Performance Outcomes Beyond the Mainstream

Presentation of Findings from FHWA/ADA10/AASHTO Peer Exchange for FHWA's "Let's Talk Performance" Webinar Series

October 28, 2014




AASHTO
THE VOICE OF TRANSPORTATION

U.S. Department of Transportation
Federal Highway Administration

Introductions and Overview

- Pete Stephanos – FHWA Office of Transportation Performance Management
- Sherry Riklin – FTA Office of Planning
- Janet D'Ignazio – ICF International

Agenda

- **Background and Overview**
- **Presentation: Measuring Accessibility**
  Andrew Owen, University of Minnesota Accessibility Observatory
- **Presentation: Performance Measures for Transportation and Economic Development**
  Charlie Howard, Puget Sound Regional Council
- **Presentation: Performance Measures for Transportation and Health**
  Frank Gallivan, ICF International
- **Overview of Peer Exchange and Summary Report**
- **Q&A**

Background and Overview

- Focus is on performance measures that assess the relationship between transportation and:
  - Accessibility
  - Economic Development
  - Health

- June 20th peer exchange on non-traditional performance measures in Scottsdale
  - 30 participants from over 20 states
  - Sponsored by FHWA and AASHTO in conjunction with the TRB's Statewide Multimodal Planning Committee

Measuring Accessibility

Andrew Owen
University of Minnesota Accessibility Observatory

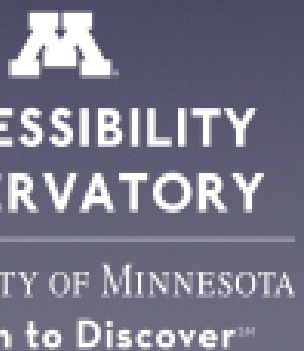


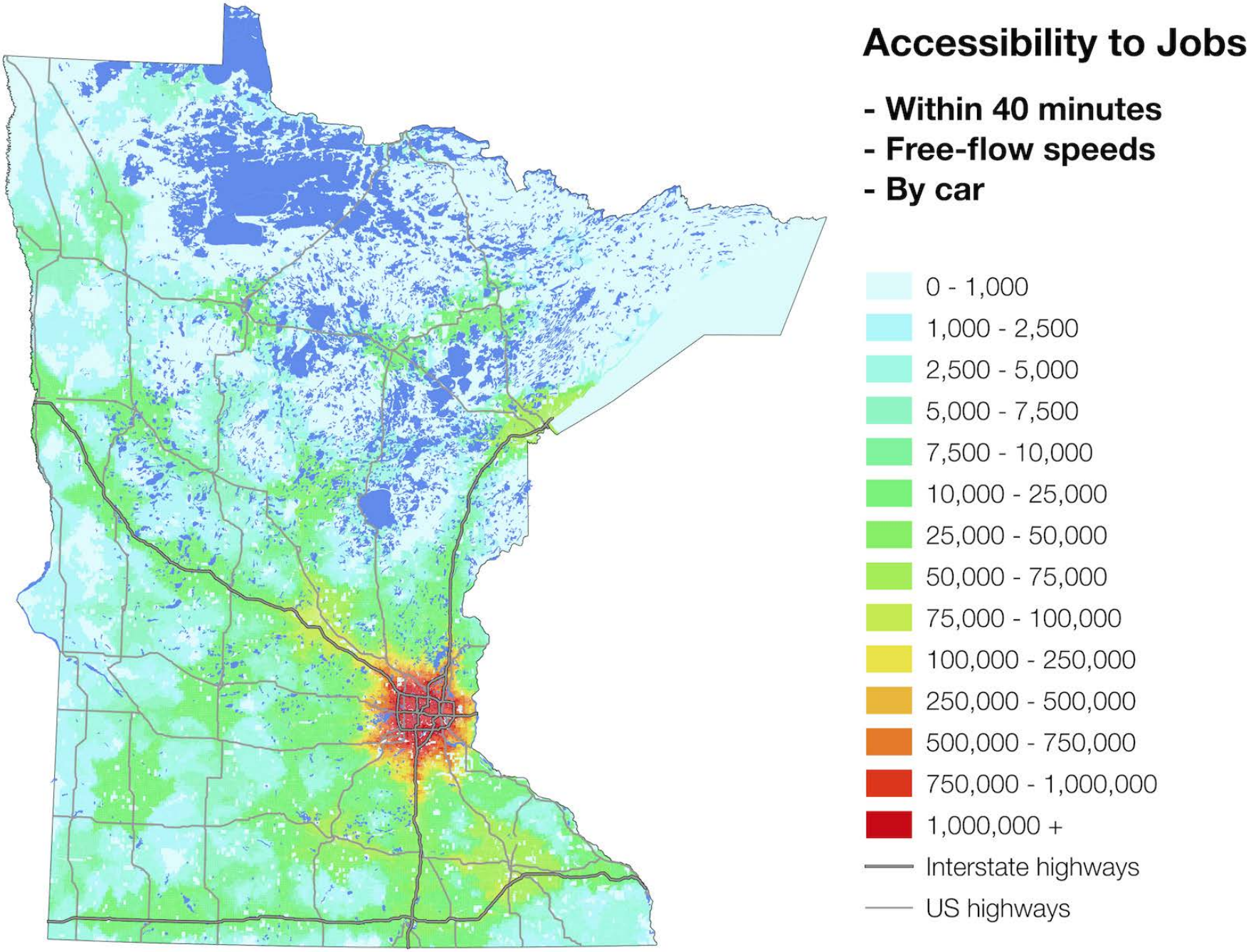

AASHTO
THE VOICE OF TRANSPORTATION

U.S. Department of Transportation
Federal Highway Administration

Accessibility

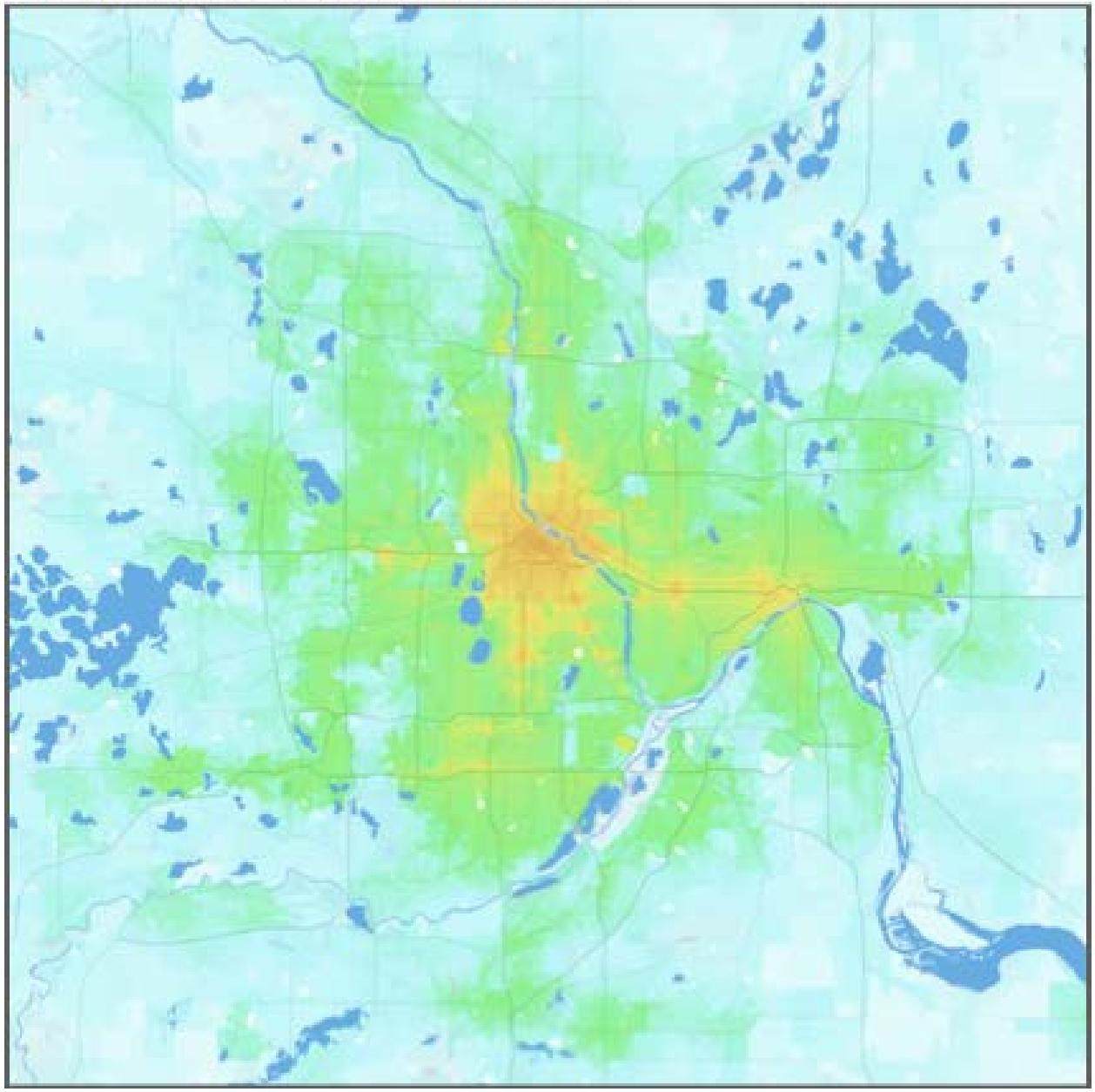
Andrew Owen – University of Minnesota




Accessibility to Jobs
- Within 40 minutes
- Free-flow speeds
- By car
0 - 1,000
1,000 - 2,500
2,500 - 5,000
5,000 - 7,500
7,500 - 10,000
10,000 - 25,000
25,000 - 50,000
50,000 - 75,000
75,000 - 100,000
100,000 - 250,000
250,000 - 500,000
500,000 - 750,000
750,000 - 1,000,000
1,000,000 +
Interstate highways
US highways

Minneapolis

Minneapolis-St. Paul-Bloomington, MN-WI



Jobs within 30 minutes
by transit, averaged 7 - 9 AM

- 0 - 1,000
- 1,000 - 2,500
- 2,500 - 5,000
- 5,000 - 7,500
- 7,500 - 10,000
- 10,000 - 25,000
- 25,000 - 50,000
- 50,000 - 75,000
- 75,000 - 100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 750,000
- 750,000 - 1,000,000
- 1,000,000 +

What is Accessibility?

What’s the purpose of a transportation system?

Accessibility is about *opportunities*

Mobility

- Mobility measures **ease of movement**
- What’s the difference?

