

May 12, 2023

Brad Brophy, P.E.
Traffic Engineer
City of Lake Elsinore
130 S. Main Street
Lake Elsinore, CA 92530

Subject: Proposal to Prepare a Local Road Safety Plan

Dear Mr. Brophy:

Lake Elsinore's decision to proceed with a LRSP is an important step towards improving roadway safety and a necessary step for eligibility of HSIP funding. We would be honored to partner with you, and feel we are uniquely qualified to do so for the following reasons:

- > **Data-driven, systemic safety approach** – Our staff have been trained by FHWA in the LRSP process and are leading efforts in California and beyond to support the transition to a more data-driven, systemic approach to safety. Proactive safety planning and context-based implementation is a critical approach to achieve a meaningful improvements in safety.
- > **Feasible, fundable, locally-derived projects** – While we thrive on analytics and the objective selection of countermeasures based on benefit-cost analysis, we also recognize that for projects to be built and make a difference in safety they must reflect community values, address critical safety needs, and position the City for competitive funding awards. We have a strong track record of supporting our clients from the earliest planning stage all the way through grant writing, near-term quick build implementation, long-term design and construction support, and project evaluation.
- > **Recognized state and national experts** – We created the award-winning Pedestrian Safety Assessment program now in use throughout California; teach multi-modal safety and complete streets courses at the regional, state and national level; contributed to the development of a new Vision Zero resource co-released by the Vision Zero Network and ITE, "Core Elements for Vision Zero Communities;" and wrote ITE's recommended practice on how to safely accommodate bicyclists and pedestrians where City streets meet freeway ramps. The knowledge our team has gained from these efforts positions us to efficiently assist the City with its goal of enhancing traffic safety.

I will oversee the LRSP as the project's Principal-in-Charge, leveraging my recent experience on similar safety projects including Systemic Safety Analysis Reports (SSARs) for Montclair, Hermosa Beach, San Jacinto, and Vista.

Our proposed project manager, **Diwu Zhou**, is a registered Roadway Safety Profession, a key member in the Fehr & Peers' Multimodal Safety Initiative and serves on the Executive Committee of the Transportation Safety Council for the Institute of Transportation Engineers. He is an author for the recently published ITE Technical Brief, "Applications of Big Data in Safety Analysis", and an instructor for ITE's Safe System Approach certification course.



He brings the critical blend of safety efficacy knowledge, operations analysis skills, and design and implementation experience.

We hope this proposal illustrates our genuine interest in this project, our strong qualifications to successfully execute it, and our commitment to improving communities through critical safety work. We also see this project as a way to continue improving mobility in Lake Elsinore as an extension to our other on-going work in the City on your Circulation Element update, previous safety work in the City, and our other on-going infrastructure projects in the City (I-15/Central Avenue and I-15/Nichols Road interchange improvement projects). Please contact me at (951) 274-4800 should you have any questions or would like to discuss our submission further.

Sincerely,

FEHR & PEERS

Steven J. Brown, PE
Principal

P23-2246-OC

“Our mission is to empower every employee to develop effective and innovative transportation solutions that **improve communities**”

Proposal to Prepare a

Local Road Safety Plan

Prepared for:

City of Lake Elsinore

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FEHR  PEERS

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Local Understanding of Lake Elsinore Safety Issues

Our extensive experience with other stakeholders such as Caltrans, RCTC and the City of Canyon Lake gives us an understanding of common concerns and competing interests which will help us to strategically position the City to achieve its goals.

We understand the importance of creating a balanced, multimodal transportation system that safely accommodates all users including pedestrians, bicyclists, transit, private vehicles, shared mobility, and freight. Our solutions range from the practical to the visionary based on the unique context of the project and the specific needs of the client.

Firm Overview

About Fehr & Peers

Fehr & Peers is a multi-modal transportation planning and engineering firm. We leverage the latest research and innovative technology to engage and improve communities through our projects, using our knowledge to develop implementable plans and policy that address the needs of all transportation system users.

We are passionate about transportation because we know how solid planning and innovative transportation solutions can benefit the communities where we live and work. As a full-service multi-modal transportation planning and engineering firm, Fehr & Peers offers clients insight and expertise with all matters relating to transportation, including land use and transportation planning, multimodal operations and simulation, bicycle, and pedestrian planning, and much more. Our deep bench of internal expertise provides a full suite of in-house services for each project we work on. We are nationally recognized experts who focus on our employees, our clients, and our communities.

Industry Leaders in Transportation Safety

Fehr & Peers is an industry leader in developing strategic transportation safety plans that are based on comprehensive collision analysis, application of proven countermeasures, prioritization of key projects and proactive solutions, and engineering design for effective implementation and funding success. Through our successful grant writing, we have helped agencies win over 50 grant funding pursuits totaling awards of over \$180 million. These funds are helping the communities we serve implement transportation projects that enhance pedestrian, bicycle, and traffic safety.

