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)
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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% - Carpooled
- 3.1% – Work at Home
- 1.1% - Walked
- 0.054% - Bicycle

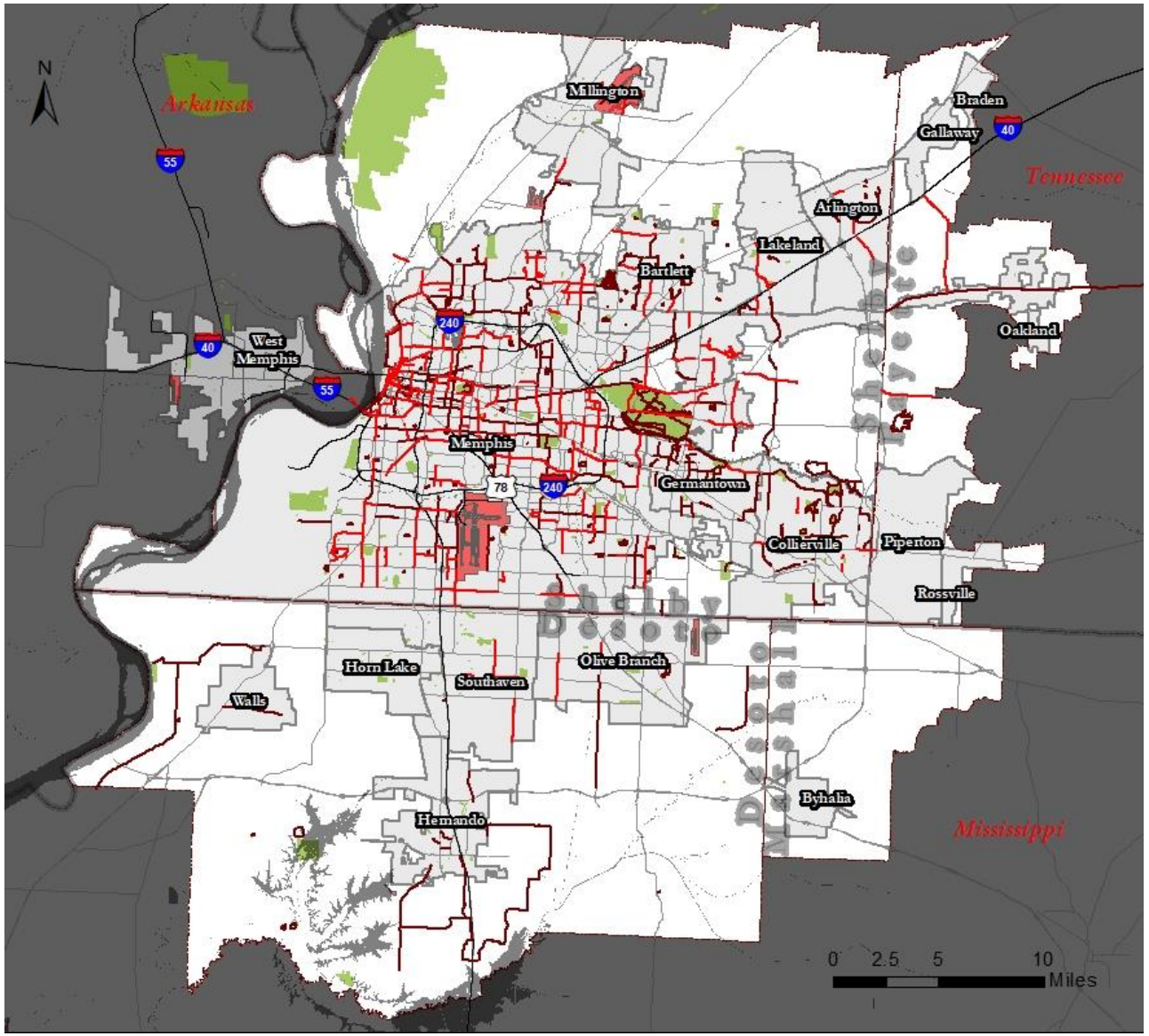
United States

- 76.6% – Drive Alone
- 9% - Carpooled
- 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)



