Bicycle and Pedestrian Planning in a Historically Car-Centric Culture:
A Focus on Connectivity, Safety, & Accessibility

Kate Horton and Zylavian Watley
Transportation Planners
Memphis Urban Area Planning Organization
(Memphis MPO)
Date: January 18, 2018
Memphis MPO - Background

- Bi-State MPO – TN and MS
  - Planning Area: 2 full counties and 2 partial counties
  - Coordination with AR (West Memphis MPO)
- 18 Municipalities

Quick Facts:
- Population approx. 1.1 million
- Land Area: 1348 sq. miles
- 3,703 center-line miles in the region
- Primary Means of Transportation (2015, ACS 1 Year Estimate):
  - Memphis MSA
    - 84.4% - Drive Alone
    - 8.84% - Carpoled
    - 3.1% – Work at Home
    - 1.1% - Walked
    - 0.054% - Bicycle
  - United States
    - 76.6% – Drive Alone
    - 9% - Carpoled
    - 4.6% - Work at Home
    - 2.8% - Walked
    - 0.6% - Bicycle
Memphis MPO – Bicycle & Pedestrian Overview

• Bicycle and Pedestrian Facilities
  ▫ Bike Lanes
  ▫ Shared-Use Paths
  ▫ Greenways/Trails
  ▫ Paved Shoulder
  ▫ Marked-Shared Roadway
  ▫ Cycle Tracks
  ▫ Located on our MPO website under Interactive Map (activated in 2016)
Memphis MPO – Bicycle & Pedestrian Overview

- Public and Stakeholder Involvement:
  - **Active Transportation Advisory Committee (ATAC)**
    - Formed in 2013
    - Meet on Quarterly Basis
    - Provide Guidance on Issues Related to:
      - Bicycling, Walking, Public Transportation, Accessibility for Persons with Disabilities
    - Membership from Broad Range of the Regional Community:
      - Greenways & Trails Groups, Municipalities (planners/engineers), Transit Providers, Advocacy Groups, State DOT
    - Review Transportation Alternatives Applications
    - Reports on Active Transportation Projects/Program that encourages regional initiatives and efforts

- **MPO Staff Involvement – Bicycle and Pedestrian:**
  - Safety Committees
  - Task Force Boards
  - Advocacy Groups
  - Representation throughout the Region

- **Public Outreach (Specific to Plans/Events etc.)**
Memphis MPO – Bicycle & Pedestrian Overview

- Initial Plan for MPO
  - 2004 - Bicycle and Pedestrian Advisory Committee Formed (BPAC)
  - 2008/2010 - Bicycling magazine named Memphis one of the “Worse Cities for Cycling”

- 2013 - Active Transportation Advisory Committee (ATAC) Formed
- 2014 –Bicycle and Pedestrian Data Collected
  - 1,100+ surveys
  - 40 manual count locations

- Extensive Public Outreach: 2,100+ surveys submitted
- 2010 – Create Grouping and Set-Aside Funding for Bicycle and Pedestrian Projects (FY 2011-14 TIP)
- 2012 - Bicycling magazine named Memphis the “Most Improved City for Cycling”
2014 Plan – Method of Analysis

- **Ranking Criteria**: Focus Around 4 Themes of Plan:
  - **Safety** – Crash Analysis
  - **Connectivity** – Bike/Ped LOS, Connected Node Ratio,
  - **Accessibility** – Shortest Path Analysis
  - **Mode Shift Potential** – Shift to Bicycle or Pedestrian Travel

<table>
<thead>
<tr>
<th>SAFETY</th>
<th>CONNECTIVITY</th>
<th>ACCESSIBILITY</th>
<th>MODE SHIFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative Crash Analysis</td>
<td>Block Length</td>
<td>Shortest Path</td>
<td>Projected Mode Shift</td>
</tr>
<tr>
<td>The higher the score, the more crashes that occur in that area (applied by Census Tract per person).</td>
<td>The higher the score, the higher the block lengths are in that area (applied by Census Tract).</td>
<td>The higher the score, the less that location supports bicycle/pedestrian travel in its current condition (applied by network segment).</td>
<td>The higher the score, the greater potential that location offers to shift trips to bicycle or pedestrian travel (applied by census Tract).</td>
</tr>
</tbody>
</table>

- **Composite Score – All Roadway Segments**
  - Composite Score = 4 Planning Theme Scores
  - Prioritization Process: Each theme involved its own Analytical methods
    - Assessment of Network
    - Project Scoring
    - Project Ranking
Method of Analysis - SAFETY

