

# SAFE STREETS AND ROADS FOR ALL ACTION PLAN 23-RFP-042

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**FORESITE**  
group

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## TECHNICAL PROPOSAL

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The following provides our detailed technical approach Effingham County's RFP, dated September 26, 2023, including key issues, solutions, and assumptions.

### TASK 1 - PROJECT MANAGEMENT

Foresite will provide overall management and coordination of the project. Foresite's Project Manager, Erik Steavens, successfully managed many planning efforts across the country. Mr. Steavens will be responsible for management of the scope, schedule and budget of this project and will be the primary point of contact with Effingham County's project manager.

Mr. Steavens and the Foresite Team recognizes that moving to implementation as early as possible is a goal of this project and will continue to look for efficiencies to accomplish this goal while not compromising the quality of the work.

**Meetings/Coordination:** The Foresite Team will provide full support to all the Stakeholders Committee, town-hall meetings, webinars, and focus group discussions. This includes meeting scheduling, preparation of agendas, meeting materials, facilitation, and meeting summaries.

Mr. Steavens will provide biweekly progress emails to Effingham County's Project Manager. Foresite, however, will not wait to notify Effingham County's Project Manager of issues. Effingham County will be alerted at once and Foresite will determine potential solutions and recommendations. Foresite and its team members will be available to meet with the Effingham County Project Manager to discuss issues or prepare for Stakeholders Committee meetings and other meetings. Furthermore, there is a once-a-month meeting with the Foresite Team and the County to work through draft technical memorandums.

**Invoicing:** Foresite will prepare monthly invoices accompanied by a written progress report that identifies work performed, upcoming work and deliverables, as well as any issues or potential issues that could affect the project scope, schedule, or budget.

**Communication:** Communication is the key to the successful completion of any project. It is particularly important when working as part of a multi-discipline team with subconsultants, and we recognize that any slip in our schedule could impact and delay the entire project delivery process. Keeping our staff and the Effingham County informed on a regular basis is critical to maintaining schedule, budget, and quality. Foresite's Project Manager will discuss the means for communication with the Effingham County and each of the reviewing agencies including key county stakeholders and set the protocol for this project. Action items will be documented and tracked, identifying task, person responsible to complete and date of completion for each action item to meet project objectives on schedule.

### TASK 2 – SAFETY DATA ANALYSIS

The Foresite team regularly weaves the fundamental 4E's perspective of highway safety (Engineering, Education, Enforcement, and Emergency medical services), as well as a fifth E for Equity, into a safe systems approach. By blending these foundational tools into a system of strategies, we have been able to assess the efficacy of safety enhancements more holistically both in terms of costs, but also more importantly in terms of lives saved. For this engagement, our approach to safety analysis will be rooted in a four-step process: data collection, data validation, high-injury network identification, and data visualization.

#### DATA COLLECTION

Effective safety planning requires a diverse set of information far beyond crash records, be it MIRE design features / roadway geometrics, safe routes to school and other active transportation networks, surrounding land use (e.g., local alcohol establishments), and disadvantaged community identifiers, to name a few. Having worked with various counties, MPOs, and DOTs; we have further found it prudent at times to include third-party data. For instance, High Street's subscription to Replica has allowed us to conduct comprehensive origin-destination assessments to better understand the profile of roadway users. Combining solutions like Replica with Climate and Economic Justice Screening Tool (CEJST) data is particularly helpful for identifying VRU routes. Our staff have also leveraged open-source data such as Strava Metro Area and RedFin's Walkscore.com data to capture walking/bicycling behaviors and better understand non-motorized crash risks.

Beyond joining in-house and third-party data, the Foresite team's local engineers stand ready to conduct roadway safety audits, apply innovative computer visioning to analyze field video logs, and collect subjective evaluations from stakeholders to ground truth our analysis.

#### DATA VALIDATION

After meticulous data collection, we conduct an in-depth exploratory data assessment, which includes quality checks, identification of data types, validation for null values, detection of outliers and inconsistencies, exploration of variable relationships, and evaluation of overall data quality and completeness.