Legend

Bike/Ped Facilities

Existing

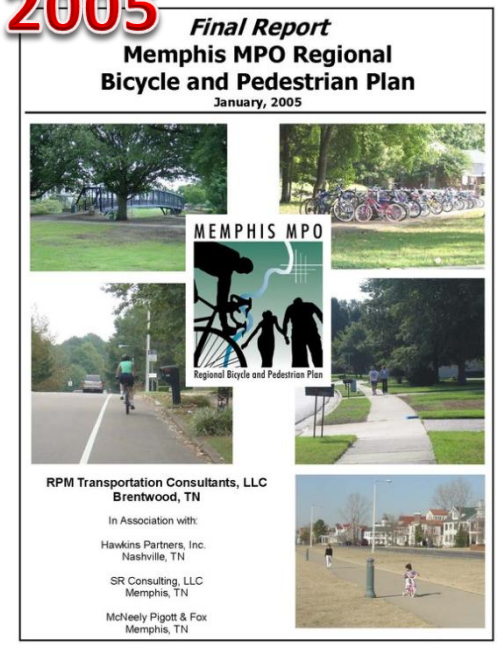
Programmed

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.)**

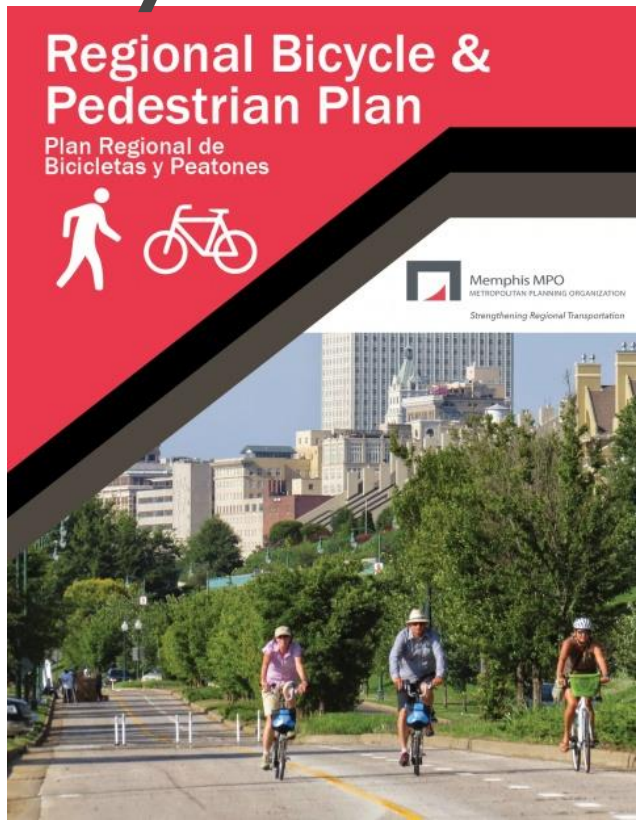
Memphis MPO – Bicycle & Pedestrian Overview

2005



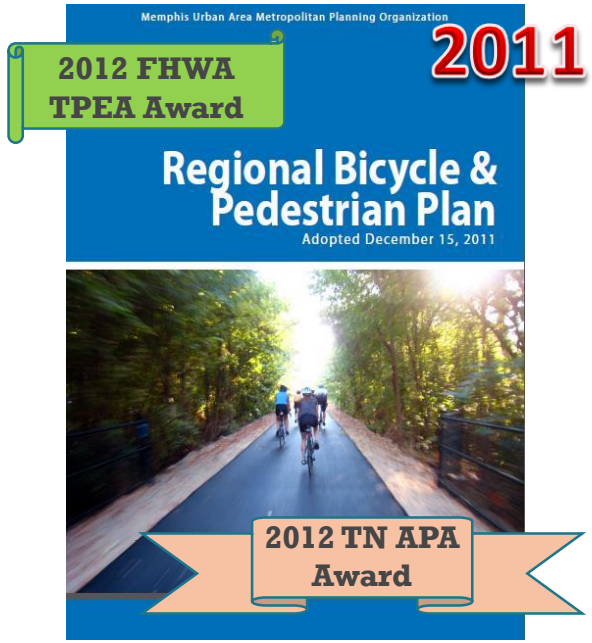
- Initial Plan for MPO
- **2004** - Bicycle and Pedestrian Advisory Committee Formed (BPAC)
- **2008/2010** - *Bicycling* magazine named Memphis one of the "Worse Cities for Cycling"

2014



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

2011



- 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

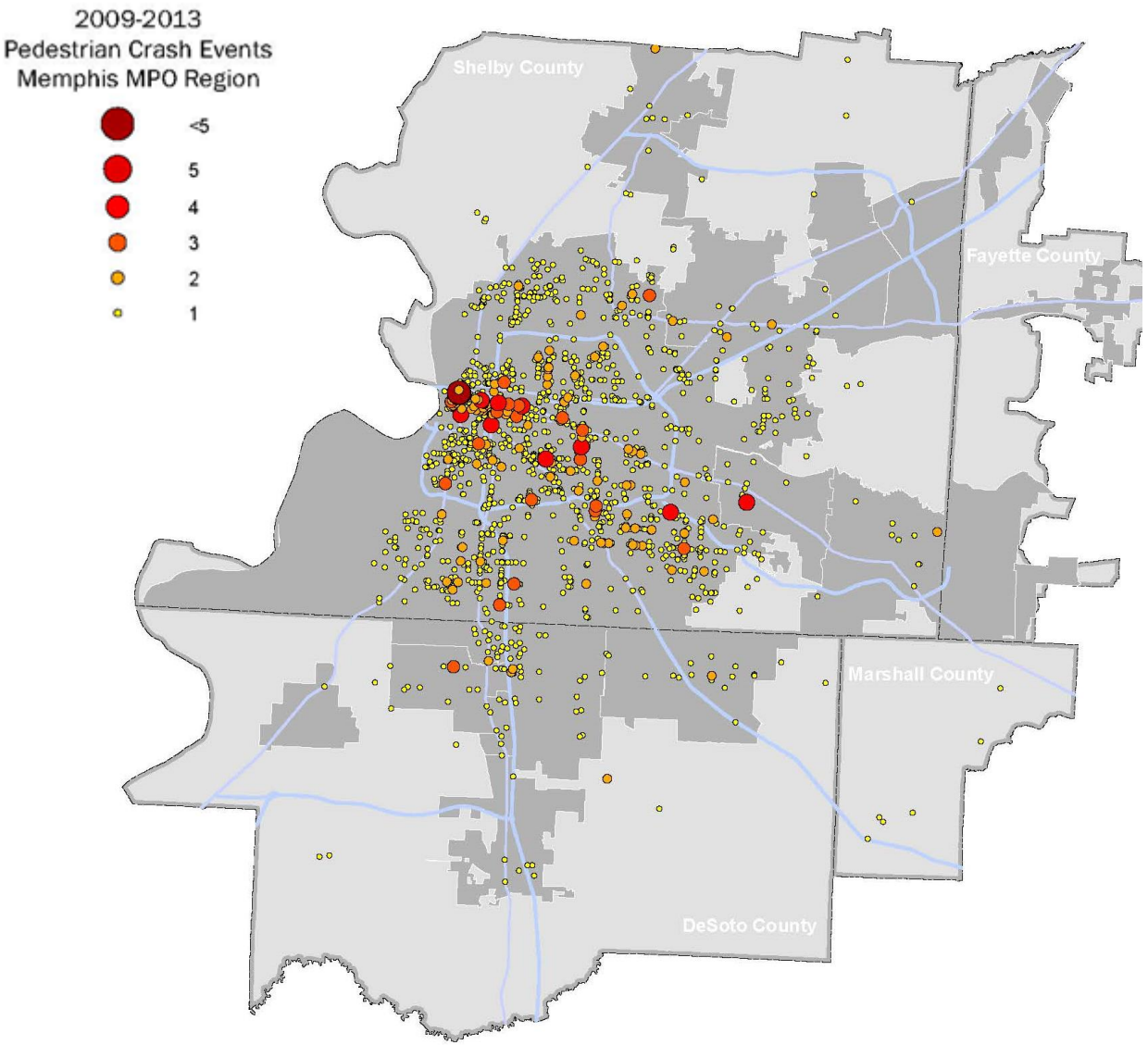
- **Ranking Criteria:** Focus Around 4 Themes of Plan:
  - **Safety** – Crash Analysis
  - **Connectivity** –Bike/Ped LOS, Connected Node Ratio,
  - **Accessibility** – Shortest Path Analysis
  - **Mode Shift Potential** – Shift to Bicycle or Pedestrian Travel

