





Submitted by:
FEHR & PEERS

Fehr & Peers
1001 4th Avenue
Suite 4120
Seattle, WA 98154



Prepared for: 


Non-Motorized Connectivity Study EXECUTIVE SUMMARY

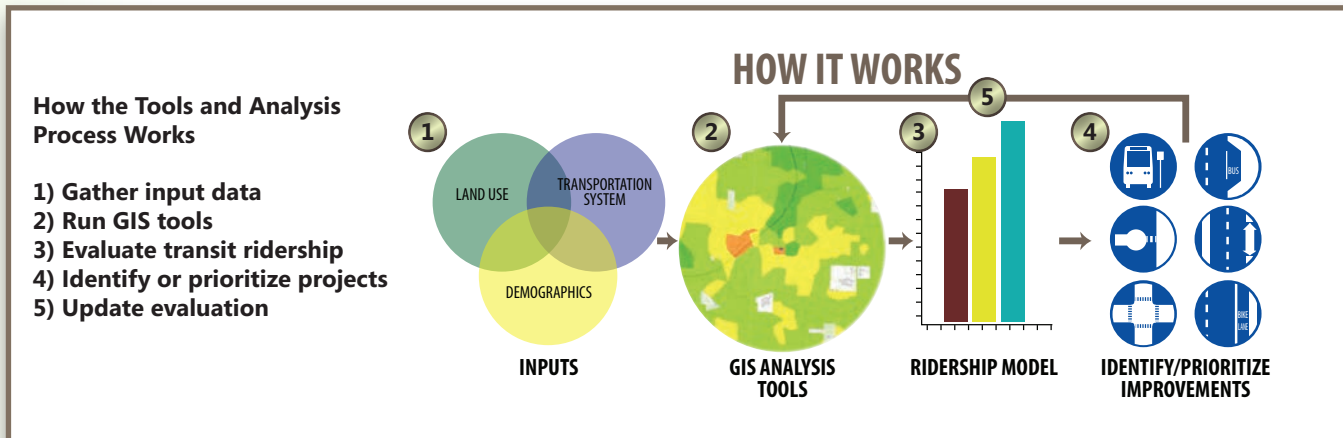
October 2014

EXECUTIVE SUMMARY

Introduction

Increasing the availability of transportation options is a primary goal of Transportation 2040, the Puget Sound region's long-range transportation blueprint. Transit plays a key role in providing local and regional mobility, but in many areas, transit access is limited by a lack of non-motorized connections to bus and train stops. Many cities in the region have developed pedestrian and bicycle master plans; however, the goals of these non-motorized plans tend to be broad-based and access to transit may not be a high priority. Other cities lack non-motorized plans all together, so barriers to transit access may not be known.

Through this study, King County Metro and Sound Transit have partnered to develop an innovative analysis approach and set of tools to evaluate the benefits of non-motorized access improvements to transit.





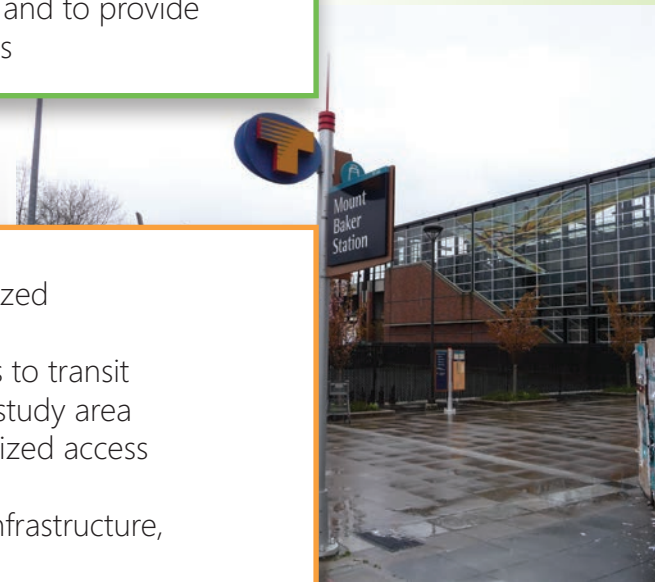
Analysis

- Conducted an extensive literature review to understand walk and bicycle demand
- Determined there are few studies of non-motorized access to transit
- Created a number of customized GIS tools
- Applied the GIS tools to analyze connectivity in more than 500 transit stops in the area
- Developed a model to forecast the number of transit riders generated by non-motorized access projects
- Identified and analyzed future non-motorized projects at the station areas
- Evaluated a set of case study locations to test the accuracy of the tools and to provide examples of project prioritization and how to evaluate future conditions



