§334.065, Florida Statutes – Center for Urban Transportation Research
1) There is established at the University of South Florida the Florida Center for Urban Transportation Research
2) The center shall be a continuing resource for the Legislature, the Department of Transportation, local governments, the nation’s metropolitan regions, and the private sector in the area of urban transportation research
3) An advisory board shall be created to periodically and objectively review and advise the center concerning its research program

Board Members:
- Ysela Llort, Chair, CUTR Advisory Board and Principal, Renaissance Planning Group, Inc.
- Jon Martz, Vice Chair, Director of Government and Public Affairs, Enterprise Holdings Company
- Kimberlee DeBosier, Director of Operations, WGI, Inc.
- Jean W. Duncan, Administrator of Infrastructure and Mobility, City of Tampa
- Dane Eagle, Secretary, Florida Department of Economic Opportunity (FDEO) / Scott Rogers
- Sonny Holtzman, Principal, The Holtzman Group
- Ron Howse, Chairman, Florida Transportation Commission (FTC)
- Ram Kancharla, Vice President Planning and Development, Port Tampa Bay
- Jared Perdue, P.E., Secretary, Florida Department of Transportation (FDOT) / Brad Thoburn, Assistant Secretary
- Shawn Hamilton, Secretary, Florida Department of Environmental Protection (FDEP) / Chris Shahl
- Joseph Waggoner, Former Executive Director, Tampa Hillsborough Expressway Authority
- Thornton J. Williams, Managing Partner, Williams Law Group, P.A.

Ex Officio Members:
- Lisa Bacot, Executive Director, Florida Public Transportation Association (FPTA)
- Ralph Yoder, Executive Director, FTC

CUTR Leadership:
- Fred Mannering, Ph.D., CUTR Executive Director
- Lisa Staes, CUTR Associate Director
- CUTR Program Directors

Agenda:
Welcome and Introductions
- New Members
- Board Members
- Other Participants
- Chair, Ysela Llort
**Topic #1: Approval of Minutes CUTR (Appendix A)**
(5 minutes)
- Ysela Llort

**Topic #2: Selection of New CUTR Advisory Board Chair/Vice Chair**
Nominees:
- Chair: Joe Waggoner
- Vice Chair: Jean Duncan
(10 minutes)
- Lisa Staes for Ram Kancharla, CUTR Advisory Board Leadership Selection Committee

**Topic #3: FDOT Update**
(10 minutes)
- Secretary David Gwynn, P.E.

**Topic #4: CUTR Updates**
- Executive Director
- Associate Director Activities
- NICR Updates
(20 minutes)
- Fred Mannering, Ph.D., CUTR Executive Director
- Lisa Staes, CUTR Associate Director
- Xiaopeng Li, Ph.D., NICR Director

**Topic #4: USF Institute of Applied Engineering**
(10 minutes)
- Tim Baxter, Executive Director, Programs and Customer Engagement

**Topic #5: CUTR Strategic Plan Update**
(10 minutes)
- Lisa Staes
- Arunima Bagui
- Sisinnio Concas
- Other Committee Members

**BREAK**
(5 minutes)

**Topic #6: CUTR Presentations**
- Evaluation of Dynamic Envelope Pavement Marking to Improve Motorist Stopping Behaviors at Highway-Rail Crossings
- Transportation Equity Toolkit
(30 minutes)
- Pei-Sung Lin, Ph.D.
- Tia Boyd

**Topic #7: CUTR Advisory Board Business**
- Upcoming Membership Transitions
- Other CUTR Business
(15 minutes)
- Chair
- Members

Adjourn
CUTR Advisory Board Meeting

Tuesday, May 10, 2022 | 1:00 – 3:00pm
CUTR Board Room
(and Microsoft Teams)
Agenda

- Welcome and Introductions
- Approval of Minutes
- Selection of New CUTR Advisory Board Chair/Vice Chair
- FDOT Update
- CUTR Updates
- USF Institute of Applied Engineering
- CUTR Strategic Plan Update
- CUTR Presentations
- CUTR Advisory Board Business
Welcome and Introductions
Chair, Ysela Llort
Approval of Minutes
Selection of CUTR Advisory Board Chair/Vice Chair