SAFETY	
Quantitative Crash Analysis	The higher the score, the more crashes that occur in that area (applied by Census Tract per person).
CONNECTIVITY	
Block Length	The higher the score, the higher the block lengths are in that area (applied by Census Tract).
Link-Node Ratio	The higher the score, the fewer links there are to nodes in that area (applied by Census Tract).
Level of Service	The higher the score, the less that location supports bicycle/pedestrian travel in its current condition (applied by network segment).
ACCESSIBILITY	
Shortest Path	The higher the score, the more that location is used, or, alternatively, in demand (applied by network segment).
MODE SHIFT	
Projected Mode Shift	The higher the score, the greater potential that location offers to shift trips to bicycle or pedestrian travel (applied by census Tract).

- 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 Patters that Impact Pedestrian and Bicycle Safety
      - Motorist Behavior
      - Bicyclist/Pedestrian

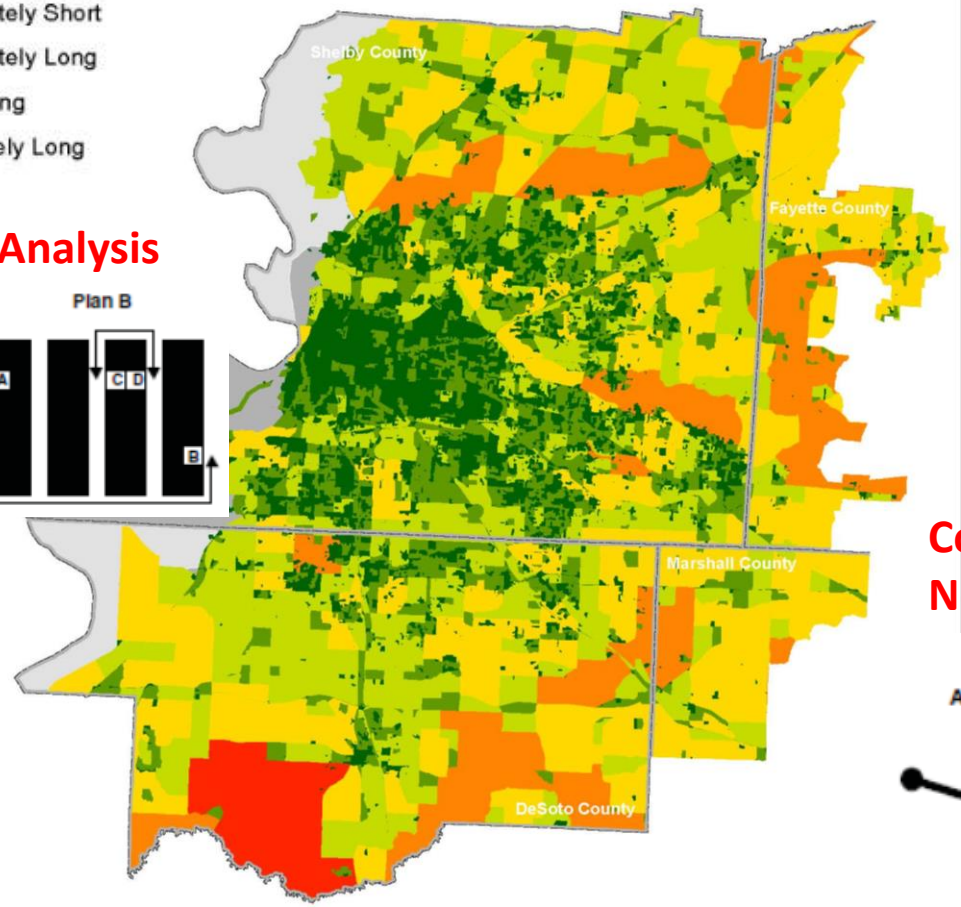


Method of Analysis - CONNECTIVITY

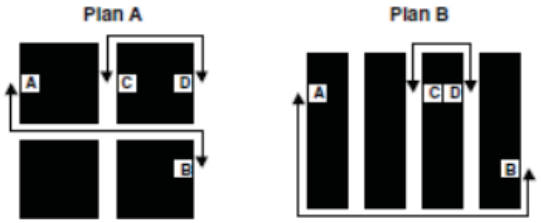
Block Length Analysis
Memphis MPO Region

- Extremely Short
- Very Short
- Moderately Short
- Moderately Long
- Very Long
- Extremely Long

