Project Work Plan & Approach

Proposed Scope of Work

The Fehr & Peers team will conduct a systemic safety analysis for motorists, bicyclists, and pedestrians on public roads in the City of Sunnyvale building on our ongoing Vision Zero efforts to produce a Roadway Safety Plan consistent with Caltrans SSARP guidelines. The completed Roadway Safety Plan will assess collision patterns by location, type of road user, roadway characteristics, and collision circumstances to guide the identification of implementable cost-effective countermeasures. The list of countermeasures will be developed in coordination with City staff. The Roadway Safety Plan will identify and prioritize engineering projects to continue to combat fatal and serious injury collisions in the City of Sunnyvale.

The final product of the SSARP will include a summary of existing relevant safety plans and policies, a vicinity/location map, crash characteristics, data gathering, data analysis and road safety audit methodology and findings, a toolbox of systemic low-cost safety countermeasures, benefit/cost ratios, and a set of priority safety projects eligible to submit for HSIP grant funding consideration. The report will also identify other potential sources for funding.

A critical element will be the robust community outreach strategy to engage residents in the program, to solicit local knowledge, and to foster an inclusive approach to community concerns.

Task 1: Project Management

The Fehr & Peers team will refine and finalize the work plan, budget, and schedule, as well as manage day-to-day operations for the contract. In addition to regularly scheduled meetings, routine communication and close coordination with City staff will be critical to help the project progress smoothly, on time and within budget.

1.1 Kick-off Meeting

The Fehr & Peers team will meet with City of Sunnyvale staff to review and revise the work plan, budget, and schedule for the Sunnyvale Roadway Safety Plan SSARP. The meeting will provide an opportunity to discuss project goals, performance measures that will be used to evaluate the contract outcomes, and communication protocols throughout the project. Additionally, we propose to identify key stakeholders who could form the basis for a Technical Advisory Group (TAG) to be consulted at key milestones throughout the project. It is anticipated that the TAG would incorporate key parties active to date in the Sunnyvale Vision Zero Plan project.

1.2 Progress Meetings

Fehr & Peers will work with the City's Project Manager to set a schedule for up to nine additional in-person meetings or conference calls. After the kick-off meeting, our team will send a meeting summary with key action items identified.

Additionally, Fehr & Peers proposed to hold bi-weekly progress meeting phone calls throughout the life of the project to ensure close coordination between City and consultant staff.

1.3 Monthly Progress Reports

Monthly progress reports will be provided with every invoice. The reports will outline tasks accomplished and deliverables provided in the monthly billing cycle. Invoices will be submitted in the format approved by the City of Sunnyvale.

Deliverables:

- *Preparation for and attendance at project kick-off meeting*
- *Final work plan, budget, and project schedule*
- *Nine in-person meetings or conference calls, including meeting agendas and minutes*
- *Bi-weekly progress meeting phone calls*
- *Monthly project invoices and progress reports*

Task 2: Document Review

Our team will strengthen our already robust understanding of the safety and overall transportation environment in the City of Sunnyvale through a review of recent plans and policies related to the City's multimodal travel network. In addition to coordinating efforts with the ongoing development of the Sunnyvale Vision Zero Plan, we will review documents such as the Safe Routes to School Plan, Pedestrian Safety Opportunities Study, 2006 Bicycle Plan, General Plan Land Use and Transportation Element, relevant Specific Plans, and the City's engineering standards guiding project implementation. Successful policies from surrounding jurisdictions that are relevant to the safety environment will also be identified. Efforts previously completed as part of the Vision Zero Plan will allow the Fehr & Peers team to complete this task quickly and efficiently.

Additionally, the consultant team will review pertinent state and federal SSARP documents such as the Caltrans Systemic Safety Analysis Report Program (SSARP) Guidelines, Caltrans Local Roadway Safety Guidelines, Caltrans Local Assistance Procedures Manual, Caltrans Strategic Highway Safety Plan, and U.S. Department of Transportation System Safety Project Selection Tool. The Highway Safety Manual, Caltrans Complete Streets Implementation Action Plan 2.0, Caltrans Complete Intersections 2010, Caltrans Smart

Mobility Framework Pilot Study of March 2015, and the latest collision data will also be reviewed. Our team is extensively familiar with these documents through other SSARP efforts.

Fehr & Peers will coordinate with the City to identify any other background documentation which may be beneficial to improving the team's understanding to the development of the Roadway Safety Plan.

