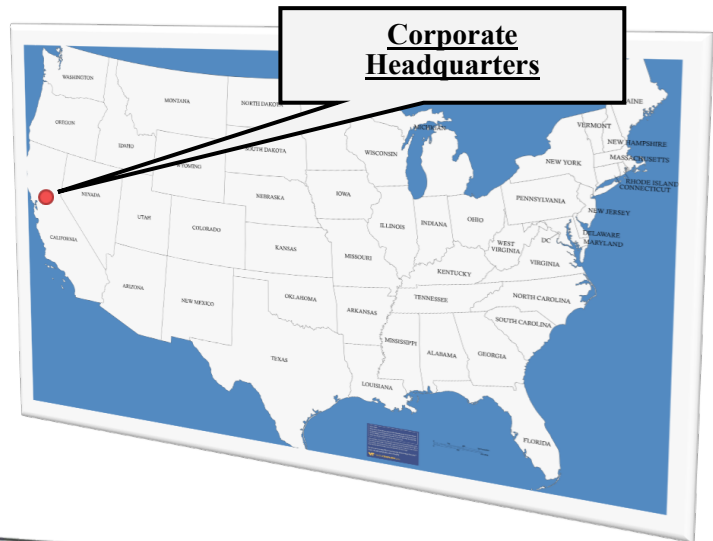
Company Ownership/Legal Entity

Procura360 Group, a company dedicated to providing project assurance services, is registered in California and Florida as a small business, Limited Liability Corporation (LLC), certified as a Disadvantaged Business Enterprise (DBE) with offices in Latin America. P360 consultants provide consulting services with a combined 120 years of experience.

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