Safer Streets Priority Finder

Free Web Based Safety Analysis Tool

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Toole Design Group | July 24, 2026

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Outline

1. Background
2. SSPF and it’s evolution
3. Analysis – Inputs and Outputs
4. Tool workflow
5. Use Cases
6. Questions & Discussion

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Traffic safety is a public-health crisis

39,000+

traffic deaths in the U.S. in 2024

2.42M

people injured in traffic crashes

Elevated

fatalities remain higher than a decade ago

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The common safety analysis process

The usual safety toolkit

- Crash summaries
- Hotspot analysis
- High Injury Networks (HIN)
- Systemic crash-risk analysis

What it usually takes

- Complete, reliable local crash data
- GIS capacity to build the network
- Statistical expertise for risk models
- Staff time to pull it all together

SSPF lowers the barrier - putting all of these analyses within reach of any agency, in one free tool.

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What SSPF is

A free, open-source web application that lets any agency screen its road network for safety risk without requiring advanced GIS, analysis, and statistical modelling skills.

Version 1.0 · 2021

- Model focused on pedestrians (bicyclists added post-hoc)
- Used a tract level pedestrian fatality model
- Limited user customization
- Funded by USDOT Safety Data Initiative

Version 2.0 · 2026

- Model includes pedestrian, bicycle, and motor vehicle modes.
- Updated block group fatal crash model
- More user customization and faster analysis
- Funded by SS4A grant

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What's new in Version 2.0

Broader modal coverage

One consistent framework now covers pedestrian, bicycle, and motor-vehicle risk across the full KABCO severity scale.

Updated risk model

The model aligns with current safety-research practice - empirical Bayes methods from the Highway Safety Manual.

Minutes, not hours

A redesigned engine replaces slow simulations; analyses that once took hours now finish in minutes, in your browser.

More user control

Severity weights, window lengths, crash costs, and more are now configurable - each with a sensible default.

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Two main analysis

Sliding Windows Analysis

"Where have severe crashes already occurred?"

- Moves a window along each corridor, weighting crashes by severity
- Fast, intuitive, and grounded in observed data
- Only as reliable as the crash record behind it

Safer Streets Model

"Where are the conditions for severe crashes present?"

- Blends a national risk model with local crash history
- Surfaces risk even where crashes aren't recorded yet
- Reveals what crash history alone would miss

Use them together: high on both = strong investment candidates · high on the model only = systemic opportunities others miss

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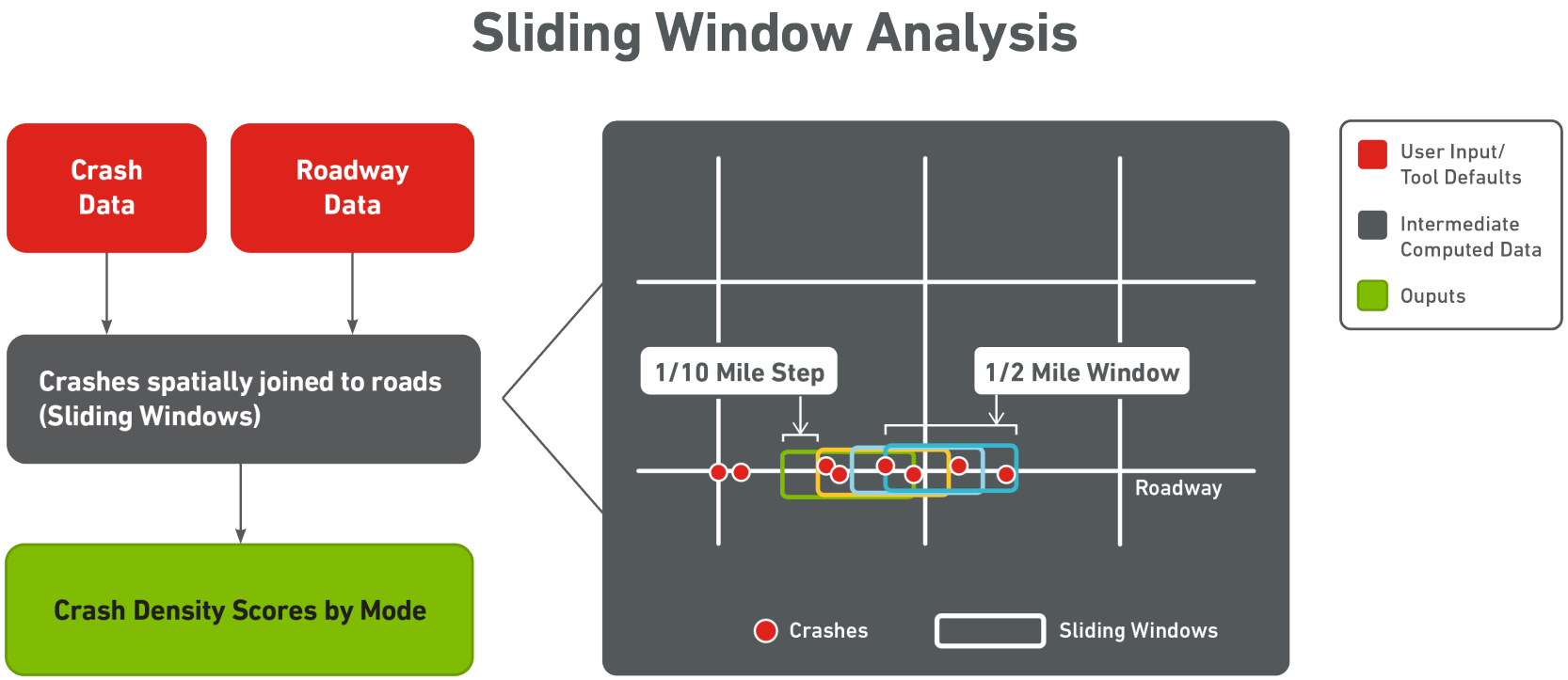
Crash Density