Deliverable:

- *A memorandum detailing key safety takeaways from the reviewed documents, including findings which may influence the final Roadway Safety Plan SSARP report*

Task 3: Data Collection

3.1 Current Crash Data

Fehr & Peers will utilize vehicle, pedestrian and bicycle collision data for the City of Sunnyvale for the five-year period spanning 2013 through 2017. Data for 2013 through 2016 were previously collected by Fehr & Peers as part of the Sunnyvale Vision Zero Plan, for which a collision database in GIS format was developed with each collision record coded to a unique location, and addition 2017 data will be collected as part of this project. The primary data source for collision data was the UC Berkeley Transportation Injury Mapping System (TIMS). The Fehr & Peers team will be able to begin analysis activities quickly and efficiently utilizing previously aggregated data.

3.2 Contextual and Roadway Data

Through our experience working with both the City of Sunnyvale and other citywide collision databases, we have learned the value of supplementing collision data with contextual variables to enrich the collision analysis and better understand collision patterns. Contextual variables contain information on the environments surrounding the collision locations, including:

- Demographic data (e.g., population, employment, age, race, gender, etc.)
- Land use data (e.g., locations of schools, parks, senior center, etc.)
- Roadway characteristics data (e.g., number of lanes, speeds, volumes, traffic controls, bicycle facilities, sidewalks, street lighting, etc.)

Fehr & Peers understands the importance of quality background data and has already established much of this as part of the Sunnyvale Vision Zero Plan project. In order to expand the transportation safety context, we propose to collaborate with the City data team to identify additional contextual variables which could be added to the collision analysis, potentially including the locations of existing sidewalk gaps, the presence of roadway lighting, and additional multimodal volumes to supplement previous City traffic count data collection.

We will incorporate relevant GIS data previously collected as part of the Sunnyvale Vision Zero Plan, but it is assumed that the City will provide relevant updates to GIS data on local land uses and roadway

characteristics, as available from the Safe Routes to School Plan, Pedestrian Safety Opportunities Study, 2006 Bicycle Plan, General Plan Land Use and Transportation Element, and other City resources. Fehr & Peers will ultimately conduct field observations at key locations to validate the feasibility of proposed countermeasures identified in later tasks.

3.3 Documentation of Implemented Countermeasures

Fehr & Peers will investigate low cost systemic countermeasures which have been successfully implemented within Sunnyvale and surrounding jurisdictions, noting the location, treatment, installation date, and post-implementation evaluations which have been completed. We will also identify programmed improvements which have not yet been implemented. The investigations will include roadway segment, signalized intersection, and unsignalized intersection improvements.

Deliverables:

- *Collected project data for reference in future tasks and inclusion in the Roadway Safety Plan SSARP*
- *Graphical, map, or tabular representations of projects which have been implemented*

Task 4: Crash and Roadway Data Analysis

The Fehr & Peers team proposes a network screening approach to identify the most critical safety risks on roadways within the City of Sunnyvale through analysis of Sunnyvale's roadway network. This will build upon the High Injury Network previously identified as part of the Sunnyvale Vision Zero Plan and result in a proactive safety evaluation that uses known crash histories to identify roadway characteristics that might increase risk. The proposed analysis methodology relies on methods described in AASHTO's Highway Safety Manual to search for patterns in historical crash activity that will highlight other areas of high risk that may not have yet experienced many crashes. These methods would form the foundation of an ongoing monitoring program for the City using its Crossroads database system.

The network screening process will require city streets and intersections to be classified into reference populations, likely based on functional classification (i.e., Principal Arterial, Arterial, Collector, Residential), number of lanes, and intersection control. These reference populations will then be used to conduct three statistical screens of the City's roadway system. These are Critical Crash Rate, Probability of Specific Crash Types Exceeding Threshold Proportion, and Excess Proportion of Specific Crash Types.

These methods need minimal data to implement. Required data elements are:

- Crashes by location
- Traffic volume
- Reference populations

The result will be an analysis of all locations within the City yielding a list of roadway segments, signalized intersections, and unsignalized intersections ranked in priority order for each of the three analyses. Ultimately, our team will work with the City to select twenty priority projects as part of Task 6.