MnDOT Motivations

- Looking beyond mobility and congestion
- Supporting our vision for transportation outcomes
- Developing a multimodal approach to planning and performance

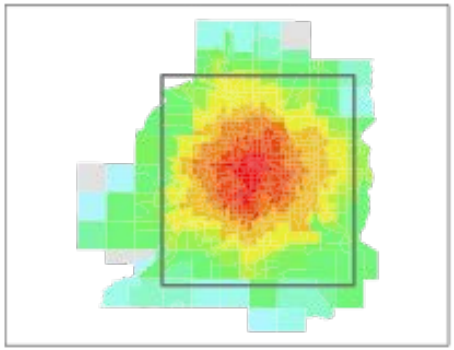
Building on Local Expertise

- Access to Destinations project
  - Established theoretical and technical foundations
  - Accessibility evaluation system for Twin Cities

Building on Local Expertise

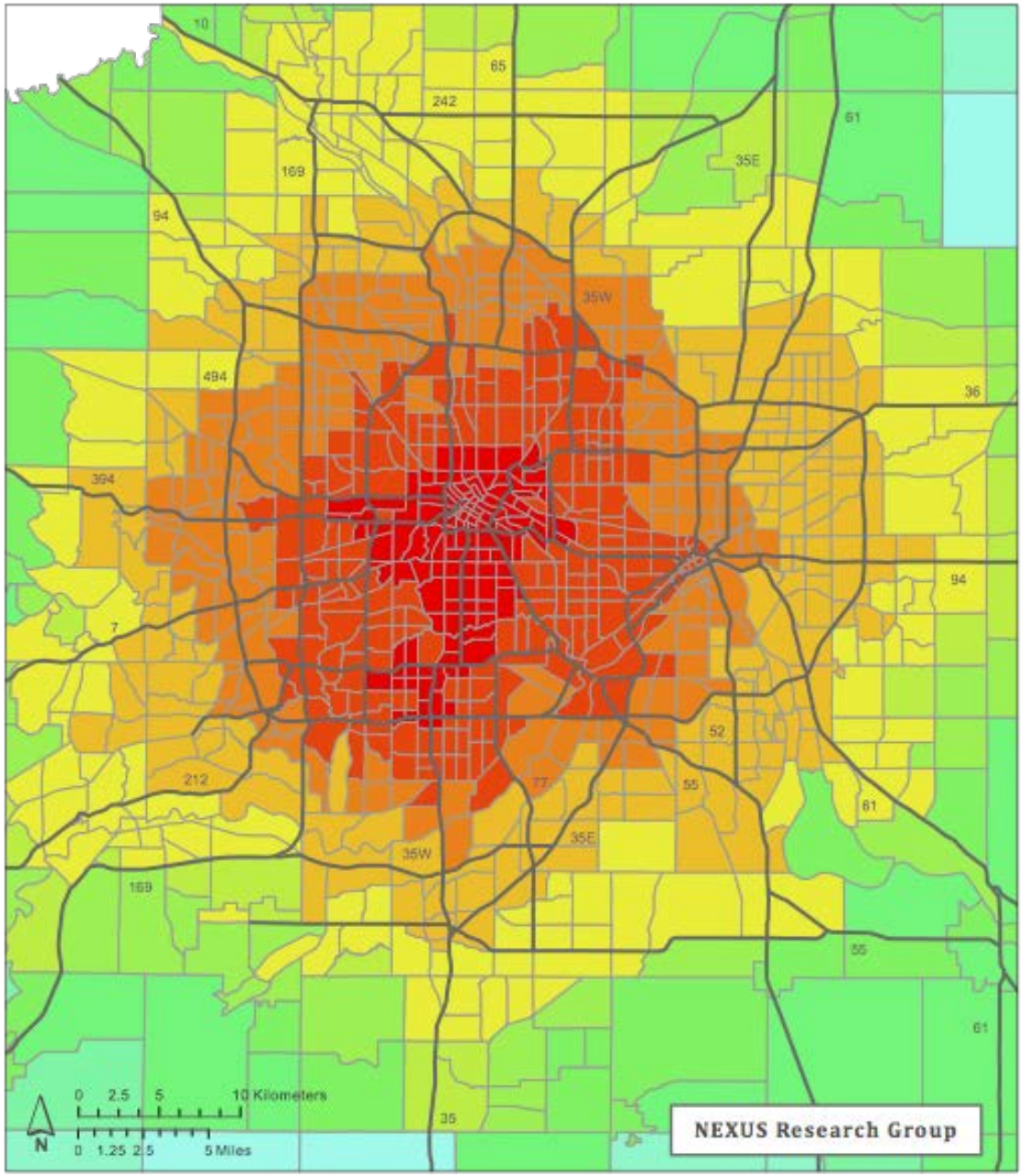
- Access to Destinations project

1. Development of Accessibility Measures (2006)
2. Refining Methods for Calculating Non-Auto Travel Times (2007)
3. Travel Time Estimation on Arterials (2007)
4. How Close is Close Enough? Estimating Accurate Distance-Decay Functions for Multiple Modes and Different Purposes (2008)
5. Twin Cities Metro-wide Traffic Micro-simulation Feasibility Investigation (2008)
6. Parcel Level Land Use Data Acquisition & Analysis for Measuring Non-Auto Accessibility (2008)
7. Monitoring Land Use Activity Changes in the Twin Cities Metropolitan Region (2008)
8. Computation of Travel Time Data for Access to Destinations Study (2008)
9. Application of Accessibility Measures for Non-Auto Travel Modes (2009)
10. Arterial Data Acquisition and Network-Wide Travel Times Estimation (2010)
11. Measuring Accessibility by Automobile (2010)
12. Using Twin Cities Destinations and Their Accessibility as a Multimodal Planning Tool (2012)
13. Access to Destinations: Annual Accessibility Measure for the Twin Cities Metropolitan Area (2012)
14. Access Across America (2013)

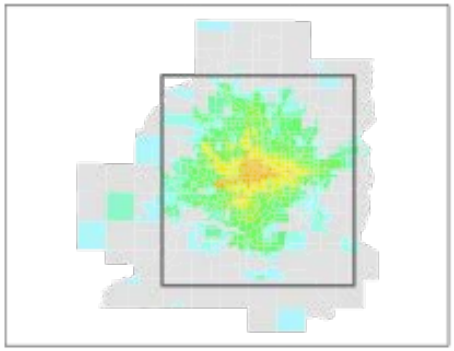


Jobs accessible within 20 minutes by car (AM peak) 2010

- 0 - 1,000
- 1,001 - 2,500
- 2,501 - 5,000
- 5,001 - 7,500
- 7,501 - 10,000
- 10,001 - 25,000
- 25,001 - 50,000
- 50,001 - 75,000
- 75,001 - 100,000
- 100,001 - 250,000
- 250,001 - 500,000
- 500,001 - 750,000
- 750,001 - 1,000,000
- 1,000,001 - 2,226,029
- Major Highways

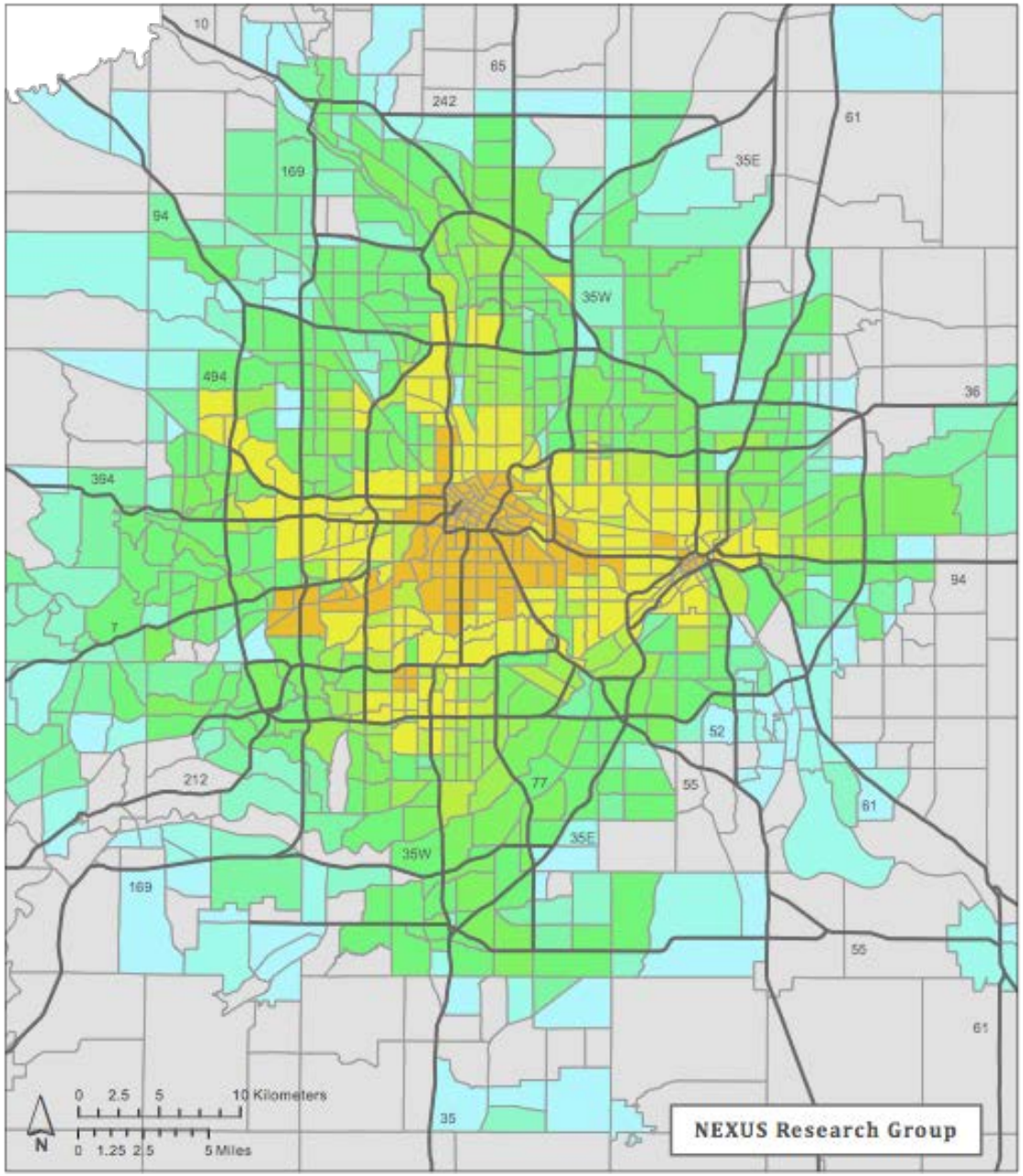


Zone Structure Displayed: Traffic Analysis Zone Boundaries
Primary Data Sources: MnDOT, Twin Cities Metropolitan Council, US Census Bureau



Jobs accessible within
20 minutes by transit (AM peak)
2010

- 0 - 1,000
- 1,001 - 2,500
- 2,501 - 5,000
- 5,001 - 7,500
- 7,501 - 10,000
- 10,001 - 25,000
- 25,001 - 50,000
- 50,001 - 75,000
- 75,001 - 100,000
- 100,001 - 250,000
- 250,001 - 500,000
- 500,001 - 750,000
- 750,001 - 1,000,000
- 1,000,001 - 2,226,029
- Major Highways



Zone Structure Displayed: Traffic Analysis Zone Boundaries
Primary Data Sources: MnDOT, Twin Cities Metropolitan Council, US Census Bureau

Accessibility in the Media

“Focusing on accessibility ... will get us much closer to tackling the frustrations that plague commuters.”