Through our recent work in the Inland Empire, Los Angeles, Sacramento, and San Francisco, we have led robust, data-driven efforts to identify the leading causes of traffic injuries and match efficient and cost-effective engineering countermeasures to address the safety challenges. We also facilitated scenario planning processes with multi-agency stakeholders to develop a prioritized list of safety projects.

Technical Capability

Fehr & Peers staff have authored numerous industry guides and articles related to multimodal safety, and our proposed team members have worked on many Local Road Safety Plans (LRSP) and other safety projects in Southern California, including Vision Zero plans, Systemic Safety Analysis Reports (SSAR), Safe Routes to School (SRTS) plans, and Complete Streets Safety Assessments (CSSA). We have also assisted with successful grant applications including winning over \$14M for our SoCal clients from Highway Safety Improvement Program (HSIP) Cycle 11, announced in March of this year.

Project	LRSP	Other Safety Study	Grant Support
Moreno Valley LRSP	X		
San Bernardino County LRSP	X		
Canyon Lake LRSP	X		
Westminster LRSP	X		
Irvine LRSP	X		
Montclair LRSP	X		
Vista LRSP	X		
San Jacinto LRSP	X		
Oxnard LRSP	X		
Montclair Systemic Safety Analysis Report (SSAR)		X	
Moreno Valley SSAR		X	
OCTA SSAR		X	
Westminster SRTS		X	
Santa Ana SRTS		X	
Culver City Vision Zero		X	
Los Angeles Vision Zero		X	
Oxnard Complete Streets Safety Assessment		X	
San Jacinto Complete Streets Safety Assessment		X	
Moreno Valley HSIP Grant Applications			X
San Bernardino County HSIP Applications			X
Canyon Lake HSIP Grant Application			X
Diamond Bar HSIP Grant Application			X
County of Orange Safe Streets for All (SS4A) Grant Application			X

130+

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Systemic Safety Analysis Report

Alameda County, Lancaster, Marin County, Modesto, Montclair, Moreno Valley, Orange County Transportation Authority, Sunnyvale, Woodland

15

Local Roadway Safety Plans

Irvine, King City, Los Gatos, Mariposa, Modesto, Montclair, Oxnard, Redwood City, Richmond, San Jacinto, Saratoga, Tuolumne County, Vista, Westminster, Woodland

14

Vision Zero Plans

Berkeley, Contra Costa County, Contra Costa Transportation Authority, Culver City, Daly City, Fremont, Los Angeles, Oakland, Pittsburg, Redwood City, Sacramento, San Francisco, Sunnyvale, Vallejo

Multi-Modal Safety

Our multi-modal safety experience in California runs deep. We have worked with 100 cities and counties, as well as the State of California, to help solve some of the most pressing roadway safety issues facing our communities. Our experience includes robust data collection and analysis, project identification and design, policy development, and funding support.

Complete Streets Safety Assessment	Safe Routes to School
HSIP Grant Applications	Systemic Safety Analysis Report
Local Road Safety Plan	Vision Zero
Pedestrian Safety Assessment	Other Safety Projects



Relevant Project Experience

San Bernardino County Local Road Safety Plan

FEHR & PEERS STAFF

Matt Benjamin (Principal-In-Charge)
Diwu Zhou (Project Manager)

CONTACT INFORMATION

Noel Castillo, PE
Assistant Director
Department of Public Works

T: (909) 387-7916
E: noel.castillo@dpw.sbcounty.gov

HOW WE ASSISTED SAN BERNARDINO COUNTY

Fehr & Peers developed the San Bernardino County's Local Road Safety Plan (LRSP) focused on County maintained roadway within unincorporated San Bernardino County. This particular Local Road Safety Plan applies a dual-pronged approach: 1) identifying priority systemic safety improvement projects based on high-risk roadway features that are correlated with fatal and severe collision types, and 2) reviewing collision trends to develop behavioral countermeasures. This project incorporates the safe systems approach, shifting from the traditional goal to reduce overall vehicle collisions towards the goal of reducing overall kinetic energy and thereby reducing the number of fatal and severe collisions. Development of the LRSP incorporated input from a multi-disciplinary stakeholder group facilitated by Fehr & Peers. Fehr & Peers prepared six HSIP grant applications and secured over ten million dollars in funding.