Outcomes

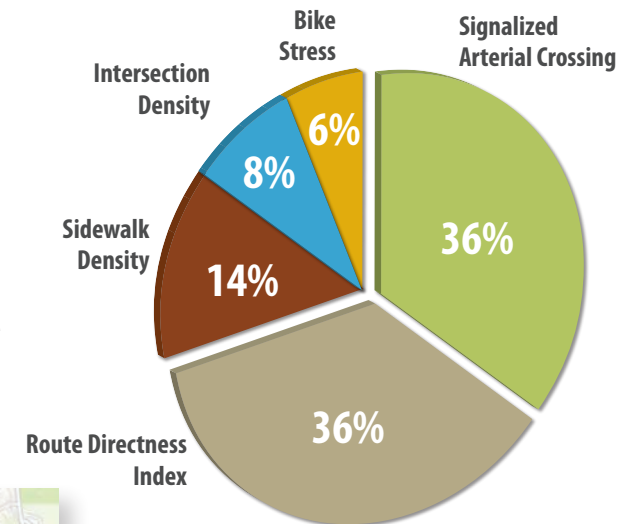
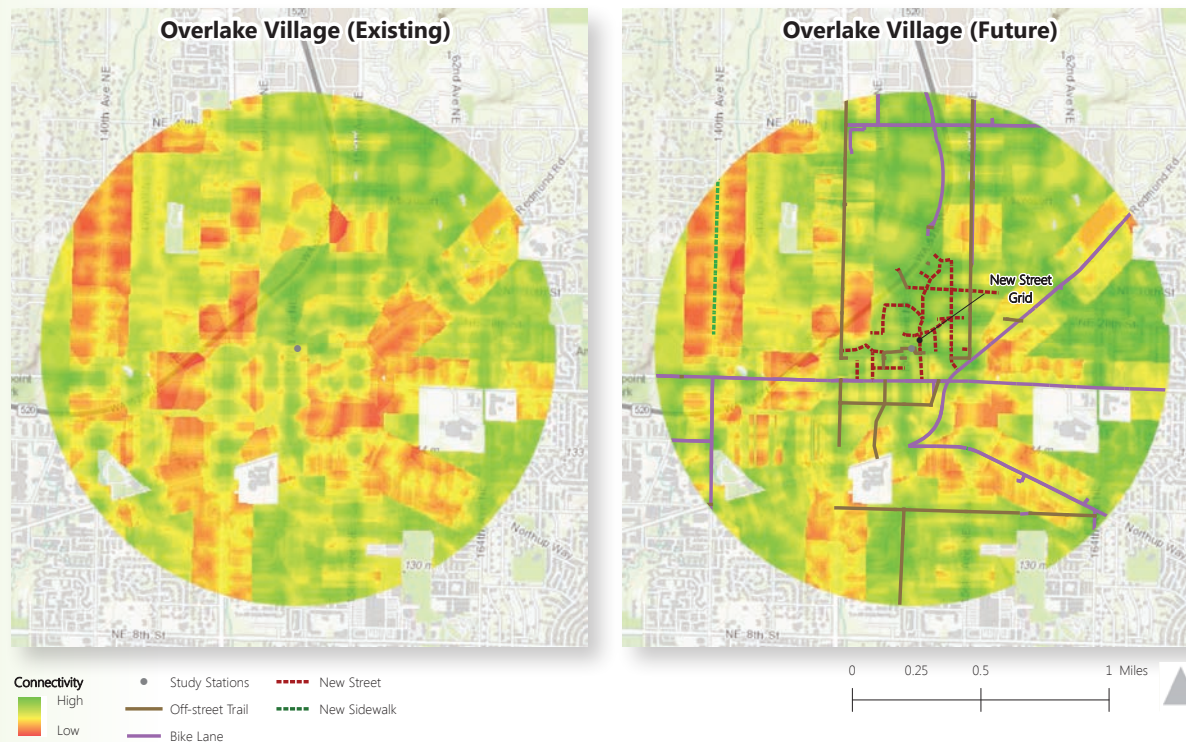
- An understanding of the relative importance of a variety of non-motorized improvements to transit ridership
- A customized set of GIS tools to evaluate pedestrian and bicycle access to transit
- An evaluation of all proposed non-motorized projects in the 3-county study area
- An identified list of project types and their relative effect on non-motorized access to transit
- A summary of the areas that would benefit most from investments in infrastructure, marketing and rezoning efforts



New Research and Tools

A thorough literature review indicated great strides in understanding the reasons behind why people choose to walk or cycle in general; however, there has been little research about how non-motorized access affects transit ridership. This project seeks to fill this gap in the research using the latest GIS analysis techniques and by developing new models to enhance our understanding of the relationships between transit ridership and non-motorized infrastructure. A set of automated GIS tools were developed for this project to facilitate future analysis by the transit agencies.

