Public Health Performance Measures and Their Role in the Regional Metropolitan Transportation Planning Process

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Background

- Increasingly regional transportation planning entities, local governments, and federal level agencies prioritizing public health outcomes
  - For example, *Safe Routes to School (SRTS)*
- Increased interest in relationship between transportation infrastructure and service investments and public health outcomes
- Although not required at federal level, public health outcomes may be directly linked to required assessments of environmental justice populations

Purpose and Scope

- 10 different MPOs reviewed for incorporation of public health into the long range planning process
- Identify performance measures for assessing public health impacts at the project level
- Explore use of Health Impact Assessments (HIAs)
- Incorporation of public health performance measures in environmental justice analysis
- Strategies for incorporating public health in regional planning

Regional Transportation Planning Efforts

- Key categories for public health objectives:
  - Safety
  - Active transportation/physical activity
  - Air quality
  - Connectivity
  - Equity
- Performance measures at project-level if included for project selection
- HIAs

MPOs evaluated

Regions (MPOs)	System-level Performance Measures					
	Safety	Air	Physical Activity	Access/Equity	HIA	Project-level
Atlanta, GA (ARC)	✓	✓	✓	✓	✓	✓
San Francisco, CA (MTPC)	✓	✓	✓	✓	✓	✓
Seattle, WA (PSRC)	✓	✓	✓	✓	✓	✓
Portland, OR (Metro)	✓	✓	✓	✓	-	✓
Houston, TX (HGAC)	✓	✓	✓	✓	✓	▪
San Diego, CA (SANDAG)	✓	✓	✓	✓	✓	✓
Nashville, TN (Nashville Area MPO)	✓	✓	✓	✓	✓	✓
Sacramento, CA (SACOG)	✓	✓	-	✓	-	-
Los Angeles, CA (SCAG)	✓	✓	✓	✓	✓	-
Phoenix, AZ (MAG)*	✓	-	-	✓	✓	-
Total = 10	10	9	8	10	8	6

State of the Practice

- All MPOs use performance measures for safety
- Many MPOs must consider air quality

- Project-level performance measures are less frequently used

System Level Performance Indicators

General Category	Specific Indicator	Examples
Air Quality	- Tons of transportation-related air pollution - Percentage of households within 500 feet of high traffic roads or ¼ mile of rail yards and ports, by Census Block group.	SANDAG, SCAG, NATA, CITP, LOPT HIA, ECEAP HIA, Metro RTP, VMT HIA, PSCAA, HGHPF, Travel Demand Model/ARB, EMFAC Model, Scenario Planning Model, ARM EMFAC Model
Physical Activity	-Percent mode share of active modes (transit, biking, walking) -Vehicle Miles Traveled (total and per capita)	SANDAG, NATA, PSRC, LOPT HIA, ECEAP HIA, Metro RTP, VMT HIA, PSRC
Safety	-Accident Cost Savings	PSRC
Safety	-Crash rates, injuries and fatalities (disaggregated by mode)	NATA, LOPT HIA, ECEAP HIA, VMT HIA, SANDAG, HGHPF, MAG, SCAG
Transportation Choice	-Percent of households within ¼ mile of transit, in walkable neighborhoods, or within ¼ mile of a bicycle route -Number of transportation options available vs auto accessibility	NATA, CITP, Metro RTP, SANDAG, SACOG, GCAQAP
Accessibility	-Access to healthy food retail, healthcare, recreation facilities, open space, public spaces and social services -Number and percent of homes within a ½ mile of the regional trail system	SANDAG, MAG, SCAG, LOPT HIA, Metro RTP, ABLHIA, HGHPF, SACOG
Travel Time	Motor vehicle and transit travel time between key origins and destinations	Metro RTP

Project Level Performance Indicators

- Transportation facility elements
  - Safety and physical activity closely linked
  - Bikability/walkability usually focuses on physical activity
  - Safety concerns can serve as a significant deterrent to physical activity
- Other factors impacting safety, physical activity, equity and air quality
  - Built environment
  - Other neighborhood characteristics (e.g. crime)

HIAs

- Usually occur at project level
- Evidence-based methods
- Assessing proposed projects
- Trying to mitigate future harms while remedying existing health issues
- Policy and implementation