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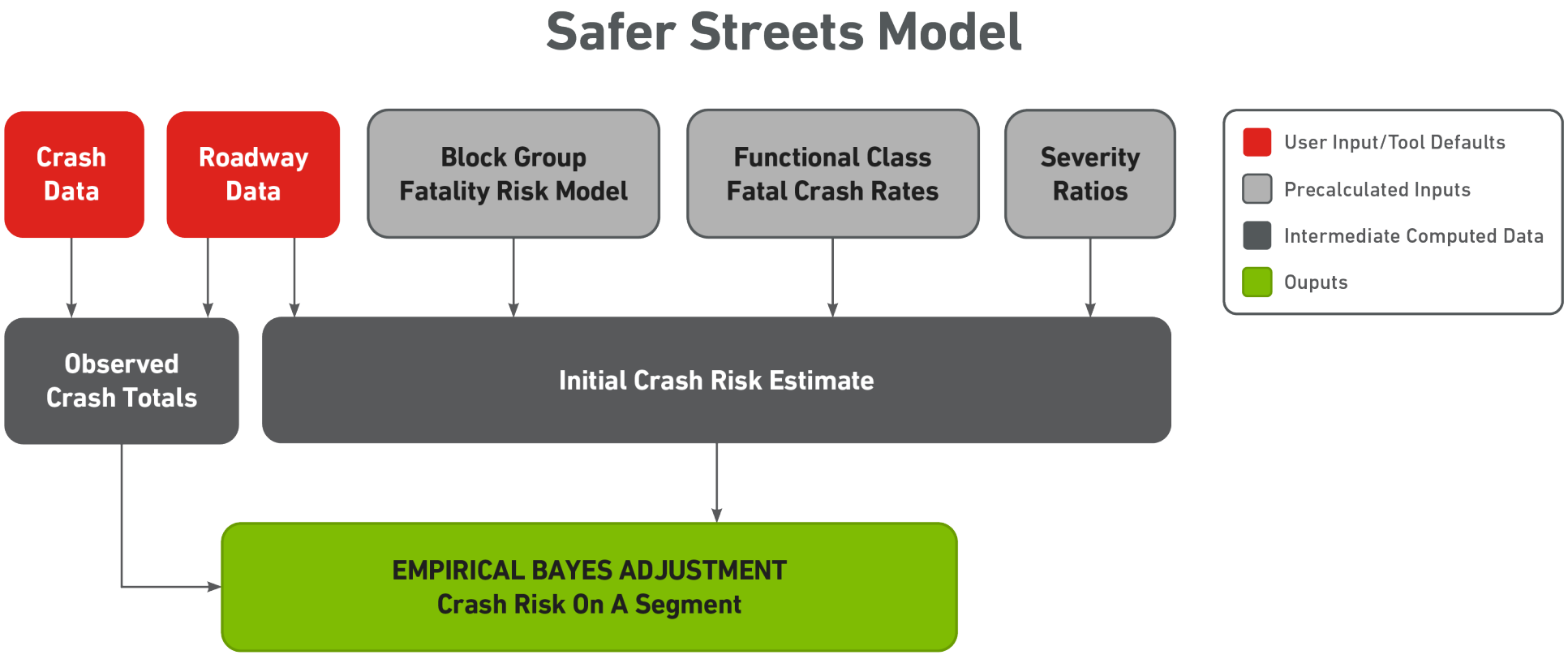
Crash Risk