Overall connectivity score at Overlake Village with and without proposed connectivity projects.
The improved connectivity results in an 11% increase in transit trips.



Relative Weight of Connectivity Variables on Transit Ridership

The research conducted as part of this study found that improved signalized arterial crossings and more direct routes were the factors most correlated with additional transit ridership in the Puget Sound region.

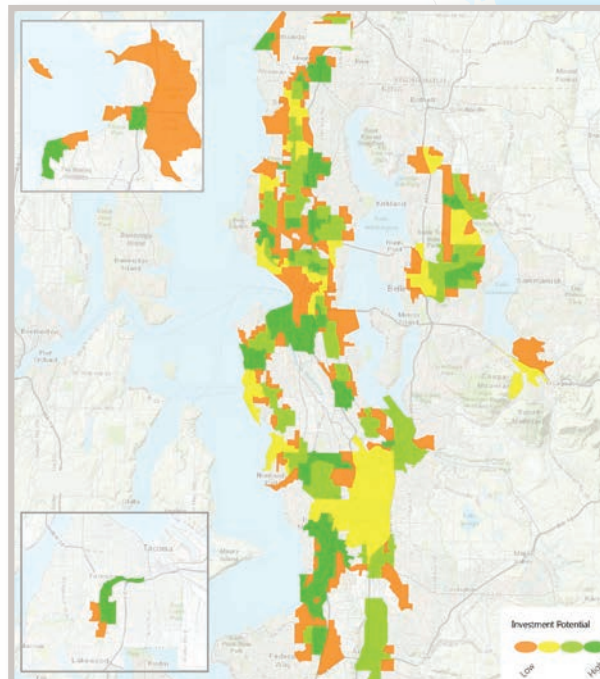
Leveraging Existing Investments

Both King County Metro and Sound Transit have made considerable investments in transit infrastructure and service throughout the region. Meeting transit demand by extending service or constructing park-and-ride lots is effective but expensive. One of the key questions evaluated by the Non-Motorized Connectivity Study is:

