Memphis Pedestrian and School Safety Action Plan

Prepared for the City of Memphis
Prepared by Alta Planning + Design
The Center for Partnerships in GIS, and The University of Memphis
Introduction

Project Background

• The City of Memphis requires resident to maintain sidewalks adjacent to their property
• Citizen’s report for sidewalks in poor condition
• City notifies owner of responsibility and proceeds through legal process, when necessary
• In 2012, City shifted to a proactive maintenance plan by completing the comprehensive review of the sidewalk network
• In spring of 2013, the City initiated a planning process to address pedestrian infrastructure needs
Introduction

HOW EXTENSIVE IS THE PROBLEM?

3,429 MILES OF EXISTING SIDEWALK

80-95% OF SIDEWALKS REQUIRE REPAIR

33% OF SIDEWALKS REQUIRE IMMEDIATE REPAIR

Additional 13% of sidewalks (446 miles) are less than standard width allowed for proper wheelchair access

OVER 250 MILES OF ROADS WITH INCOMPLETE SIDEWALKS & 750 MILES OF NON-HIGHWAY ROADS WITH NO SIDEWALKS

WHAT IS THE NEED?

More than 11,000 MEMPHIS RESIDENTS walk directly to work or to reach a bus on their way to work each day

African Americans make up 70% OF MEMPHIS RESIDENTS who walk directly to work or to reach a bus on their way to work each day

Almost 23% 150,000 Memphis residents are under 16 and non-drivers

10% 65,000 Memphis residents are over 65 and typically over 20% of these (13,000) do not drive

8% 50,000 Memphis residents have a disability that requires mobility assistance (i.e. wheelchair)

12.5% 30,000 Memphis households do not have access to a car
Introduction

**WHAT IS THE COST?**

**TOTAL REPLACEMENT COST** for existing sidewalk network in Memphis is **$1,100,000,000**

Total replacement cost for most urgent repair in Memphis is **$363,000,000**

**LIFE SPAN OF A SIDEWALK** under normal conditions is somewhere between **50 - 75 YEARS** depending on a number of environmental factors.

In order to properly maintain sidewalks on an annual basis, Memphis would need to budget and spend **$19,000,000 EACH YEAR, INDEFINITELY**

At a rate of $19,000,000 each year, it would take more than **24 YEARS** to fix only those sidewalks in need of urgent repair or substandard width. Before those repairs were completed, another 33% of sidewalks would age into disrepair.

Since 2004, Memphis has only cumulatively budgeted **$334,000** on sidewalk repair.
Project Team

Consultant Team

• Alta Planning + Design
• Powers Hill Design, LLC
• Kimley-Horn and Associates
• University of Memphis
  • The Center for Partnerships in GIS (now CEASAR)
  • Intermodal Freight Transportation Institute
• Department of Civil Engineering

Technical Advisory Committee

• City of Memphis Engineering Division
• Shelby County Schools
• Mayor’s Advisory Council for Citizen’s with Disabilities
• Aging Commission of the Mid-South
• Livable Memphis
• Sierra Club
• Memphis Area Transit Authority
• Mayor’s Office
Project Objectives

• To assess existing conditions and **develop a transparent, data-driven prioritization methodology** that identifies needed sidewalk and pedestrian crossing projects serving public schools

• To craft **an implementation strategy capable of delivering high-priority projects in the short-term** that improve pedestrian connectivity and safety
Project Scope

- Task 1. Project Management
- Task 2. Existing Conditions Analysis
- Task 3. Pedestrian Project List
- Task 4. Pedestrian Facility Toolbox
- Task 5. Analyze Cost of Proposed Projects
- Task 6. Project Prioritization
- Task 7. Implementation Plan
- Task 8. Draft and Final Pedestrian Route Plan
Existing Conditions

Key Opportunities

• Sidewalk Maintenance & Closing Gaps
• **Major Roads**: Provide buffers (& shade), widen sidewalks, reduce lanes
• Increase the **frequency of formal pedestrian crossings**
• Enhance existing **midblock/unsignalized crossings**
• Ensure pedestrian-friendly design at **major intersections**
• **Behavior Change** Programs
Existing Conditions: Crash Analysis

Youth aged 10 to 19 are overrepresented in pedestrian crashes
Existing Conditions: Crash Analysis

More than 40% of pedestrian crashes occur at intersections
## Existing Conditions: School Survey

