The Trail Modeling and Assessment Platform (T-MAP)

Presentation to Caltrans Active Transportation & Livable Communities Advisory Group

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Overview

- Rails-to-Trails Conservancy's (RTC) research program
- Applicability to Caltrans:
  - Tools for ATP applicants, state & local agencies
  - Metrics & evaluation tools for State Bike & Ped Plan
  - Benchmarks & data for Strategic Plan goals of tripling biking & walking by 2020

Research and Information: Creating Quality Trail Systems

Photo by RTC/Katie Harris

Our commitment to research is driven by a simple but powerful goal: to assist trail builders across America in creating trails and trail networks that change the fabric of their communities—increasing mobility, improving health and wellness, spurring economic development and supporting vibrant social interactions.

We continue to achieve this by:

- Implementing a research agenda that provides the trail-building community with resources, materials and innovative training methods
- Documenting the benefits (and returns-on-investment) of filling gaps in biking and walking systems, leveraging the benefits of strong partnerships with world-class researchers in the field

Project Highlight

The Trail Modeling & Assessment Platform (T-MAP)
RTC is leading a nationwide effort to create the next generation of urban trail planning tools.

Learn More

Our Trail-Building Expertise

With a command of international best practices, tools and research, our trail development team helps communities around the country successfully build, maintain and generate public support for trails and connected trail systems. Learn about our extensive trail-building services.

Rails-to-Trails Conservancy Mission

"To create a nationwide network of trails from former rail lines and connecting corridors…

…to build healthier places for healthier people."

- Adopted Oct 2004

Looking Back

<u>Past success:</u>

- 1986: 250 miles
- 2015: >22,000 miles

Looking Ahead: Our BHAG

<u>Our Big, Hairy, Audacious Goal:</u>

By 2020, 90 percent of Americans will live within three miles of a local trail system.

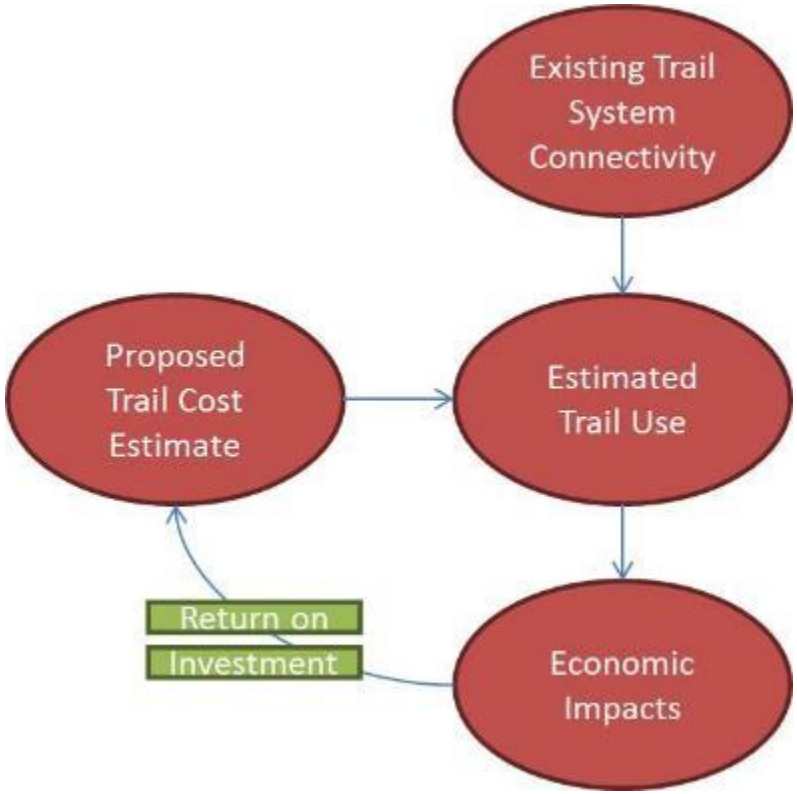
Conclusions

- Measuring proximity is useful, but limited
- It does not address equity
- It does not ensure usage
- Accessibility and connectivity are crucial factors in determining if infrastructure change supports behavior change

The Genesis of T-MAP

- Emerged from an internal staff dialogue about creating “TrailScore” to measure trail system connectivity
- Evolved into a platform of tools that will take the trails movement to an entirely new level of sophistication
- Will permit us to make the case for trail investment based on ROI

Logic Model


Existing Trail System Connectivity
Proposed Trail Cost Estimate
Estimated Trail Use
Return on Investment
Economic Impacts

Our Team

Dr. Greg Lindsey

University of Minnesota
Driven to Discover℠

Dr. Thomas Gotschi

University of Zurich[UZH]