Lisa Staes (for Ram Kancharla)
FDOT Update

David Gwynn, P.E., FDOT District 7 Secretary
CUTR Updates

Dr. Fred Mannering, CUTR Executive Director
Lisa Staes, CUTR Associate Director
Dr. Xiaoping Li, NICR Director
CUTR Executive Director Updates

- News from the College of Engineering
- USF Leadership Changes
- University Transportation Centers Update
University Transportation Centers Recompete

- National CTECH – Preserving Environment (Cornell)
- National NICR – Recompete (USF/CUTR)
- National or Tier 1 – ACES Equity (USF/CUTR)
- National or Tier 1 – Urban Air Mobility (U of Buffalo)
- Tier 1 – Mineta Consortium for Transportation Mobility (SJSU)
- Tier 1 – Cyber-Physical Systems (U of Cincinnati)
- Tier 1 – CTEDD (UT – Arlington)
- Regional – MULTI-SAFE (UCF)
Associate Director Activities

▪ CUTR Internal Standing Meetings
▪ CUTR Strategic Plan Update
▪ Transportation Achievement Awards and Florida’s Transportation Hall of Fame event (now Thursday, October 27, 2022)
▪ ENSCO/TTC Updates
CUTR Budget Update
(FY 2016 – 2022)
Research Funding (State FY 2016 – FY YTD 2022)

Value of Contracts Received

(*State Fiscal Year – July 1 through June 30)
# Award Details (FY 2016 – YTD 2022)

<table>
<thead>
<tr>
<th></th>
<th>USDOT</th>
<th>FTA</th>
<th>FDOT</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FY 2016</strong></td>
<td>$1,393,300</td>
<td>$2,106,835</td>
<td>$13,892,216</td>
<td>$1,981,621</td>
<td>$19,373,972</td>
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<tr>
<td><strong>FY 2017</strong></td>
<td>0</td>
<td>$3,409,692</td>
<td>$15,465,523</td>
<td>$3,231,174</td>
<td>$22,106,389</td>
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<tr>
<td><strong>FY 2018</strong></td>
<td>0</td>
<td>$1,283,423</td>
<td>$16,903,034</td>
<td>$1,596,169</td>
<td>$19,782,626</td>
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<tr>
<td><strong>FY 2019</strong></td>
<td>0</td>
<td>$4,395,344</td>
<td>$14,835,282</td>
<td>$1,931,428</td>
<td>$21,162,054</td>
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<td><strong>FY 2020</strong></td>
<td>$2,609,409</td>
<td>$843,561</td>
<td>$9,458,098</td>
<td>$2,052,292</td>
<td>$14,963,360</td>
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<td><strong>FY 2021</strong></td>
<td>$2,443,750</td>
<td>$2,107,672</td>
<td>$9,853,865</td>
<td>$2,382,701</td>
<td>$16,787,988</td>
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<tr>
<td><strong>FY 2022 – April 28, 2022</strong></td>
<td>$2,718,734</td>
<td>$500,000</td>
<td>$8,141,490</td>
<td>$1,181,614</td>
<td>$12,541,838</td>
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<tr>
<td><strong>FY 2016 - 2022</strong></td>
<td>$9,165,193</td>
<td>$14,646,527</td>
<td>$88,549,546</td>
<td>$14,356,999</td>
<td>$126,718,227</td>
</tr>
</tbody>
</table>
Value and Source of Active Projects, April 2022

Total Value of Active Projects: $35,677,774
CUTR Update: National Institute for Congestion Reduction (NICR)
Research Project Update

- Year 3 Projects Selection
  - 3 short-term projects, covering topics such as equity, micro-mobility, data (2 USF)
  - 2 education projects, TB-CAT, access management curriculum development (both USF)
  - 12 research projects funded (6 USF)
NICR Newsletters