**Major roadways are the top barrier for students travelling to school**

Figure 2.5 Obstacles to Crossing Streets in the Vicinity of Schools

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Obstacle Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>74%</td>
<td>Roadways with too much traffic</td>
</tr>
<tr>
<td>61%</td>
<td>Roadways with vehicles traveling at high speeds</td>
</tr>
<tr>
<td>32%</td>
<td>No crossing guards where children cross busy streets</td>
</tr>
<tr>
<td>26%</td>
<td>Crosswalks are not present where children actually cross streets</td>
</tr>
<tr>
<td>16%</td>
<td>Crosswalks are difficult to see</td>
</tr>
<tr>
<td>13%</td>
<td>Crosswalks are faded</td>
</tr>
<tr>
<td>13%</td>
<td>Crossing guards do not show up on a regular basis</td>
</tr>
<tr>
<td>10%</td>
<td>Roadways with too many large trucks</td>
</tr>
</tbody>
</table>
Network Analysis: Demand

Orange and red indicate higher relative demand for walking trips
Network Analysis: Supply

Orange and red indicate lower relative comfort and safety for pedestrians

Supply (Suitability)
- High
- Medium High
- Medium
- Low
- City Boundary

Roadway Characteristics
Pedestrian Space
Sidewalk Quality
Network Analysis: Shortest Path

Orange and red indicate routes most likely to serve walking trips

Elementary Schools
Middle Schools
High Schools
Parks
Employment Centers
Transit Stops
Proposed Network: Sidewalks + Crossings

The full project list includes new sidewalks, infill, repair, and crossings
Proposed Network: Prioritization

Criteria and weights were established with project stakeholders

<table>
<thead>
<tr>
<th>Prioritization Criteria</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promotes Safety <em>(crash analysis)</em></td>
<td>15%</td>
</tr>
<tr>
<td>School Access</td>
<td>15%</td>
</tr>
<tr>
<td>Inadequate Infrastructure <em>(supply analysis)</em></td>
<td>15%</td>
</tr>
<tr>
<td>Equity</td>
<td>10%</td>
</tr>
<tr>
<td>Promotes Connectivity <em>(shortest path analysis)</em></td>
<td>10%</td>
</tr>
<tr>
<td>Serves Activity Centers <em>(demand analysis)</em></td>
<td>10%</td>
</tr>
<tr>
<td>Transit Access</td>
<td>10%</td>
</tr>
<tr>
<td>Civic Amenity Access <em>(libraries, comm. centers)</em></td>
<td>5%</td>
</tr>
<tr>
<td>Previously Proposed Projects</td>
<td>5%</td>
</tr>
<tr>
<td>Stakeholder Input</td>
<td>5%</td>
</tr>
</tbody>
</table>
### Proposed Network: Prioritization

Several criteria directly relate to the stakeholder-identified needs of persons with disabilities

<table>
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<td>• <strong>Inadequate Infrastructure <em>(supply analysis)</em></strong></td>
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</tr>
<tr>
<td>• Equity</td>
<td>10%</td>
</tr>
<tr>
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<td>10%</td>
</tr>
<tr>
<td>• Serves Activity Centers <em>(demand analysis)</em></td>
<td>10%</td>
</tr>
<tr>
<td>• Transit Access</td>
<td>10%</td>
</tr>
<tr>
<td>• Civic Amenity Access <em>(libraries, comm. centers)</em></td>
<td>5%</td>
</tr>
<tr>
<td>• Previously Proposed Projects</td>
<td>5%</td>
</tr>
<tr>
<td>• <strong>Stakeholder Input</strong></td>
<td>5%</td>
</tr>
</tbody>
</table>
Proposed Priority Network: Phasing

Sidewalk and intersection projects were divided into ten phases
Proposed Priority Network: Tables

Project tables indicate the school served, planning level cost estimates, and more