— National Review

Accessibility in the Media

“Transportation is not an end in itself; it’s a means to other ends … If the purpose of an urban transportation system is accessibility, we should work to make the system serve that goal”

— Reason Foundation

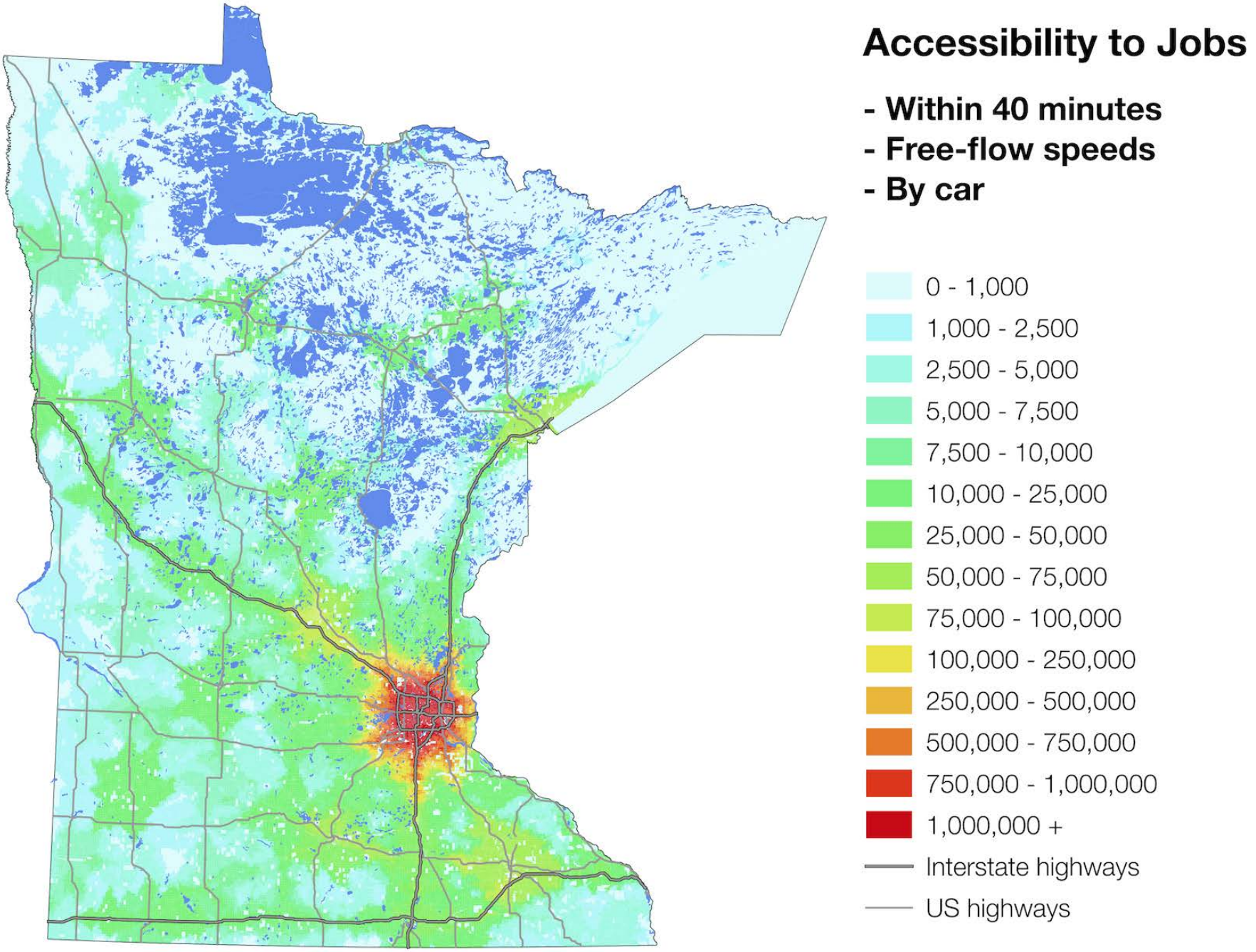
Accessibility Is Not a New Idea

Hansen, W. G. (1959). How accessibility shapes land use. Journal of the American Institute of Planners, 25(2), 73-76.

Cumulative Opportunities

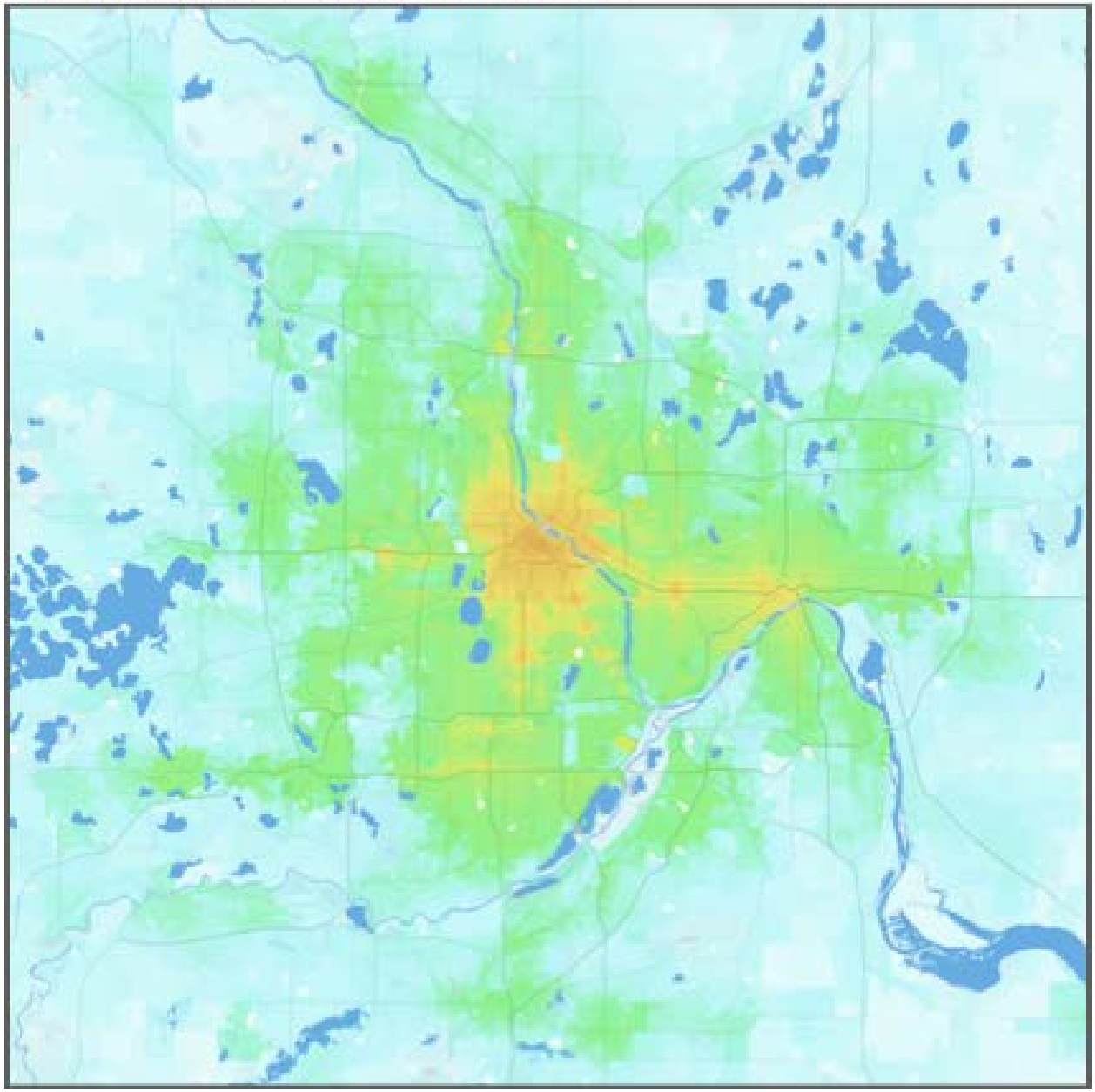
- Simple count of destinations reachable within threshold.
- It is not an index, it is an actual thing.
- “30-minute accessibility to 10,000 jobs”
- “Can reach 10,000 jobs within 30 minutes”
- Multiple metrics and maps for multiple thresholds

Expanding the scope, increasing the resolution


Accessibility to Jobs
- Within 40 minutes
- Free-flow speeds
- By car
0 - 1,000
1,000 - 2,500
2,500 - 5,000
5,000 - 7,500
7,500 - 10,000
10,000 - 25,000
25,000 - 50,000
50,000 - 75,000
75,000 - 100,000
100,000 - 250,000
250,000 - 500,000
500,000 - 750,000
750,000 - 1,000,000
1,000,000 +
Interstate highways
US highways