- https://mailchi.mp/d6a57e89e6f7/march-2022-newsletter
### Submitted April 30th

#### Table 2. Performance Measures for Research Outputs.

<table>
<thead>
<tr>
<th>A. T2 Goal and Description</th>
<th>B. Performance Measure</th>
<th>C. Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal 1. Share new knowledge to address society’s challenges and opportunities for reducing congestion</strong></td>
<td>Number of presentations and estimated audience sizes</td>
<td>9/253</td>
</tr>
<tr>
<td></td>
<td>Number of research reports and papers</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Number of peer reviewed journal publications</td>
<td>1</td>
</tr>
<tr>
<td><strong>Goal 2. Provide diverse research products to meet the needs of stakeholders; i.e., to put the right information in the right hands at the right time to combat congestion.</strong></td>
<td>Number of Policy Briefs published</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Number of webcasts</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Number of podcasts</td>
<td>0</td>
</tr>
<tr>
<td><strong>Goal 3. Professional &amp; workforce development including educating &amp; mentoring next generation transportation professionals, training existing workforce and grooming future leaders</strong></td>
<td>Reported in Performance Metrics Annually (will be included in the next semi-annual progress report)</td>
<td>--</td>
</tr>
<tr>
<td><strong>Goal 4. Commercialize research products to leverage public investment and yield broader implementation</strong></td>
<td>Number of faculty and students completing I-Corps training</td>
<td>6</td>
</tr>
</tbody>
</table>
### Semi Annual Progress Report

**Submitted April 30**

#### Table 3. Performance Measures for Research Outcomes.

<table>
<thead>
<tr>
<th>A. T2 Goal and Description</th>
<th>B. Performance Measure</th>
<th>C. Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1. Share new knowledge to address society’s challenges and opportunities for reducing congestion</td>
<td>Number of downloads of Journal of Public Transportation &amp; Journal of TDM Research</td>
<td>47,081</td>
</tr>
<tr>
<td>Goal 2. Provide diverse research products to meet the needs of stakeholders: i.e., to put the right information in the right hands at the right time to combat congestion.</td>
<td>Usage metrics for NICR website, project-related websites, and Congestion Help Desk</td>
<td>4,183</td>
</tr>
<tr>
<td></td>
<td>Number of articles in popular media</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Social media engagement (e.g., shares, comments, etc.)</td>
<td>2,932</td>
</tr>
<tr>
<td>Goal 3. Professional &amp; workforce development including educating &amp; mentoring next generation transportation professionals, training existing workforce and grooming future leaders</td>
<td>Contact hours in training, instructor-led and asynchronous learning</td>
<td>2,241</td>
</tr>
<tr>
<td></td>
<td>Courses taught by personnel on a NICR research project team.</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Number of students in courses taught by personnel on a NICR research project team.</td>
<td>1070</td>
</tr>
<tr>
<td>Goal 4. Commercialize research products to leverage public investment and yield broader implementation</td>
<td>Number of patent applications</td>
<td>1</td>
</tr>
</tbody>
</table>
Submitted April 30th

Table 4. Performance Measures for Research Impacts.

<table>
<thead>
<tr>
<th>A. T2 Goal and Description</th>
<th>B. Performance Measure</th>
<th>C. Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1. Share new knowledge to address society’s challenges and opportunities for reducing congestion</td>
<td>Number of citations in professional publications by NICR PIs</td>
<td>15,559</td>
</tr>
<tr>
<td></td>
<td>Changes in policies or practice resulting from research</td>
<td>0</td>
</tr>
<tr>
<td>Goal 2. Provide diverse research products to meet the needs of stakeholders; i.e., to put the right information in the right hands at the right time to combat congestion.</td>
<td>Numbers of subscribers to online networks, social media post reach, and reach of online peer-to-peer networks</td>
<td>14,726</td>
</tr>
<tr>
<td>Goal 3. Professional &amp; workforce development including educating &amp; mentoring next generation transportation professionals, training existing workforce and grooming future leaders</td>
<td>See Research Outcomes</td>
<td>--</td>
</tr>
<tr>
<td>Goal 4. Commercialize research products to leverage public investment and yield broader implementation</td>
<td>Cumulative number of patent disclosures, patents received, licenses issued, and businesses formed</td>
<td>0</td>
</tr>
</tbody>
</table>
UTC Re-Competition

- NOFO out this May?
- Letter of Support
- External Advisory Board
Thanks to NICR Staff

Kristine Williams, AICP
NICR Senior Program Manager
University of South Florida

Sean Barbeau, Ph.D.
Principal Mobile Software Architect for USF
USF Associate Director Technology Transfer
University of South Florida

Philip L. Winters
USF NICR Tech Transfer Assistant Director
University of South Florida