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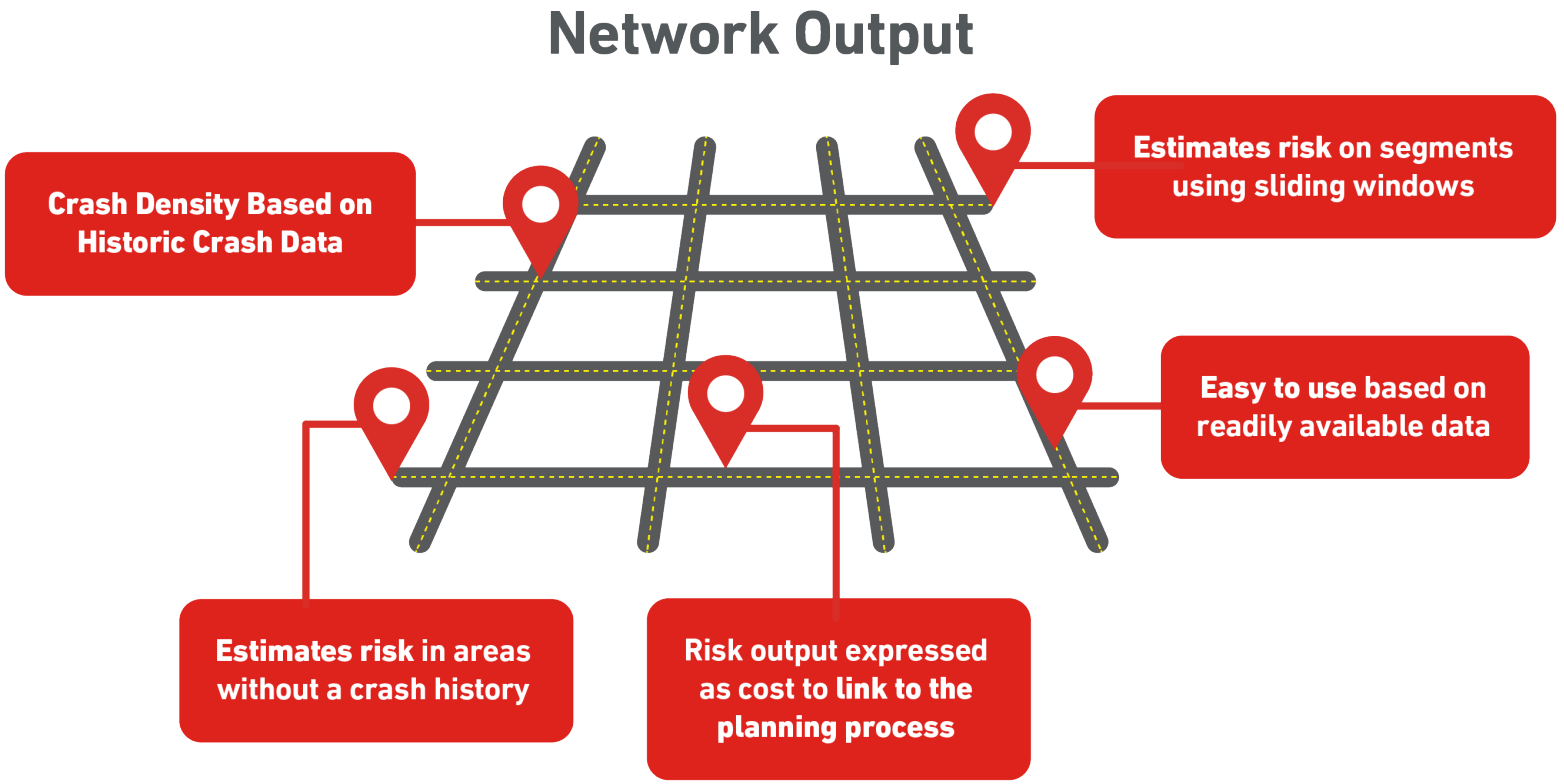
Network-based Output



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What goes in, what you can tune

What you provide

- **Study area** - a county/parish, or your own boundary
- **Road network** - OpenStreetMap by default, or upload your own
- **Crash data** - your local 5-year, all-severity records, or pre-loaded FARS data

Six national datasets come pre-loaded.

What you can tune

- **Severity weights** - how much each injury level counts
- **Window length** & spatial resolution
- **Crash costs** - default to FHWA societal costs
- **Join distance** & number of corridors reported

Every parameter ships with a sensible default.

