Mapping Pedestrian Networks and Density to Improve Transit

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MPO for the Dallas-Fort Worth Region

Metropolitan Planning Area (MPA)
12 Counties = 9,441 sq. mi.

Land area larger than the States of New Hampshire, New Jersey, Connecticut, Delaware, and Rhode Island
Metropolitan Planning Area (MPA)
- 209 cities
- 13 cities larger than 100,000 pop.

MPA Population
- 2018 Estimate = 7.4 million
- 2045 Forecast = 11.2 million
Levels of Congestion/Delay

2018 Levels of Congestion/Delay

Cost of Congestion/Delay: $11.9 billion
Congestion Index is based on percent increase in travel time.

2045 Levels of Congestion/Delay

Cost of Congestion/Delay: $27.2 billion
Congestion Index is based on percent increase in travel time.
Sustainable Development

Support alternative modes of transportation (walking, biking, transit)

- Walking-friendly development
- Bicycle/pedestrian infrastructure
- Transit-Oriented Development
Planning and Designing for All Ages and Abilities
(Ages 8 to 80)
All Ages and Abilities

(Ages 8 to 80)
Regional Veloweb

- Existing: 455 Miles
- Funded: 143 Miles
- Planned: 1,285 Miles
- Total: 1,883 Miles

Facility recommendations indicate transportation need. Corridor-specific alignment, design, and operational characteristics for the Regional Veloweb system will be determined through ongoing project development.
Community Shared-Use Paths supplement the Regional Veloweb network. These paths do not include recreational paths/loops, private paths, equestrian or nature trails, or wide sidewalks less than 10 feet in width.

Facility recommendations indicate transportation need. Corridor-specific alignment, design, and operational characteristics will be determined through ongoing project development.
On-street bikeways in the urbanized area include: separated or protected bike lanes/cycle tracks, bike lanes, marked shared lanes, and marked bicycle boulevards. On-street bikeways in the urbanized area do not include: signed bike "routes", signed "share the road", unmarked wide outside lanes, or signed wide shoulders. The use of wide shoulders is included on various roadways linking rural communities outside of the urbanized area.

Facility recommendations indicate transportation need. Corridor-specific alignment, design, and operational characteristics will be determined through ongoing project development.

June 2018
What are Complete Streets?

Multimodal Complete Streets

There is no singular design prescription for Complete Streets; each one is unique and respond to its community context.

They are designed and operated to enable safe access for all users, including **pedestrians, bicyclists, motorists and transit riders of all ages and abilities.**

Source: Smart Growth America
Proven Safety Countermeasures

https://safety.fhwa.dot.gov/provencountermeasures/
Pedestrian and Bicycle Routes to Rail Stations

Distance and gaps in the actual “Routes” to stations (walksheds)

Barriers and Gaps in the Network

Rail Station  Destination

0.5 mile actual walk distance

0.5+ mile

Disconnected pedestrian facility

“A true walkable radius does not typically exist.”
Facility Disconnected From Network
Poor Design for Access to Transit
Goal: Identify public rights-of-way needing sidewalks and sidewalk improvements

1. Digitizing Sidewalks
2. Network Analysis
3. Prioritizing Projects

Routes to Rail Stations
2. ArcGIS Network Analysis

0.5 mile walkshed on a connected sidewalk route
2. ArcGIS Network Analysis

0.5+ mile walkshed on a connected sidewalk route
2. ArcGIS Network Analysis

Other sidewalks disconnected from the network
FTA Grant
Data Collection
Sidewalk Gaps And Verification

Legend
- **Sidewalk**
- **Sidewalk Gap**
- **Unacceptable Sidewalk Condition**
3. Prioritizing Projects

300+ Miles missing sidewalk in the 0.5 mile radius around rail stations

Where to start?
3. Prioritizing Projects

http://www.pedbikeinfo.org/planning/tools_apt.cfm
3. Prioritizing Projects

Variables:
- Demographics
- Crashes
- Distance to station
- Density
3. Prioritizing Projects

Calculated Employment and Population Density

- Appraisal district parcel data (Dallas, Collin, Denton, Tarrant Counties)

- Edits/Quality control in 0.5 mile rail station buffer:
  SQFT, land use, and parcel geometry

- Calculate parcel population
  e.g. 300 SQFT office = 1 person
3. Prioritizing Projects