- **Safety and Comfort**

- **Two Sections of Analysis**
  - Quantitative Crash Analysis
  - Qualitative Bicycle and Pedestrian Comfort Analysis

- **Key Safety Issues**
  - Roadway Barriers
  - Signalized Intersections
  - Unsignalized Crossings
  - Walkways (Sidewalks)
  - Bikeways
  - Lack of Accessibility for Person with Disabilities
  - Behavior Patterns that Impact Pedestrian and Bicycle Safety
    - Motorist Behavior
    - Bicyclist/Pedestrian
Method of Analysis - CONNECTIVITY

Pedestrian Block Length Analysis

Block Length Analysis

- Green: Extremely Short
- Yellow: Moderately Short
- Orange: Moderately Long
- Red: Very Long
- Light Red: Extremely Long

Pedestrian Connected Node Ratio Analysis

Connected Node Ratio

- 0.91 - 1.00
- 0.86 - 0.91
- 0.82 - 0.86
- 0.78 - 0.82
- 0.75 - 0.78
- 0.70 - 0.75

Plan A: 0.88
Lack of Connectivity

Plan B: 1.13
Well Connected Network
Method of Analysis - **ACCESSIBILITY**

**Continued Measure of Connectivity: Achieving Greater Access to Common Destinations**

- **Creating an Accessible System**
  - Eliminate gaps in the network.
  - Identify “high demand” routes or pieces of the network that are likely to see the highest level of use.
  - Design projects where users feel **safe** navigating the network.
Method of Analysis – **MODE SHIFT**

**Shifting from Motor Vehicle to Bicycle and Pedestrian Travel**

- Mode Shift dependent on **density**
  - Increase in density allows potential for mode shift within networks
- Where **public transportation** is utilized is the highest potential locations for mode shift
  - Need for greater investment in public transportation
- **Non-Infrastructure Programs**
  - Expand Public Campaigns (rights and responsibilities of users)
  - Bicycle and Pedestrian Safety Education (TN Highway Safety Campaign)
  - Enforcement Campaigns
  - Local Development Guidelines
  - Shared Use Systems (Implementation)
Composite Score

• All roadway segments receive composite scores
  o Centered Around - 4 Planning Themes
  o Composite Score out of Total of 100 Points
• Example: Block Length Analysis
  o Shorter Block Length = Higher Point Value

<table>
<thead>
<tr>
<th>Max</th>
<th>Criteria</th>
<th>Measurement</th>
<th>Points Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 pts</td>
<td>Connectivity</td>
<td>Block Length Analysis</td>
<td>Shorter Block Length = Higher Point Value</td>
</tr>
</tbody>
</table>

• Individual Projects Overlaid on Segments
  - Identified: 2011 Bike/Ped Plan, Local Bike/Ped Plans
• Used Project Prioritization TIP
### Bike/Ped Plan Priorities

#### TOP 75 BICYCLE CORRIDOR IMPROVEMENT PRIORITIES

<table>
<thead>
<tr>
<th>Priority</th>
<th>MOLEY NAME</th>
<th>FROM</th>
<th>TO</th>
<th>TYPE OF MOLEY</th>
<th>JURISDICTION</th>
<th>ST</th>
<th>MILE</th>
</tr>
</thead>
</table>