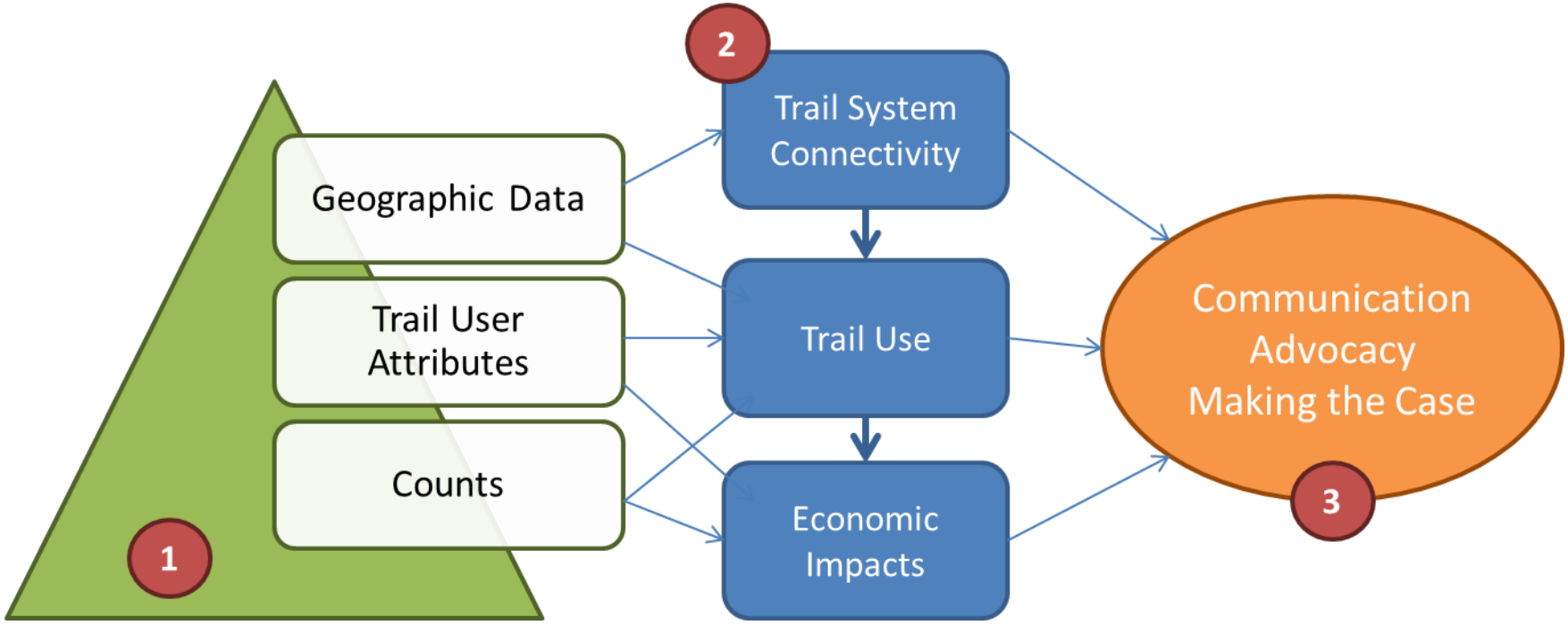
Dr. Mike Lowry

University of Idaho

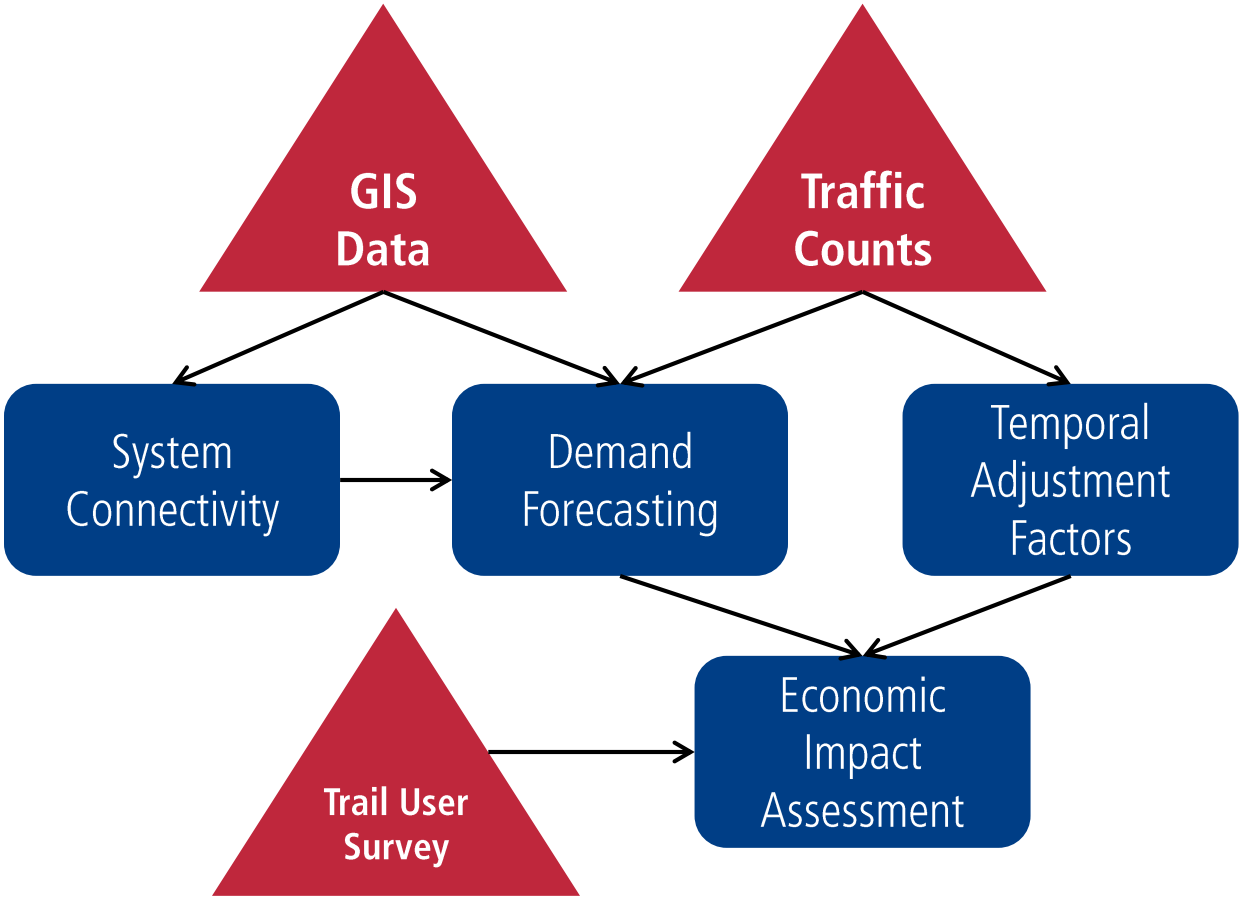
Advisory Committee

- Jack Wells, retired USDOT Chief Economist
- Andy Dannenberg, University of Washington School of Environmental and Occupational Health Sciences & School of Urban Design and Planning
- Sean Co, Toole Design
- Peter Furth, Northeastern University, Department of Civil Engineering
- Jean-Francois Rheault, Eco-Counter
- Joan Dorn, City University of New York, Department of Community Health and Social Medicine
- Spencer Finch, Langan Engineering & Environmental Services
- Jeffrey Riegner, Whitman, Requardt & Associates