4.1 Critical Crash Rate

Critical Crash Rate is the average crash rate at all sites within a reference population. This analysis will compare the observed crash rate at given locations to the critical crash rate to identify under-performing roadway segments and intersections relative to their peers within the City. This method allows lower volume roadways with higher crash risk factors that would be missed with an exclusive eye towards raw crash rates.

The result of this measure will be the locations where crash rates are highest above their peer locations.

4.2 Probability of Specific Crash Type Exceeding Threshold Population

This measure looks at the proportion of crash types in the reference population and determines a probability factor for each crash type. The analysis then determines how likely crash activity at a given location truly exceeds the average outside chance occurrence of crashes. This analysis can take an additional step towards identifying unusual crash activity both positive and negative.

The result of this measure are locations where crash activity does not match its peer locations, triggering the possibility of outlying characteristics that can be remedied, and perhaps tracked to other locations.

4.3 Excess Proportion of Specific Crash Types

Similar to Critical Crash rate, this measure uses reference populations to isolate similar roadways and intersections. A threshold for crash types or severities is identified by determining how crash types and severities are distributed in the study population, and then identifying locations where a given crash type is over-represented.

Each of these network screening methods will result in a short list of locations that can be studied both for short-term local mitigation, and for challenges that can be employed for systemic improvements city wide.

4.4 Safety Planning Tool (Proposed Innovation)

The Fehr & Peers team proposes installing an updated module to the City's Crossroads system to implement a more seamless procedure for the City of Sunnyvale to continually monitor its progress in improving roadway safety and to allow re-prioritization of safety needs as conditions change and projects are completed.

We have included the Crossroads Software team in our proposal to assist in developing and implementing this update. This will prevent the need for the City to maintain and use a separate spreadsheet or GIS tool and will take advantage of existing maintenance agreements with Crossroads.

The updated system will include the ability to re-run any of the three network screening methods used as part of the SSAR development, allowing for a consistent and empirical prioritization of safety improvements in the City.

Deliverables:

- *Critical Crash Rate - GIS file of locations with highest crash potential by reference population.*
- *Excess Proportion of Specific Crash Types - GIS file of locations with highest crash potential by reference population.*
- *Probability of Specific Crash Type Exceeding Threshold Population - GIS file of locations with highest crash potential by reference population.*
- *A report documenting the crash and roadway data analysis results, including public-facing maps, figures, and tables depicting the severity and locations of non-injury, injury, severe injury, and fatal crashes. The analyses outlined in the report will also be included in the final Roadway Safety Plan.*
- *One in-person meeting to review data analysis results and findings.*
- *An updated Crossroads module to be installed on the City's Crossroads system*

Task 5: Countermeasure Selection

The team will compile a preliminary set of suggested countermeasures to address the safety challenges identified under Task 4 and present the preliminary set at an advisory group workshop to gather input. To help promote community buy-in and engagement, as well as to further deepen the understanding of current conditions and countermeasure feasibility, the team proposes in-person and online community outreach in the form of a community workshop and accompanying online survey.

5.1 Preliminary Countermeasure List

The Fehr & Peers team will use the Crash Reduction Factors provided in the Local Roadway Safety Manual (LRSM) to suggest the most effective countermeasures for the primary collision types and safety issues identified in Task 4. We will also investigate additional proven countermeasures from sources like FHWA PedSAFE and BikeSAFE toolboxes and the CRF Clearinghouse to supplement the countermeasures currently available in the LRSM. Effective countermeasures will be identified as those with potentially high benefit-to-cost ratios for improving safety performance

We will compile a pictorial summary of the proposed countermeasures.

5.2 TAG Workshop #1

We will facilitate a formal stakeholder workshop involving members of the TAG identified in Task 1 to discuss the systemic safety analysis process and gather input regarding the locations with safety issues and suggested countermeasures for improvement and prioritization. The workshop will be focused on educating and informing stakeholders of the systemic and proactive approach and discussing and prioritizing safety countermeasures.

Based on the feedback from the workshop, we may modify the preliminary list of suggested countermeasures by reprioritizing the list or by adding or eliminating countermeasures. Documentation of the workshop will be included in the final report, and eliminated countermeasures will still be documented.

5.3 Community Outreach Event #1

The Fehr & Peers team will develop workshop parameters to assist the City in conducting a community outreach event. It is anticipated that the event will build on the feedback and relationships developed through outreach during the Sunnyvale Vision Zero Plan project, allowing the Fehr & Peers team to more efficiently and effectively introduce the SSARP process to the community.