<table>
<thead>
<tr>
<th>PROJECT ID</th>
<th>STREET</th>
<th>FROM</th>
<th>TO</th>
<th>PROJECT TYPE</th>
<th>LENGTH (MILES)</th>
<th>PLANNING LEVEL COST ESTIMATE (ENTIRE PROJECT, INCLUDING INTERSECTIONS)</th>
<th>SCHOOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Mountain Torraco Street</td>
<td>Victoria Park Lane</td>
<td>Whitney Avenue</td>
<td>Sidewalk Repair</td>
<td>0.1</td>
<td>$48,000</td>
<td>Grandview Heights Elementary School</td>
</tr>
<tr>
<td>25</td>
<td>Frayser Boulevard</td>
<td>Ledue Street</td>
<td>West Range Hills Drive</td>
<td>Sidewalk Repair, Sidewalk Instill</td>
<td>0.5</td>
<td>$371,000</td>
<td>Trezevant High School</td>
</tr>
<tr>
<td>25</td>
<td>New Frayser Boulevard</td>
<td>Redcoat Road</td>
<td>Warford Road</td>
<td>Sidewalk Repair</td>
<td>0.2</td>
<td>-</td>
<td>Trezevant High School</td>
</tr>
<tr>
<td>38</td>
<td>Jones Road</td>
<td>Powers Road</td>
<td>Raleigh Millington Road</td>
<td>Sidewalk Repair</td>
<td>0.1</td>
<td>$404,000</td>
<td>Coleman Elementary School</td>
</tr>
<tr>
<td>38</td>
<td>Powers Road</td>
<td>Jones Road</td>
<td>Yale Road</td>
<td>Sidewalk Repair, Sidewalk Instill</td>
<td>1.0</td>
<td>-</td>
<td>Coleman Elementary School</td>
</tr>
<tr>
<td>41</td>
<td>Yale Road</td>
<td>Arsenal Street</td>
<td>Northmoor Street</td>
<td>Sidewalk Repair, Sidewalk Instill</td>
<td>0.7</td>
<td>$188,000</td>
<td>Craigmont Middle School</td>
</tr>
<tr>
<td>378</td>
<td>Macon Road</td>
<td>Chatwood Street</td>
<td>Weimar Road</td>
<td>Sidewalk Repair</td>
<td>0.8</td>
<td>$665,000</td>
<td>Kingsbury Middle School</td>
</tr>
<tr>
<td>378</td>
<td>Westing Road</td>
<td>Emily Avenue</td>
<td>Macon Road</td>
<td>Sidewalk Repair</td>
<td>0.1</td>
<td>-</td>
<td>Kingsbury Middle School</td>
</tr>
<tr>
<td>378</td>
<td>Wells Station Road</td>
<td>Lawrence Road</td>
<td>Macon Road</td>
<td>Sidewalk Repair</td>
<td>0.1</td>
<td>-</td>
<td>Kingsbury Middle School</td>
</tr>
<tr>
<td>420</td>
<td>Macon Road</td>
<td>Heathcliff Drive</td>
<td>Mullins Station Road</td>
<td>Sidewalk Instill</td>
<td>0.2</td>
<td>$1,563,000</td>
<td>Shady Grove Elementary School</td>
</tr>
<tr>
<td>420</td>
<td>Mottmac Drivoe</td>
<td>Boyto Cove</td>
<td>Mullins Station Road</td>
<td>Sidewalk Repair, Sidewalk Instill</td>
<td>0.2</td>
<td>-</td>
<td>Shady Grove Elementary School</td>
</tr>
<tr>
<td>420</td>
<td>Mullins Station Road</td>
<td>Macon Road</td>
<td>Nixon Drive</td>
<td>Sidewalk Repair, Sidewalk Instill, New Sidewalk</td>
<td>0.7</td>
<td>-</td>
<td>Shady Grove Elementary School</td>
</tr>
</tbody>
</table>
## Proposed Priority Network: Summary