Run with the defaults, or substitute local data and adjust where local policy or crash patterns warrant.

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What you get out

Interactive dashboard

Explore top corridors and crash patterns through interactive charts - filter and export as you go.

Map visualization

Overlay crashes, segment results, and block-group risk on a single interactive map.

Compiled PDF report

A shareable summary of inputs, settings, and key results - ready for stakeholders.

GIS data package

A GeoPackage of every input and output for your own GIS workflows and project pipelines.

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Tool Workflow

1. Load Data
2. Set Analysis Parameters
3. Run Analysis
4. Explore Dashboard
5. Review Map Results
6. Download Outputs

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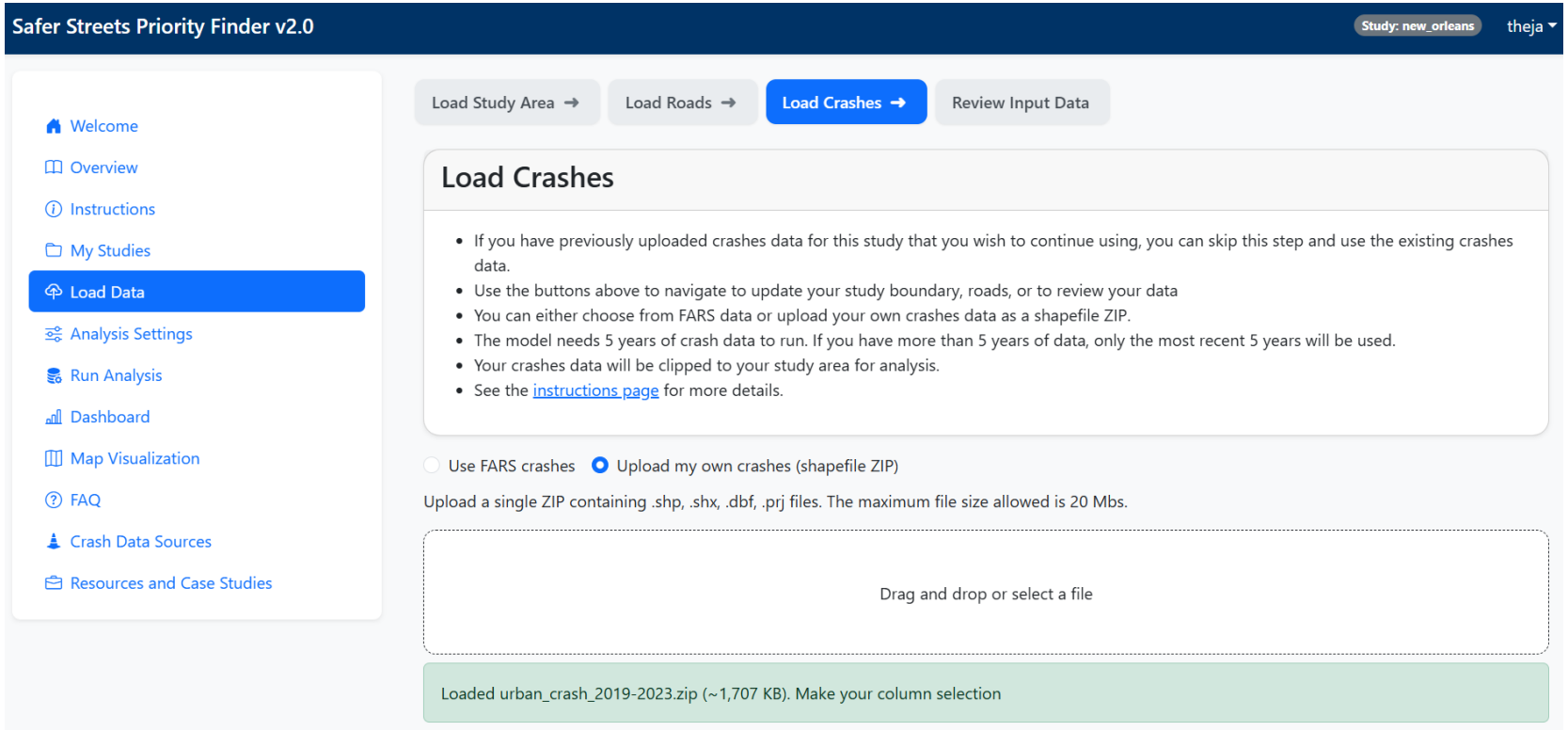
Step 1: Load Data

- Study Boundary
  - Select county or upload a shapefile
- Roads
  - Select built-in OSM roads or upload a shapefile
  - Fields: Functional Class and Name
- Crashes
  - Select built-in FARS data or upload a shapefile
  - Fields: Crash mode, severity, year