Combining data layers often yields more value than the sum of its parts. As a simple example, crash counts and roadside design features are typically separate datasets; combining the two can yield important insights such as, the expected number of future fatal and serious injury crashes on a horizontal curve given its radius and outside shoulder width. To realize this value and build out a comprehensive library of safety data, our team has learned to employ the following guiding principles:

- 1. Add value.** Through transformations, cleaning or filling erroneous or missing data, combination with other data

sources, or simply creating descriptive field aliases, we always aim to improve the usability and value of the datasets we process and publish.

- 2. Standardize.** Whether through conflating data to common, canonical linework (e.g., a statewide Linear Referencing System (LRS) used by multiple agencies), or reprocessing data to exist at the same spatial or temporal “grain” as other datasets, we prepare datasets to be easily and logically combined with other library datasets.
- 3. Plan for sustainability.** We assume the data layers we produce will be updated over time. We plan for this from the outset, writing scripts, applications, and documentation that will enable a successful transition to the long-term data steward to update and maintain these layers over time.
- 4. Publish with professionalism.** High Street’s 12-step Publication Ready checklist for public facing GIS feature layers ensures that all published data layers are ready for public consumption, with complete metadata, attribution, and useful default symbolization.

High Street is an ESRI business partner and has extensive experience working with the full gambit of Esri software and infrastructure product offerings, including ArcGIS Server/Portal, ArcGIS Online, ArcGIS Pro, Experience Builder, Operations Dashboards, and Esri’s Roads and Highways LRS.

We will apply our proven approach, collaborating with project staff to identify target data layers, methods for adding value, and the publication destination. Except where limited by privacy concerns, our proposal would be to publish all data layers to a publicly accessible data portal to enable use by all stakeholders. Visually reviewing the data can further help validate that the collected data is fully telling the story given our and stakeholders’ understanding of local context.

### HIGH-INJURY NETWORK (HIN) IDENTIFICATION

Identifying high risk areas is a pivotal aspect of our safety analysis and a strong column in SS4A grant funding. We utilize a dual approach, encompassing both location-specific and systemic analyses, to identify areas warranting further evaluation and potential safety treatments. Our holistic approach recognizes the importance of addressing evidence-based crash hot spots while also proactively modernizing high-risk roadways, even before a significant number of crashes occur. We then compare this high-injury network to disadvantaged and vulnerable road users to find our most important types of corridors, intersections, and locations.

### LOCATION-SPECIFIC ANALYSIS

To pinpoint high fatal and serious injury crash locations, we segment data into 1-mile roadways and intersections and calculate five-year rolling average counts and crash rates. Our methodology extends to calculating Excess Expected Crashes and Level of Service of Safety (LOSS) through the use of Safety Performance Functions (SPFs) and the Empirical Bayes (EB) Method. This comprehensive approach allows us to identify concentrations of fatal and serious injuries that

exceed expected norms, providing a flexible framework for effective intervention, whether infrastructural, behavioral, or operational.

### SYSTEMIC-BASED ANALYSIS

Harnessing the power of machine learning algorithms and empirical analysis, our team delves into data patterns and trends to find the contributing circumstances related to crashes. We employ techniques such as Pearson correlation plots and tables, ensemble decision tree models, and traditional negative binomial regression models to identify statistically significant contributing factors behind high-severity, low-frequency crash locations. Identifying independent variables that correlate to crash risk, such as driver condition/behavior, non-motorist presence, environmental factors, roadway characteristics, crash sequence, injured person characteristics, and vehicle crash factors such as speeding. This systemic analysis provides an epidemiological framework to treat traffic incidents as a public health issue where we aim to identify underlying causes and predict future risk of incidents, much like an epidemiologist would identify causes and risks of a disease. This enables us to propose interventions that are both responsive and proactive, addressing the root causes rather than just the symptoms.

### DATA VISUALIZATION

Finally, our commitment to clarity and accessibility leads us to translate data analyses into engaging and understandable graphics, utilizing interactive, dynamic, and static infographic visualizations. High Street’s comprehensive approach ensures actionable insights and effective safety solutions tailored to the unique needs of each project. We stand ready to prepare automated spatial tools and dashboards to visualize crash hot spots, communicate summary statistics by region and member agencies, filter crash types by emphasis area and location, collect project submittals, and prioritize them, among other policy features identified with your staff. We will also use our experience leading the FHWA Data Visualization Center for the last decade to prepare infographics and other collateral for leadership around key safety messaging and talking points.