Christina Van Allen
NICR Communications Officer
University of South Florida

Reena Raturi
NICR Fiscal Manager
University of South Florida

Taylor Dinehart
Graduate Student Researcher
University of South Florida

https://nicr.usf.edu/
Xiaopeng Li, Ph.D.
xiaopengli@usf.edu
USF Institute of Applied Engineering

Tim Baxter, Executive Director of Programs and Customer Engagement
CUTR Strategic Plan Update

CUTR Group Leads
CUTR Strategic Plan Update

- Developed action items in response to two goals
  - Combined Goals 1 and 6: Financially Sustain CUTR Over the Long Term and Identify the Most Promising Markets
  - Goal 5: Build and Maximize the Capacity of our Human Resources

- Internal committees established to develop action items
  - Goals 1 & 6: Vicky Perk, Sisinnio Concas, Jodi Godfrey, Jeff Kramer, Pei-Sung Lin, Julie Bond
  - Goal 5: Sisinnio Concas, Arunima Bagui, Martin Catala, Austin Sipiora, Stephen Wachtler, Sara Hendricks, Vishal Kummetha, Kristin Larson
Initial Action Items for Goals 1 & 6

- Secure multi-year appropriation from the Florida Legislature, USF Foundation, or corporate sponsor to support program and service development expansion and short-term technical support to “the Legislature, the Department of Transportation, local governments, metropolitan regions and the private sector.”

- Obtain remedies for USF indirect charges and redistributions

- Create a business plan to direct CUTR’s long-term investments, priorities and targeted market areas.
Initial Action Items for Goal 5

- Maximize the skill sets of our current employee base and internally promote or hire additional administrative staff to assist in key areas of operations like Pre-Award and human resources.
- Allocate startup funds to attract new junior faculty as well as transitioning Post-docs into full time faculty positions.
- Formal mentoring program for Post Docs, junior faculty and staff/administrative positions to prepare for career path.
- Make more tools available for 1) better productivity like grant writing, project management and 2) better tracking of different request submissions like proposals, project execution, project amendments, etc.
Next Steps

- Distribution to all CUTR personnel for comment/input
- Presentation and discussion final action items, corresponding assignments, and responsible parties with all CUTR personnel
- Update the plan and present to board
- Monitor the progress on each action item
- Report back to CUTR personnel and board, quarterly at a minimum
Break

5 Minutes
Evaluation of Dynamic Envelope Pavement Marking to Improve Motorist Stopping Behaviors at Highway-Rail Crossings

Dr. Pei-Sung Lin, P.E., PTOE, FITE
Dr. Zhenyu Wang

Center for Urban Transportation Research
University of South Florida

CUTR Advisory Board Meeting
May 10, 2022
TRB Poster Presentation
During 2015-2019, Florida experienced an increasing trend of highway-rail crossing crashes.

509 highway-rail crossing crashes resulted in 38 fatalities and 223 injuries.

Most highway-rail crossing crashes (81%) are collisions between trains and motorized vehicles.

Highway vehicles stopping at crossings (including stopping, or stopping and going) is a major cause of train-vehicle crashes at highway-rail crossings (47%).

If a grade crossing is close to a signalized intersection, vehicle stopping behaviors are influenced by downstream traffic signal operations.
Stopping Behaviors at Highway-Rail Crossings

Improper behaviors: vehicles stopping at rail track areas during red signals

Proper behaviors: vehicles stopping before stop bar during red phases
Florida Operation STRIDE Program

- FDOT established Florida Operation STRIDE (Statewide Traffic and Railroad Initiative using Dynamic Envelopes) in December 2019.

- Engineering countermeasures include installing (1) Railroad Dynamic Envelope (RDE) pavement markings and (2) traffic signs (R8-8) at existing FDOT roadway and State-owned highway-rail grade crossings.

- The goals were to increase the visibility of highway-rail grade crossings to motorists, and reduce improper stopping behaviors at highway-rail grade crossings.
Florida DOT To Invest $60M In Rail Crossing Improvements

(Photo: FDOT)

(Source: Hanson Inc. website)
Research Objectives

• Conduct a before-after study to assess the effectiveness of Florida STRIDE in improving the safety performance at grade crossings in Florida.