T-MAP by Component

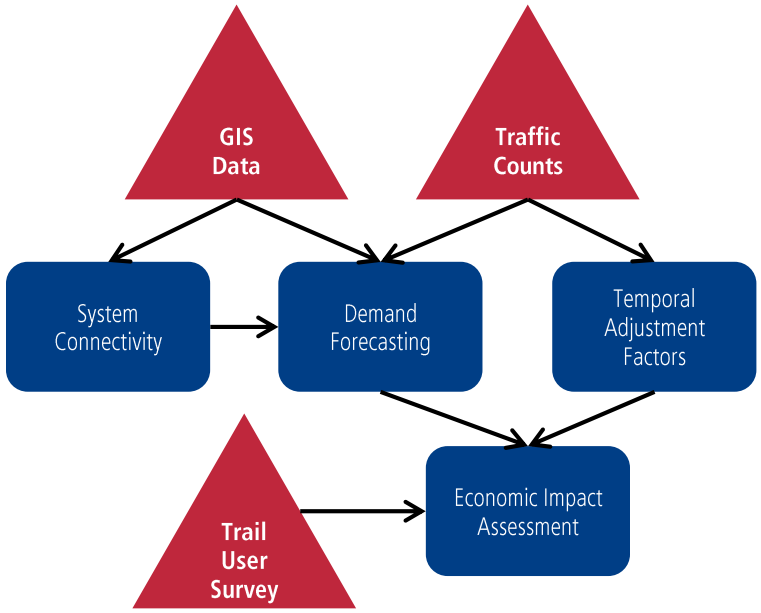


Inputs & Outputs



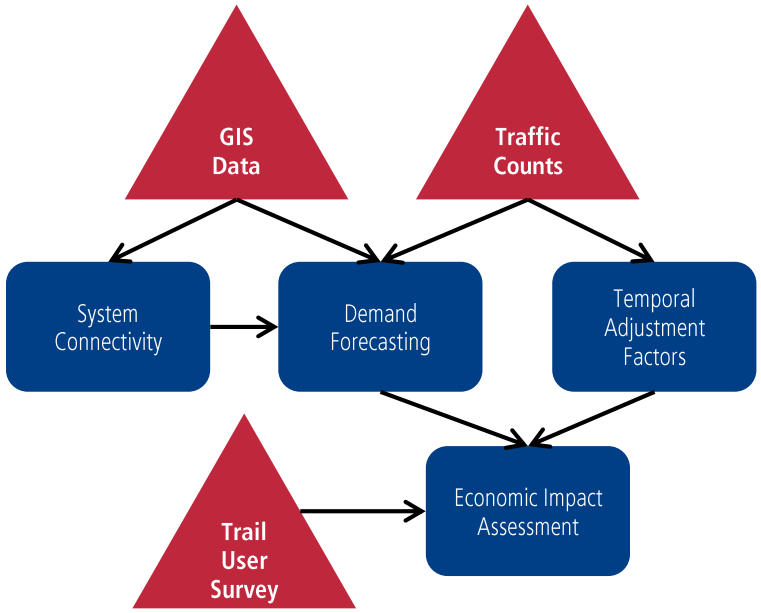
Four New Tools

- Temporal adjustment factors
- Demand forecasting
- Economic impact assessment
- System connectivity



Four New Tools

- Temporal adjustment factors



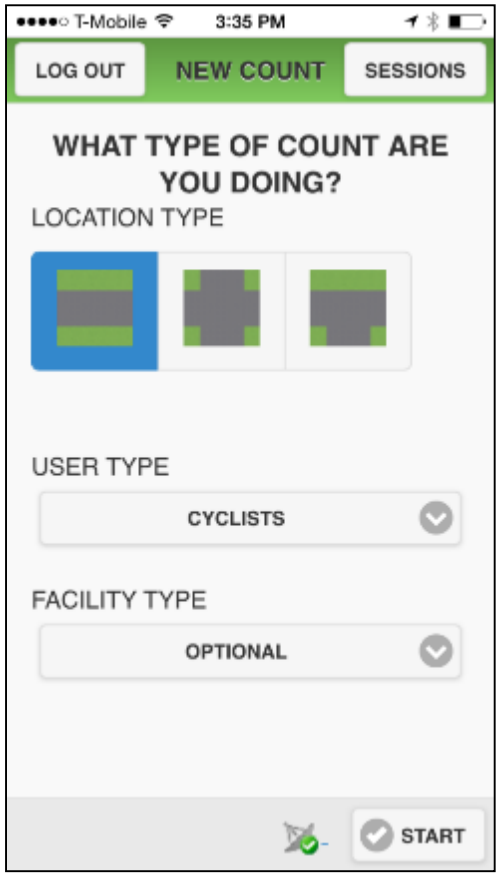
Temporal Adjustment Factors

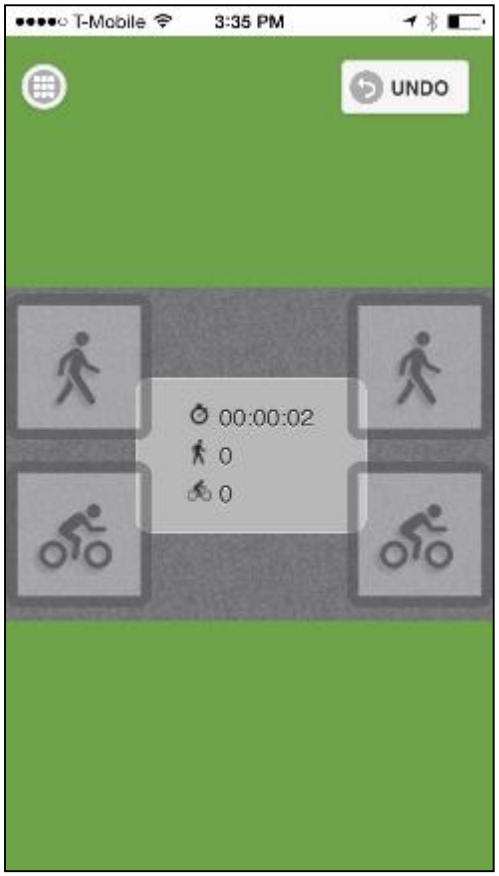
X

=

- How many visits does my trail get per year?
- What is the peak trail use on my facility?
- What is the modal distribution of my users?