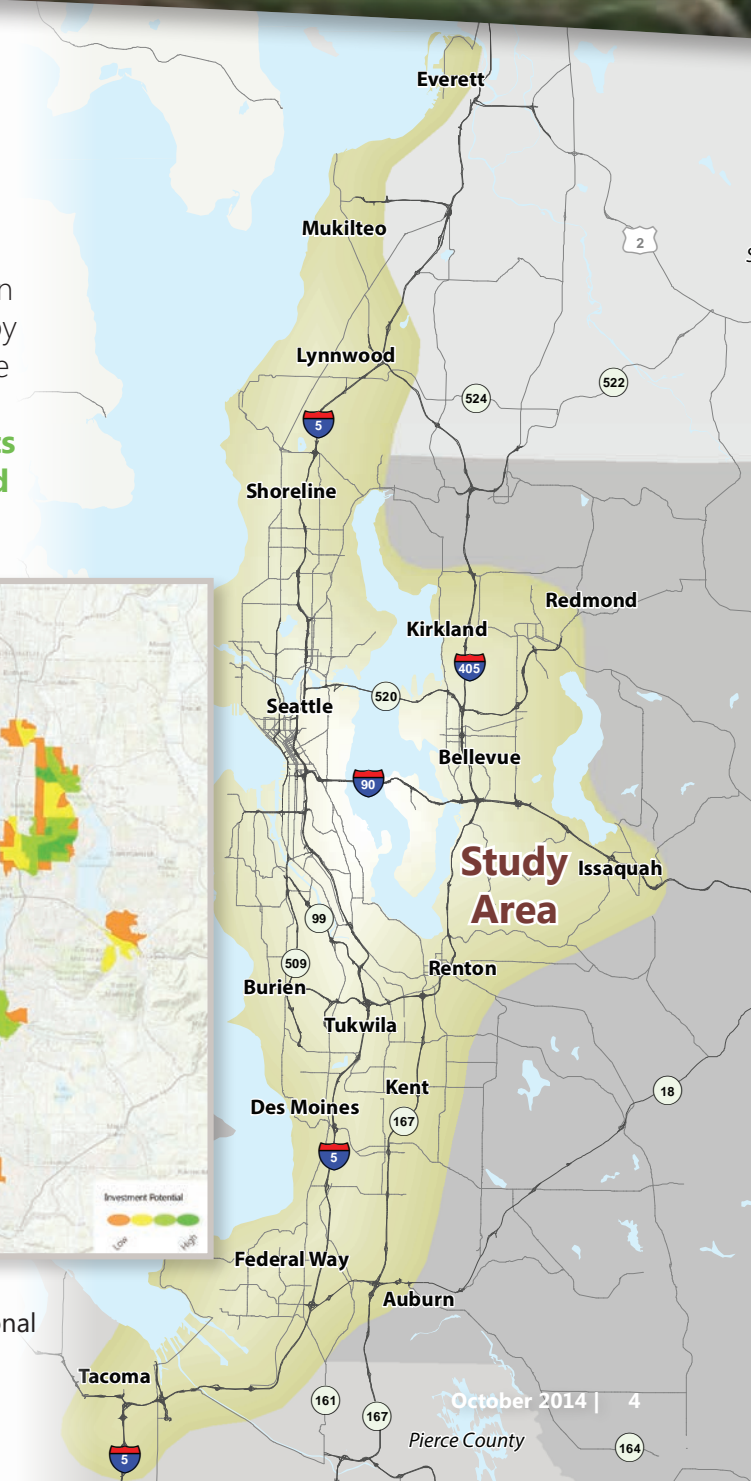
How can the transit agencies maximize the efficiency of their investments by increasing access to routes and transit centers through non-motorized connectivity improvements?

To answer this question, the GIS analysis was applied to more than 500 transit stops across a 400 square mile study area. The project team collected the planned bicycle and pedestrian improvements from more than 20 jurisdictions in Snohomish, King, and Pierce Counties. The GIS tools produced output to forecast how many new riders might be expected at the transit stops if the jurisdictions' non-motorized improvements were made. Areas were identified that could see the greatest gains from non-motorized improvements based on their existing transit service and land use characteristics.

Investment Map



High-level evaluation of locations most likely to benefit from additional connectivity investments



Identifying Projects

The study also prioritized how well groups of the jurisdictions' planned pedestrian and bicycle projects perform based on the following criteria:

- Which projects generate the most new daily transit riders?
- Which projects have the lowest cost per new transit rider?
- Which projects balance new transit riders, cost, and access to transit-dependent populations?

These project prioritization lists can serve as a good starting point for more detailed evaluations and to begin a dialogue with partner agencies.

A set of four case studies were also performed at:

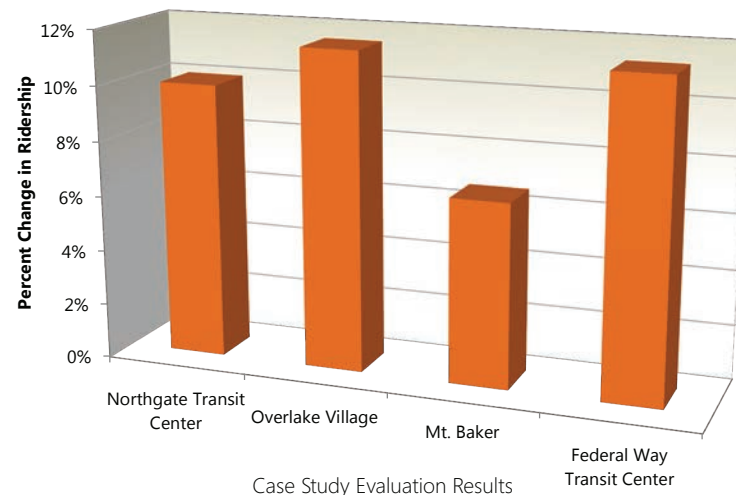
- Northgate Transit Center
- Overlake Village
- Mount Baker Transit Center
- Federal Way Transit Center