• Compare stopping behaviors in critical zones at grade crossings with and without RDE pavement markings and supporting traffic signs.
### Study Sites in Tampa Bay Area

<table>
<thead>
<tr>
<th>#</th>
<th>Intersect. (Approach)</th>
<th>Fun. Class.</th>
<th>AADT</th>
<th>Lane # (LT/TH/RT)</th>
<th>SPD LMT, mph</th>
<th>3-Leg</th>
<th>Rail Track Location/Num.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>E Adamo Dr at N 39th St (SB)</td>
<td>Urban – Minor Arterial</td>
<td>13,500</td>
<td>2/0/1</td>
<td>40</td>
<td>Y</td>
<td>On approach/3</td>
</tr>
<tr>
<td>2</td>
<td>E Busch Blvd at N Florida Ave (NB)</td>
<td>Urban – Minor Arterial</td>
<td>29,500</td>
<td>1/3/1</td>
<td>45</td>
<td>N</td>
<td>On approach/1</td>
</tr>
<tr>
<td>3</td>
<td>E Busch Blvd at N Nebraska Ave (NB)</td>
<td>Urban – Principal Arterial</td>
<td>106,013</td>
<td>1/2/1</td>
<td>40</td>
<td>N</td>
<td>On approach/1</td>
</tr>
<tr>
<td>4</td>
<td>N Nebraska Ave and E Cass St (NB)</td>
<td>Urban – Minor Arterial</td>
<td>101,563</td>
<td>1/1(Shared)</td>
<td>35</td>
<td>N</td>
<td>On approach/1</td>
</tr>
<tr>
<td>5</td>
<td>W Kennedy Blvd at N Willow Ave (EB)</td>
<td>Urban – Principal Arterial</td>
<td>34,000</td>
<td>1/1(Shared)</td>
<td>40</td>
<td>N</td>
<td>Inside Intersection/1</td>
</tr>
<tr>
<td>6</td>
<td>W Kennedy Blvd at N Willow Ave (WB)</td>
<td>Urban – Principal Arterial</td>
<td>34,000</td>
<td>1/1(Shared)</td>
<td>40</td>
<td>N</td>
<td>Inside Intersection/1</td>
</tr>
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</table>
## Data Collection Schedule

<table>
<thead>
<tr>
<th>Day of Week</th>
<th>Morning</th>
<th>Noon</th>
<th>Afternoon</th>
<th>Night</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday &amp; Thursday</td>
<td>7:30 am – 9:30 am</td>
<td>11:00 am – 1:00 pm</td>
<td>4:00 pm – 6:00 pm</td>
<td>10:00 pm – 12:00 am</td>
</tr>
</tbody>
</table>
Stopping Behaviors at Grade Crossings

<table>
<thead>
<tr>
<th>Zone</th>
<th>Risk Level</th>
<th>Definition</th>
</tr>
</thead>
</table>
| 1    | Safe       | • 20 ft behind stop bar  
          • Motorist stopped safely  
          • Code vehicle only if driver stopped in Zone 1 without any vehicles immediately in front of it |
| 2    | Moderate   | • Between stop bar and foul zone  
          • Stopped motorists would be caught between gate arm and train |
| 3    | High       | • On tracks or in foul zone  
          • Stopped motorists would be struck by train |
| 4    | Moderate   | • 20 ft immediately downstream of tracks and outside of track foul zone  
          • Stopped motorists are too close to tracks |
Analysis Methods

- The stopping rate in Zone $i$ for $k$th period ($R_{i,k}$)

$$R_{i,k} = \frac{S_{i,k}}{\sum_i S_{i,k}}$$

where $S_{i,k}$ is the count of stopping behaviors in Zone $i$ for $k$th period (before or after)

- Hypothesis Testing - Use Pearson’s chi-squared test to compare the stopping rates before and after the implementation of RDE.