We will work with the City to develop an outreach strategy plan that outlines how, when, where, why and with whom we are planning outreach. We will prepare necessary presentations, project boards and visual aids, as well as prepare event summaries. The City will be responsible for compilation of attendee lists and dissemination of event invitations and information to participants, along with logistical support and securing venues. Potential approaches to outreach could include traditional workshops, pop-up informational booths at community events, and/or feedback collection at popular local establishments.

We envision the community event to be interactive and engaging, while also fostering an environment for mutual learning. Participants will provide firsthand insight on community needs and desires. This feedback will be essential in the development of the final Roadway Safety Plan SSARP report. The focus of the event will be to educate the community on traffic safety issues, present results of the data analysis, and get input on acceptable countermeasures and strategies. Feedback from the event may prompt our team to incorporate new countermeasures or remove countermeasures considered infeasible. Any removed countermeasures will still be documented in the final report even if not recommended.

Fehr & Peers will create an interactive online survey to accompany the community outreach event and provide opportunities for Sunnyvale residents to contribute to the SSAR process. The survey will be used to solicit feedback from residents about specific trouble spots to help ground-truth our data-driven process, and it will allow residents who might not participate in community meetings to be engaged in the process. The survey will be similar to that which was used by Fehr & Peers as part of the Sunnyvale Vision Zero Plan and survey feedback from the two projects can be aggregated if desired be aggregated.

Deliverables:

- *Preliminary list of proposed traffic safety countermeasures*
- *Stakeholder workshop PowerPoint presentation with overall framework for roadway safety planning and summary of systemic analysis and potential countermeasures*
- *Stakeholder workshop summary*
- *One community workshop, including online survey, presentations, project boards and visual aids, as well as workshop summaries*
- *If selected, draft and final concept plans for installation of a living preview; publicity materials design; meeting to confirm design; staff and materials budget to install project for up to two days; and summary of event.*

Task 6: Develop Projects

The Fehr & Peers team will develop a list of high-priority safety improvement projects by performing benefit/cost analyses and using feedback from City staff and stakeholders. To facilitate a robust dialogue with all interested parties, the team proposes a second formal stakeholder workshop and community outreach event to receive input on the refined list of countermeasures.

6.1 Benefit/Cost Ratios and Project Packages

Our team will use the Caltrans Benefit Calculator tool to calculate benefit/cost ratios for the potential countermeasures identified in Task 3 for the priority focus areas. We will use our experience working on similar projects to develop general cost estimates for treatments based on recent local bid results. Using the calculated benefit and cost, we will develop project packages that will be competitive for HSIP funding. This will be an iterative process to maximize the benefit/cost ratio. A detailed benefit/cost calculation methodology for each project will be documented and included in the final report.

6.2 TAG Workshop #2

The Fehr & Peers team will facilitate a second formal TAG workshop to present potential high-priority safety improvement projects and gather input from relevant stakeholders concerning the most appropriate projects for further consideration. Documentation of the workshop will be included in the final report.

6.3 Community Outreach Event #2

The Fehr & Peers team will assist the City in conducting a community outreach event using methods similar to those described in Task 5.3 above. It is anticipated that the event will focus on safety improvement projects identified in Task 6.1 and agreed upon in collaboration with TAG members in Task 6.2. Similar to Task 5.3, we will create an interactive online survey to accompany the community outreach event.

We will prepare necessary presentations, project boards and visual aids, as well as prepare event summaries. The City will be responsible for compilation of attendee lists and dissemination of event invitations and information to participants, along with logistical support and securing venues.

6.4 Summary of Prioritized Safety Projects

The team will develop a final prioritized list of up to twenty safety projects based on calculated benefit/cost ratios and feedback from City staff and the stakeholder workshops. The list will clearly identify projects that are likely to compete well for HSIP funding. The methodology for project selection and prioritization will be identified and included in the final report.

We will develop concept project fact sheets for each of the twenty prioritized safety projects, including types of safety improvements, beginning and end points, benefit/cost ratio, estimated total project cost, construction by year, and expected funding sources/amounts.