### TASK 3 – COMMUNITY ENGAGEMENT

#### ENGAGEMENT PLAN

The purpose of an engagement plan is to serve as a road map for community and stakeholder engagement and communications in support of the SS4A planning process.

Below is a short list of components that the Foresite Team has identified for the SS4A engagement plan:

- Engagement objectives
- Target audience(s)
- Outreach strategies
- Engagement phasing and scheduling

Detailed recommendations related to each item are provided below.

### **1. Objectives**

The objectives for the engagement plan set the tone for stakeholder engagement and help determine which outreach strategies are appropriate for inclusion in the plan. For the SS4A some might include:

- Identify community-based organizations (CBOs) and others with a stake in the development of the plan and consider establishing a formal partnership with one or more CBO(s) to support the engagement process.
- Identify outreach techniques for engaging community groups and the broader public.
- Ensure all stakeholders have open access to and input into the decision-making process and have timely information about the project as it moves forward.
- Provide reasonable public access to technical and other information about the project.
- Ensure the concerns, issues, and preferences of stakeholders are understood and reflected in the final plan document.

### **2. Target Audience**

Engagement will be tailored to include the wide range of SS4A internal and external stakeholders. Each target audience has a unique constellation of needs regarding how, where, when, and with whom engagement will be conducted. Furthermore, each target audience has its own unique familiarity with different facets of plan content (e.g., engineering knowledge, political knowledge and concerns, personal experience with safety issues). Audiences should be engaged in an order that best leverages and builds upon available information and solicits feedback that supports the next phase of engagement or plan development.

### **3. Outreach Strategies**

Foresite has used several strategies to get critical input from constituents. Foresite will work with County staff on the details of our proposed plan. Approaches for engagement could include:

- Establishing a Stakeholders Committee. This group has been referred to in the approach but will have a mix of technical staff, political and appointed staff, interest groups, and the public.
- Partnering with community-based organizations (CBOs) and neighborhood or district groups to receive input and feedback via small group meetings. CBOs can serve as trusted liaisons between city/county staff and consultants to the public who create a comfortable and familiar small-group context in which community members feel comfortable asking questions and sharing feedback. They are also great at helping to identify and address equity issues.
- Community workshops and public forums. Large workshops and forums (virtual or in-person) provide opportunities to share information with the public, get the word out about draft plans, and advertise upcoming engagement

opportunities. In-person workshops provide opportunities to gather nuanced insights from the public via hands-on idea-generating activities (e.g., mapping and sketching).

- Online outreach via a project website and surveys. This medium provides the opportunity to engage individuals who cannot attend in-person or timed events. It is important to be aware of language barriers (i.e., provide the website in commonly spoken languages) and acknowledge who cannot access this medium based on digital divides in the community.

## **TASK 4 – IDENTIFICATION AND ANALYSIS OF UNDERSERVED COMMUNITIES**

The SS4A plan will be developed using inclusive and representative processes to pursue a comprehensive approach to advancing equity for all, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, Indigenous, and Native Americans, Asian Americans and Pacific Islanders, and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality. The plan will further focus on the disproportionate, adverse safety impacts that affect certain groups on our roadways, particularly people walking and biking in underserved communities. Underserved communities are identified through data and available regional Environmental Justice Analysis, and in collaboration with community partners.

### **EQUITY CONSIDERATIONS**

Equity considerations are integral to our safety analysis. We leverage resources like the Justice40 dataset and Replica data to cross-reference findings with crash data, shedding light on the connections between transportation safety and socio-economic factors. This insight informs the integration of equity into location and facility prioritization. We'll take origin-destination data and determine if our most disadvantaged users are passing through our identified high-injury network.