Pedestrian Block Length Analysis



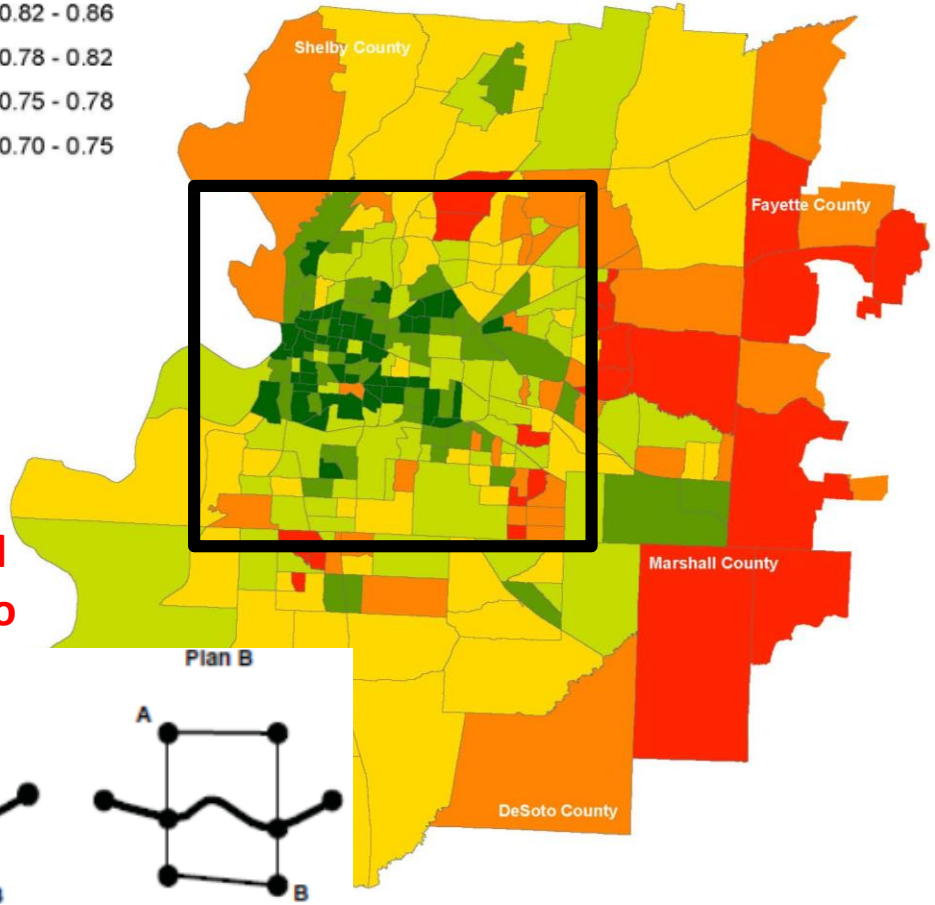
Block Length Analysis



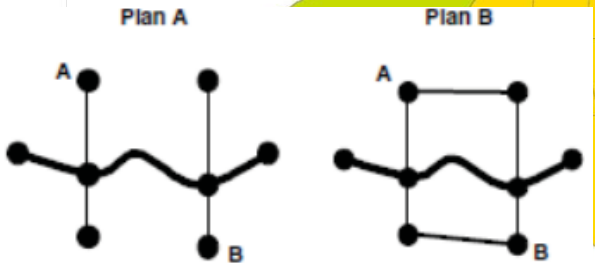
Connected Node Ratio
Memphis MPO Region

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

Pedestrian Connected Node Ratio Analysis



Connected Node Ratio



Plan A: 0.88
Lack of Connectivity

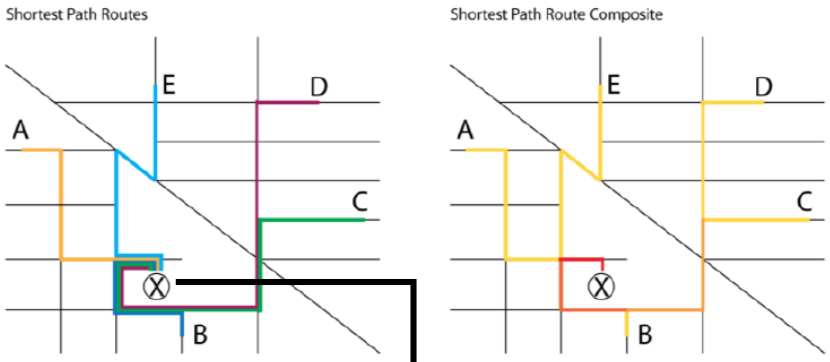
Plan B: 1.13
Well Connected Network

Method of Analysis - ACCESSIBILITY

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