Minneapolis

Minneapolis-St. Paul-Bloomington, MN-WI



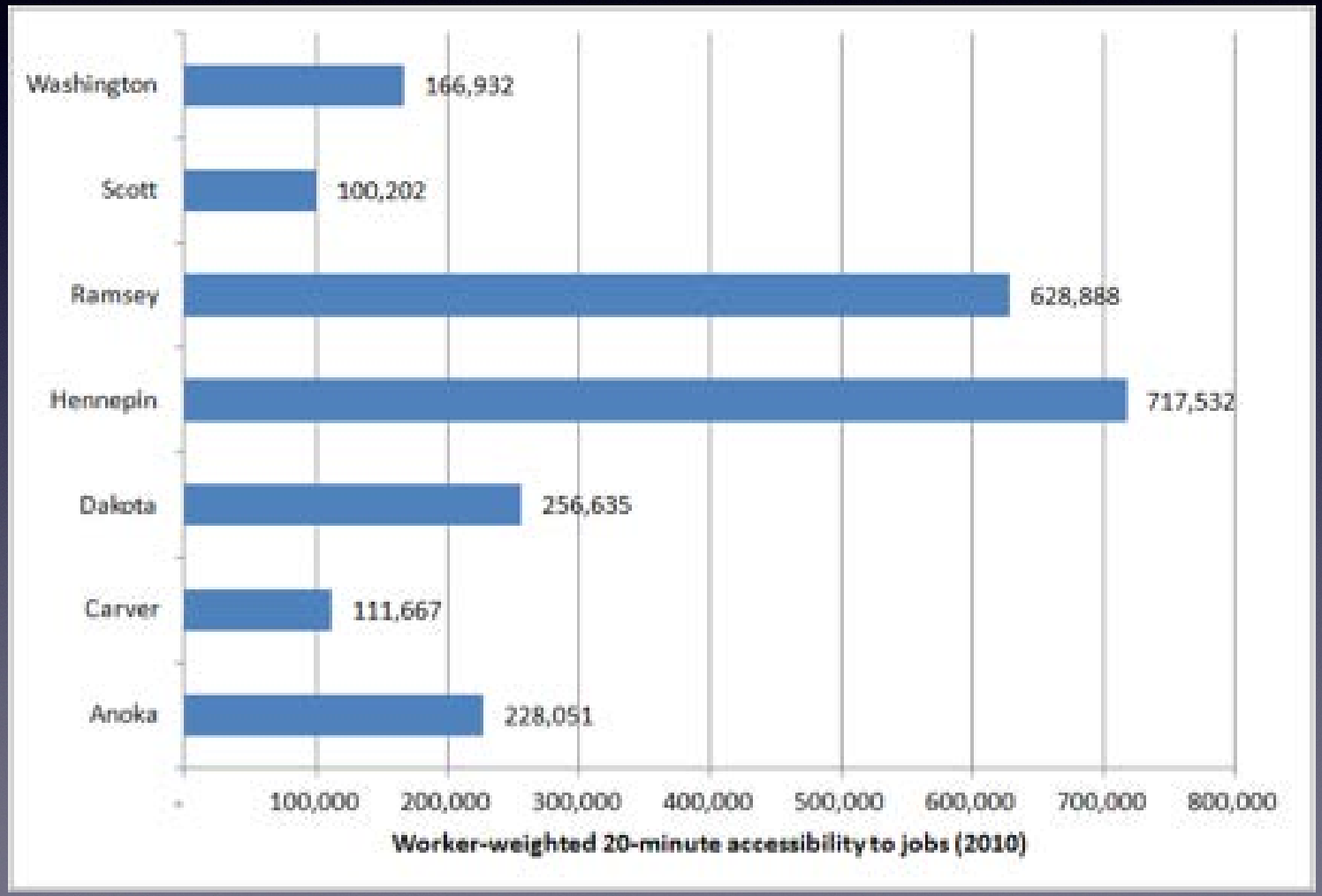
Jobs within 30 minutes
by transit, averaged 7 - 9 AM

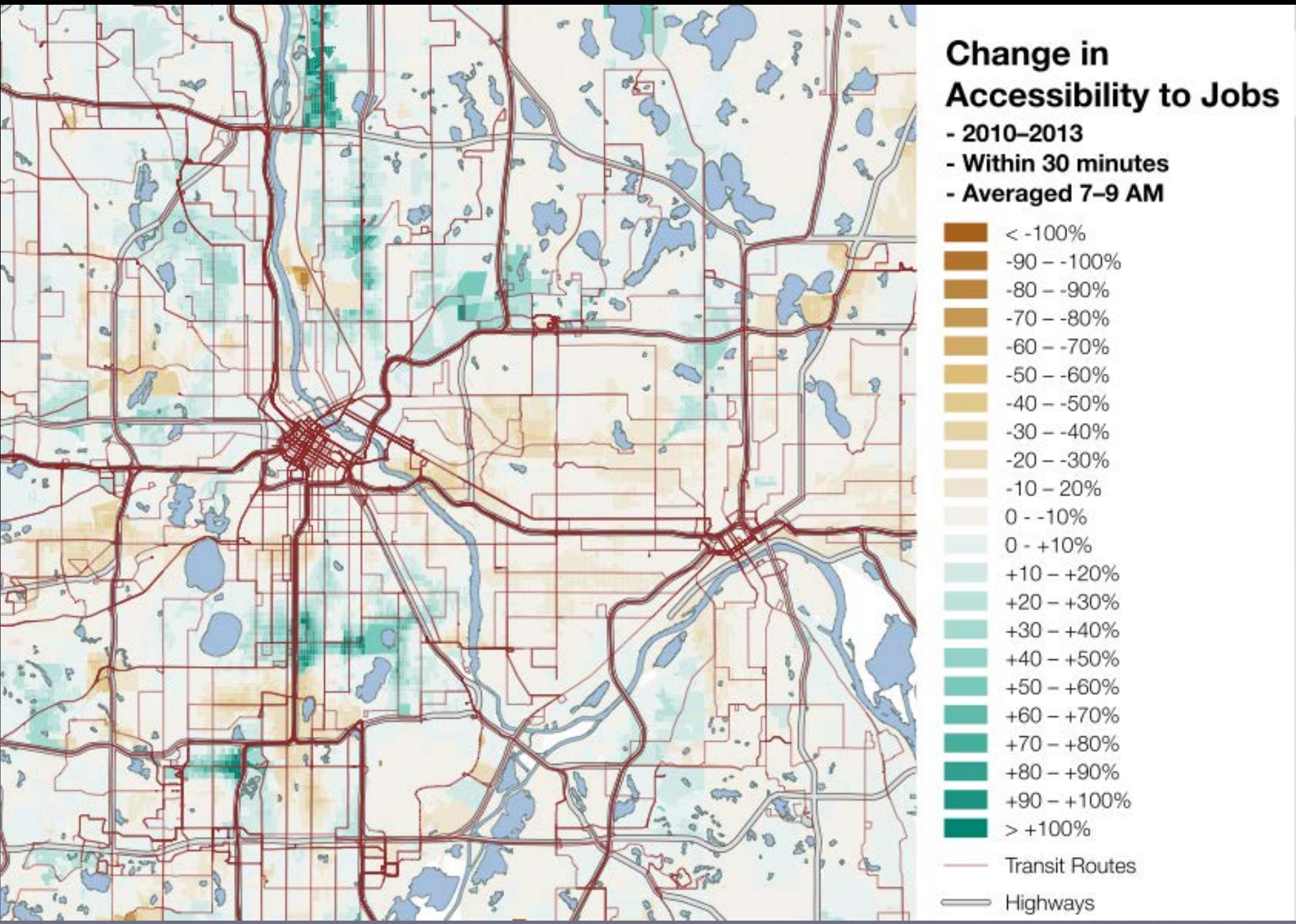
- 0 - 1,000
- 1,000 - 2,500
- 2,500 - 5,000
- 5,000 - 7,500
- 7,500 - 10,000
- 10,000 - 25,000
- 25,000 - 50,000
- 50,000 - 75,000
- 75,000 - 100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 750,000
- 750,000 - 1,000,000
- 1,000,000 +

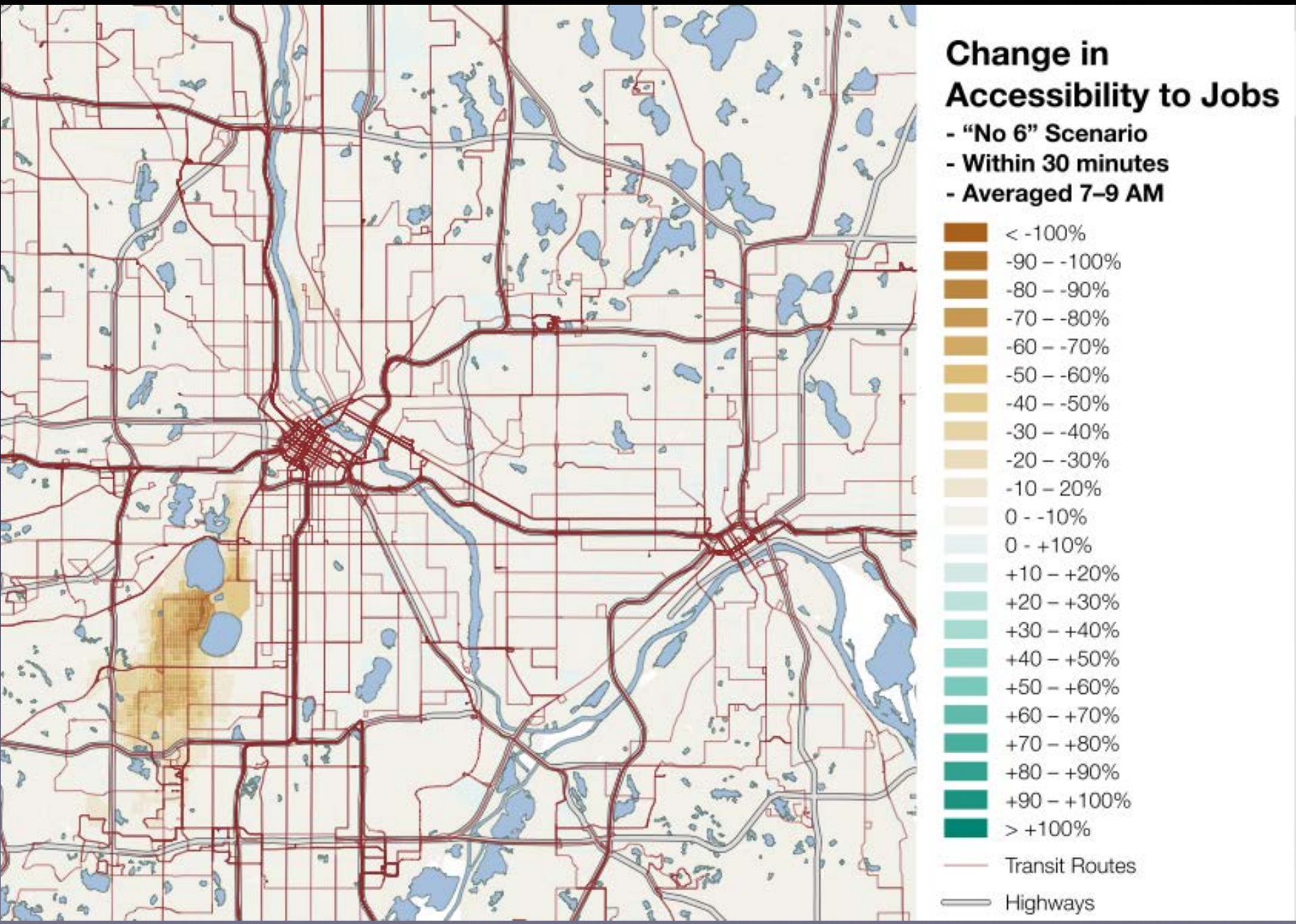
Accessibility is About the Big Picture

- Evaluation
- Monitoring
- Planning

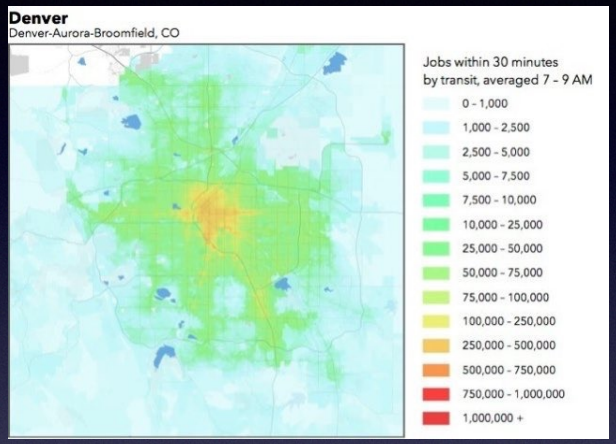
Worker Weighted 20-minute Accessibility to Jobs by Auto