### **FOCUSING ON VULNERABLE ROAD USERS**

Our analysis will include quantitative analysis of VRU fatalities and serious injuries that includes data such as location, roadway functional classification, design speed, speed limit, and time of day. To identify the percentage of VRU's killed or seriously injured we will take a multi-pronged approach:

- Align with upcoming VRU submittals by reviewing the safety assessments due to FHWA in November that considers the demographics of the locations of fatalities and serious injuries, including race, ethnicity, income, and age.
- Track trips originating from disadvantaged locations. We will leverage census resources like the Equitable Transportation Community Explorer (ETCE) to blend with origin-destination (OD) data by cross-reference findings with crash data, shedding light on the connections between transportation safety and socio-economic factors. This insight informs the integration of equity into location and facility prioritization.

By combining routing engines like the Open Streets Routing Machine (OSRM) with OD information (from the regional travel demand model, tools like Replica) to traffic analysis zones, the number of trips using a facility can be estimated without running a time-intensive select-link analysis with the TDM.

- Engage with stakeholders to leverage their local knowledge of locations with higher VRU and crash density on the HIN.

## **TASK 5 – ASSESSMENT OF CURRENT POLICIES, GUIDELINES, AND STANDARDS**

Having a clear vision is important when beginning to develop the plan. A vision is a description of the desired outcome of the RCSA. This may be simple, such as, “to improve road safety within our jurisdiction in order to significantly reduce the number of people being killed and seriously injured.”

### **GOALS ARE SET TO ACHIEVE A MISSION AND VISION.**

Goals should be linked to the mission statement and should be realistic. For example, “saving lives and preventing serious injuries over the next decade on our local county roads” is concise and easily understood. It creates the need to move forward because it prompts action.

The Foresite Team will work with the County and the Stakeholder Committee to ensure regional and local goals that lead to action are thoughtfully developed.

### **PROPOSE ORDINANCES AND POLICIES**

One potential outcome to assist in implementing emphasis areas may be changes in current practices. This may necessitate changes to the laws and regulations in the County. Local ordinances and local government policies addressing local road safety may help support efforts to meet the goals and objectives of the SS4A and increase public awareness of driver behavior issues.

Formalizing policies can also help to improve and institutionalize safety. For example, a locality can develop policies related to maintenance of signs and pavement markings, provision of pedestrian features, transverse rumble strips, or vegetation removal. These policies can also serve as proactive risk management tools if they improve and institutionalize safety, by showing a measured approach towards improving safety.

If these types of changes are deemed necessary by the County and Stakeholder Committee, the Foresite team will assist drafting such items for the County member jurisdictions.

## **TASK 6 – IDENTIFICATION AND PRIORITIZATION OF PROJECTS AND STRATEGIES**

The true challenge in transportation safety lies not just in gathering abundant data but in transforming that information into meaningful, targeted actions. Task 6 is designed to synthesize analytical findings, community sentiments, and expert opinions to pinpoint emphasis areas that are both data-validated and community-endorsed. This nuanced approach allows us to leverage available resources efficiently, while laying the groundwork for securing additional funds.

## **UTILIZATION OF ADVANCED DATA LAYERS AND PREVIOUS EXPERIENCE**

Leveraging the multi-layered safety database developed in Task 2, we will use our High-Injury Network to identify emphasis areas that are important to the region. Diving into community meetings, stakeholder engagement, and planning documents to identify areas of most concern that match our high-risk network. We will also integrate the lessons learned from our implementation of the Strategic Highway Safety Plan (SHSP) in Kansas. For instance, rural intersections with poor lighting can be overlooked but may have a higher rate of nighttime crashes. We will apply similar insights to identify often overlooked but crucial emphasis areas. Our team of data scientists and GIS professionals will be able to quickly flag and explore potential causes and risk factors associated with different crash types.

## **DEEP-DIVE COMMUNITY ENGAGEMENT AND STAKEHOLDER MEETINGS**

To augment our data-driven approach, we plan to hold a series of town-hall meetings, webinars, and focus group discussions. Unlike general community sessions, these will be thematic based on information from the systemic analysis, e.g., “Pedestrian Safety in School Zones,” to obtain specific and actionable community insights. For example, we found that involving local schools in discussions about pedestrian safety resulted in more targeted and effective solutions.