Railroad Canyon Road Local Road Safety Plans

FEHR & PEERS STAFF

Steve Brown (Principle-in-Charge)
Diwu Zhou (Project Manager)

CONTACT INFORMATION

Mike Borja
Administrative Service Director
City of Canyon Lake

T: (951) 246-2024
E: mborja@canyonlakeca.gov

HOW WE ARE ASSISTING THE CITY OF CANYON LAKE

Fehr & Peers developed two Local Road Safety Plans (LRSPs) focused on the Railroad Canyon Road corridor for the City of Canyon Lake and City of Lake Elsinore. Since the Local Road Safety Plans are focused on a single high-speed roadway, the systemic safety identification process was focused on similarities between intersections and roadway segments within the corridor. Recommended countermeasures included roadway and intersection improvements, as well as behavioral countermeasures such as education programs, media campaigns, local policies, and enforcement efforts, for segments of the Railroad Canyon Road corridor that have exhausted the list of engineering countermeasures. Fehr & Peers prepared one HSIP grant application for the City of Canyon Lake and secured over one million dollars in funding.

Proposed Key Personnel

Steven J. Brown, PE (Principal-in-Charge)

Steve will serve as Principal-in-Charge on this project. Steve has 35 years of experience in transportation planning and engineering. In addition to his 30 plus years of consulting experience, Mr. Brown was the Director of Transportation Planning for the City of Sacramento. He has managed projects in eight states and three countries. He is a licensed Traffic Engineer in CA with practical and research experience in safety issues related to autos, freight, bicyclists, and pedestrians. He also oversees the firm's national freight practice, specializes in roadway safety studies, multi-modal transportation planning projects, and complete streets design. Steve will use his oversight role to ensure that the Local Road Safety Plan—in addition to ensuring eligibility for future HSIP funding—is strategically aligned with the City's other goals. Steve is also a primary author of the *US Traffic Calming Manual*, a key resource used for implementing traffic calming devices on City Streets.

Diwu Zhou, PE (Project Manager)

Diwu will serve as the Project Manager and day-to-day point of contact for this project. Diwu is a Senior Transportation Engineer who specializes in safety planning, big data, and traffic operations analysis. Diwu is passionate about balancing the often-conflicting needs of mobility and safety and is well suited to provide clients with advice and recommendations backed by research, data, and analysis through his intimate knowledge of traffic operations and design, safety best practices, and big data. Diwu is committed to being at the forefront of safety best practices and innovations and serves as a key member of the firm's Multimodal Safety Initiative and serves on the Executive Committee of the Transportation Safety Council for the Institute of Transportation Engineers. Diwu managed and served as the project manager and technical advisor for safe routes to school assessments, local collision studies, community based-transportation plans, multimodal traffic simulations, and community outreach efforts.

Key personnel resumes are included in Attachment A.

Approach to Budget and Schedule Issues

In the event that this project does face a setback to an unforeseen issue, we can typically bring the project back on budget and schedule using one or more of the following approaches:

Adjusting Resource Allocation

Some tasks may require more than the anticipated level of effort, while others can be satisfactorily completed with less.

Increased Efficiency

Our project management system promptly alerts us to any task overruns, allowing us to quickly respond with a plan to more efficiently perform subsequent tasks.

Strategic Use of Technical Experts

As a large, multi-modal transportation planning and engineering firm, Fehr & peers can make strategic use of our staff resources to suggest methods to quickly address unforeseen obstacles and move the project forward.

Project Approach

Lake Elsinore's decision to proceed with a LRSP is an important step towards improving roadway safety and a necessary step for eligibility of HSIP funding. Specifically, the LRSP can provide Lake Elsinore with the opportunity to accomplish the following:

- Incorporate recently available collision data to identify new and emerging safety trends
- Build a culture of safety and safety champions within Lake Elsinore
- Incorporate the Safe System framework and new Caltrans Strategic Highway Safety Plan priorities, ensuring alignment with future Caltrans HSIP funding priorities
- Help Lake Elsinore prepare for the 2025 HSIP cycle

Our proposed scope of services is presented below and is consistent with the scope of work identified in the RFP.

Task 1. Project Management Plan, Team Meetings

Task 1.1. Project Management Plan

Fehr & Peers will prepare a Project Management Plan (PMP) for the project including the task milestones, team coordination, communication protocols, and quality assurance/ quality control procedures. The PMP will include the project schedule and all deadlines for deliverables with responsibilities and submission procedures clearly outlined. In addition, Fehr & Peers will work with the city to develop a regular project meeting schedule to facilitate collaboration and coordination.

TASK 1.1 DELIVERABLES:

- PMP
- Project Schedule

Task 1.2. Project Team Meetings

This task will include regularly scheduled project meetings between Fehr & Peers and City staff, as established in the PMP. Meeting agenda, notes, and minutes will be documented and made available to City staff.