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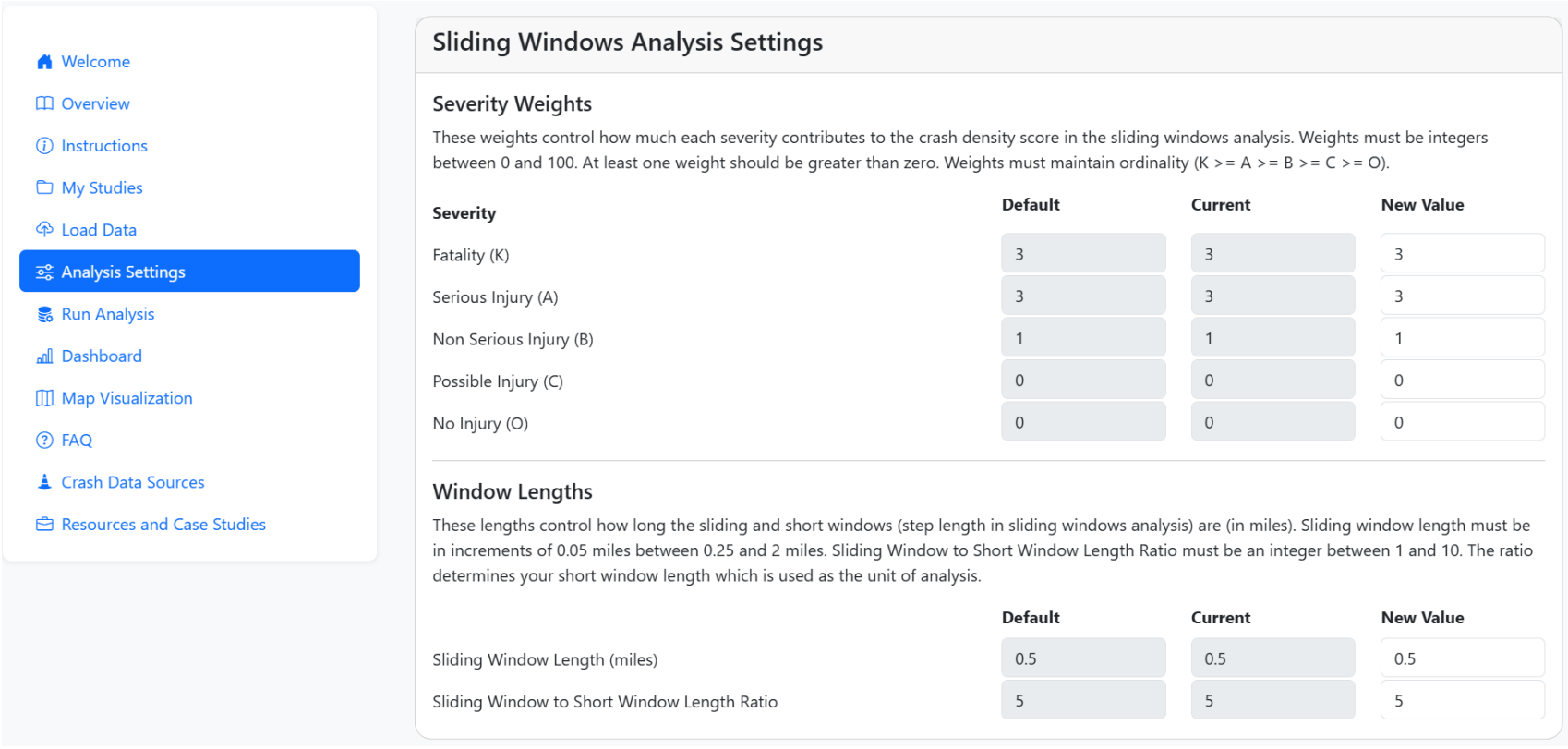
Step 2: Set Analysis Parameters

- Severity weights
- Window lengths
- Crash Costs
- Crash join distance
- Number of corridors in output
- Use the defaults or update based on study needs