## **VULNERABLE ROAD USERS SUB-COMMITTEE**

We propose a special sub-committee to deal exclusively with the safety of vulnerable road users. This sub-committee will utilize the portion of the data analysis that used Justice40 and Replica data to combine them with field studies and stakeholder interviews. The aim will be to create an effective method to categorize a vulnerable user emphasis area.

## **REVIEW OF PLANNING DOCUMENTS AND SPEED MANAGEMENT**

After identifying a preliminary list of emphasis areas, we will consult existing planning documents, such as the Strategic Highway Safety Plan, County Traffic Study Plans, and historical complaints databases for validation.

Using the machine learning algorithms refined in Task 2 systemic analysis, we will dig deep into broader issues like speed management to identify a speed related emphasis area. Speeding crashes involve exceeding safe speed for conditions, failing to reduce speed to avoid a crash or operating a vehicle in an erratic, reckless, careless, negligent, or aggressive manner. Speeding often results in greater potential of losing control of the vehicle, less time for driver response for crash avoidance, and the need for increased stopping distance and increased crash severity.

## **PRESENTATION TO COUNTY STAFF AND FINAL DELIVERABLES**

We will compile a detailed final report that incorporates all aspects mentioned above. Our experiences have taught us the importance of engaging with County staff early and often. Hence, this report will be presented in a workshop setting to

the County staff, allowing for real-time feedback and iterative revisions. All allowing us to employ a data-driven yet deeply human-centered approach to identify and prioritize emphasis areas.

### TASK 7 – IDENTIFY STRATEGIES TO ADDRESS EMPHASIS AREAS

The Foresite team will facilitate the working group to identify the key emphasis areas for the SS4A plan. An emphasis area is an area of opportunity to improve safety through a comprehensive 4 E -approach(engineering, enforcement, education, and emergency services).

The emphasis areas will be consistent with trends identified during the data analysis. The development of emphasis areas should have a robust public engagement process so that citizens have the chance to identify areas of concern.

### IDENTIFY EMPHASIS AREA OBJECTIVES AND PERFORMANCE MEASURES

Each emphasis area will help meet the plan’s overall goal by establishing objectives and performance measures. Performance measures are short term outcomes that contribute to achieving the strategic plan. They provide milestones, indications of progress, and will be established within a specific, actionable time period. Performance measures may be set at specified time intervals measured over the life of the plan such as, “reducing roadway departure fatalities each year and an overall reduction of 10 percent within five years.”

### CATEGORIZE AND REVIEW

The SS4A will include strategies focused on addressing the emphasis areas that are confirmed by the working group. Strategies will be based on identifying, categorizing, and reviewing high priority corridors or intersections for improvement. These are locations where safety improvements are most needed to achieve the goals of the SS4A and can form the basis for system-wide improvement strategies. Strategy selection will also be based on effective and validated practices. Options will be provided by the Foresite Team to the County and working group for consideration and ultimate inclusion in the plan.

### IDENTIFY PRIORITIES

The Foresite team will propose strategies for each key emphasis area. These will be prioritized by the working group by comparing the benefits and costs of implementation. This comparison will help the implementation phase by starting with the strategies that provide the highest benefit (e.g., reduction in crashes) for the least cost. However, costs and benefits are not the only considerations. Other considerations for prioritization will include the availability of manpower (e.g., does the County maintenance staff have time available to trim vegetation over the summer), the schedule for implementation (e.g., are there short-term strategies that can be implemented rather quickly), and the relative importance of each emphasis area. The working group will determine an agreed upon priority for the strategy with these considerations in mind.

### TASK 8 – DEVELOP THE SS4A PLAN

#### DRAFT THE PLAN

At this point the working group has developed and prioritized the issues, needs, and strategies to address the safety concerns in the County and at the local level. The Foresite Team will provide a through accounting of this process using the following as out report outline.

- INTRODUCTION
- PURPOSE
- MISSION AND VISION STATEMENTS
- FINDINGS FROM CRASH ANALYSIS
- EMPHASIS AREAS
  - Objectives
  - Performance Measures
  - Strategies
  - Action Plans

The goal of the written report will be to make the case for safety improvements in the County but at the local level as well. This document will be the basis for engaging state and federal agencies funding to implement the plan.



Foresite Group has no exceptions or changes to the County's proposal at this time.