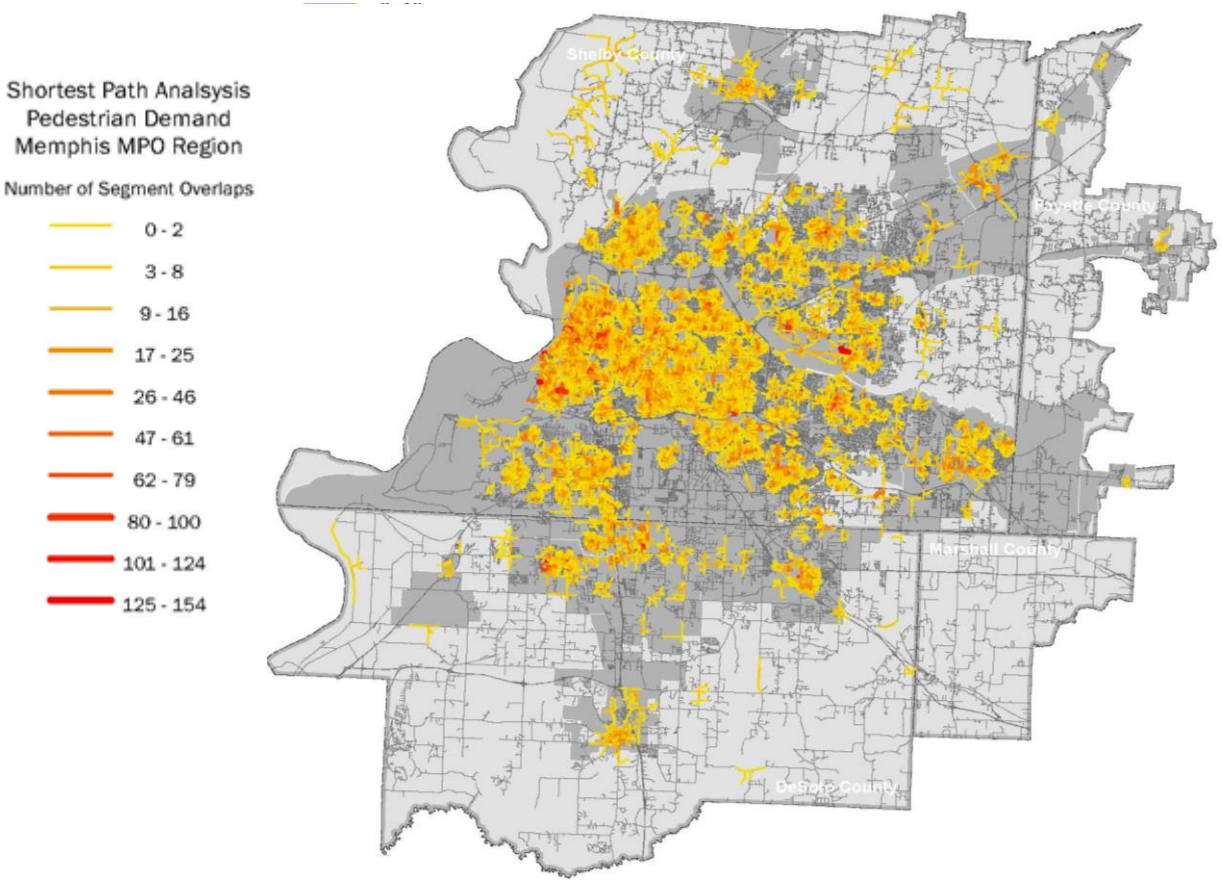
- **Creating an Accessible System**
  - **Eliminate gaps** in the network.
  - Identify **"high demand"** routes or pieces of the network that are likely to see the highest level of use.
  - Design projects where users feel **safe** navigating the network.

Shortest Path Analysis



Common Destinations (Schools, Parks, Markets)

Shortest Path Analysis

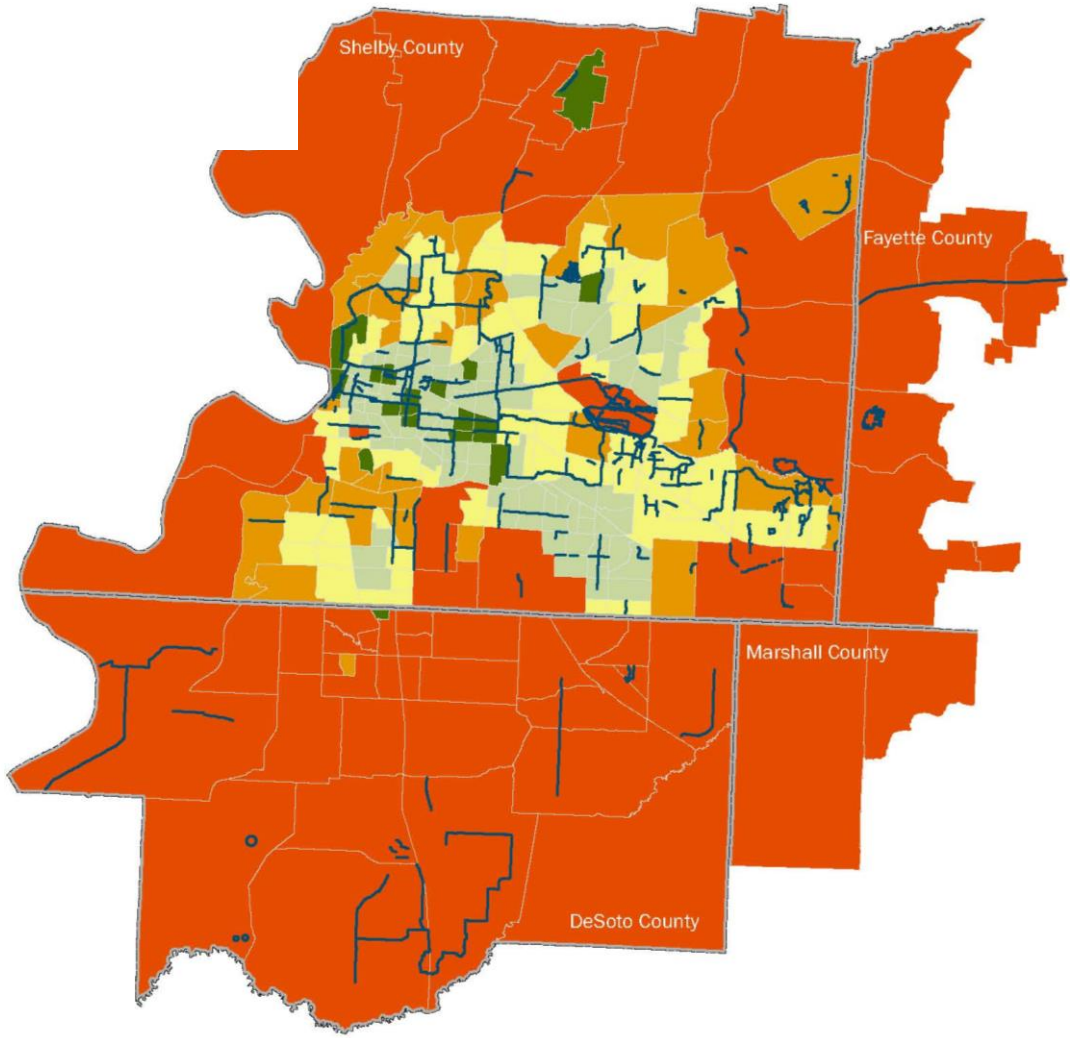


Method of Analysis – MODE SHIFT

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)