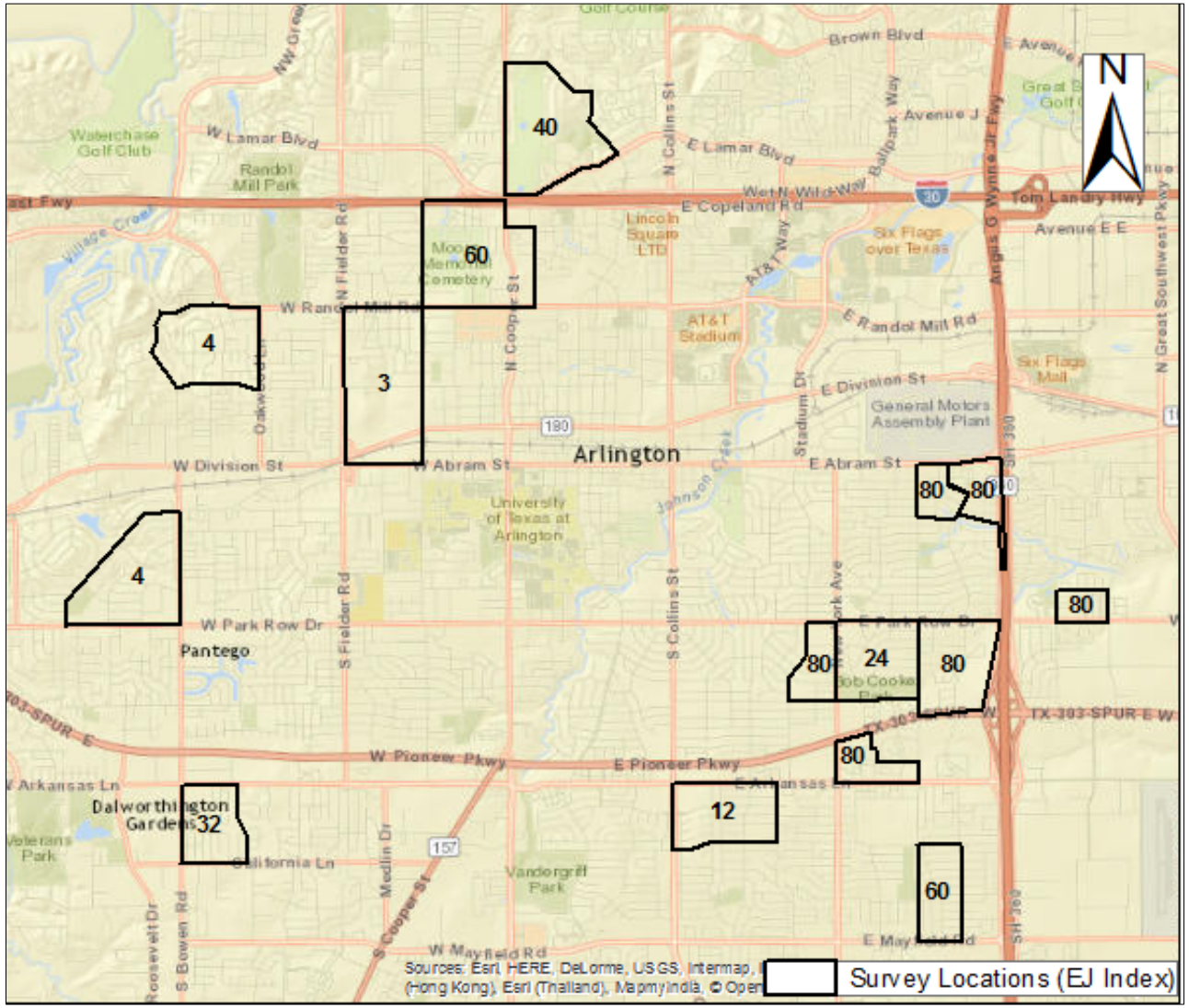
Environmental Justice Analysis

- Less frequently use public health indicators (4 MPOs)
  - Primarily in California
- Focus on air quality and physical activity
- Physical activity may be direct measure such as percentage of population engaging in 30 minutes of physical activity or a proxy measure like a park within a 30 minute travel distance by transit or pedestrian
- Air quality at regional level may miss hot spots
- Air quality may use a direct measure like asthma incidence or a proxy measure like distance to transportation facility

Project-level Performance Measures in Spatial Analysis

- Objectives
  - Assess safety and physical activity of pedestrian and bicyclists at both segments and intersections.
  - Perform spatial analysis of transportation facilities that serve EJ populations and as a control, transportation facilities that serve non-EJ populations
  - Explore the differences in performance between the facilities that serve EJ populations and the control group