TASK 1.2 DELIVERABLES:

- Meeting Agendas
- Meeting Notes & Minutes

Task 2. Safety Partners & Field Visits

Task 2.1. Safety Partners & Public Outreach

Fehr & Peers will coordinate with the City to select and identify partners that will be able to provide advice for acquiring and analyzing data, selecting emphasis areas, developing safety strategies, and implementing the final plan. This stakeholder group will provide input to the LRSP. Stake holders may include traffic safety partners, police/fire representatives, emergency responders, the school district, neighboring agencies, and City staff.

Separate outreach to the general public will be coordinated through other means consisting of surveys, social media, or other methods identified by City staff and included in Fehr & Peers' fee hours as part of the project. Fehr & Peers will organize and facilitate up to two (2) stakeholder working meetings. The timing of stakeholder meetings and level of stakeholder involvement will be discussed during the project kick-off meeting.

TASK 2.1 DELIVERABLES:

- Preparation for and attendance of up to two (2) stakeholder meetings

Task 2.2. Field Visits

Fehr & Peers will field visits to priority project locations identified through the data analysis task and approved by City staff. City staff will be included in these field visits to discuss the issues at the corridors and intersections.

TASK 2.2 DELIVERABLE:

- Preparation for and attendance of up to one (1) half-day of field visits

Task 3. Comprehensive Review of Existing Documents

Fehr & Peers shall perform a review of pertinent plan and policy documents applicable to the street system and transportation network of the City. This will consist of the Lake Elsinore General Plan, Active Lake Elsinore, Specific Plans in the City, Lake Elsinore's standard plans and specifications, Capital Improvement Program, Systematic Safety Analysis Report (SSARP) and other relevant local and regional policies and guidelines identified by City Staff. Special attention will be given to areas with vulnerable roadway users.

TASK 3 DELIVERABLE:

- Draft and final document review memorandum including key findings, identified corridors and areas with safety concerns

Task 4. Collision History and Safety Data Analysis

Fehr & Peers will perform a comprehensive review of collision data, traffic data, and roadway characteristics using the Statewide Integrated Traffic Records System (SWITRS), Transportation Injury Mapping System (TIMS), Lake Elsinore collision database, Lake Elsinore GIS assets, citizen requests, and dispatch records. Fehr & Peers will coordinate with the City on the appropriate time period that will be used for data evaluation and create tables and exhibits demonstrating key findings with respect to areas such as primary collision factors, time of day, age of responsible party, high incident locations, bike/pedestrian involvement, etc.

The following information will be identified and discussed with the City:

1. **City-wide collision analysis:** Conduct a citywide review of the collision data, summarized in exhibits such as: collisions over time, collisions by type, collisions by mode, etc. This will enable the project team to identify citywide collision trends.
2. **Collision maps:** Develop a series of collision maps and heatmaps. Collisions will be mapped by mode and severity. This task will enable the project team to identify the top high collision locations, with an emphasis on fatal and severe injury collisions.
3. **Emphasis areas:** Identify emphasis areas through the city-wide collision analysis and a systemic collision approach, which involves cross tabulating collision data with contextual data to identify key trends in locations that experience high concentrations of fatal and severe injury collisions. Then use the collision key trends and the contextual data to identify the similar locations within the City's street network that have not yet experienced high concentration of the fatal and severe collisions, but due to their similar characteristics are susceptible to those types of collisions. This cross tabulation of data is referred to as systemic collision analysis. Systemic collision analysis will be developed for motor vehicle, bicycle, and pedestrian modes. Through this systemic analysis and the city-wide collision trends, emphasis areas will be identified, focusing mainly on fatal and severe injury collisions. Each emphasis area will include a map of the corresponding collisions, the percent of fatal and severe injury collisions within that emphasis area, and the similar locations identified through the systemic analysis. This section would also include the identification of applicable potential countermeasures for implementation considerations.
4. **Collision data summary exhibits:** Prepare copies of emphasis area summaries to present at stakeholder engagement meetings. These materials will include a hard copy and online survey that allows attendees to prioritize the identified emphasis areas. Top priority locations will be identified through the feedback received in this task.

TASK 4 DELIVERABLES:

- Collision assessment memo including results of the city-wide collision analysis, high collision locations, and emphasis areas
- Collision data summary exhibits
- Emphasis area summaries and survey materials for the outreach meetings

Task 5. Identify Countermeasures and Strategies

Using the analysis and stakeholder engagement from the previous tasks, Fehr & Peers will develop a list of countermeasures. This list will form the basis of a safety countermeasure toolbox that will best address the most outstanding safety challenges identified in the previous tasks. The toolbox will consist of proven measures that will be among the countermeasures identified in the Caltrans Local Road Safety Manual, as these countermeasures are eligible for HSIP grant funding, along with other successful measures that could be considered for application outside of HSIP funding.

