Alternative Intersection Analysis for US 192 to improve Multimodal Transportation

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STUDY PURPOSE

• Identifies potential traffic operational improvements for US 192

• Can serve as a supplemental information for the US 192 BRT PD&E which will comprehensively study land use, context, safety and best accommodating all modes and users
STUDY PURPOSE

• Represent FDOT needs
  • Improved Pedestrian Safety
  • Improve On-time arrival of buses
  • Reduce TT for transit relative to vehicular traffic
  • Maintaining LOS for vehicular traffic for design year
• Create a win-win-win situation for
  • Pedestrians
  • Transit
  • Vehicles
US 192 Corridor Overview
US 192 CORRIDOR OVERVIEW

• Study segment: US 27 to Florida’s Turnpike
• US 192 is a heavily congested corridor critical to the City of Kissimmee and Osceola County
LYNX completed an Alternatives Analysis (AA) for premium transit on US 192

Locally Preferred Alternative (LPA) for a BRT adopted in 2014

Osceola County is coordinating with LYNX, MetroPlan Orlando, and FDOT for project development

US 192 BRT is Osceola County top priority
STARTING POINT FOR ANALYSIS
**CENTER-RUNNING BRT TYPICAL**

- BRT in existing median
- Existing median currently used for turn bays

Creating turn bays would remove through lane or require ROW.
ANALYSIS TECHNIQUES

• HDR develop design traffic
• Existing Counts
• Streetlight Data for OD and Travel Time
• Uniform growth rate based on regional model
• Synchro for signal evaluation and managing traffic redistribution
2040 NO BUILD

Existing congestion becomes markedly worse by 2040
2040 CENTER-RUNNING BRT WITH TRADITIONAL TREATMENTS

LOS F at every signalized intersection in PM, all but 1 in AM
OBSERVATIONS

- Much more extensive queues with traditional BRT vs without
- Delays exceed what is expected to be accepted by the public
- Degree of oversaturation varies throughout corridor
- When signals expected to go overcapacity at different times
  - Need some additional *capacity at right time* to maintain functional travel time
  - Worth repeating we are not trying to get LOS everywhere to D
  - Looking to maintain vehicular travel times
  - Allow for phased implementation to avoid over-improving vehicular flow
• Ways to add capacity
  • Add lanes – Not possible due to ROW constrains
  • Reduce Phases to Increase flow by giving more time
Innovative Intersection Treatments
ROOSEVELT SUPERSTREET

- Roosevelt and 28th St North – Pinellas Park, FDOT District 7
- Primary arterial intersection with heavy turns to and from minor street
- Signals can run independently (north half and south half)
- Minor street through movement diverted
ROOSEVELT MEDIAN U TURN (MUT)

• Minor street through movement is allowed
• All left turns diverted
Incorporating Transit Ops Into Concepts
PROPOSED MUT/Bus STOP

• Signals, already needed for the U turns would also protect pedestrian crossings

• Pedestrian crossings would thus be provided throughout the corridor and are short, minimizing impact on vehicular flow

• Use left running buses to protect pedestrians, eliminate number of crossing movements
TWO-LANE MEDIAN BUSWAY

Normal Operations

Stop Opposing Traffic

Allow Express Bus to Overtake

STOP

Bus Stop
Intersection Evaluation and Complexity
CLOSELY SPACED INTERSECTIONS

- Signals at 1000’ or less spacing through out the corridor
- Requires Design Traffic rebalancing and operational analysis as a system
CUSTOM ALTERNATIVE INTERSECTIONS

• Due to complex geometry the result is a tailored solution

• Focus on reducing phases to maintain acceptable LOS
2040 MINOR BUILD

Substantial improvement, but critical failures remain
## 2040 Minor Build Corridor Performance

Number of intersections in 2040 AM (PM) peak hours

<table>
<thead>
<tr>
<th>v/c</th>
<th>No build</th>
<th>Traditional BRT</th>
<th>Superstreet/MUT</th>
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<tbody>
<tr>
<td>Below 0.9</td>
<td>9 (5)</td>
<td>1 (0)</td>
<td>28 (29)</td>
</tr>
<tr>
<td>0.9 to 1.0</td>
<td>7 (8)</td>
<td>1 (1)</td>
<td>8 (5)</td>
</tr>
<tr>
<td>1.0 to 1.1</td>
<td>8 (7)</td>
<td>1 (0)</td>
<td>1 (2)</td>
</tr>
<tr>
<td>1.1 to 1.5</td>
<td>12 (15)</td>
<td>26 (28)</td>
<td>0 (1)</td>
</tr>
<tr>
<td>Over 1.5</td>
<td>1 (2)</td>
<td>8 (8)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>
Next Steps

Operational Analysis showed an opportunity
Need Phased Implementation Plan

• Need to tailor to desired operational outcomes
• Review impacts to ROW, costs, etc
• Create logical approach to operate bus
SUMMARY

Traditionally think of transportation modes separately. We can use Innovative Techniques and combine modes to achieve outcomes.

Closely spaced intersections must be treated as a system versus looked at in isolation.

Following a TSMO approach of a... can move us closer to a solution:

• Clear performance goal
• Evaluating alternatives based on their impact
• Developing a Concept of Multimodal Operations