Mode Shift Potential

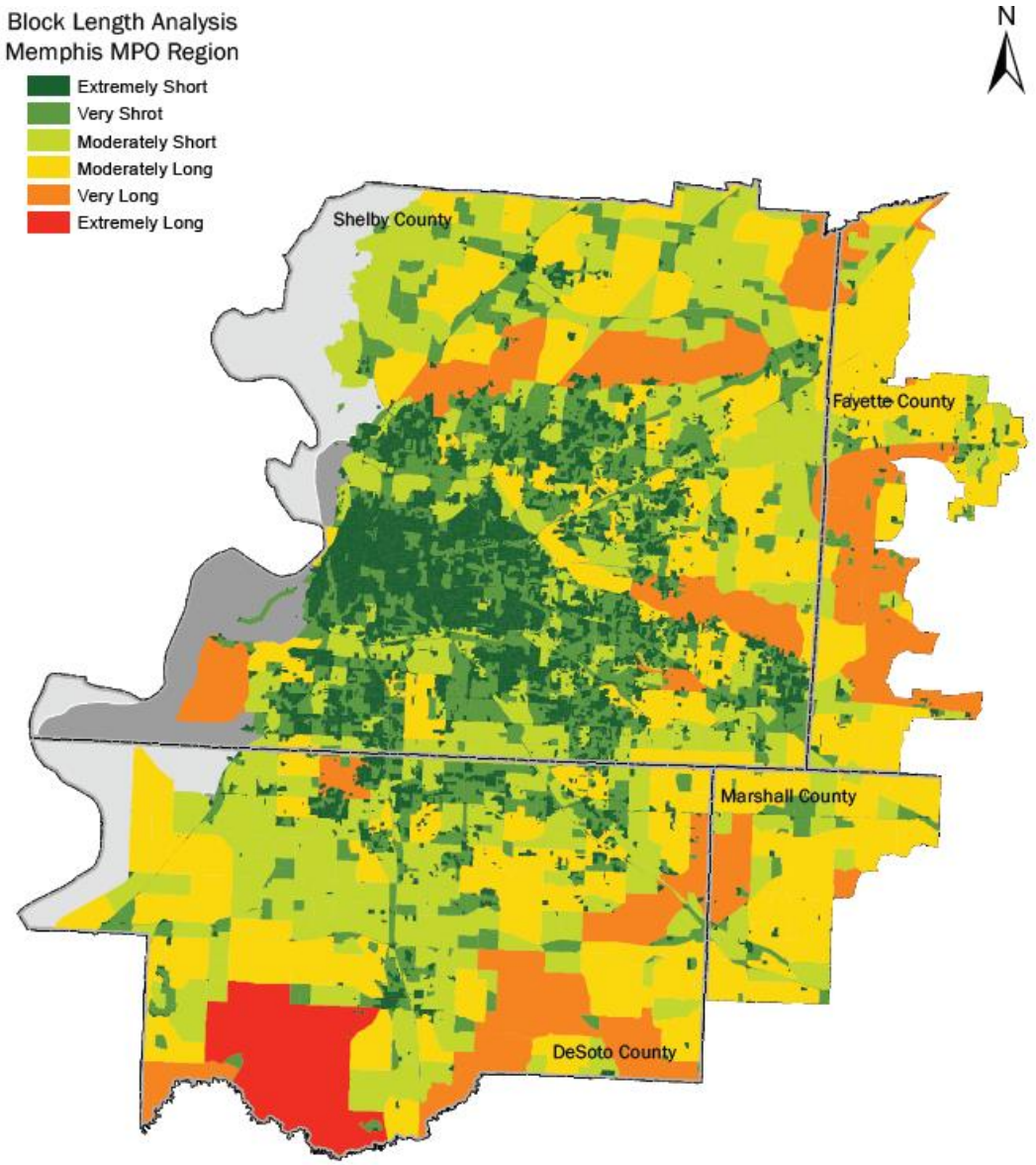


Composite Score

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

Max	Criteria	Measurement	Points Allocation
10 pts	Connectivity	Block Length Analysis	Shorter Block Length = Higher Point Value