TASK 5 DELIVERABLE:

- Draft and final countermeasure toolbox

Task 6. Implementation Program

The consultant will collaborate with Lake Elsinore City staff to develop a strategy for implementing the recommended countermeasures and monitoring safety outcomes. The program developed will identify strategies and tools for monitoring performance, potential funding sources, agency roles and responsibilities for implementation of the plan, opportunities for funding of maintenance, and potential updates to Lake Elsinore design standards.

TASK 6 DELIVERABLE:

- Draft and final implementation program memorandum

Task 7. LRSP Development

Fehr & Peers will develop a draft LRSP based on the findings from the work conducted in Tasks 1 through 6. The draft LRSP shall include existing safety efforts and policies, data analysis methods and results, emphasis areas, countermeasures, top priority locations, and ways to implement the Plan. Exhibits and maps will be included as appropriate. Fehr & Peers will circulate the draft LRSP to City staff and stakeholders for input.

Fehr & Peers will create a final LRSP that addresses one round of consolidated comments from the City on the draft LRSP. The Final LRSP will provide a roadmap for the City moving forward. It will describe the implementation program the City should follow and any subsequent updates to the plan necessary based on new data or information becoming available. Fehr & Peers will also create a public-facing summary presentation and deliver the presentation at one City Council meeting.

TASK 7 DELIVERABLES:

- Draft Report
- Final Report

Proposed Project Schedule

We are proposing an 8-month schedule that will require intensive coordination with City staff early in the process to establish dates for stakeholder engagement and internal and external review schedules.

	1	2	3	4	5	6	7	8
Task 1 – Project Management Plan, Team Meetings								
Task 2 – Safety Partners & Field Visits								
Task 3 – Comprehensive Review of Existing Documents								
Task 4 – Collision History and Safety Data Analysis								
Task 5 – Identify Countermeasures and Strategies								
Task 6 – Implementation Program								
Task 7 – LRSP Development								

Cost Proposal

Fee Proposal for Lake Elsinore LRSP										
Tasks	Fehr & Peers					Labor Costs	Direct Costs	Total Hours	Total Costs	
	Principal-in-Charge	Project Manager	Planning/Graphics	Project Support						
	Steve Brown	Diwu Zhou	Sean Reseigh	Sandra Hyatt						
	\$355	\$195	\$160	\$145						
Task 1 - Project Management Plan, Team Meetings										
1.1 Project Management Plan	2	4	0	0		\$1,490		6	\$1,490	
1.1 Project Team Meetings	8	8	4	0		\$5,040		20	\$5,040	
Task 2 - Safety Partners & Field Visits										
2.1 Safety Partners & Public Outreach	4	8	8	2		\$4,550	\$500	22	\$5,050	
2.2 Field Visits	8	10	0	2		\$5,080	\$500	20	\$5,580	
Task 3 - Comprehensive Review of Existing Documents										
3.1 Comprehensive Review of Existing Documents	4	8	16	4		\$6,120		32	\$6,120	
Task 4 - Collision History and Safety Data Analysis										
4.1 City-wide Collision Analysis	4	24	60	11		\$17,295		99	\$17,295	
4.2 Collision Maps	2	8	16	3		\$5,265		29	\$5,265	
4.3 Emphasis Areas	2	16	20	4		\$7,610		42	\$7,610	
4.4 Collision Data Summary Exhibits	2	4	12	2		\$3,700		20	\$3,700	
Task 5 - Identify Countermeasures and Strategies										
5.1 Identify Countermeasures and Strategies	4	16	16	5		\$7,825		41	\$7,825	
Task 6 - Implementation Program										
6.1 Implementation Program	2	8	12	3		\$4,625		25	\$4,625	
Task 7 - LRSP Development										
7.1 Draft and Final LRSP Development	8	16	24	4		\$10,380		52	\$10,380	
Total for all Tasks (Tasks 1-7)	50	130	188	40		\$78,980	\$1,000	408	\$79,980	

Notes:

This fee proposal is valid for a period of 90 days from the proposal submittal date.

Actual billing rate at the time of service may vary depending on the final staffing plan at the time the project starts; the overall fee will not be exceeded.

Mileage is billed at the IRS rate plus 10% handling fee

Other direct costs include computer, communications, and reproduction charges are billed as a percentage of labor

Rates and staff are subject to change at any time, without notice, and within the total budget shown

Resumes



Steven J. Brown, P.E.