$H_0$: Before Stopping Rate at Zone $i$ = After Stopping Rate at Zone $i$

$H_a$: Before Stopping Rate at Zone $i$ ≠ After Stopping Rate at Zone $i$
Results of Comparison by Sites

Site 1
- Before: 9%, 32%, 8%, 36%
- After: 34%, 47%, 12%, 22%

Site 2
- Before: 23%, 68%, 10%, 23%
- After: 10%, 45%, 12%, 19%

Site 3
- Before: 26%, 44%, 20%, 25%
- After: 9%, 44%, 6%, 25%

Site 4
- Before: 56%, 69%, 23%, 16%
- After: 5% 2%, 11%, 2%

Site 5
- Before: 54%, 66%, 40%, 5%
- After: 3%, 31%, 3%

Site 6
- Before: 68%, 82%, 27%, 27%
- After: 5%, 3%, 16%, 3%

*** 99% significance; ** 95% significance, * 90% significance
Right-Turn Channelization at Site 3

- A right-turn channelization existed (within Dynamic Envelope area) at Site 3 (E Busch Blvd at N Nebraska Ave [NB], Tampa, Florida)

- Induces right-turning motorists to stop at Zone 3 or Zone 4 to seek available gaps in conflicting traffic when they see a red signal.
Results of Comparison by Movements

**Right-Turn**
- Zone 1: Before 6% - After 20%
- Zone 2: Before 25% - After 15%
- Zone 3: Before 46% - After 44%
- Zone 4: Before 23% - After 21%

**Right-Turn (excluding Site 3)**
- Zone 1: Before 6% - After 34%
- Zone 2: Before 27% - After 19%
- Zone 3: Before 38% - After 27%
- Zone 4: Before 29% - After 20%

**Through**
- Zone 1: Before 76% - After 87%
- Zone 2: Before 22% - After 12%
- Zone 3: Before 2% - After 1%
- Zone 4: Before 0.1% - After 0.1%

**Left-Turn**
- Zone 1: Before 31% - After 49%
- Zone 2: Before 28% - After 29%
- Zone 3: Before 22% - After 12%
- Zone 4: Before 20% - After 10%

*** 99% significance; ** 95% significance, * 90% significance

[University of South Florida]
Results of Comparison by Time

Morning (7:30 AM - 9:30 AM)

<table>
<thead>
<tr>
<th>Zone</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>1***</td>
<td>48%</td>
<td>61%</td>
</tr>
<tr>
<td>2***</td>
<td>22%</td>
<td>18%</td>
</tr>
<tr>
<td>3***</td>
<td>18%</td>
<td>12%</td>
</tr>
<tr>
<td>4***</td>
<td>12%</td>
<td>9%</td>
</tr>
</tbody>
</table>

Noon (11:00 AM - 1:00 PM)

<table>
<thead>
<tr>
<th>Zone</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>1***</td>
<td>44%</td>
<td>61%</td>
</tr>
<tr>
<td>2***</td>
<td>27%</td>
<td>19%</td>
</tr>
<tr>
<td>3***</td>
<td>18%</td>
<td>13%</td>
</tr>
<tr>
<td>4***</td>
<td>11%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Night (10:00 PM - 12:00 AM)

<table>
<thead>
<tr>
<th>Zone</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>1**</td>
<td>60%</td>
<td>65%</td>
</tr>
<tr>
<td>2</td>
<td>21%</td>
<td>18%</td>
</tr>
<tr>
<td>3</td>
<td>11%</td>
<td>11%</td>
</tr>
<tr>
<td>4***</td>
<td>7%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Afternoon (4:00 PM - 6:00 PM)

<table>
<thead>
<tr>
<th>Zone</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>1***</td>
<td>38%</td>
<td>57%</td>
</tr>
<tr>
<td>2***</td>
<td>26%</td>
<td>16%</td>
</tr>
<tr>
<td>3***</td>
<td>23%</td>
<td>18%</td>
</tr>
<tr>
<td>4***</td>
<td>13%</td>
<td>9%</td>
</tr>
</tbody>
</table>

*** 99% significance; ** 95% significance, * 90% significance
Overall Benefits

- Safe Stopping (Zone 1): Increased by 20%
- Most Dangerous Stopping (Zone 3): Decreased by 8%
- Moderately-Dangerous Stopping (Zone 2): Decreased by 7%
- Moderately-Dangerous Stopping (Zone 4): Decreased by 5%

Excluding Site 3
Conclusions and Recommendations

- Implementations of Railroad Dynamic Envelope (RDE) pavement markings and traffic sign - “DO NOT STOP ON TRACKS” (MUTCD R8-8) significantly improved the safety performance at grade crossings on urban major and minor arterials.

- It is recommended to avoid right-turn channelization within RDE areas or use No Turn on Red operations at downstream signalized intersections.