Census Block Groups Studied



- Environmental Justice Index
  - Larger is greater indication of EJ population
- 3 non-EJ (EJI ≤ 10)
- 12 EJ (EJI > 10)

Spatial Analysis Methodology

- Assessment only includes major arterials, minor arterials and collector streets
- Collects data through a visual assessment of street segments and intersections with an observational survey by a trained observer.
  - Pedestrian Safety Assessment Index (PSAI) and the Bicyclist Safety Assessment Index (BSAI)
  - The Walkability Assessment Index (WAI) and Bikeability Assessment Index (BAI)
- Observers completes a separate survey form for each individual intersection and street segment

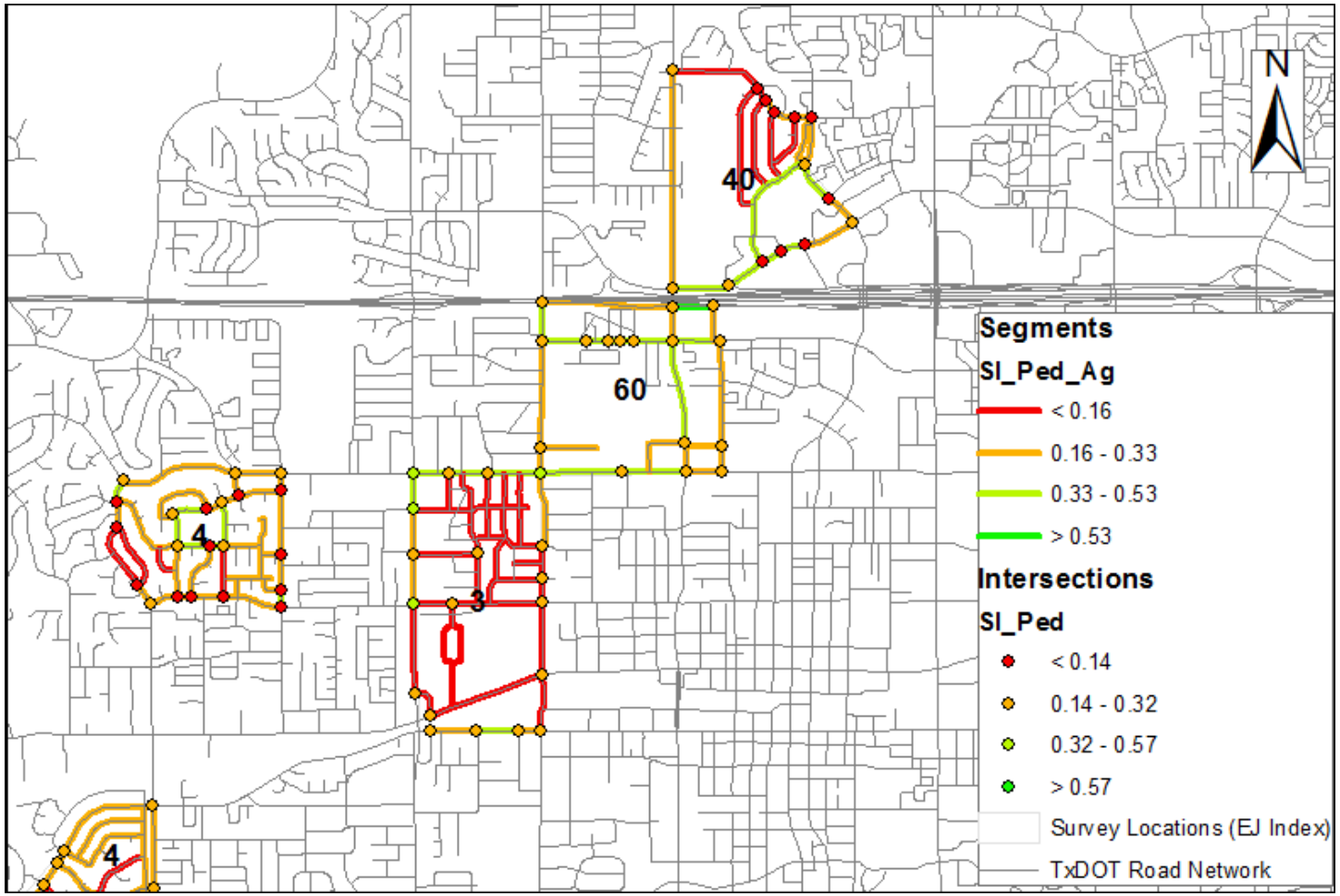
Identification of Safety Zones …

Safety Impact	Color Code	Bicyclist Safety Assessment Index (BSAI)	
		Segment	Intersection
Negative Impact		< 0.25	< 0.14
Negative - Minimal Impact		>= 0.25 - < 0.37	>= 0.14 - < 0.30
Minimal – Positive Impact		>= 0.37 - <= 0.49	>= 0.30 - <= 0.43
Positive Impact		> 0.49	> 0.43