Principal

EDUCATION

Bachelor of Science in Civil Engineering
University of California, Berkeley, 1985

Master of Science in Transportation
University of California at Berkeley, 1987

Master of Business Administration
Golden Gate University, 1998

REGISTRATIONS

Licensed Traffic Engineer, State of California
(TR1510)
Road Safety Professional (cert 2019)

AFFILIATIONS

Member of *NCHRP Committee* to Develop
Safety Manual for Unsignalized Intersections,
2012 -2015

Member of *Bicycle Sub-Committee* of
NCUTCD, 1995/96

ITE Northern California Section President
2000-2001

Co chair ITE District 6 Conference, 2004

AWARDS

2nd Place, APA Transportation Planning
Division National Student Paper Competition

EXPERTISE

- Multimodal Corridor Planning
- Corridor Safety Studies
- Transportation Demand Management
- Freight Planning

ABOUT

Mr. Brown is a Senior Principal with 35 years of experience in transportation planning and engineering. In addition to his 30 years of consulting experience, Mr. Brown was the Director of Transportation Planning for the City of Sacramento. He has managed projects in eight states and three countries.

Mr. Brown is a licensed Traffic Engineer in CA with practical and research experience in safety issues related to autos, freight, bicyclists, and pedestrians.

Mr. Brown is a senior partner in the firm and is part of the executive team. He also oversees the firm's national freight practice.

PROJECT EXPERIENCE

Mr. Brown was either the project manager or principal-in-charge of all the following studies conducted by Fehr & Peers:

Systemic Safety Analysis Reports

Mr. Brown served as Principal-in-charge of many recent Systemic Safety Analysis Reports (SSARs), including the cities of *Montclair*, *Hermosa Beach*, *San Jacinto*, and *Vista*. In all cases, these studies have yielded insights for the jurisdictions regarding collision patterns, hot-spots, and appropriate remedies. Our process has made it easy for agency staff to provide input and review key materials. We have engaged key stakeholders, at the direction of staff, to provide feedback on key issues and trouble locations. Some of these jurisdictions have asked Fehr & Peers to use the SSARs to prepare grant applications for state monies to implement the high-priority recommendations.

Road Safety Audits

Fehr & Peers led roadway safety audits for the following agencies/locations:

- Caltrans, SR 70 corridor (2019)
- Caltrans, SR 49 corridor (2020)
- LA Bureau of Engineering, 4 arterial corridors (2020)

These studies incorporated a team of experts and stakeholders that ranged from 10-15 people. Fehr & Peers led the team through data review, field reviews, brainstorming, and countermeasure identification. The reports are concise representations of the challenges, options, and recommendations.

Pedestrian Safety Audits (25 cities)

Fehr & Peers developed a manual for Pedestrian Safety Audits to be performed upon request from California cities/communities. The manual included collaboration with an expert review panel and review of best practices in pedestrian safety. The program won numerous awards and has been recognized as a national model for such programs. Upon completion of the manual, Fehr & Peers was retained to conduct audits throughout California. Mr. Brown was the lead investigator for more than 25 individual studies from small towns (Lomita and Hermosa Beach) to large cities (Los Angeles and Irvine). These audits included a full day of walking the streets with City staff and interested parties to identify the problems and remedies related to pedestrian safety. The studies also created a GIS map of historical pedestrian-involved collisions in each jurisdiction.

Roadway Safety Expert Witness

Mr. Brown has conducted roadway safety analysis as an expert witness. These analyses included field reviews of potentially hazardous conditions, comparison of roadway designs to professional standards, and statistical analysis of collision records to identify patterns. Mr. Brown testified in each of these cases, and the courts have ruled favorably for our client in each case.

Traffic Calming, National Expert

Mr. Brown, who co-authored the *US Traffic Calming Manual*, has led the firm's efforts in creating citywide traffic calming programs (more than 15) and developing plans for individual neighborhoods (more than 25). This includes the largest traffic calming project in the US (Downtown Sacramento) and award-winning programs from Ithaca, NY to Ft. Bragg, CA.

Truck Safety, Beverly Hills

Mr. Brown was the principal investigator on behalf of the City of Beverly Hills in developing remedies to enhance safety for trucks on their steep residential streets. A series of fatal collisions led the City to engage Fehr & Peers in creating a plan to improve conditions. The plan included treatments such as a city-sponsored truck inspection program, escorting of over-sized trucks, time-of-day limitations, parking management, traffic calming treatments, and new signing/stripping.

Cal Poly Pomona Pedestrian Safety Study

Fehr & Peers conducted a pedestrian safety study of the entire Cal Poly campus. We evaluated existing pedestrian facilities and vehicle data on campus, with particular attention to pedestrian-vehicle conflict locations. As part of our work we recommend specific crosswalk, roadway, and intersection improvements both on-campus and on City of Pomona roadways. We developed guidelines for the University for future pedestrian treatments, including crosswalk design standards.