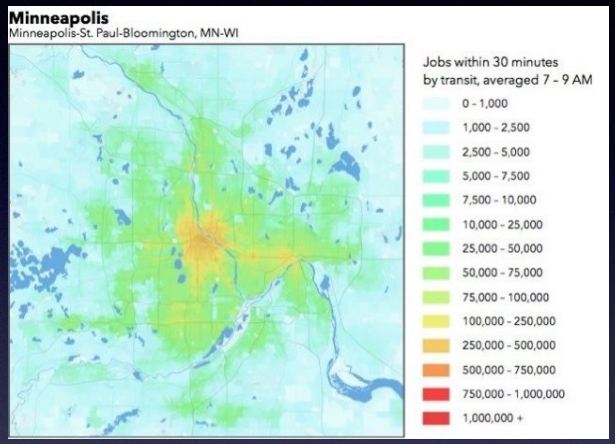


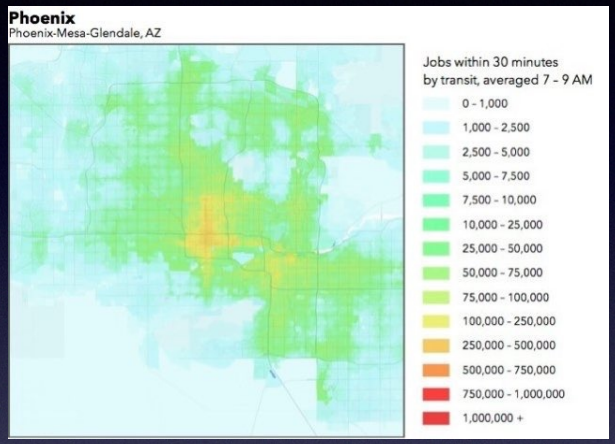

Change in
Accessibility to Jobs
- 2010–2013
- Within 30 minutes
- Averaged 7–9 AM
< -100%
-90 – -100%
-80 – -90%
-70 – -80%
-60 – -70%
-50 – -60%
-40 – -50%
-30 – -40%
-20 – -30%
-10 – 20%
0 - -10%
0 - +10%
+10 – +20%
+20 – +30%
+30 – +40%
+40 – +50%
+50 – +60%
+60 – +70%
+70 – +80%
+80 – +90%
+90 – +100%
> +100%
Transit Routes
Highways

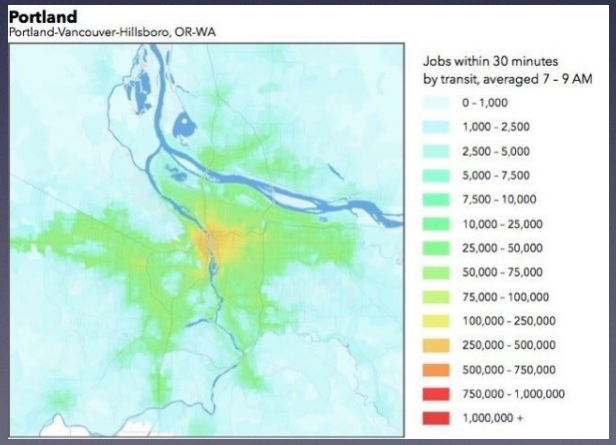

Change in
Accessibility to Jobs
- "No 6" Scenario
- Within 30 minutes
- Averaged 7–9 AM
< -100%
-90 – -100%
-80 – -90%
-70 – -80%
-60 – -70%
-50 – -60%
-40 – -50%
-30 – -40%
-20 – -30%
-10 – 20%
0 - -10%
0 - +10%
+10 – +20%
+20 – +30%
+30 – +40%
+40 – +50%
+50 – +60%
+60 – +70%
+70 – +80%
+80 – +90%
+90 – +100%
> +100%
Transit Routes
Highways

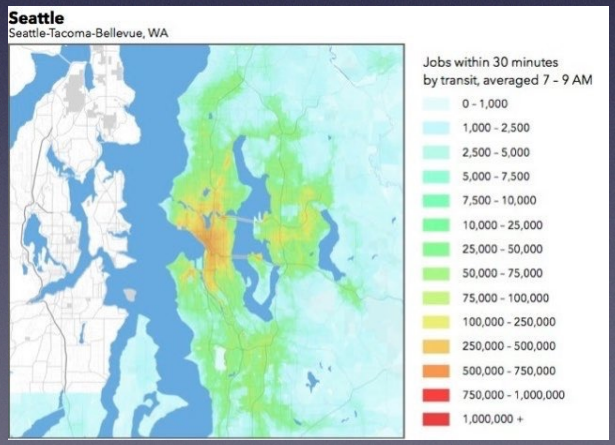
Consistent Methodology Allows Meaningful Comparisons

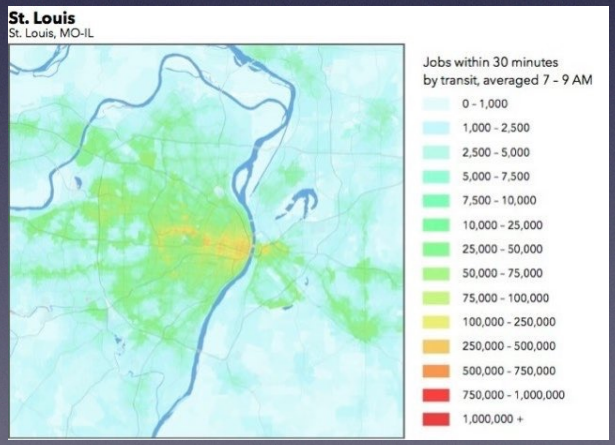












From *Access Across America: Transit 2014*
(http://access.umn.edu/research/america/transit2014/index.html)

Access Across America Pooled Fund

- Led by Minnesota Department of Transportation
- Annual reports: Access Across America
- Partner benefits:
  - Sponsorship of annual report
  - Detailed data and report for local state/metro
  - Input into methodology and data decisions
- More information: http://access.umn.edu/research/pooledfund/

Thanks!