Top 10 Project Types with the Largest Change in Daily Transit Ridership

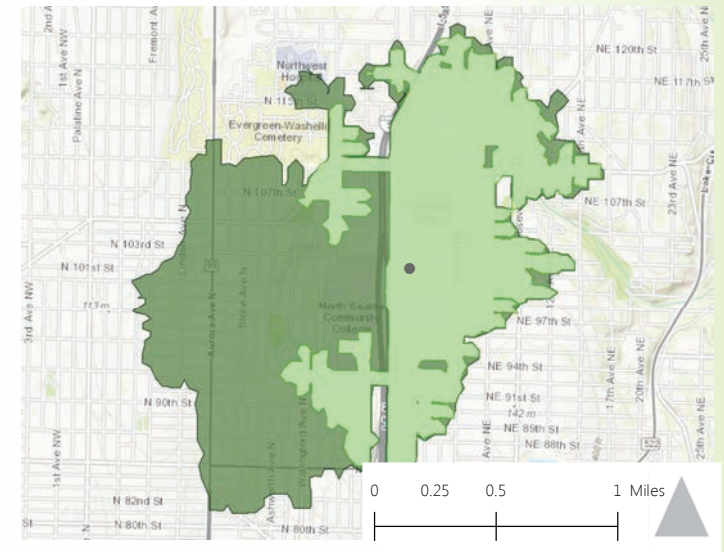
Stop Location	Project Type	Potential New Daily Boardings	Annual Cost per Annual Rider
Northgate Transit Center	Off-street Trails / Cycletracks*	443	\$19
Westlake Station	Off-street Trails / Cycletracks	329	\$13
University Street Station	Off-street Trails / Cycletracks	249	\$14
Federal Way Transit Center	New Streets / Sidewalks	149	\$19
Northgate Transit Center	Greenways / Signalized Crossings	140	\$9
Northgate Transit Center	Bike Lanes	116	\$6
Mt. Baker	Greenways / Signalized Crossings	88	\$9
Bellevue Transit Center	Bike Lanes	87	\$7
Beacon Hill	Off-street Trails / Cycletracks	87	\$47
Mt. Baker	Off-street Trails / Cycletracks	83	\$34

*Includes new pedestrian/bicycle bridge across I-5.

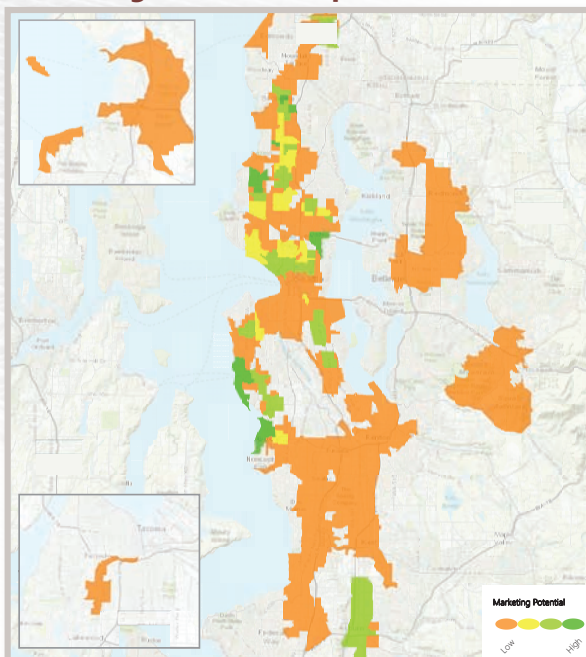
Percent Change in Ridership from Non-Motorized Improvements



These case studies involved a detailed application of the GIS tools and ridership model for both existing and 2035 conditions. The future year analysis considered planned population and employment growth and new transportation investments (new transit projects and improved non-motorized connectivity). Using the tools, the transit ridership gains from the planned non-motorized connectivity projects were quantified, the proposed bicycle/pedestrian projects were prioritized, and new projects were identified to further enhance access to the transit stations. The figure to the right shows how the bike shed grows as a result of the proposed non-motorized projects at the Northgate Transit Center.