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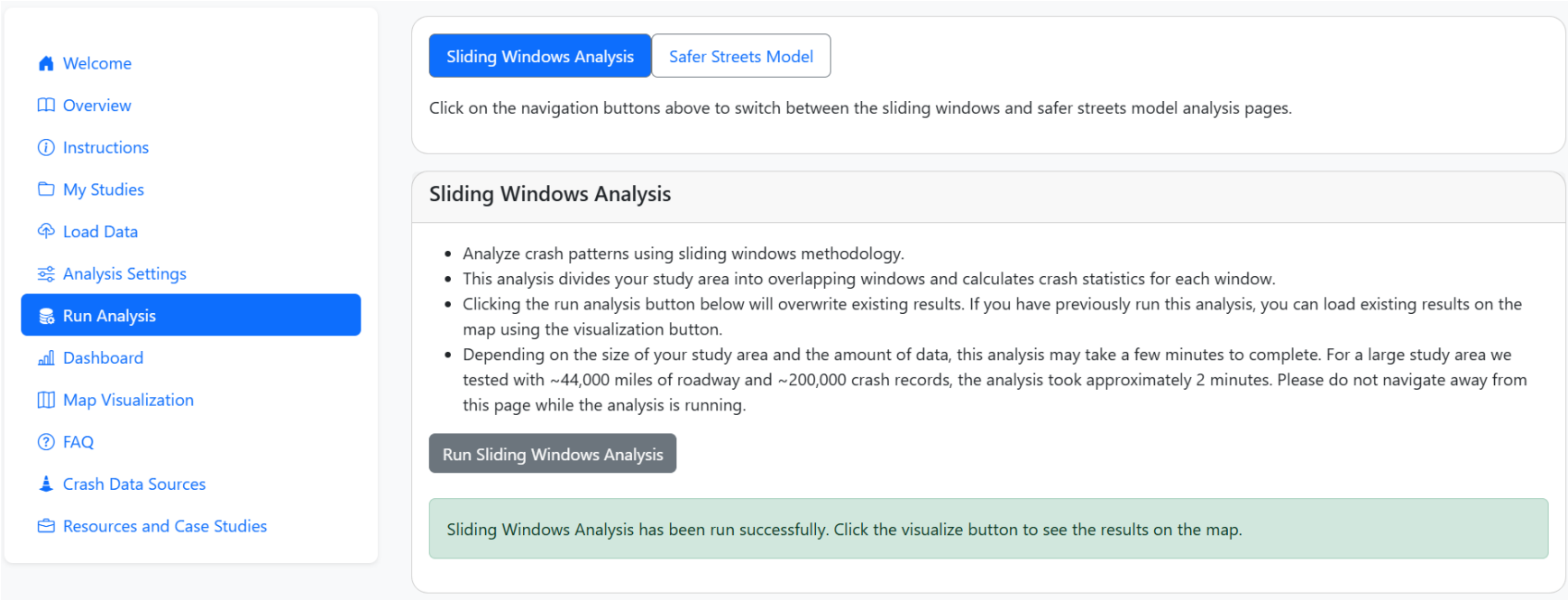
Step 3 · Run Analysis

- Run Sliding Windows
- Run Safer Streets Model
- Review both outputs in the same page



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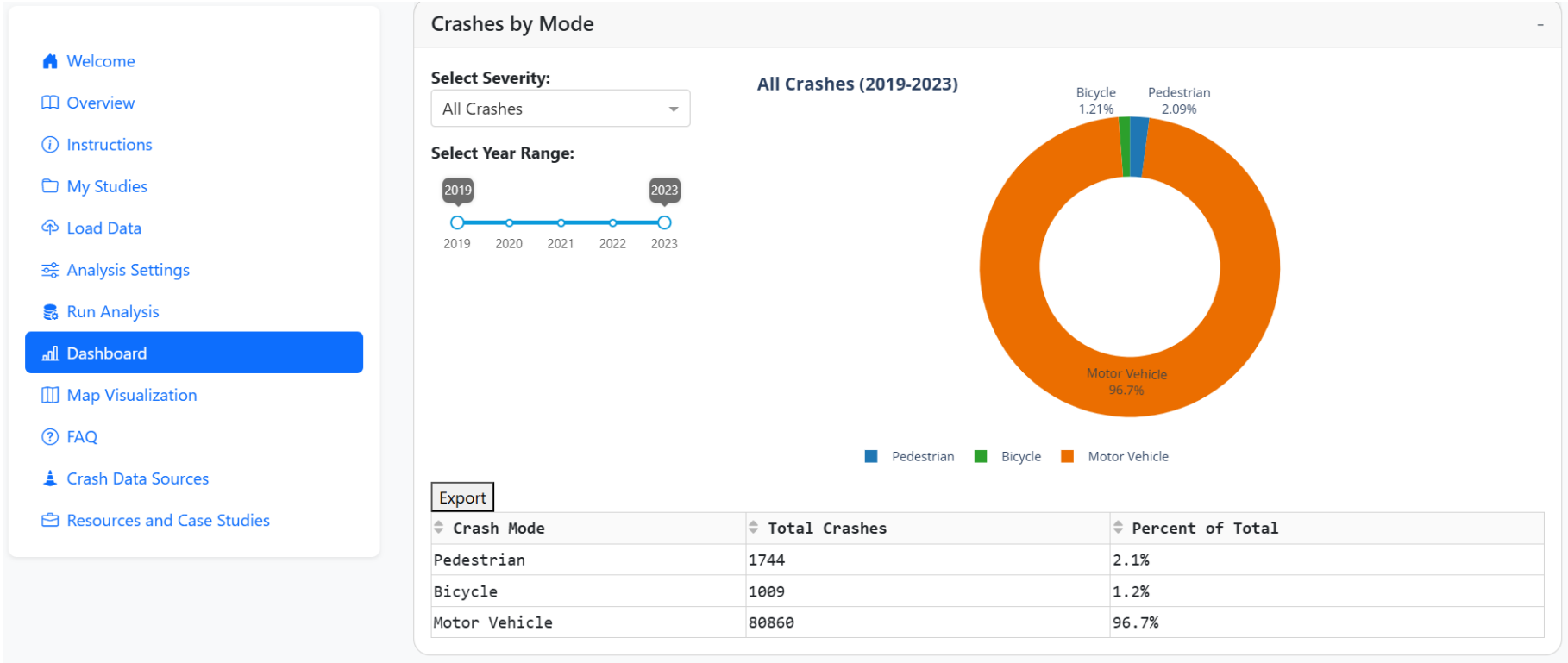
Step 4 · Explore Dashboard