Andrew Owen
aowen@umn.edu
ao.umn.edu
@UMNAccOb

ACCESSIBILITY OBSERVATORY

UNIVERSITY OF MINNESOTA
Driven to Discover℠

Measuring the Connections between Transportation and Economic Development

Charlie Howard
Puget Sound Regional Council



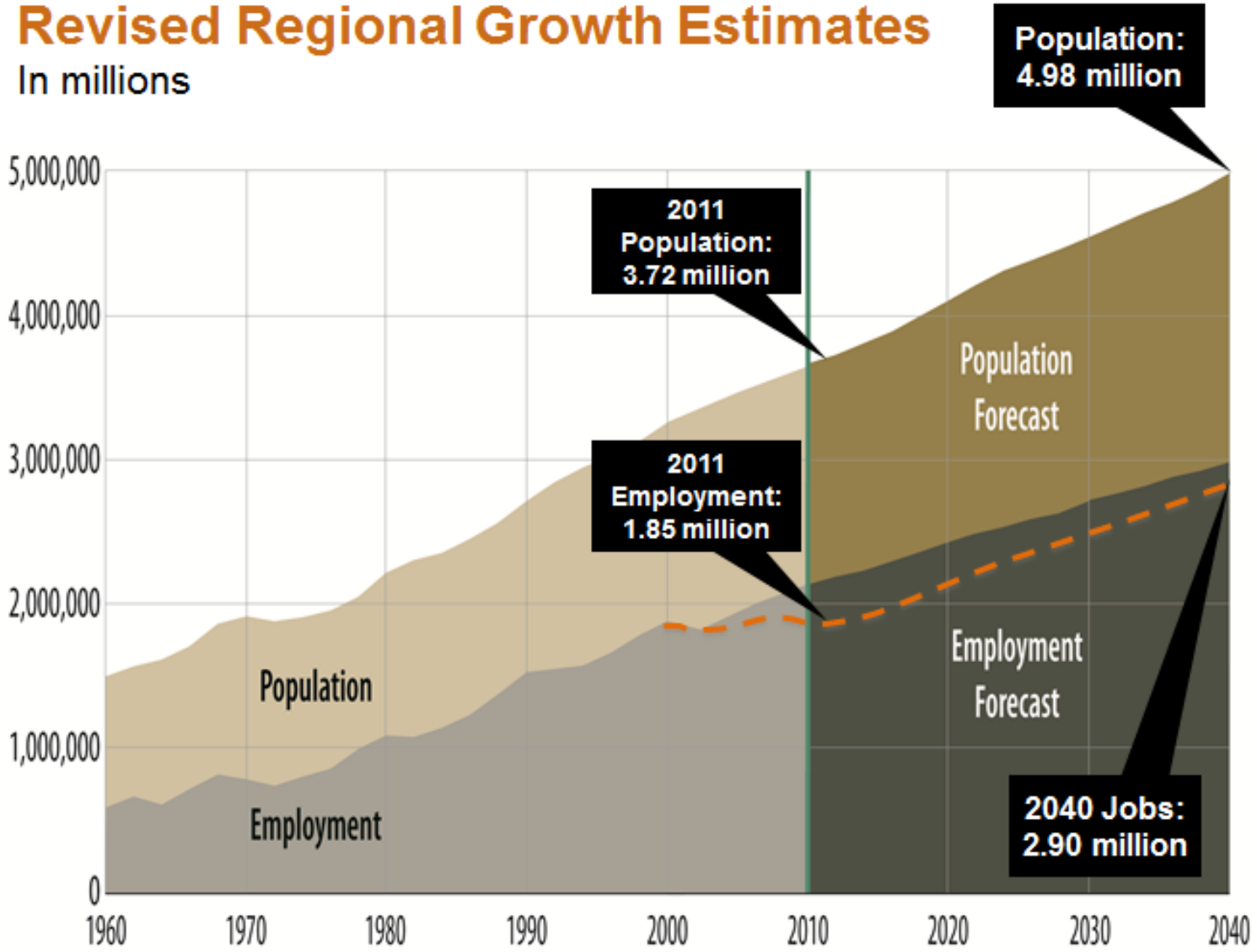

AASHTO
THE VOICE OF TRANSPORTATION

U.S. Department of Transportation
Federal Highway Administration

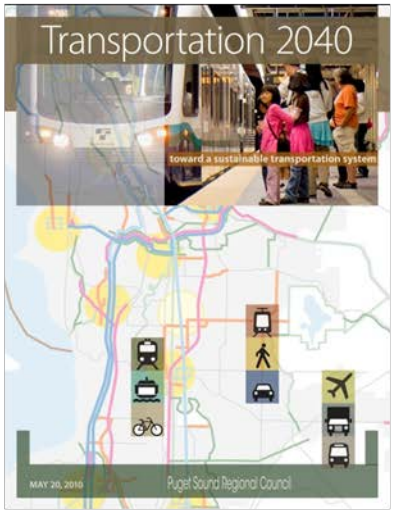
Overview of presentation

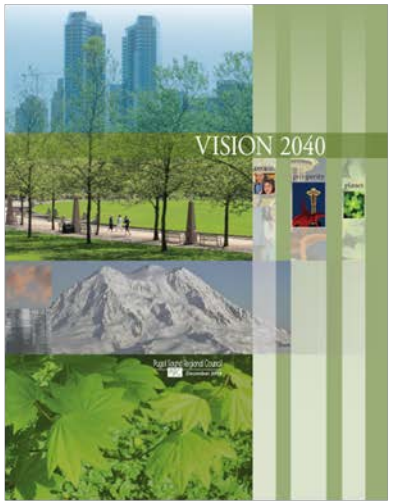
- Background
- Successes Achieved
- Challenges to Date
- Challenges Anticipated

Background - Central Puget Sound Region



Background – PSRC Integrated Planning



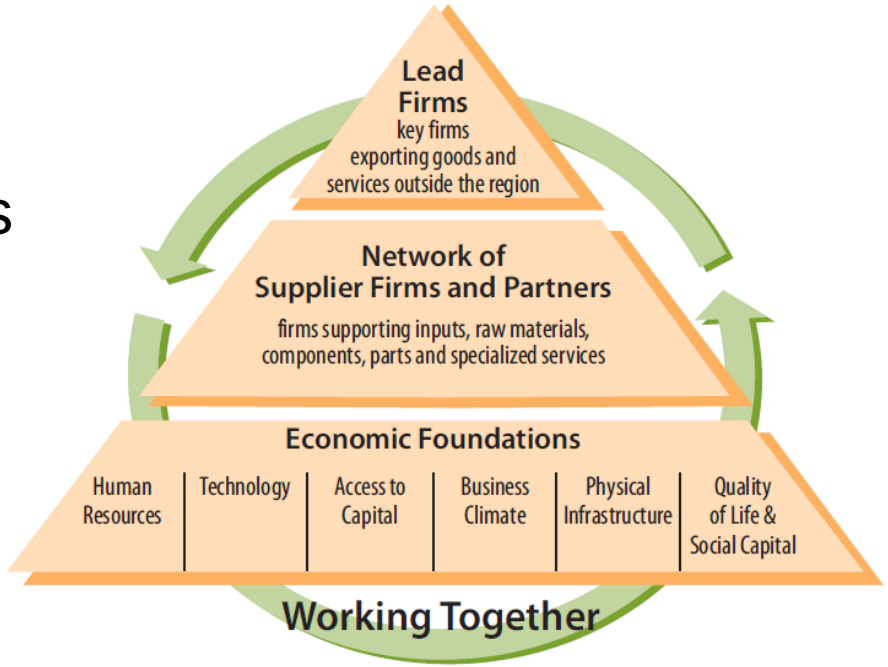


Background – VISION 2040

"The region will have a prospering and sustainable regional economy by supporting businesses and job creation, investing in all people, sustaining environmental quality, and creating great central places, diverse communities, and high quality of life."

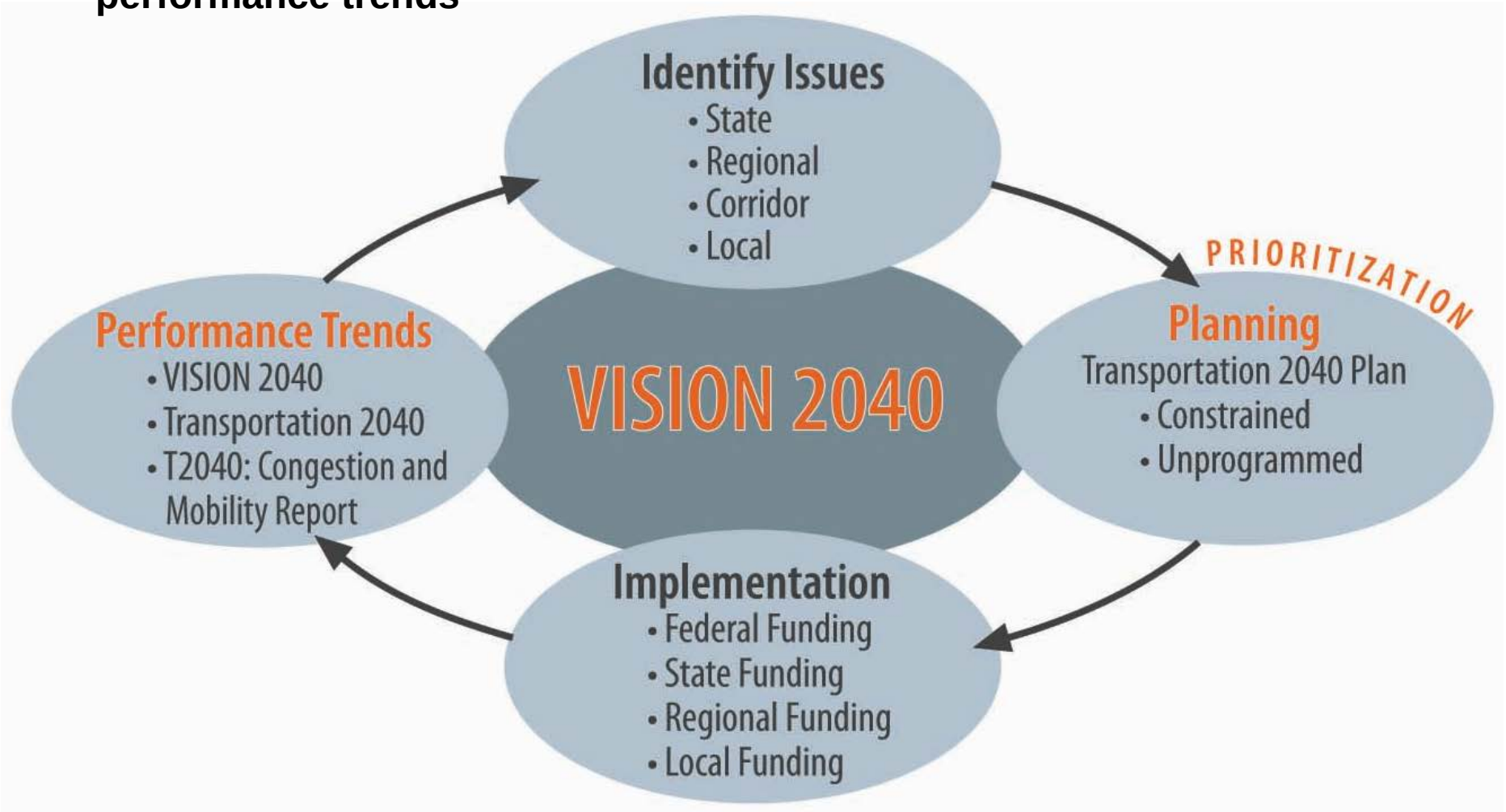
Policy focus areas:

- Foster supportive environment for all business
- Focus on developing skills and promoting education
- Focus on jobs/housing balance and protect environment



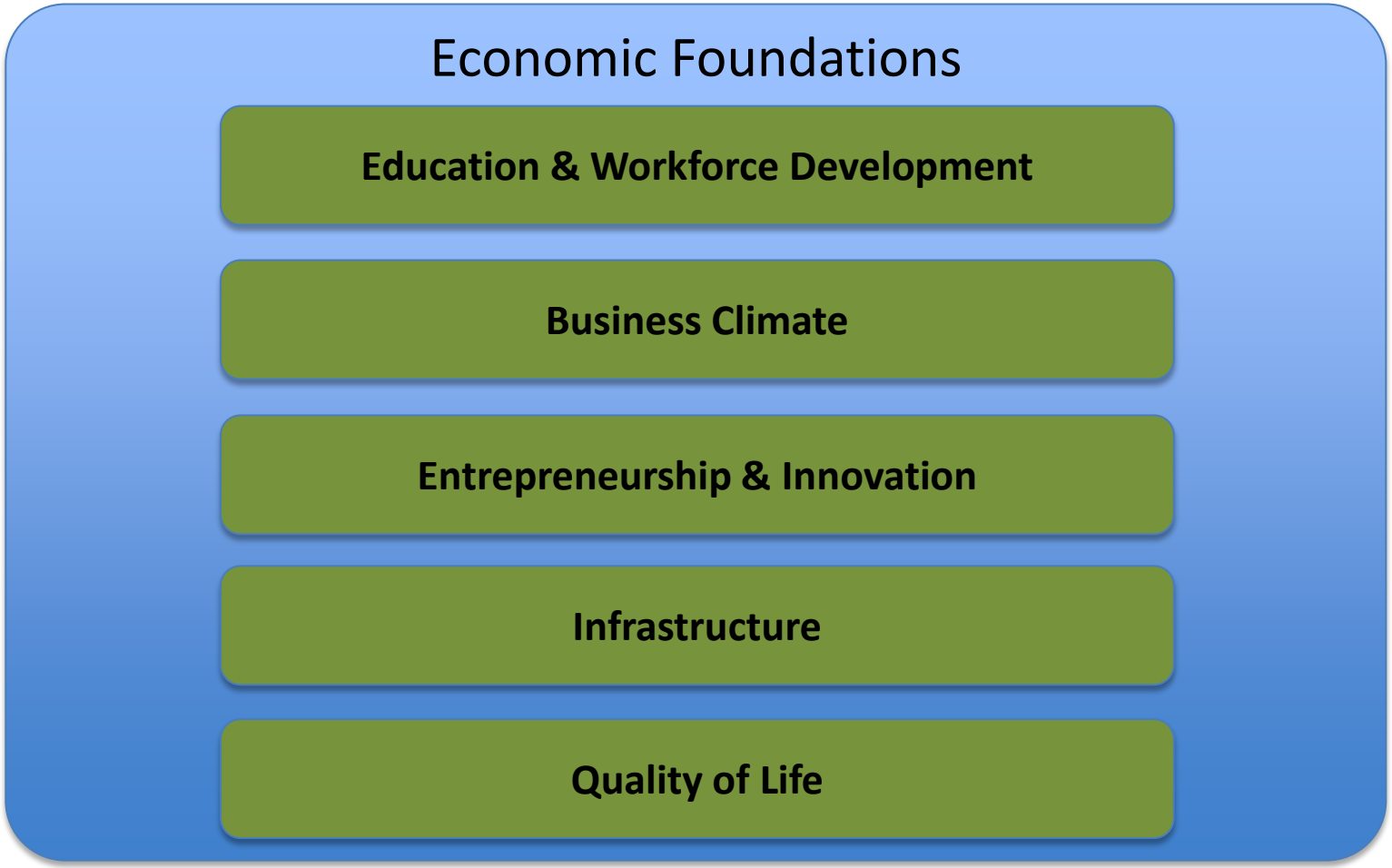
Background – PSRC Transportation Planning Process