Temporal Adjustment Factors





Trail Traffic Calculator

Data Source: Department of Energy Building America Climate Zones
http://energy.gov/eere/buildings/downloads/building-america-best-practices-series-volume-7-1-guide-determining-climate

Region: Please Select

Mode: Please Select

Day Type: Please Select

Date: mm/dd/yyyy

Start Time: Please Select

Count:

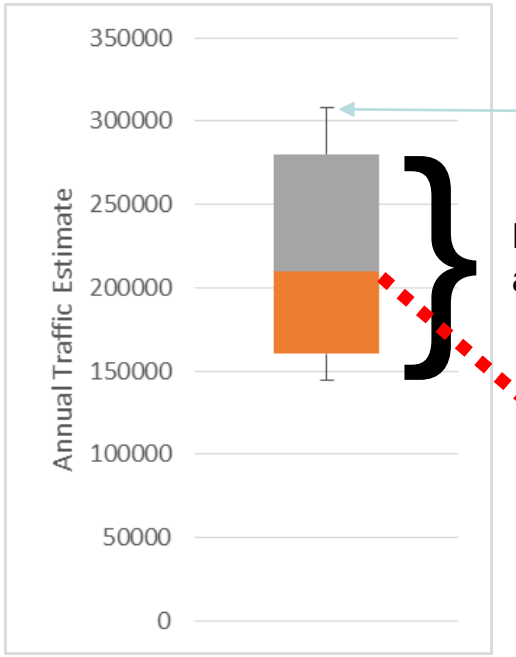
Calculate

AADT:

Temporal Adjustment Factors

Temporal Adjustment Factors

The _____ Trail:



10% margin

Estimate range using alternative factoring methods

Mean estimate: 220,000 annual trips

Four New Tools

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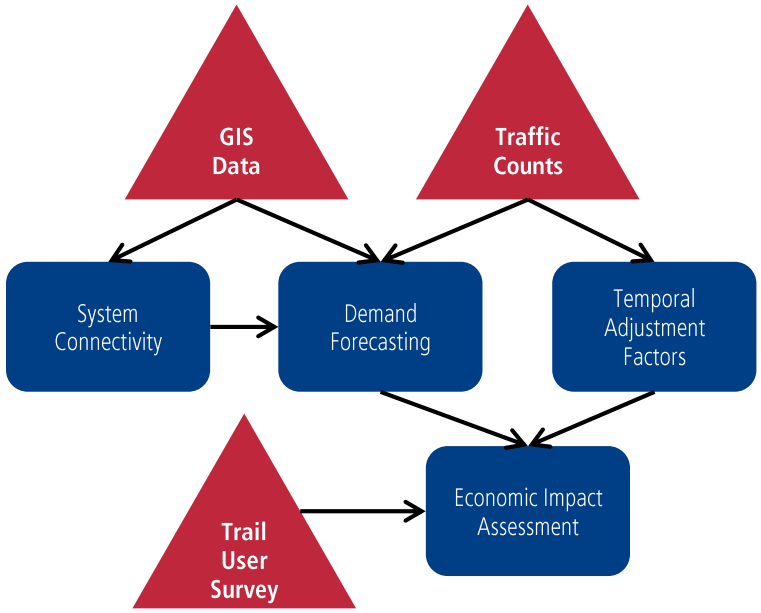
- – Demand forecasting



Demand Forecasting

Model coefficients

$$Y = a + b_1*X_1 + b_2*X_2 + \ldots + b_p*X_p$$

OUT OF SAMPLE PREDICTION

Proposed trail variables:
Trail width, population within some distance, etc

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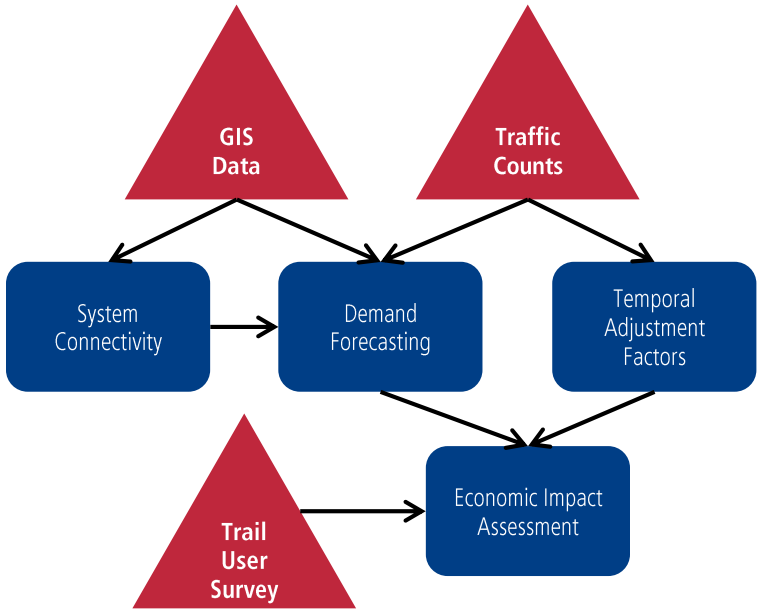

$ Benefits of Trails

Economic Impact Assessment

- Real estate
- Consumer spending (tourism)
- Mobility
- Health
- Safety
- Floodplain management
- Historic & cultural
- Livability

Economic Impact Assessment

Real estate

Safety

Consumer spending (tourism)