Marketing Potential Map



Beyond the evaluation of non-motorized connectivity improvements to transit stops and stations, the study evaluated the entire region to identify the following:

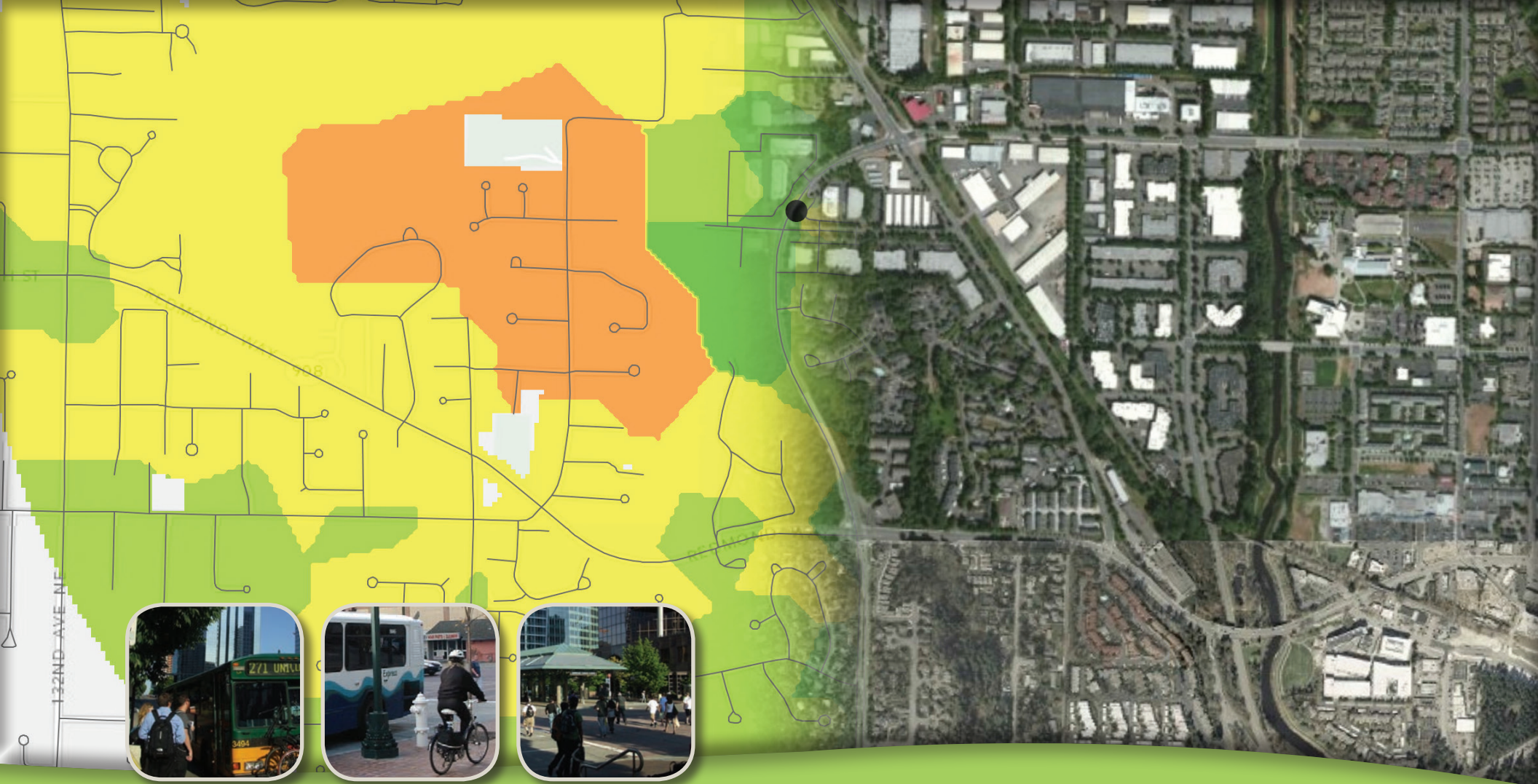
- **Marketing potential** – Areas with good connectivity but lower transit ridership that may benefit from targeted marketing to increase transit use
- **Investment potential** – Areas with poor connectivity but good transit potential that could see ridership gains with additional non-motorized projects
- **Zoning potential** – Areas with good connectivity and transit potential, but low zoning density that could benefit from additional land use intensity

Working with Partners to Implement Solutions

The GIS tools were designed as a plug-in to standard GIS software. The modular nature of the GIS tools enables them to be shared with partner agencies so they can enhance their pedestrian and bicycle planning with a greater emphasis on how to improve transit access. This ability to share the tools and provide quantitative estimates on potential transit ridership gains, mode shift, and GHG emission benefits, makes the outcome of this study particularly valuable for obtaining grants and demonstrating the benefits of non-motorized projects to the public and decision-makers.







Submitted by:

FEHR & PEERS

Fehr & Peers
1001 4th Avenue
Suite 4120
Seattle, WA 98154