Different, but related, metrics used for planning, implementation and performance trends



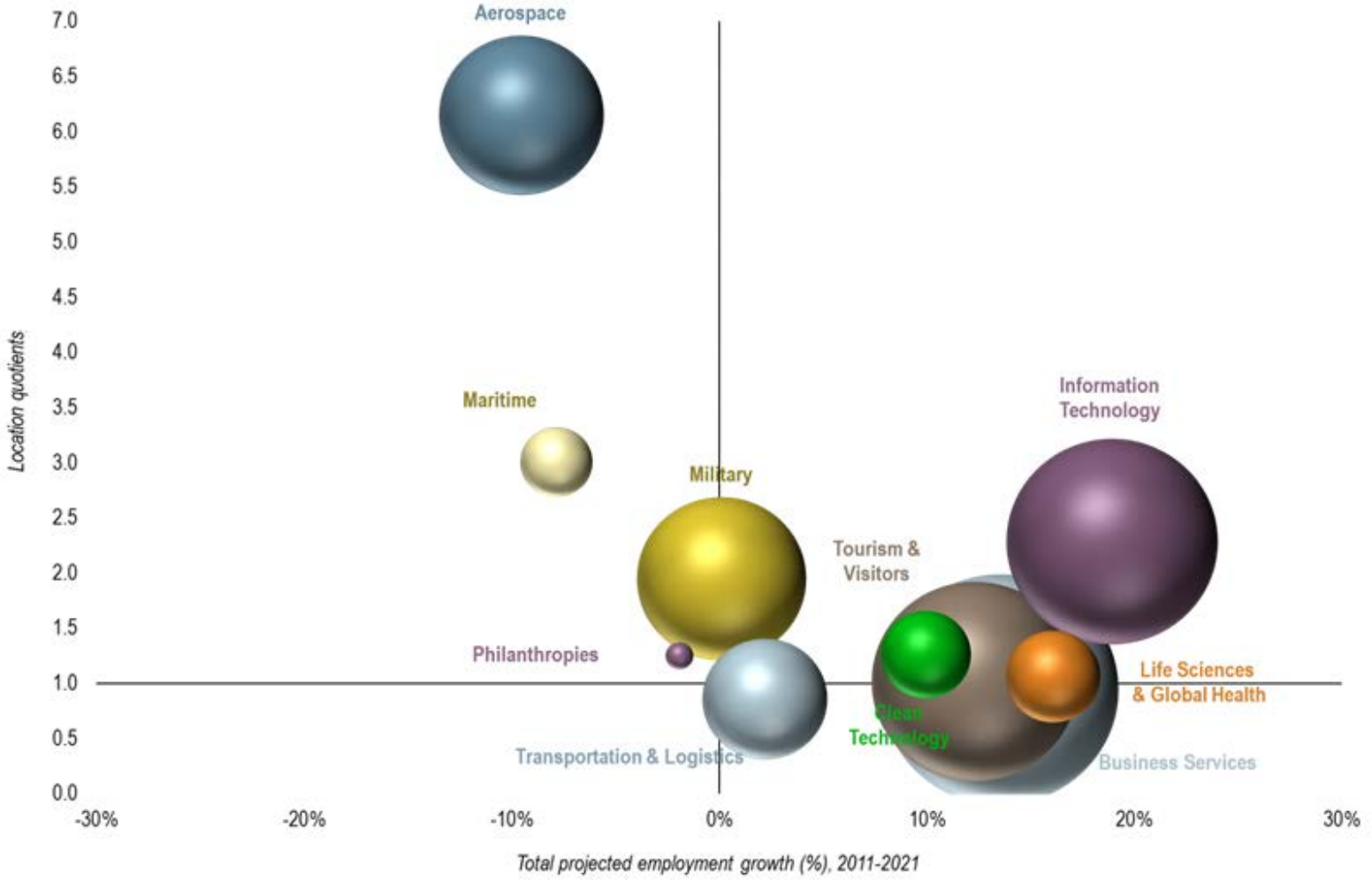
Background - Regional Economic Strategy

Economic Foundations are the overarching building blocks that support all industry clusters and drive a competitive regional economy.



Regional Economic Strategy - Industry Clusters

Industry Clusters are groups of interrelated businesses that have a strong employment base and/or high concentration in the region.



Successes Achieved –Transportation Prioritization

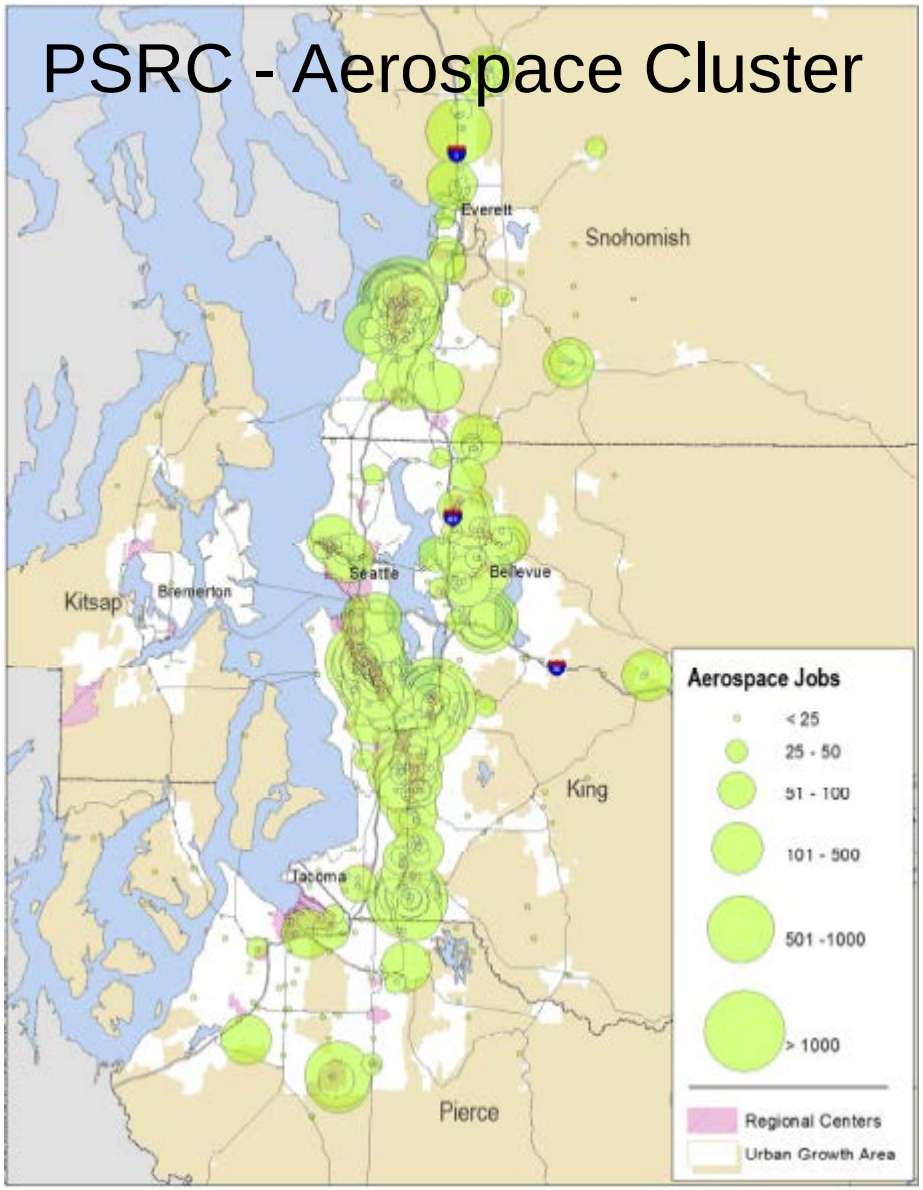
- Prioritization measures used to balance financial strategy ($15.5 billion)
- This measure addresses the extent to which projects support existing and new businesses and job creation.

Purpose: Access to areas of high job concentration. How well does the project support job retention or expansion by improving access?				Prepopulated	% No Response
J1a	Choose one	3	The area served by this project has an employment density[6] of 18 jobs per acre, and is planned (has unused zoned capacity) to accommodate a density of 32 jobs per acre. (Areas that currently exceed the higher threshold would receive points here as well).	Yes	0%
J1b		1	The area served by this project has an employment density of 18 jobs per acre.	Yes	
J2	2		The area served by this project has an employment density of 15 jobs per acre for jobs related to cluster employment.[7]	Yes	0%
J3	2		The area served by this project has an employment density of 15 jobs per acre for family-wage related employment.	Yes	1%
Purpose: Access to economic foundations. How well does the project provide access to job-related training or educational opportunities (vocational schools, community colleges, universities)?					
J4	3		In area with, or supports access to institutions identified as economic foundations.	Yes	0%
10 points maximum score					

Challenges to Date

- How to anticipate future impact on job retention and creation: measures are all model-based
- How to truly measure improvements to productivity caused by transportation investment
- Multiple outcomes: economic growth, access to opportunity, distribution of economic growth, etc.
- Reconciling the Triple Bottom Line: People, Prosperity, Planet
- “Economic Advantage”: competitive edge is a difficult concept to measure

Challenge – Effective jobs measure



- How does transportation investment lead to supporting new/existing jobs?
- Survey of corporations shows "Availability of skilled labor," "highway accessibility" are highest ranking*

**Area Development Magazine* (2011 & 2013 survey)

DRAFT - Transportation 2040 Performance Measures

Freight Mobility is improved	FAST Partnership Projects are completed
	Project Tracking (grade crossings)
	Freight access improved to MICs
Access to transportation is improved (for all)	Amount of employment (measured in jobs?) within 1/4 mile of transit service (or access points to transit, such as a bus stop, rail station, etc.)
Access to jobs/activities/education and opportunities is improved	Projects connecting low opportunity areas with high opportunity areas

Challenges Anticipated – Keeping it meaningful & understandable

MOSAIC
Value and Cost Informed Planning

Contact | Home

About | User's Guide | Categories & Indicators | Programs Guide | Download Tool

Home > Categories & Indicators > Category

Scoring Categories & Indicators

- Accessibility
- **Economic Vitality**
  - Economic Impacts of More Efficient Transportation Services
  - Economic Impacts of Spending for Construction
  - Structural Economic Effects
- Environmental Stewardship
- Equity
- Funding the Transportation System/Finance
- Land Use and Growth Management
- Mobility
- Quality of Life and Livability
- Safety and Security

Economic Vitality

Does the "bundle of actions" contribute to the economic prosperity of Oregon (i.e., growth in employment, production, or other high value economic activity)?