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Type</th>
<th>Unit</th>
<th>Estimated Quantity</th>
<th>Unit Cost (Typical)</th>
<th>Estimated Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sidewalks</td>
<td>Sidewalk on one side (including curb and gutter installation)</td>
<td>Linear Mile</td>
<td>36</td>
<td>$1,320,000</td>
<td>$46,911,000</td>
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<tr>
<td></td>
<td>Sidewalk infill (one side, without curb and gutter installation)</td>
<td>Linear Mile</td>
<td>36</td>
<td>$343,200</td>
<td>$12,462,000</td>
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<tr>
<td></td>
<td>Sidewalk Repair (Obstructions)</td>
<td>Obstruction</td>
<td>4,454</td>
<td>$7,050</td>
<td>$31,401,000</td>
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<tr>
<td></td>
<td>Sidewalk Repair (Obstacles)</td>
<td>Obstacle</td>
<td>98,391</td>
<td>$600</td>
<td>$59,035,000</td>
</tr>
<tr>
<td>Crossings</td>
<td>High-Visibility Crosswalk</td>
<td>Crossing</td>
<td>669</td>
<td>$1,300</td>
<td>$870,000</td>
</tr>
<tr>
<td></td>
<td>Parallel Line Crosswalk</td>
<td>Crossing</td>
<td>3,160</td>
<td>$500</td>
<td>$1,580,000</td>
</tr>
<tr>
<td></td>
<td>Crosswalk Marking Maintenance</td>
<td>Crossing</td>
<td>1,622</td>
<td>$500</td>
<td>$811,000</td>
</tr>
<tr>
<td></td>
<td>Curb Ramp</td>
<td>Ramp</td>
<td>7,500</td>
<td>$1,200</td>
<td>$9,000,000</td>
</tr>
<tr>
<td></td>
<td>Refuge Island</td>
<td>Crossing</td>
<td>78</td>
<td>$22,000</td>
<td>$1,716,000</td>
</tr>
<tr>
<td>Enhanced Crossings</td>
<td>Hybrid Beacon: HAWK</td>
<td>Crossing</td>
<td>114</td>
<td>$155,000</td>
<td>$17,670,000</td>
</tr>
<tr>
<td></td>
<td>Active Warning Beacon: RRFB</td>
<td>Crossing</td>
<td>57</td>
<td>$15,200</td>
<td>$866,000</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td><strong>$182,322,000</strong></td>
<td></td>
</tr>
</tbody>
</table>
Design Toolkit (Appendix C)

Provides detailed design guidance for all project types

Rectangular Rapid Flash Beacons (RRFB) dramatically increase compliance over conventional warning beacons.

Providing secondary installations of RRFBs on median islands improves conspicuity and driver yielding behavior.
Pilot Projects

Selected to illustrate the types of improvements in the project list

- **Weighted score** from prioritization,
- **Geographic representation,** and
- **Facility type representation** (ten corridors, ten crossings)
Pilot Projects: Sidewalk Example

Powers Road
Pilot Projects: Intersection Example

Honduras Road & Horn Lake Road

- Shift existing crossing north to allow installation of accessible curb ramps and to make room for vehicles turning left off of Honduras Road to enter Horn Lake Road in advance of new stop lines.
- Install a pedestrian-activated Active Warning Beacon (DRITI) for the crossing of Horn Lake Road.
- Reconfigure Horn Lake Road to make room for a median refuge island.
- Install high-visibility crosswalk and appropriate signage on Horn Lake Road and stripe the crossing of Honduras Road.

Legend:
- Install High Visibility Crosswalk
- Upgrade to High Visibility Crosswalk
- Install High Visibility Midblock Crosswalk
- Upgrade Midblock Crosswalk to High Vic.
- Install Crosswalk
- Reduce Curb Radii
- Install Curb Ramps
- Upgrade Ramps to ADA
- Install Pedestrian Hybrid Beacon (HAWC)
- Install Rain Cover
- Install Active Warning Beacon (DRITI)
- Stripe Bicycle Lanes
- Stripe Center Turn Lane
- Install Speed Bump
- Install Pedestrian Signal Head
- Install Stop Line

Cost Estimate:
- Materials: $14,046
- Mobilization/Traffic Control: $2,467
- Engineering: $2,713
- Contingency: $1,865
- Total Cost: $19,515
Implementation Strategy

Walk Friendly Community Framework: The 6 E’s

- Engineering
- Education
- Encouragement
- Enforcement
- Evaluation and Planning
- Equity

News and Updates

Oct 1, 2014: PBIC announces 50th Walk Friendly Community.

April 24, 2014: PBIC announces new Walk Friendly Communities.

Nov. 28, 2012: “Giving Cities Legs: Ideas and Inspirations From Walk Friendly Communities” is now available online.

Tennessee

The following communities in Tennessee have been designated as a Walk Friendly Community:

- Franklin — Honorable Mention
Implementation Strategy

Education
- Property owner’s guide to sidewalk maintenance
- Courses for Memphis Police and Memphis planners and engineers

Encouragement
- Financial Incentives for sidewalk repair
- Fast-Fix Sidewalk Repair Program

Enforcement
- Implement Crosswalk Enforcement Actions

Equity
- A sidewalk maintenance program for disadvantaged property owners
Implementation Strategy

Project List Implementation: All hands on deck

• Send Phase 1 project list along state-owned roads to TDOT
• Send Phase 1 project list near high-use transit stops to MATA
• Send property owners along Phase 1 and Phase 2 projects a guide to sidewalk maintenance
• Establish City funding set-aside amount to begin construction on priorities
Additional Information

www.BIKEPEDMEMPHIS.com