Deliverables:

- *Up to twenty priority safety projects for implementation based on calculated benefit/cost ratios and feedback from City staff and stakeholders*
- *Stakeholder workshop materials presenting potential high-priority safety improvement projects for participant review and feedback, with one round of revisions based on consolidated comments*
- *Stakeholder workshop summary*
- *One community workshop, including online survey, presentations, project boards and visual aids, as well as workshop summaries*
- *Refined list of up to twenty prioritized safety projects, the limits of each project, types of safety improvements, and benefit/cost ratios*
- *Benefit/cost calculation and project selection/prioritization methodologies summarized in technical memorandum to be included in the final report, along with a table detailing the financial aspects of countermeasure implementation, including estimated total project cost, construction by year, and expected funding sources and amount for each project*

Task 7: Final Roadway Safety Plan

The Fehr & Peers team will prepare a Draft Roadway Safety Plan that incorporates the findings from Tasks 1 through 6. This report will satisfy SSARP reporting requirements while also presenting a list of prioritized projects with supporting safety evidence to position the City of Sunnyvale for success in competitive funding processes such as the HSIP program. All work products produced as part of previous tasks will be packaged and delivered as part of the report. The consultant team will receive one round of consolidated comments and then finalize the report.

The report will include maps and graphics to complement the report narrative and make it accessible to non-technical readers. The maps and graphics will also be part of a presentation developed by the consultant team that can be presented to City Council, City commissions, and the public. In addition to the visuals, the presentation will include non-technical language to help the City communicate the results of the systemic safety analysis to both internal and external audiences.

The report will meet the requirements of the Systemic Safety Analysis Report Program (SSARP) Guidelines, including: Executive Summary, Engineer's Seal and Signature, Statement of Protection of Data from Discovery and Admissions, Safety Data Utilized, Data Analysis Techniques and Results, Highest Occurring Crash Types, High-Risk Corridors and Intersections, Countermeasures Identified to Address the Safety Issues, Viable Project Scopes and Prioritized List of Safety Projects, and Attachments and Supporting Documentation.

Deliverables:

- *Five hard copies and one electronic copy of Draft Report*

- *Five hard copies and one electronic copy of Final Report to satisfy SSARP guidelines*
- *Delivery of visually-focused presentation at one meeting, potentially including attendance of public and/or elected officials*

Task 8: Additional Presentations

Fehr & Peers proposes to lead the development and delivery of up to four additional presentations at meetings which may or may not include public officials (i.e., Commissions, City Council, or Bicycle/Pedestrian Advisory Group). These meetings are in addition to meetings with City staff and work shop events as described in Tasks 1 through 7 in the preceding scope of services.

Optional Task

In addition to the base scope items described above, the Fehr & Peers team has identified one optional task which could provide value for the City of Sunnyvale. If selected, it is anticipated that a portion of the contingency would be allocated to this optional task and the exact scope and fee would be identified at the time of its request.

Deliverables:

Living Preview (Proposed Innovation)

As an optional task, Fehr & Peers will install a temporary or 'living' preview of a proposed safety countermeasure improvement project at a location determined in collaboration with the City. Treatments which make ideal candidates for living previews include bicycle facilities, curb extensions, parklets, roundabouts, and road 'right-sizing' projects. These living previews allow residents to observe, interact, and comment on the proposed improvement projects. Fehr & Peers staff would be present on-site to collect real-time feedback from participants in the living preview during anticipated times of high participation.

Fehr & Peers has put on numerous living preview projects, including a two-way protected bikeway on Park Boulevard in Palo Alto organized by Steve Davis and Ryan McClain to coincide with the weekly California Avenue Farmers Market. Living previews are an exciting opportunity to explain proposed improvements to community members in full-scale design. To date, two of these living preview projects have resulted in implementation of permanent street changes people are enjoying every day, and two others have funding for PS&E and construction already secured.

Living previews have a great deal of benefit for technical stakeholders, including City engineering staff, as on-the-fly design modifications can be made to ensure the proposal operates as well as possible. They can allow for coordination and testing of actual design vehicles with emergency service providers. Project evaluation can also be done during the Living Preview event to collect data on how the facility is used, including speed data, volumes, and community preference and perception.

An important aspect of the event will be explaining the various improvements and the purpose of the installation. Our budget assumes that the City of Sunnyvale will take the lead on appropriate permits, temporary traffic control (if needed), event publicity, and borrowing supplies available to the City (e.g. cones, sandwich board signs, etc).

Deliverables:

- *If selected, draft and final concept plans for installation of a living preview; publicity materials design; meeting to confirm design; staff and materials budget to install project for up to two days; and summary of event*