GENERAL INDICATORS

Economic Impacts of More Efficient Transportation Services

Economic Impacts of Spending for Construction

Structural Economic Effects

Health and Transportation

Frank Gallivan
ICF International




AASHTO
THE VOICE OF TRANSPORTATION

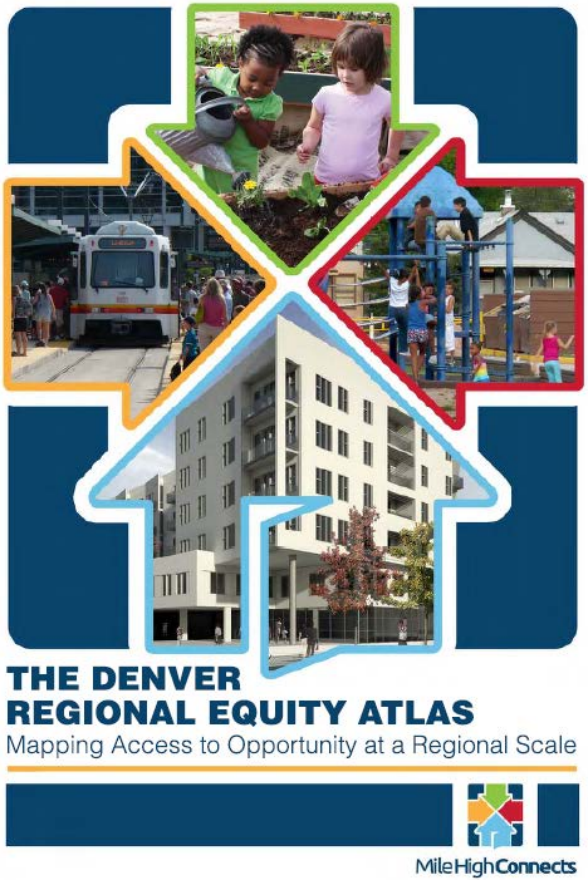
U.S. Department of Transportation
Federal Highway Administration

Key Points

- Wide variety of health initiatives and topic areas in transportation
- Health is a new area for transportation agencies, but is being integrated in performance measurement
- Transportation agencies perceive methodological and domain-related challenges in addressing health

Current Health and Transportation Initiatives

- Federal initiatives
  - Developing a Framework for Better Integrating Health into Transportation Decision Making (FHWA)
  - H+T Index (FHWA)
  - Healthy Communities Index (HCI)
  - Community Transformation Grants (CDC)
- Other initiatives
  - Denver Regional Equity Atlas
  - TransForm (SF Bay Area)
  - Transportation Choices (Seattle region)
  - T4America: Planning for a Healthier Future



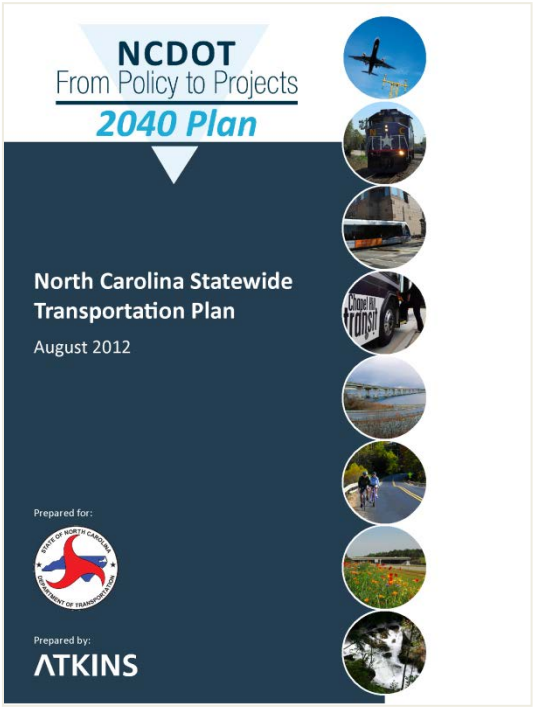
Transportation is a Health Issue

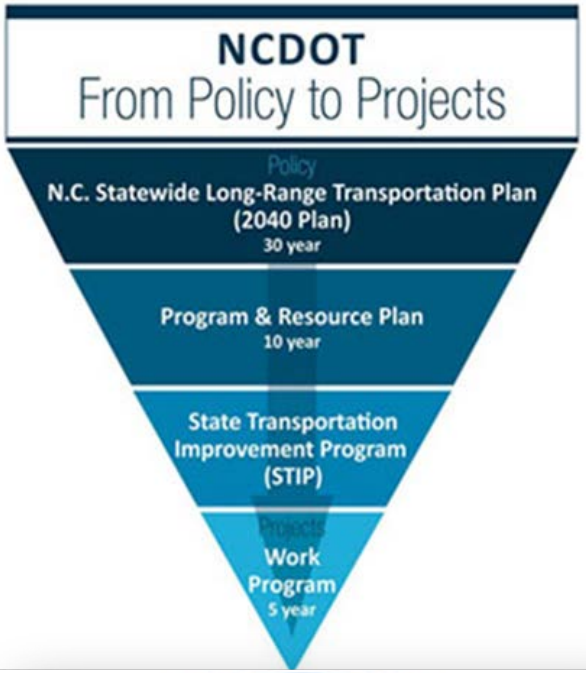
- Active living and fitness
- Obesity
- Cardiovascular disease
- Communicable/infectious disease
- Health care
- Mental health
- Nutrition/healthy eating
- Senior independence/aging
- Respiratory/pulmonary disease
- Transportation-related injuries

State of the Practice

Agency	Measures
SF Bay Area - Metro. Transp. Commission	• Average daily minutes walking or biking per person for transportation (LRTP)
Kansas City Mid-America Regional Council	• Physical inactivity levels (LRTP) • Obesity rates (LRTP)
Texas DOT	• Number of transit trips (monitoring)
North Carolina DOT	• Alternative mode share (discussed) • Alternative mode access (discussed) • Health equity index (discussed)
Massachusetts DOT	• Triple mode share of bicycling, transit + walking (goal)
Transit Cooperative Research Program	• Obesity rates (proposed methodology) • Injuries/fatalities (proposed methodology)

NC DOT: Policy and Planning Context





NC DOT: Integrating the Accountability Framework into Prioritization 3.0

- **Expand prioritization criteria to reflect broadened mission (environment, economy, health and well-being)**
- **Consistent treatment/evaluation of projects (by goal, tier and mode)**
- **Score and rank projects considering the principles and objectives of the Accountability Framework**
- **Three characteristics for criteria:**
  - Project-specific
  - Measurable
  - Data is available (i.e., attainable)

Criteria to Consider: Bike/Ped Projects

Gap	Criterion	Source	Method/Data
Resource Protection	**Estimated reduction in air pollutants from mode substitution**	TxDOT, Nashville MPO, SANDAG	**Mode choice model + EPA MOVES or similar**
Prosperity	**Estimated reduction in household expenditures on transportation from mode shift**	*New*	**Mode choice model + fleet-average MPG + gas costs**
Account-ability	**No Criteria Identified**		
Healthy Communities	**Bicycle, pedestrian, and transit mode share**	TxDOT, Boston Indicators, Santa Monica, SANDAG, Academic Literature	**Mode choice model**
	Health Equity Index	NC DHHS	**Compiled Indicator; *county-level only***

Discussion Topics at Peer Exchange

- Definitions of Health
  - Accessibility to healthy infrastructure
  - Health through transportation choices
- Methodological Challenges in Linking Health to Transportation
- Partnering with Health Agencies

Key Takeaways from Peer Exchange

- Transportation agencies don’t yet fully understand their contribution to public health
- Methodological and domain-related challenges are most pressing
- Partnering with health agencies is a way forward

Key Findings

AASHTO
THE VOICE OF TRANSPORTATION

U.S. Department of Transportation
Federal Highway Administration

Key Findings: Accessibility

- Methodologies are sophisticated, but there's little consensus on how to define (and, thus, measure) accessibility.
- Providing accessibility information in a widely accepted way would bring great value to the industry.
- There are not many examples yet of accessibility measures being used in transportation decision making.
- It's unclear how decision makers will respond to information about accessibility.

Key Findings: Economic Development

- Appropriate economic development performance measures are policy-driven and specific to each region.
- There is no consensus on economic development goals that can be widely used across regions or states
- Value of trying to define common goals at a national level is unclear
- Outcome measures may not be innovative (e.g. wages, GDP), but should be rigorously linked to desired economic development strategies.

Key Findings: Health and Transportation

- There are many ways to measure public health, but establishing a causal link between transportation and public health is a big challenge.
- Transportation agencies should recognize improving health as a shared societal goal, and assume responsibility for managing transportation facilities in ways that support (rather than deter) that goal.

Final Summary Report

Includes:

- Key findings and takeaways from discussions
- Results from survey of 22 practitioners on the state of the practice
- Top priorities for research and technical assistance (for the three topics)
- Other next steps identified by participants

Q & A




AASHTO
THE VOICE OF TRANSPORTATION

U.S. Department of Transportation
Federal Highway Administration

Additional Resources

- **Webinar on the Planning Process Bundle (C02/C08/C09/C12/C15):**
  - Thursday, December 11, 2014 (11:00 AM - 12:30 PM (EST)) (Register here!).
  - SHRP2 Planning Process Bundle Fact Sheet:
    - http://www.fhwa.dot.gov/goshrp2/Content/Documents/Factsheets/Planning_Process_Bundle_H_508.pdf

- **Transportation for Communities-Advancing Projects through Partnership (TCAPP) Beta website**
  - http://transportationforcommunities.com/shrpc01/framework_application_kdps/9/0

- **SHRP 2 Capacity Performance Measures Web Resource (CO2)** http://shrp2webtool.camsys.com/

- **Health and Transportation Corridor Planning Framework Fact Sheet**
  - http://www.fhwa.dot.gov/planning/health_in_transportation/research_efforts/framework_fact_sheet/index.cfm