Mobility

Health

Floodplain management

Historic & cultural

Livability

Fiscal Impacts

Economic Impact Assessment

T-MAP tool

Impact measure	Monetization
Premature deaths avoided, live years saved, life expectancy	Value of statistical life
Prevented disease cases, injuries	Treatment costs
	Loss in productivity costs
Reduction in air pollution	(VSL, treatment costs)
Reduction in GHG	n.a.
Vehicle miles avoided	Fuel savings, (other?)
	Road wear and tear savings

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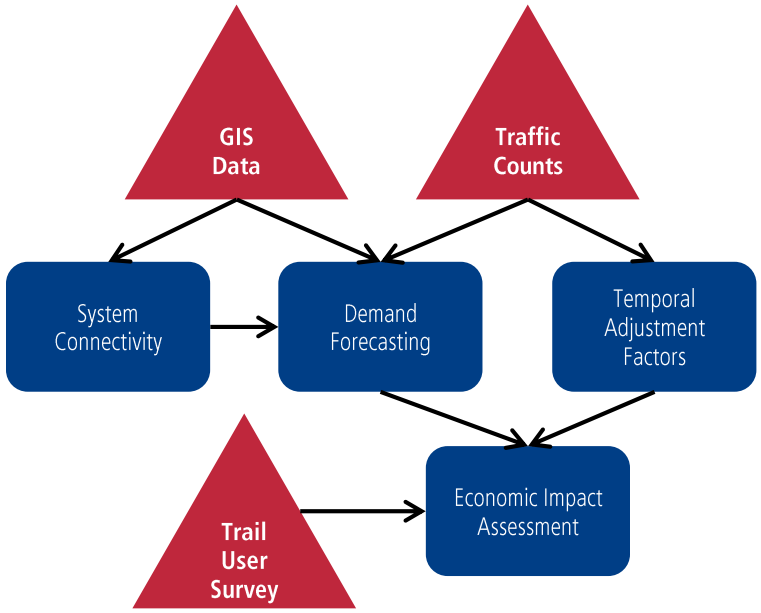
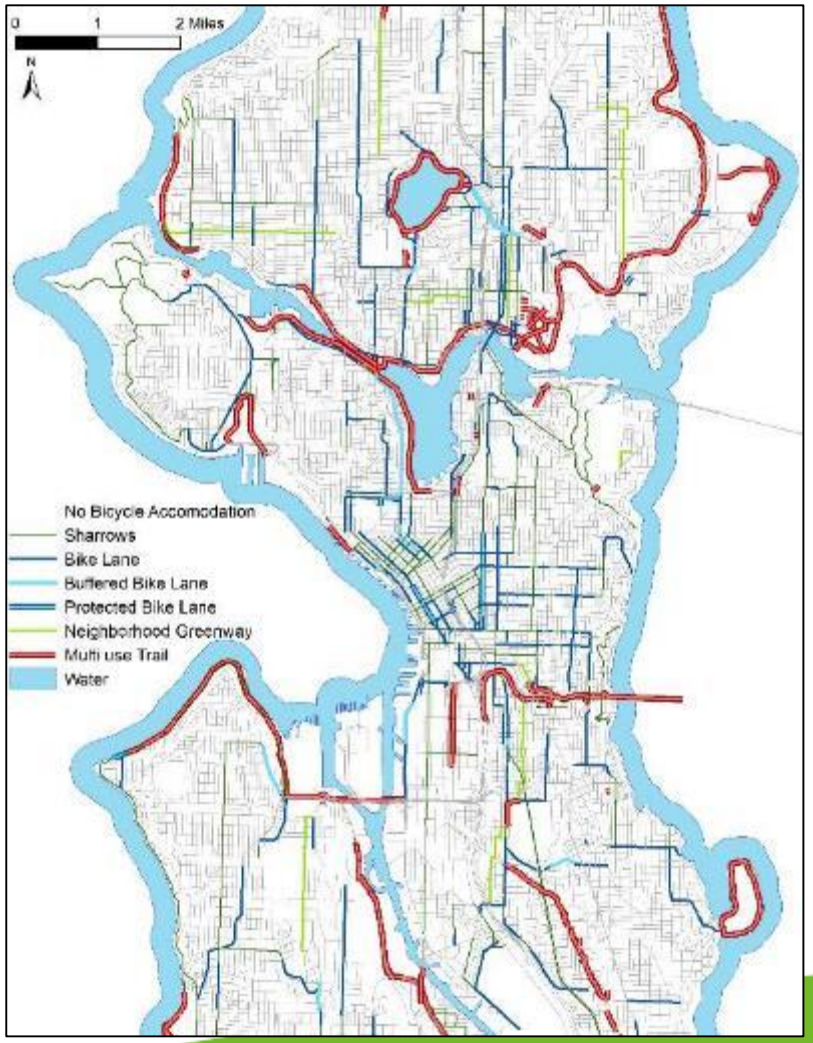