- Descriptive Statistics
- Interactive charts
- Highest crash density corridors
- Model fit charts



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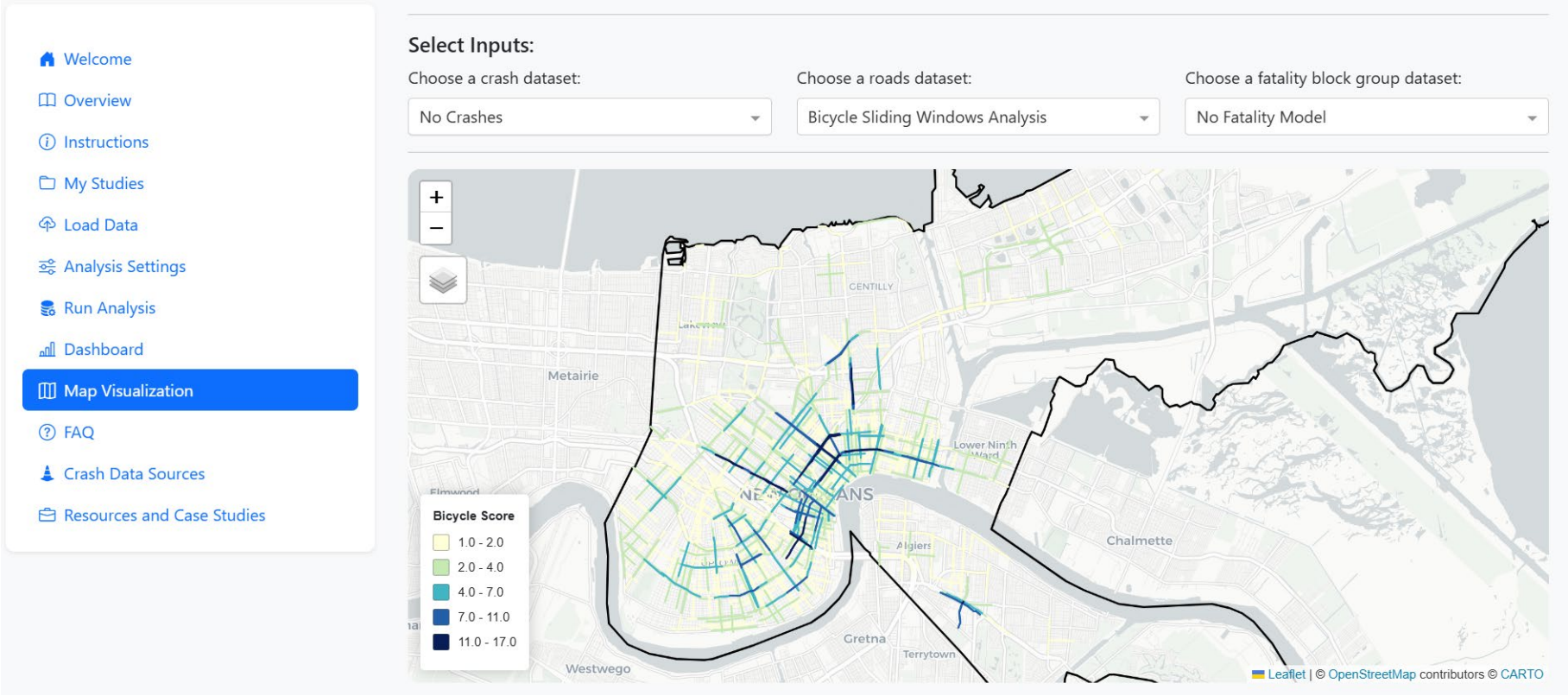
Step 5 · Review Map Results