California Central Valley Freight Safety

Fehr & Peers, as part of two related studies, created a GIS spatial database of truck-related collisions covering five counties in

central CA. This database was then used to query issues related to location, type, and cause of collisions to develop counter-measures for both pilot testing and long-term implementation. Mr. Brown was the principal for both of these efforts.

Rancho Mission Viejo Sustainable Transportation Program

Fehr & Peers prepared a sustainable transportation program for Rancho Mission Viejo, a new development in Southern Orange County. Our work on the sustainable transportation program included development of the bicycle plan, bicycle facilities and NEV (Neighborhood Electronic Vehicle) plan. The comprehensive NEV network is a unique feature that highlights the development's sustainable transportation program and is only the second such plan in the state. In Rancho Mission Viejo NEVs, bicyclists, and pedestrians will coexist on a well-connected network of paths and trails that link residential, retail, and recreational land uses, thus reducing the amount of automobile trips within the development.

Downtown Anaheim Pedestrian Safety

Fehr & Peers assisted the City of Anaheim on a number of transportation projects that will enhance the downtown environment. We evaluated the safety and performance of modifications to Anaheim Boulevard and Broadway, which included: angled parking, bulb-outs, reduced lanes, and wider sidewalks. Our analysis resulted in several refinements to the proposed street modifications. We have also analyzed the ability of the existing and proposed parking supply to support additional development in the area.

Auto/Ped Safety Study, West Hollywood

Mr. Brown led an effort by Fehr & Peers to address auto/pedestrian safety conflicts on a critical section of Santa Monica Boulevard. The data collection effort included a detailed review of driver behavior during evening hours when bars and nightclubs are active. Our recommendations included adding traffic signals, consolidating crossing locations, enhancing pedestrian visibility, and removing dynamic pedestrian signals.



Diwu Zhou, PE, RSP1

Senior Transportation Engineer

EDUCATION

University of California, Berkeley, M.S. in Transportation Engineering, 2016

The University of Texas at Austin, B.S. Civil Engineering, 2015

LICENSES

Professional Engineer – Civil
CA No. 89029

Road Safety Professional 1
No. 635

PRESENTATIONS/PUBLICATIONS

Instructor: "Synchro and SimTraffic",
University of California, Berkeley, Institute of Transportation Studies

Instructor: "Safe Systems Certification",
Institute of Transportation Engineers

Author: "Applications of Big Data in Safety Analysis". Institute of Transportation Engineers

AFFILIATIONS

Secretary for the National Safety Council
Institute of Transportation Engineers (ITE)

Member of the Transportation Research Board, Intermodal Freight Transport Committee (AT045)

EXPERTISE

- Multimodal Safety
- Traffic Operations and Microsimulation
- Big Data

ABOUT

Diwu is a transportation engineer who specializes in safety planning, big data, and traffic operations analysis. Diwu is passionate about balancing the often conflicting needs of mobility and safety, and is well suited to provide clients with advice and recommendations backed by research, data, and analysis through his intimate knowledge of traffic operations and design, safety best practices, and big data.

Diwu is committed to being at the forefront of safety best practices and innovations and serves as a key member of the firm's Multimodal Safety and Transportation Equity Technical Initiatives. Diwu also has a broad background in transportation planning through his experience with transportation impact studies, safe routes to school assessments, citywide and countywide planning studies, multimodal traffic simulations, and community outreach.

PROJECT EXPERIENCE

San Bernardino County Local Road Safety Plan (San Bernardino County, CA)

Fehr & Peers developed the San Bernardino County's Local Road Safety Plan (LRSP) focused on County maintained roadway within unincorporated San Bernardino County. This particular Local Road Safety Plan applies a dual-pronged approach: 1) identifying priority systemic safety improvement projects based on high-risk roadway features that are correlated with fatal and severe collision types, and 2) reviewing collision trends to develop behavioral countermeasures. This project incorporates the safe systems approach, shifting from the traditional goal to reduce overall vehicle collisions towards the goal of reducing overall kinetic energy and thereby reducing the number of fatal and severe collisions. Development of the LRSP incorporated input from a multi-disciplinary stakeholder group facilitated by Fehr & Peers. Strategies included roadway design projects, education programs, and enforcement efforts, based on safety efficacy research and equity best practices. Fehr & Peers prepared six HSIP grant applications and secured over ten million dollars in funding. Diwu was the project manager for this effort.