System Connectivity

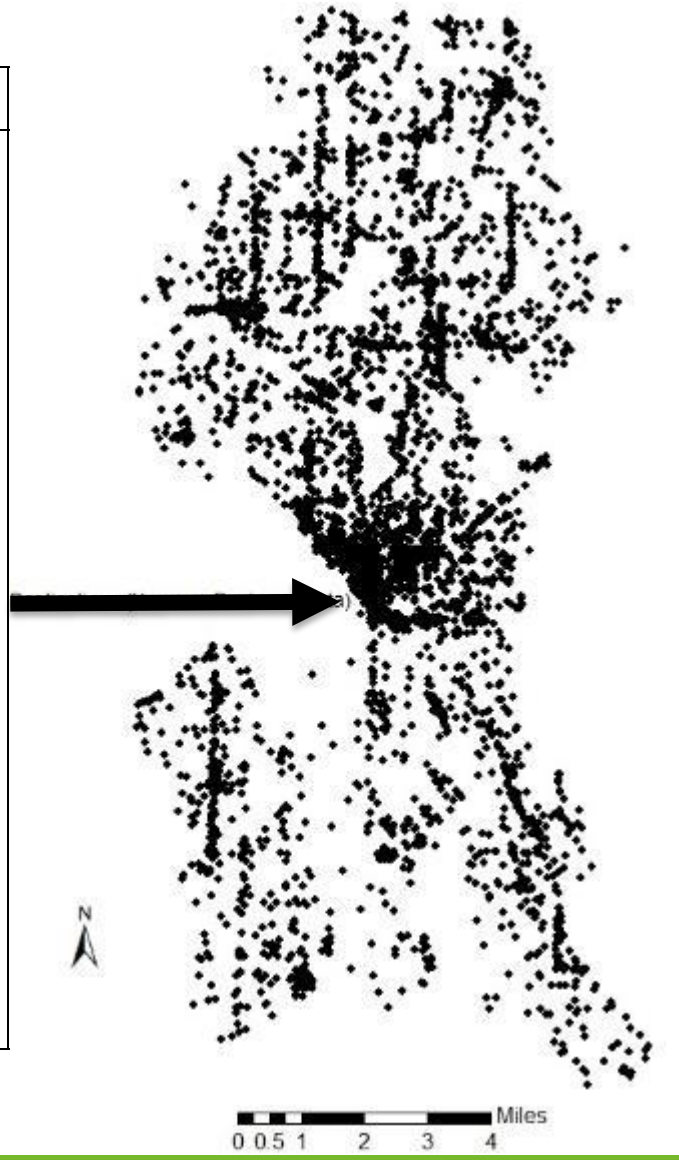


Existing Conditions

Bicycle Master Plan

System Connectivity

Basket
Amusement and Recreation
Bank
Beauty Salon and Barber Shop
Child Care
Clothing and Accessory Store
Colleges and Universities
Computer and Electronics Store
Drinking Place
Eating Place
Elementary and Secondary Schools
General Retail Store
Grocery Store
Health Care Provider
Insurance
Legal Services
Library
Movie Theater
Office and Homefurnishings Store
Pharmacy
Physcial Fitness Facility
Postal Service
Public Parks



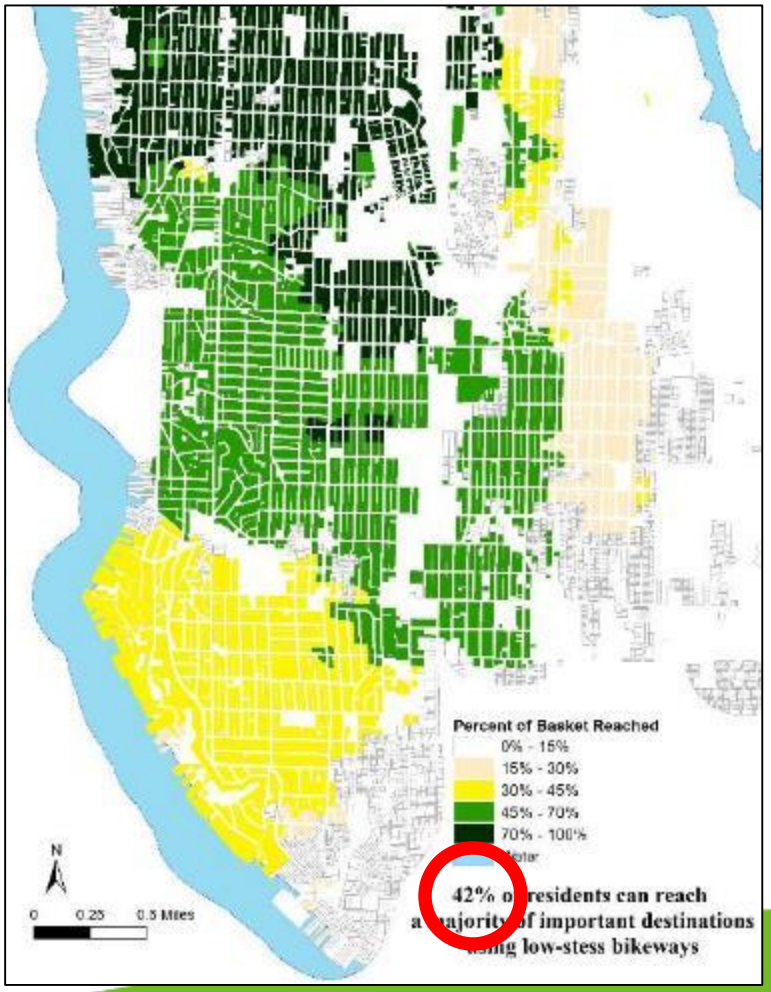
System Connectivity

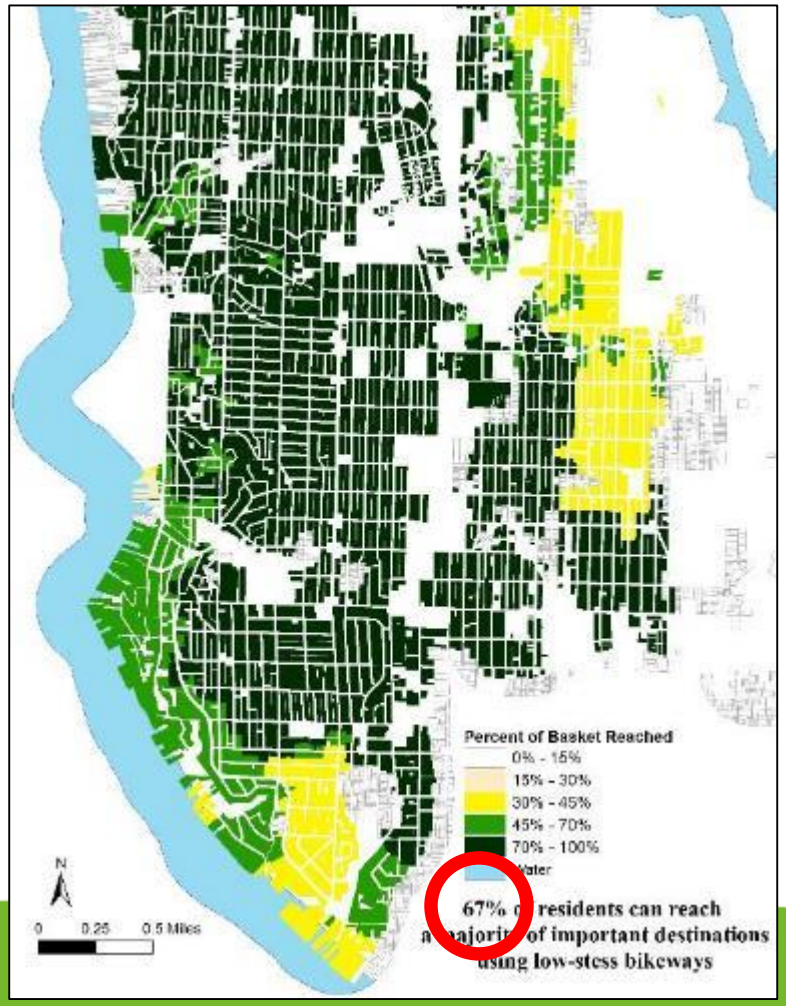
Roadway Number of Lanes	Speed Limit	Stress Marginal Rate of Substitution
2 lanes (residential)	Up to 25 mph	10%
2 lanes (residential)	30 mph	15%
2-3 lanes	Up to 25 mph	20%
4-5 lanes	Up to 25 mph	35%
2-3 lanes	30 mph	40%
6+ lanes	Up to 25 mph	67%
4-5 lanes	30 mph	70%
6+ lanes	30 mph	80%
2-3 lanes	35+ mph	100%
4-5 lanes	35+ mph	120%
6+ lanes	35+ mph	140%