- Visualize
  - Crashes
  - Sliding Windows or Model outputs
  - Block Group Fatal Crash Model
- Interactive Map
- Click features for details



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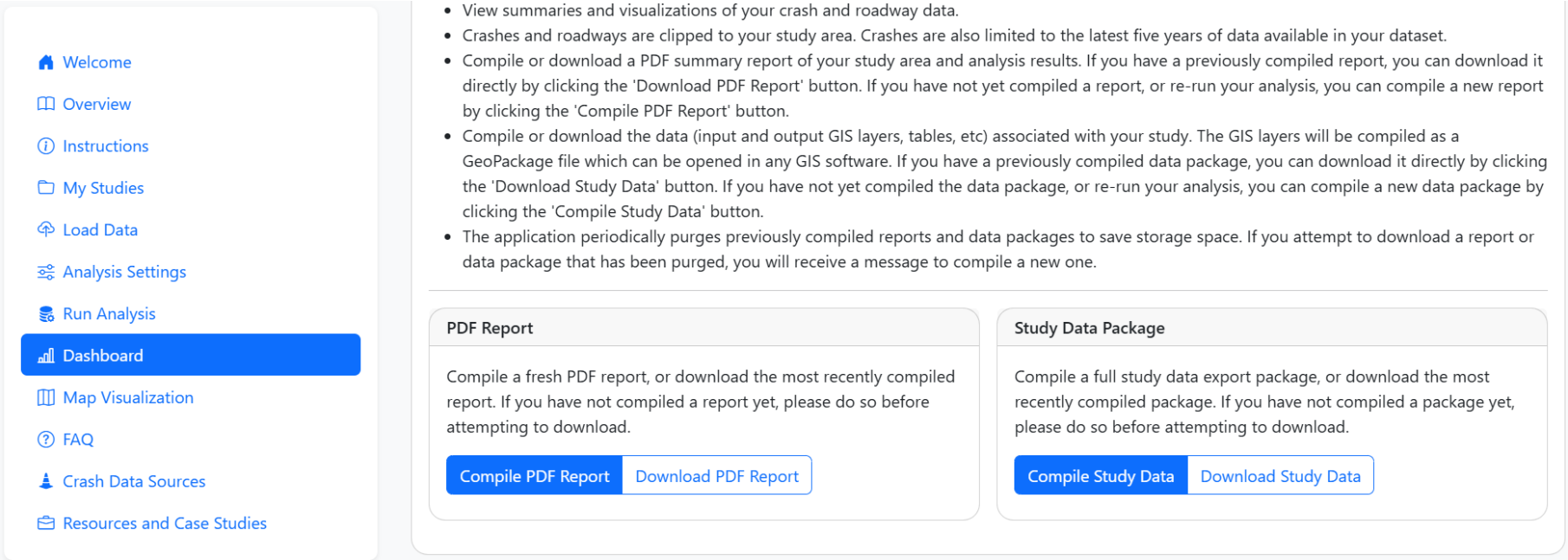
Step 6 · Download Outputs

- Download in dashboard page
- Study data as a GIS layers
- Study outputs as a compiled PDF



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Tested across three contexts

New Orleans, LA
Dense urban

Albany, OR
Small–mid suburban

Knox County, OH
Low-density rural

Model Validation and Calibration

The model is validated using 10 years of crash data split into two 5-year testing and validation dataset.

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Using SSPF well

Use it for

- Early-stage screening and quick risk overviews
- Building and prioritizing a project pipeline
- Supporting a Safety Action Plan
- Comparing corridors within a single analysis

Not a substitute for

- Detailed engineering studies or calibrated SPFs
- Site-specific crash diagnosis and countermeasure selection
- Treating modeled counts as exact crash forecasts

SSPF is the entry point - it shows where deeper analysis should focus, not a replacement for it.

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Get started - it's free and open-source

Use the tool https://sspf.tooledesign.com/

Resources & Case Study Data https://sspf.tooledesign.com/resources

Source code https://github.com/tooledesign/Safer-Streets-Priority-Finder

Contact saferstreetspriorityfinder@tooledesign.com

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