Railroad Canyon Road Local Road Safety Plans (Lake Elsinore and Canyon Lake, CA)

Fehr & Peers developed two Local Road Safety Plans (LRSPs) focused on the Railroad Canyon Road corridor for the City of Canyon Lake and City of Lake Elsinore. Since the Local Road Safety Plans are focused on a single high-speed roadway, the systemic safety identification process was focused on similarities between intersections and roadway segments within the corridor. Recommended countermeasures included roadway and intersection improvements, as well as behavioral countermeasures like

education programs, media campaigns, local policies, and enforcement efforts, for segments of the Railroad Canyon Road corridor that have exhausted the list of engineering countermeasures. Fehr & Peers prepared one HSIP grant application for the City of Canyon Lake and secured over one million dollars in funding. Diwu was the project manager for this effort.

Safe Routes to School (Alameda County, CA)

Fehr & Peers worked with Alameda County, five public school districts, and two public charter schools to plan active transportation routes to and from 35 schools within Unincorporated Alameda County. Diwu performed numerous walking audits and analyzed crash data to determine safety enhancements to encourage parents and students to feel more confident walking and biking to school. Projects were ranked through a prioritization scoring system based on socio-economic, geographic, and crash data collected at each school. Diwu also assisted with Active Transportation Grants for many of the proposed projects. Diwu served as the Deputy Project Manager for this project.

Railroad Avenue Completes Streets Study (Pittsburg, CA)

Fehr & Peers evaluated Railroad Avenue within the vicinity of the newly opened BART station to identify potential multimodal safety and access improvements. As part of this project, Fehr & Peers conducted a safety evaluation by evaluating recent collision reports and performing a near-miss analysis. Fehr & Peers provided recommended improvements to address identified safety concerns, which were vetted through microsimulation operational analysis, and provided recommended programmatic solutions for reducing single occupant vehicle travel in the project area. Selected improvements were laid out in a conceptual plan.

SR-55 Safety Assessment (Orange County, CA)

Fehr & Peers worked with Orange County Transportation Authority to evaluate the safety implications of modifying a proposed freeway mainline auxiliary lane, that would facilitate weaving between two off ramps, to separate acceleration and deceleration lanes due to right-of-way constraints along the SR-55 corridor. Crash reduction factors were estimated for four alternatives using the Highway Safety Manual, NCHRP's Crash Modification Factors Clearinghouse, and FHWA's Interchange Safety Analysis Tool. Diwu served as the lead engineer on the project.

SR-91 Central (Compton, CA)

Fehr & Peers worked with Los Angeles County Metropolitan Transportation Authority (LA Metro) to improve a portion of the State Route 91 corridor. The preferred alternative would provide operational and safety improvements as opposed to capacity improvements on the freeway. Fehr & Peers also conducted an interchange control evaluation for the Central Avenue/SR-91 and Wilmington Avenue/SR-91 interchanges. Diwu conducted the

safety assessment for both the freeway and interchange control evaluation.

Iron Triangle Yellow Brick Road Neighborhood Plan (Richmond, CA)

Fehr & Peers worked with the City of Richmond to design a accessible, multimodal corridor for pedestrian and bicyclists of all ages and ability. The final design included reduced travel lane widths, curb extensions, pedestrian scale lighting, and intersection enhancements to increase pedestrian visibility. Fehr & Peers design services included traffic signal design and lighting analysis and design, as well as previous work planning the corridor-wide improvements.

Community Based Transportation Plan - CBTP (Contra Costa County, CA)

Fehr & Peers worked with Contra Costa County to identify local infrastructure needs in the cities of Richmond and Pittsburg, California. Our GIS specialists developed maps of the CBTP areas using collision data and information about gaps in the current bicycle and pedestrian network. The Existing Conditions Report and Preliminary Needs Assessment was used during public outreach to develop recommended strategies to address transportation challenges identified by community members. Diwu served as the Project Manager for this project

Connect Orinda (Orinda, CA)

Fehr & Peers worked with the City of Orinda to identify streetscape and transportation projects that beautify, improve travel through and preserve the uniqueness of downtown Orinda for people traveling by all modes. Fehr & Peers' extensive community outreach included interviews, surveys, walking tours, and three well-attended community events; Connect Orinda engaged hundreds of residents and business-owners, who submitted over 1,000 comments. Collision data and data from cellular devices was used to create infographics for travel to and within the City. Diwu served as the Project Manager for this project.

Park Boulevard Road Diet (Oakland, CA)

The Park Boulevard corridor between State Route 13 and I-580 in Oakland serves a diverse range of users but lacked dedicated bicycle facilities. Fehr & Peers developed a conceptual plan and used microsimulation to determine the impacts of a road diet in order to install dedicated bike lanes. Two major alternatives were considered, one requiring reconfiguration of roadway geometry at a signalized intersection along the corridor. Operations analysis was performed for both options to compare multimodal impacts.