Multi use Trail

6 Lanes 35 mph

System Connectivity

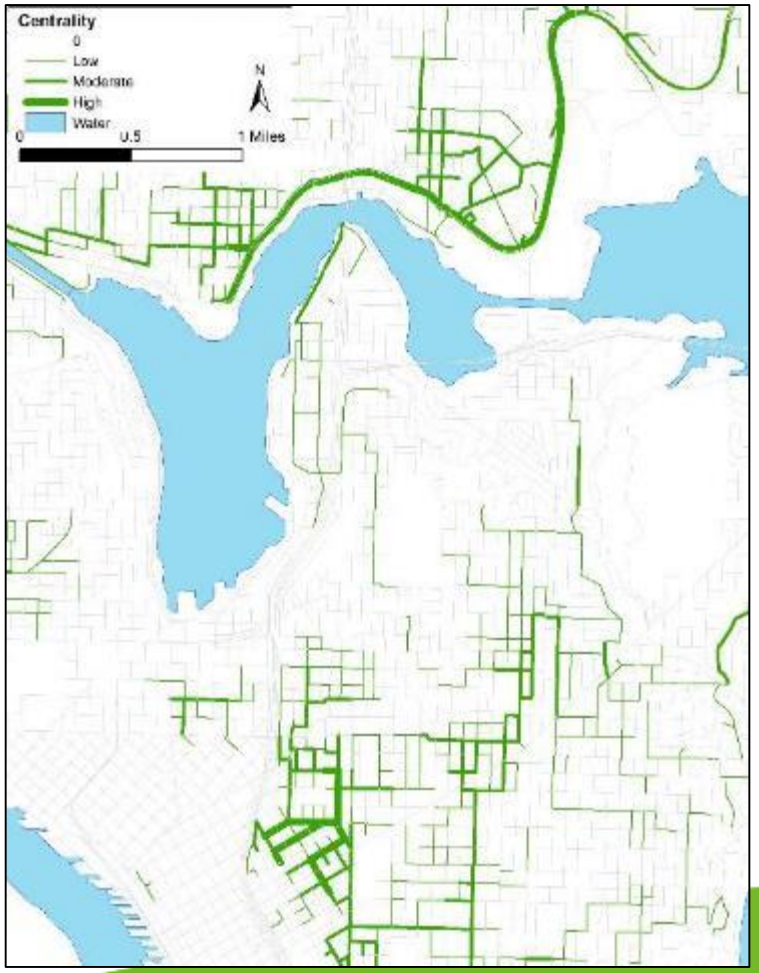




Existing Conditions

Bicycle Master Plan

System Connectivity



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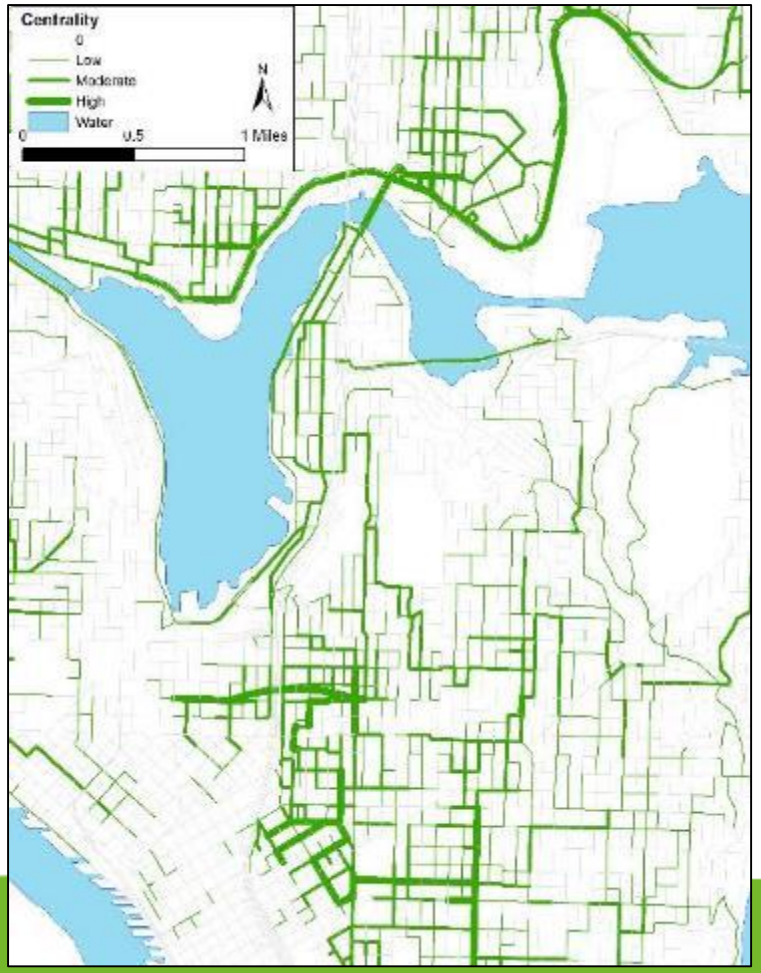