- It is recommended to improve the visibility of RDE pavement markings and traffic signs to motorists at night via improving street lighting level.

- It is recommended to relocate the traffic signs if blocked by obstacles.

- It is recommended to add flashing beacons to the traffic signs.
Transportation Equity Toolkit

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Center for Urban Transportation Research
The Transportation Equity Toolkit

Focuses on the transportation needs of underserved communities

Two equity-based processes
• Needs assessment
• Project prioritization

Emphasizes community engagement throughout each process

Source: Metro ATL Pedestrians12 by Transportation for America
Source: Jerilee Bennett/The Gazette
Source: d.wildapricot.net
Traditionally Underserved Communities

- Communities whose needs have traditionally been underserved in the transportation planning process
- Populations may include
  - Low-income
  - Minority
  - Older adults
  - Young persons
  - Women
  - Persons with disabilities
  - Single-parent households
  - Zero-vehicle
  - Limited English Proficiency (LEP)
  - LGBTQ+
  - Other underserved or disadvantaged populations groups

Individuals may belong to more than one underserved community and face intersecting barriers.
Identifying Community Needs

Source: Jerilee Bennett/The Gazette
Identifying Community Needs

- Integrate equity into needs assessment processes
  - Identify the specific needs of underserved communities
  - Evaluate needs to determine root causes
- The toolkit includes a survey-based audit tool based on criteria of relevance to traditionally underserved communities.
How to Conduct the Needs Assessment?

Develop a community profile
- Define and map underserved communities
- Develop an inventory and assess mobility needs

Involve the community

Use the audit tool

Prioritize needs
Defining & Mapping Underserved Communities

- Use census, state, regional, or local data to identify COCs
- Calculate the concentration of COCs
- Use GIS to map the concentration of COCs in the community

Develop a community profile
Involve the community
Use the audit tool
Prioritize needs
Developing an Inventory & Assess Mobility Needs

1. Summarize travel patterns and modes used
2. Identify current and proposed projects and services
3. Use GIS to build inventory maps
4. Overlay the inventory maps onto the COC maps
5. Conduct targeted field studies & summarize findings

Develop a community profile  Involve the community  Use the audit tool  Prioritize needs
Example: Sidewalk and Crosswalk Analysis

Develop a community profile
Involve the community
Use the audit tool
Prioritize needs

No Sidewalk
No Crosswalk
Collaborate and Co-create with the Community

- Inform
- Consult
- Involve
- Collaborate
- Empower

Source: Sustainable CT Equity Toolkit

A goal of the audit is to empower community members to become advocates for their needs

Develop a community profile
Involve the community
Use the audit tool
Prioritize needs

Source: Community Meeting by San Jose Public Library
Source: Interactive Design Charrette by Daniel Farrell
The Transportation Equity Audit Tool

Community Characteristics
Access to Opportunity
Environment
Safety
Active Transportation
Public Transportation
Investments and Burdens

Develop a community profile
Involve the community
Use the audit tool
Prioritize needs

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Suggested Methods to Evaluate Audit Results

- Prioritize needs
  - Identify indicators to measure and prioritize transportation needs
  - Conduct a SWOT analysis
- Identify and analyze causes
  - Root cause analysis
  - Cause and consequence analysis
- Summarize and share findings
  - Review, synthesize, and document evaluation results

Adapted from Comprehensive Needs Assessment, Office of Migrant Education, 2001
Project Prioritization

Source: 2.bp.blogspot.com
Project Prioritization

- Integrate equity into project screening and prioritization
  - Advancing the needs of underserved communities
  - Avoiding adverse and disproportionate impacts
- Includes an excel-based project screening tool developed using criteria specific to these needs

Source: streets.mn
How to Conduct the Prioritization Process?