- 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

PRIORITY #	FACILITY NAME	BEGIN	END	TYPE OF FACILITY	JURISDICTION	ST	MILES
1	Watkins St	Jefferson	Madison	On Street Facility	Memphis	TN	0.18
2	Clarke Rd	Myers	Flowering Peach	On Street Facility	Memphis	TN	0.10
3	Front St	Jefferson	Union	On Street Facility	Memphis	TN	0.29
4	Stonewall St	Tutwiler	North Parkway	On-Street Facility	Memphis	TN	0.05
5	Barfield Rd	Waring	Perkins	On Street Facility	Memphis	TN	0.46
6	McNeil St	Jefferson	Madison	On Street Facility	Memphis	TN	0.18
7	Canton Dr	Cresser	Ridgewood	On Street Facility	Memphis	TN	0.07
8	Wagner Pl	Union	Huling	On Street Facility	Memphis	TN	0.58
9	Young Ave	Cooper	East Parkway	On Street Facility	Memphis	TN	0.38
10	Park Ave	Lamar	East Parkway	On Street Facility	Memphis	TN	0.22
11	Bass Pro Dr	I-40	Riverside	On Street Facility	Memphis	TN	0.27
12	Horner St	Macon	Wayne	On Street Facility	Memphis	TN	0.11
13	Claudette Rd	American Way	Parkchester	On Street Facility	Memphis	TN	0.86
14	Cooper St	Poplar	Central	On Street Facility	Memphis	TN	1.09
15	Alicia Dr	Poplar	Union	On Street Facility	Memphis	TN	0.44
16	Robin Hood Ln	Kimball	Elliston	On Street Facility	Memphis	TN	0.45
17	Bellevue Blvd	Vollintine	North Parkway	On Street Facility	Memphis	TN	0.78
18	Sharpe Ave	Semmes	Robin Hood	On Street Facility	Memphis	TN	1.28
19	McClure Rd	Davis	Auburn	On Street Facility	Memphis	TN	0.08
20	Robin Hood Ln	Park	Kimball	On Street Facility	Memphis	TN	1.02
21	North Second Street (TN-3 / TN-14)	I-40	Union	On Street Facility	Memphis	TN	0.73
22	Ridgewood Dr	Canton	Whitworth	On Street Facility	Memphis	TN	0.05
23	Scottsdale Ave	Knight	Mendenhall	On Street Facility	Memphis	TN	1.41
24	Vollintine Ave	Bellevue	Springdale	On Street Facility	Memphis	TN	1.94
25	Lauderdale St	Jackson	Alabama	On Street Facility	Memphis	TN	0.09
26	Waring Rd	Summer	Walnut Grove	On Street Facility	Memphis	TN	1.22
27	Meadow Ridge Trail	Raines	Meadow Valley	On Street Facility	Memphis	TN	0.22
28	Clearbrook St	Cottonwood	Chuck	On Street Facility	Memphis	TN	0.90
29	Hickory Hill Rd	Knight Arnold	Winchester	On Street Facility	Memphis	TN	0.74
30	Elliston Rd	Robin Hood	Getwell	On Street Facility	Memphis	TN	0.47
31	Autumn Creek Dr	Cordova Club	Meadow Trail	On Street Facility	Memphis	TN	0.30
32	Pendleton St	Park	Ketchum	On Street Facility	Memphis	TN	1.93
33	Perkins Rd	Southern	Park	On Street Facility	Memphis	TN	0.56
34	Kimball Ave	Robin Hood	Getwell	On Street Facility	Memphis	TN	0.47
35	Fourth St	Linden	Walker	On Street Facility	Memphis	TN	1.22
36	Deermont Rd	Altruria	Crossing	On Street Facility	Bartlett	TN	0.51
37	Altruria Rd	Stage	US-70	On Street Facility	Bartlett	TN	0.92
38	Chuck Ave	Goodlett	Perkins	On Street Facility	Memphis	TN	0.91
39	Rockcreek Parkway	Germantown	US-64	On Street Facility	Memphis	TN	2.76
40	Massey Rd	Lendenwood	Massey Estate	On Street Facility	Memphis	TN	0.50
41	Hollywood St	Union	Southern	On Street Facility	Memphis	TN	1.23
42	Walker Ave	Fourth	Neptune	On Street Facility	Memphis	TN	1.03
43	Linden Ave	Wagner	Main	On Street Facility	Memphis	TN	0.14
44	Macon Rd	Cully	Cully	On Street Facility	Memphis	TN	0.15
45	Southern Ave	Semmes	Highland	On Street Facility	Memphis	TN	0.87
46	Cooper St	Southern	Lamar	On Street Facility	Memphis	TN	0.39
47	Greer St	Spottswood	Park	On Street Facility	Memphis	TN	0.38
48	Echles Ave	Southern	Park	On Street Facility	Memphis	TN	0.58
49	Kingham Dr	Stout	Bainbridge	On Street Facility	Memphis	TN	0.38
50	Clarke Rd	Cottonwood	Winchester	On Street Facility	Memphis	TN	1.34
51	Delaware St	EH Crump	Metal Museum	On Street Facility	Memphis	TN	0.14
52	Butler Ave	Third	US-51	On Street Facility	Memphis	TN	0.48
53	McLemore Ave	James	Southern	On Street Facility	Memphis	TN	0.62
54	Castleman St	Cottonwood	Shoreham	On Street Facility	Memphis	TN	1.61
55	Springdale St	Chelsea	North Parkway	On Street Facility	Memphis	TN	1.07
56	South 2nd St (US-64 / US-70 / US-79)	Union	GE Patterson	On Street Facility	Memphis	TN	0.75
57	Manassas St	Poplar	Union	On Street Facility	Memphis	TN	0.50
58	Dunn Rd	Cincinnatti	Perry	On Street Facility	Memphis	TN	0.25
59	Spottswood Ave	Cooper	Goodlett	On Street Facility	Memphis	TN	3.75