Bicycle Master Plan

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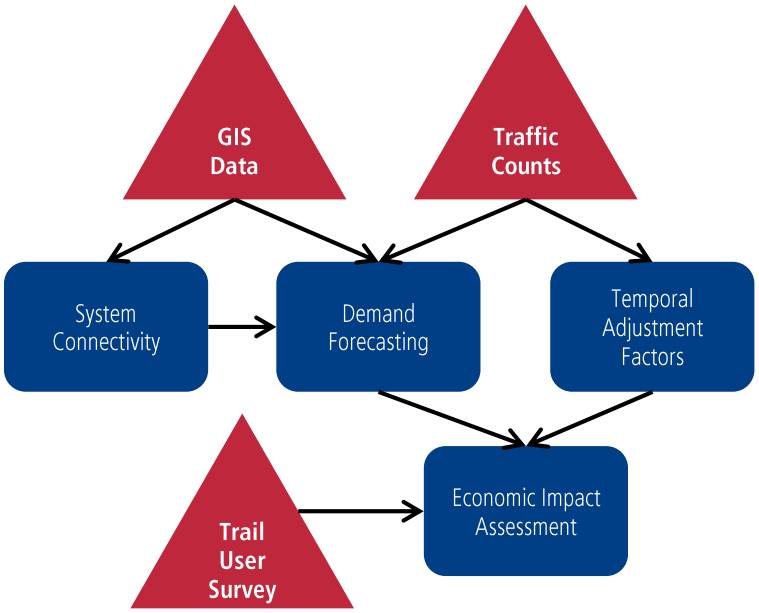
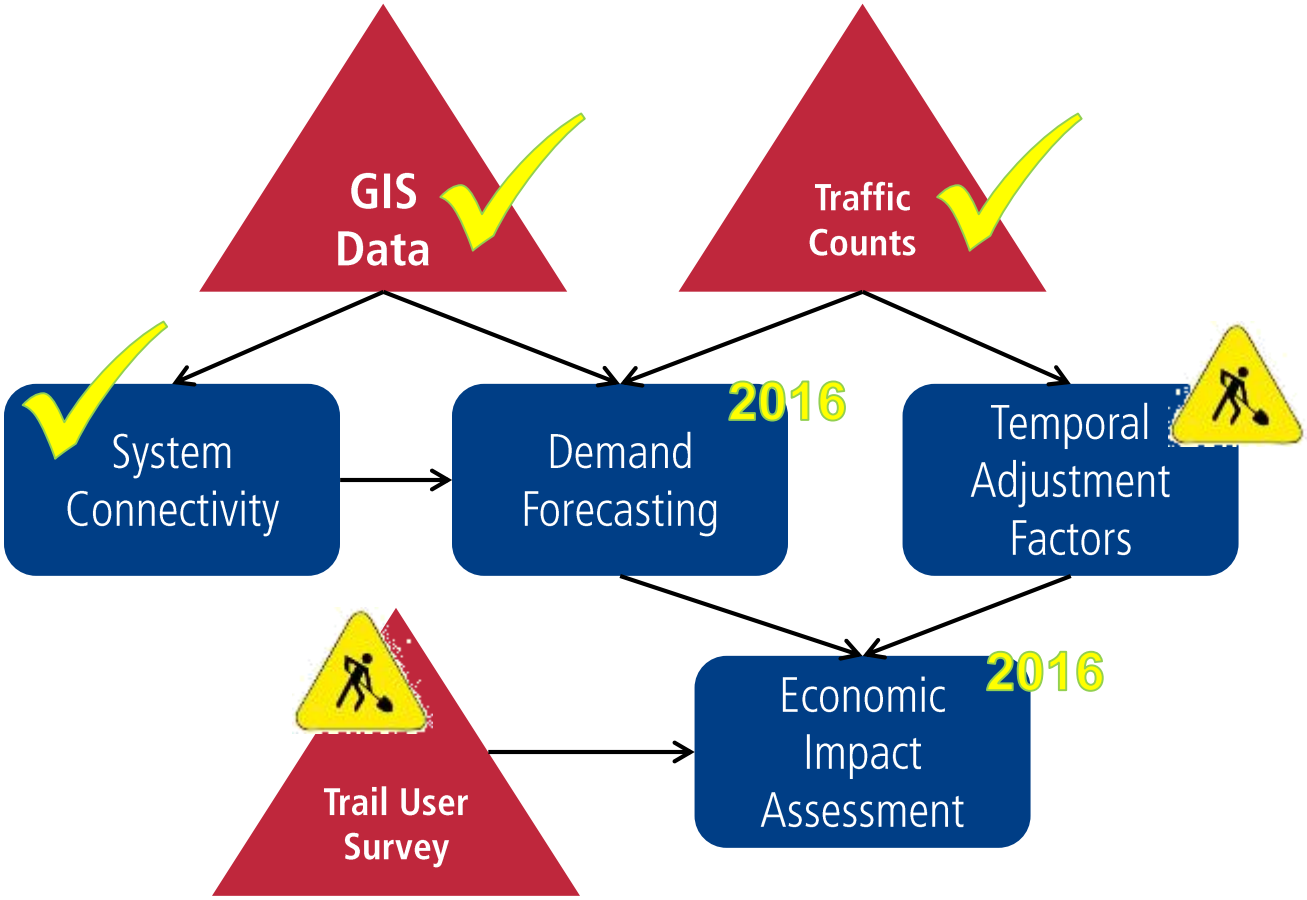


Project Status



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