#### TIP Ranking Criteria

<table>
<thead>
<tr>
<th>Bicycle and Pedestrian Criteria</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proximity to Land Uses (within 1/2 mile ped, 3 mile bicycle)</td>
<td>10</td>
</tr>
<tr>
<td>Schools and Colleges</td>
<td>2</td>
</tr>
<tr>
<td>Parks</td>
<td>2</td>
</tr>
<tr>
<td>Major and Local Retail Centers</td>
<td>2</td>
</tr>
<tr>
<td>Major Employment Centers</td>
<td>2</td>
</tr>
<tr>
<td>Travel Routes</td>
<td>2</td>
</tr>
<tr>
<td>Network Continuity</td>
<td>10</td>
</tr>
<tr>
<td>Project provides regional network continuity - region wide benefits</td>
<td>10</td>
</tr>
<tr>
<td>Project provides local network continuity - localized benefits</td>
<td>5</td>
</tr>
<tr>
<td>No Network Continuity</td>
<td>0</td>
</tr>
<tr>
<td>Bicycle Related Improvements</td>
<td>8</td>
</tr>
<tr>
<td>Project scope includes cycle track or shared-use path</td>
<td>5</td>
</tr>
<tr>
<td>Project scope includes signed and painted bike lane or bicycle boulevard</td>
<td>4</td>
</tr>
<tr>
<td>Project scope includes end of trip facilities (WiPS/washing stations, racks, etc.)</td>
<td>3</td>
</tr>
<tr>
<td>Project scope does not include bicycle facilities</td>
<td>0</td>
</tr>
<tr>
<td>Pedestrian Related Improvements</td>
<td>8</td>
</tr>
<tr>
<td>Project scope includes ADA accessible sidewalks, curbs, shared-use path, or overpass/underpass</td>
<td>4</td>
</tr>
<tr>
<td>Project scope includes pedestrian signals or enhanced on-street crossing facilities</td>
<td>2</td>
</tr>
<tr>
<td>Project scope includes marked crosswalks</td>
<td>1</td>
</tr>
<tr>
<td>Project scope includes pedestrian amenities</td>
<td>1</td>
</tr>
<tr>
<td>Project scope does not include pedestrian facilities</td>
<td>0</td>
</tr>
<tr>
<td>Pedestrian Priority in Regional Bicycle and Pedestrian Plan</td>
<td>5</td>
</tr>
<tr>
<td>Corridor Priority Ranking #1-262</td>
<td>5</td>
</tr>
<tr>
<td>Corridor Priority Ranking #263-505</td>
<td>3</td>
</tr>
<tr>
<td>Corridor Priority Ranking #506-788</td>
<td>1</td>
</tr>
<tr>
<td>Corridor is not a ranked priority in the Regional Bicycle and Pedestrian Plan</td>
<td>0</td>
</tr>
<tr>
<td>Incorporate Traffic Calming and Design Improvements</td>
<td>4</td>
</tr>
<tr>
<td>Project Addresses Location with History of Fatal Bike/Ped Crashes</td>
<td>5</td>
</tr>
</tbody>
</table>

Bicycle and Pedestrian Criteria total points | 50 |
Regional Collaboration

Wolf River Greenway

- Greenway – 36 miles from Memphis to Collierville
- Built in Phases
  - First phase completed 2010 (2.6 miles)
  - Currently Developing Four Phases
  - Goal completed by 2020
  - Intersects with other trail systems including the Shelby Farms Greenline
Regional Collaboration

Harahan Bridge/Big River Crossing

- 2012 – TIGER IV Grant Award ($15 M)
- Longest Public Pedestrian/Bike Bridge across Mississippi River
- 2016 (October) – Opened to Public
  - 20,000 visitors crossed first week of operation
- Public/Private Partnership:
  - Memphis, TN & West Memphis, AR
  - TDOT, MDOT, USDOT
  - FedEx, AutoZone, many others
Data Driven

**Implementation**

- **Automated Count Bike/Ped Pilot Program**
  - $20,000 Grant from FHWA to Purchase Counters
    - Infrared (3) and Pneumatic Tube Counters (3)
  - 2015 – 1 of 10 MPO’s selected
  - Bike/Ped Counting Program – Check-out Equipment

- **Programmed FY 2017-20 TIP**
  - Funding Set-Aside: Bike/Ped Grouping
  - Bike/Ped Projects = 25%+
    - MPO managed funds
  - Project Ranking Criteria:
    - Road Projects/Grouping – Bike/Ped Improvements
    - Priority Ranking in the MPO’s Regional Bike/Ped Plan
On-going Initiatives

• **Tennessee Highway Safety Office**
  - 5-Year Demonstration Grant – Improving Safety for Cyclists and Pedestrians

• **Bicycle and Pedestrian Report**
  - Updates to the Plan Since 2014 (Safety, Agency Reports, Mapping)
  - Questionnaire sent out to Jurisdictions/Agencies
  - Completion of Bicycle and Pedestrian Report (Update to 2014 Plan)
    - Includes Updated Safety Data (2014-2017)

• **Coordination & Collaboration**
  - State DOT’s (TN & MS) – Coordination Efforts & Safety Data
  - Member Jurisdictions & Agencies – Serve on advisory councils, task forces, committees

• **Implementation**
  - Construction of New Bicycle and Pedestrian Facilities
  - Incremental Steps

• **Incremental Steps**
  - Change in the Culture for Active Transportation

---

**Exponential Growth for Shared-Use Facilities**

<table>
<thead>
<tr>
<th>City of Memphis:</th>
<th>1.5 miles</th>
<th>400 miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>2017</td>
<td></td>
</tr>
</tbody>
</table>