Analysis

- Segment
  - Pedestrian Safety Assessment Index (PSAI)
  - Bicyclist Safety Assessment Index (BSAI)
  - Walkability Assessment Index (WAI)
  - Bikeability Assessment Index (BAI)
- Intersection
  - Pedestrian Safety Assessment Index (PSAI)
  - Bicyclist Safety Assessment Index (BSAI)
  - Walkability Assessment Index (WAI)
  - Bikeability Assessment Index (BAI)

Element Weights …



Safety Impact Levels by Census Block Type

Facility	Index	Census Block Type	Safety Impact Level			
			Negatively Impact	Negatively - Minimally Impact	Minimally - Positively Impact	Positively Impact
Segment	Pedestrian - Safety	Non-EJ	33%	52%	15%	0%
		EJ	6%	26%	60%	9%
	Bicyclist - Safety	Non-EJ	48%	51%	0%	1%
		EJ	25%	46%	26%	3%
Intersection	Pedestrian - Safety	Non-EJ	23%	70%	7%	0%
		EJ	13%	83%	5%	0%
	Bicyclist - Safety	Non-EJ	23%	77%	0%	0%
		EJ	17%	80%	1%	2%

- Arlington's infrastructure appears to need significant modification to positively impact safety
- Majority of EJ census blocks' infrastructure appears to have a minimally positive impact on safety
- Virtually none of the segments positively impact safety
- Intersections infrastructure conditions either impact or minimally impact safety negatively.

Physical Activity Impact Levels

Facility	Index	Census Block Type	Physical Activity Level			
			Discourages	Discourages - Neutral Effect	Neutral Effect - Definitely Improves	Definitely Improves
Segment	Pedestrian - Walkability Index	Non-EJ	0%	88%	13%	0%
		EJ	1%	61%	38%	0%
	Bicyclist - Bikeability Index	Non-EJ	0%	43%	56%	1%
		EJ	0%	41%	58%	0%
Intersection	Walkability / Bikeability Index	Non-EJ	0%	72%	28%	0%
		EJ	1%	60%	38%	1%

- Study segments do not discourage or encourage either walking or cycling.
- Segments and intersections have a neutral effect on physical activity levels
- Walking appears to be more discouraged along segments

Spatial Analysis

- EJ community facilities are “better” than non-EJ communities
- Arlington needs to significantly improve its facilities to address bicycle and pedestrian safety issues
- In the areas studied, Arlington’s infrastructure minimally impacts physical activity

Challenges in Developing Health-related Indicator System

- Data
  - Budget vs. data quantity and quality
  - Regional focus for data availability and consistency
  - Making evidence at a higher geography relevant for localized issues
- Collaboration
  - Connecting with collaborative organizations
  - Aligning partner goals and perspectives
  - Deciding what to measure and how to measure it
- Outreach
  - Getting user communities engaged
  - Communicating about health issues and social determinants of health
  - Getting decision makers to use the data

Action Strategies

- Short to mid-term
  - Identify motivation
  - Develop a working group or standing committee
  - Develop a prioritized performance measures inventory
- Mid to long-term
  - Formal integration
  - Outreach
  - Pilot projects

Conclusions

- MPOs integrating health objectives into their regional and transportation planning in safety, encouraging physical activity, improved air quality, connectivity, and equity
- Developing health-related criteria for Transportation Improvement Project (TIP) selection
- Most MPOs have already advanced strategies in ensuring safety across transportation modes.
- Similarly, although monitoring and improving air quality has been an integrated part of MPOs
- MPOs typically address potentially disadvantaged communities by focusing on improving connectivity and equitable access to transportation infrastructure and services
  - direct performance measures (e.g. annual PM_{10} emission and respiratory hospitalization incidents among 0-15 years of children)
  - proxy measures (e.g. low birthweight of mothers living near highways).
- Identify the motivation and potential partnerships in integrating health objectives into their planning process.
- Assemble a workgroup or standing committee represents an important step to solidify partnerships between transportation planning agency, public health institutions, and community groups.

Questions ?