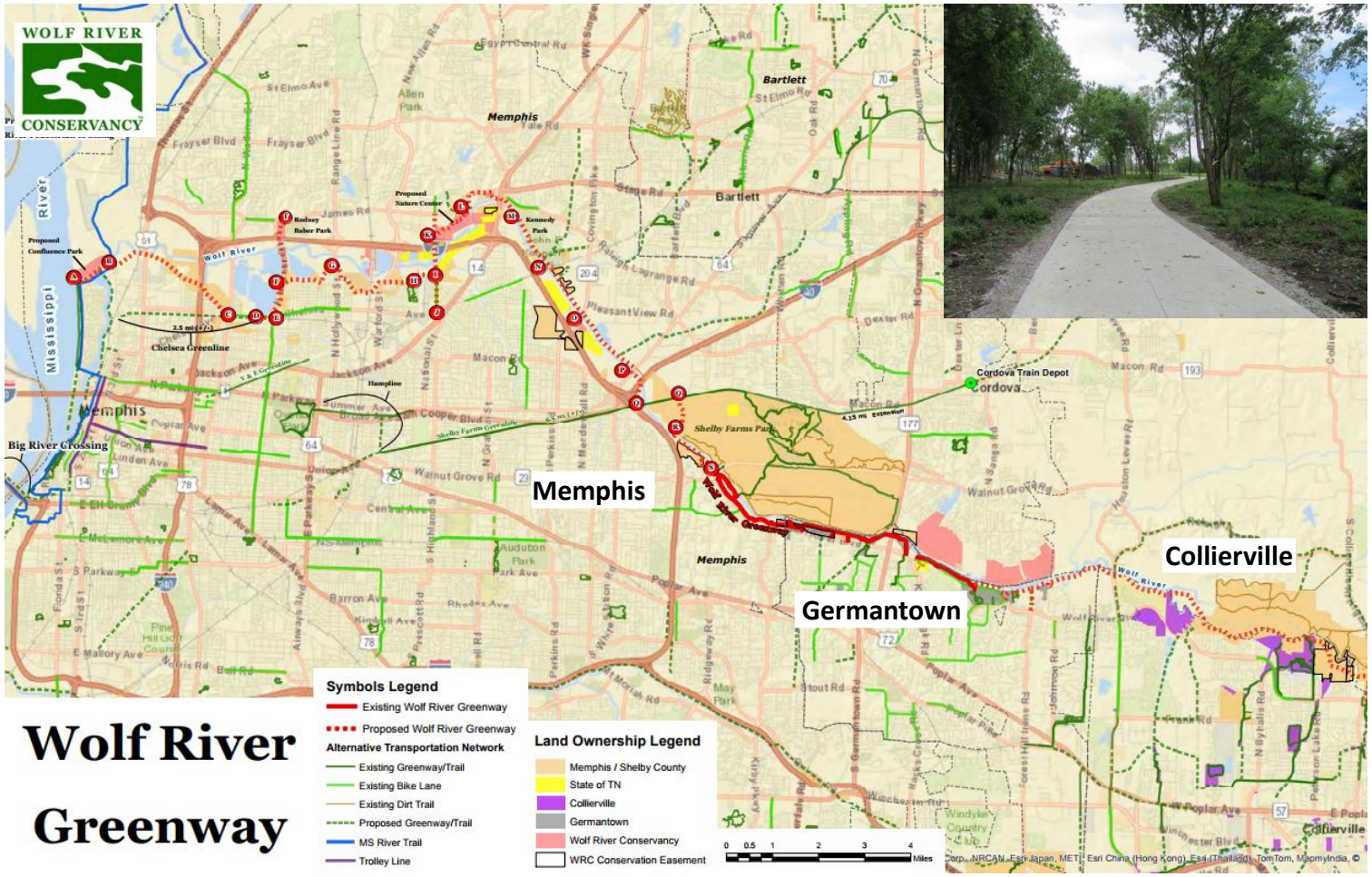
TIP Ranking Criteria

Bicycle and Pedestrian Criteria	Score
Proximity to Land Uses (within 1/2 mile ped, 3 mile bicycle)	**10**
Schools and Colleges	2
Parks	2
Major and Local Retail Centers	2
Major Employment Centers	2
Transit Routes	2
Network Continuity	**10**
Project provides regional network continuity - region wide benefits	10
Project provides local network continuity - localized benefits	5
No Network continuity	0
Bicycle Related Improvements	**8**
Project scope includes cycle track or shared-use path	5
Project scope includes signed and painted bike lane or bicycle boulevard	4
Project scope includes end of trip facilities (Wayfinding Signs, Racks, Etc.)	3
Project scope does not include bicycle facility	0
Pedestrian Related Improvements	**8**
Project scope includes ADA accessible sidewalks, curp ramps, shared use path, or overpass/underpass	4
Project scope includes pedestrian signals or enhanced on-street crossing facilities	2
Project scope includes marked crosswalks	1
Project scope includes pedestrian amenities	1
Project scope does not include pedestrian facilities	0
Pedestrian Priority in Regional Bicycle and Pedestrian Plan	**5**
Corridor Priority Ranking # 1-262	5
Corridor Priority Ranking #263-525	3
Corridor Priority Ranking #526-788	1
Corridor is not a ranked priority in the Regional Bicycle and Pedestrian Plan	0
Incorporates Traffic Calming and Design Improvements	**4**
Project Addresses Location with History of Fatal Bike/Ped Crashes	**5**
Bicycle and Pedestrian Criteria total points	**50**

Regional Collaboration

Wolf River Greenway

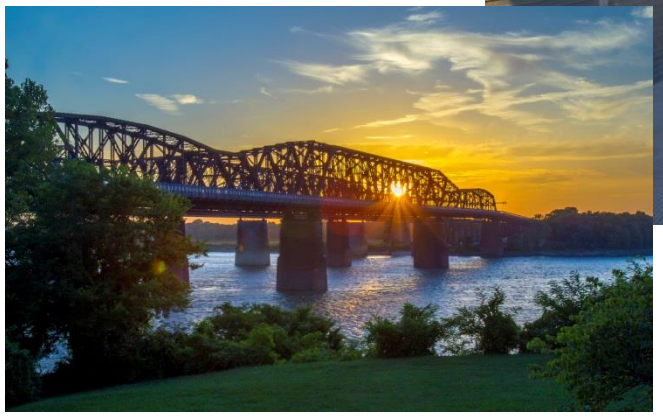
- Greenway – 36 miles from Memphis to Collierville
- Built in Phases
  - First phase completed 2010 (2.6 miles)
  - Currently Developing Four Phases
  - Goal completed by 2020
  - Intersects with other trail systems including the Shelby Farms Greenline



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

MPO's Selected for Pilot Program

- **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
(bike lanes, shared lanes, paved shared-use paths, etc.)

City of Memphis: **1.5 miles** 2010 → **400 miles** 2017

Contact Information

Kate Horton, RLA, ASLA
Transportation Planner
Email: Kate.Horton@memphistn.gov
Phone: 901.636.7218

Zylavian Watley
Bicycle and Pedestrian Coordinator
Email: Zylavian.Watley@memphistn.gov
Phone: 901.636.7216