1. Define and locate COCs
2. Select scoring system and methods
3. Conduct the evaluation
4. Rank and select projects

Stakeholder & public outreach
<table>
<thead>
<tr>
<th>Category</th>
<th>Factor</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to Opportunity</td>
<td>Employment</td>
<td>Project improves access to employment opportunities.</td>
</tr>
<tr>
<td></td>
<td>Education</td>
<td>Project improves access to educational opportunities (e.g., higher education, job training, schools, daycare, after school programs).</td>
</tr>
<tr>
<td></td>
<td>Community Services and Shopping</td>
<td>Project improves access to community services and shopping areas.</td>
</tr>
<tr>
<td>Health and Environment</td>
<td>Health Care</td>
<td>Project improves access to health care services.</td>
</tr>
<tr>
<td></td>
<td>Healthy Food</td>
<td>Project connects to grocery stores or markets that provide healthy and fresh food at affordable prices.</td>
</tr>
<tr>
<td></td>
<td>Environment</td>
<td>Project increases livability (e.g., community cohesion, streetscaping, green infrastructure, etc.) through design and/or mitigation measures.</td>
</tr>
<tr>
<td>Safety and Emergency Evacuation</td>
<td>Safety</td>
<td>Project improves safety for pedestrians and bicyclists at high-crash locations.</td>
</tr>
<tr>
<td></td>
<td>Emergency Evacuation</td>
<td>Project improves safety at other (non-high crash) locations.</td>
</tr>
<tr>
<td></td>
<td>Project improves emergency evacuation (e.g., transit coordination, connections to shelters, etc.).</td>
<td></td>
</tr>
<tr>
<td>Affordability</td>
<td>Housing</td>
<td>Project improves access to and from affordable housing.</td>
</tr>
<tr>
<td></td>
<td>Transportation</td>
<td>Project increases availability of affordable transportation options.</td>
</tr>
<tr>
<td></td>
<td>Housing and Transportation Costs</td>
<td>Project decreases the share of household income consumed by transportation and housing.</td>
</tr>
<tr>
<td>Mobility</td>
<td>Active Transportation</td>
<td>Project includes construction or improvement of sidewalks, trails, bike lanes, or other active transportation options.</td>
</tr>
<tr>
<td></td>
<td>Transit Access and Service</td>
<td>Project improves transit service and/or access, including first and last mile access.</td>
</tr>
<tr>
<td></td>
<td>Americans with Disabilities Act (ADA)</td>
<td>Project improves accessibility for persons with disabilities (e.g., transit stops, ADA curb ramps, audio-visual signals, driveway grade, etc.).</td>
</tr>
<tr>
<td>Burdens</td>
<td>Adverse Impacts</td>
<td>Project has adverse impacts (e.g., cumulative or disproportionate impacts, creates a barrier, increases noise or emissions, increases displacement/gentrification etc.)</td>
</tr>
</tbody>
</table>
Select Scoring System

0: No concentration of COCs
+1: Low to medium concentration of COCs
+2: High concentration of COCs
-10: Adverse impact on COCs

<table>
<thead>
<tr>
<th>Score</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Points (COCs)</td>
<td>Max Points</td>
</tr>
<tr>
<td>-10, 0, +1, or +2</td>
<td>2</td>
</tr>
</tbody>
</table>
Conduct the Evaluation

- Identify the project type, project location or coverage, and location of COCs in relation to the project.
- Identify potential impacts.
- Add projects to the scorecard.
34th Street, City of Tampa

**Results:** The 34th Street project is a safety project.

**Summary:**
34th Street from Columbus Drive to Hillsborough Avenue is primarily a 2-lane undivided collector roadway with a posted speed of 30 mph, as shown in Figure 2. 34th Street provides a secondary north/south access between the port area and northeast Tampa with 40th Street being the primary north/south arterial. 34th Street has an average daily traffic volume of 6,000 to 8000.

In a review of city-wide fatal and incapacitating injury crashes from 2009 to 2011, this section of 34th Street was identified as having a clustering (14) of fatal and severe injury crashes. As such, this section of roadway was analyzed for countermeasures to improve safety and apply as a candidate for Highway Safety Improvement Program (HSIP) Off-System Funds. Appendix A: Photo Log contains all the field review photographs taken.

Source: City of Tampa, 2013
Select scoring system & methods
Conduct the evaluation
Rank and select projects
Add Projects to the Scorecard

Scores are automatically calculated based on responses.

Select scoring system & methods
Conduct the evaluation
Rank and select projects
Rank and Select Projects

Scores for each factor/criteria.

Scores for each category.

Select scoring system & methods
Conduct the evaluation
Rank and select projects
Thank you!

tiaboyd@usf.edu
CUTR Advisory Board Business
Advisory Board Member Updates

- Membership transitions
- Other Board Items
Adjourn