<table>
<thead>
<tr>
<th>COG LU</th>
<th>Description</th>
<th>Housing Units</th>
<th>SQFT</th>
<th>People</th>
<th>SQFT/person</th>
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</thead>
<tbody>
<tr>
<td>111</td>
<td>Single family</td>
<td>1</td>
<td>--</td>
<td>2.5</td>
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<tr>
<td>112</td>
<td>Multi-family</td>
<td>1</td>
<td>--</td>
<td>1.8</td>
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<tr>
<td>120</td>
<td>Commercial</td>
<td>--</td>
<td>1,000</td>
<td>3.5</td>
<td>286</td>
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<tr>
<td>121</td>
<td>Office</td>
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<td>1,000</td>
<td>3</td>
<td>333</td>
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<tr>
<td>122</td>
<td>Retail</td>
<td>--</td>
<td>1,000</td>
<td>8</td>
<td>125</td>
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<tr>
<td>125</td>
<td>Institutional/semi public</td>
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<td>1,000</td>
<td>6</td>
<td>167</td>
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<tr>
<td>126</td>
<td>Education</td>
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<td>1,000</td>
<td>12</td>
<td>83</td>
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<tr>
<td>131</td>
<td>Industrial</td>
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<td>1,000</td>
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<td>143</td>
<td>Utilities</td>
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<tr>
<td>148</td>
<td>Rail road</td>
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<td>Mixed use</td>
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<td>250</td>
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<td>Parks/recreation</td>
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<tr>
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<td>Vacant</td>
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<td>0</td>
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<td>401</td>
<td>Parking</td>
<td>--</td>
<td>--</td>
<td>0</td>
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</tr>
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</table>
3. Prioritizing Projects

Population

- 0 - 1
- 2 - 15
- 16 - 50
- 51 - 100
- 101 - 324
- 325 - 476
- 477 - 700
- 701 - 1,030
- 1,031 - 1,771
- 1,772 - 4,104
- 4,105 - 14,000
3. Prioritizing Projects

- Sidewalk Gaps
- Existing Sidewalk
- Route
- Density Zone
## Criteria And Weighting

### Proposed Improvements

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>Distance / Proximity of Improvements to the Station</td>
<td>50</td>
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<tr>
<td>Employment and Population Density</td>
<td>25</td>
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<tr>
<td>(Number of potential riders connected by the improvement's catchment area)</td>
<td></td>
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<tr>
<td>Walkshed Trip Length Reduction</td>
<td>5</td>
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<tr>
<td>(Catchment area benefitting from a reduced walk distance to the station)</td>
<td></td>
</tr>
<tr>
<td>Land Use Types and Key Destinations</td>
<td>5</td>
</tr>
<tr>
<td>(e.g. schools, government buildings, social services, hospitals, large shopping centers, parks)</td>
<td></td>
</tr>
<tr>
<td>Crash History</td>
<td>5</td>
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<tr>
<td>(Number of crashes in the general area of the project improvement)</td>
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</tr>
<tr>
<td>Safety Benefit</td>
<td>5</td>
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<tr>
<td>(systemic safety of the project improvement)</td>
<td></td>
</tr>
<tr>
<td>Equity / Transit Dependent Populations</td>
<td>5</td>
</tr>
<tr>
<td>(zero car households, % below poverty line)</td>
<td></td>
</tr>
</tbody>
</table>

Total 100
Pedestrian Routes to Rail - Parker Road Station

Last Updated: February 2015

Legend

Rail Stations
0.5 Mile Station Buffer
Railroads

Existing sidewalk facilities within a 0.5 mile walk distance
Existing sidewalk facilities greater than a 0.5 mile walk distance
Existing sidewalk facilities that are disconnected due to a gap in the network

Project Overview

The Pedestrian Routes to Rail study identifies all existing pedestrian facilities within a half-mile radius of existing light rail and commuter rail stations in the Dallas-Fort Worth region based on 2014 data. ArcGIS Network Analyst tool was used to identify continuous facilities that are less than or greater than a half-mile actual walking distance to a station. The maps also reflect existing facilities that are disconnected due to gaps or other barriers not allowing a continuous pedestrian route to a station. The maps do not reflect the condition or ADA compliance of the existing infrastructure. More information on the Routes to Rail study and methodology is available at:
High and Medium Priority
Parker Rd. Routes to Rail Analysis

Legend
- Rail Stations
- 0.5 Mile Station Buffer
- Railroads
- Existing sidewalk facilities within a 0.5 mile walk distance
- Existing sidewalk facilities greater than a 0.5 mile walk distance
- Existing sidewalk facilities that are disconnected due to a gap in the network

Legend
Half Mile Population and Employment Connected (9,026)
- 0 - 10
- 11 - 50
- 51 - 100
- 101 - 250
- 251 - 578
- 579 - 1000
- 1001 - 1500
- 1501 - 2500
- 2501 - 5000
- 5001 - 24170

*Per NTCOG Calculation

+ 492
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