GPC WO # 29

DOWNTOWN MIAMI BUS LANES STUDY

SEPTEMBER 2, 2015

PREPARED BY: PARSONS BRINCKERHOFF
AGENDA

- Study Objectives
- Existing Conditions
  - Roadway Existing Conditions
  - Transit Existing Conditions
- Hot Spots
- Potential Bus Lane Improvements
- Potential Intersection Priority
- Further Evaluation
- Discussion
STUDY OBJECTIVES

- To identify the need and feasibility of Transit Priority Measures (TPM), such as bus-only lanes, in the Downtown Miami area.
- The intended purpose of TPMs is to improve performance of bus routes operated downtown.
- Systems/services to be analyzed
  - Miami-Dade Transit
  - Miami Trolley
  - Broward County Transit
- Future transit considerations
  - New Miami-Dade Transit bus terminal
  - All Aboard Florida Miami Central Station
  - Future Miami Streetcar / Beach Connector routes
## EXISTING CONDITIONS

<table>
<thead>
<tr>
<th>Roadway</th>
<th>Transit</th>
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<tbody>
<tr>
<td>Traffic Volumes - ADT and Peak</td>
<td>Bus Volumes – Daily &amp; Peak</td>
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<tr>
<td>Traffic Signals</td>
<td>Passenger Volumes - Daily</td>
</tr>
<tr>
<td>Intersection Level of Service (LOS) – AM and PM Peak</td>
<td>Bus Speeds – Daily &amp; Peak</td>
</tr>
<tr>
<td>Crashes – 5 Year (2008-2012)</td>
<td>MDT Street Supervisor Input</td>
</tr>
<tr>
<td>Roadway Number of Lanes (Directional)</td>
<td></td>
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<tr>
<td>Parking Availability (No. of spaces)</td>
<td></td>
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<tr>
<td>Parking Occupancy – AM and PM Peak and Mid-day</td>
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</tbody>
</table>
EXISTING TRAFFIC OPERATIONS

- Most intersections show LOS A-B
- Some extended queuing particularly with Miami River Bridge openings
- High volume roadways
  - I-95 and I-395
  - Biscayne Blvd
  - NE 1st Ave and NE 2nd Ave
  - NW 5th St

Source: Downtown Miami Freight Mobility Study; FDOT Florida Traffic Online
CRASHES

- Orientation to east and south sides of study area where higher traffic exists
- Higher crash corridors
  - I-95 and I-395
  - Biscayne Blvd
  - NE/SE 2\textsuperscript{nd} Ave
  - NE/SE 1\textsuperscript{st} Ave
  - SE/SW 1\textsuperscript{st} Ave
  - SE/SW Flagler St
  - NE/NW 1\textsuperscript{st} St

Source: FDOT Safety Office
NUMBER OF DIRECTIONAL LANES

- Increased arterial capacity
  - North – South
    - Biscayne Blvd
    - NE 1st, 2nd, 3rd Avenues
  - East – West
    - NE 5th St and 6th St
    - SE 1st St

- One-way pairs focused on east-west
  - NE 5th St and 6th St
  - NE 1st St and SE 1st St
  - No continuous north-south pair
TRAFFIC SIGNALS

Legend
- Traffic Signals
- Study Area

Source: City of Miami
PARKING INVENTORY

- Streets with higher number of parking spaces
  - NE Miami Ave (NE 6th St to NE 20th St)
  - NE 1st Ave (NE 6th St to NE 16th St)
  - NW 2nd St (NW 6th St to MW 1st Ave)
  - NW 6th St (NW 7th Ave to NW 1st Ave)
- Most streets in downtown core do not have on-street parking

Source: Field Review
PARKING OCCUPANCY (AM/PM)
PARKING OCCUPANCY (MID-DAY)

- Lower parking during peaks in general
  - Exception - sections of SE 1\textsuperscript{st} St and SW 2\textsuperscript{nd} St
- Highest mid-day occupancy
  - NE/NW 20\textsuperscript{th} St
  - NE 1\textsuperscript{st} St
  - NE 3\textsuperscript{rd} St
  - NE 1\textsuperscript{st} Ave
### AVAILABLE DATA FOR BUS MODES IN STUDY AREA

<table>
<thead>
<tr>
<th>Agency</th>
<th>Available Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bus Volumes</td>
</tr>
<tr>
<td>MDT</td>
<td>●</td>
</tr>
<tr>
<td>Miami Trolley</td>
<td>●</td>
</tr>
<tr>
<td>BCT</td>
<td></td>
</tr>
</tbody>
</table>
DIRECTIONAL BUS VOLUMES (AM-PM PEAK)
Higher bus volume streets / number of routes
- NE Biscayne Blvd / 12 routes
- NE 6\textsuperscript{th} St / 10 routes
- NE 1\textsuperscript{st} Ave / 6 routes
- NE 17\textsuperscript{th} St / 5 routes
- NW 3\textsuperscript{rd} Ave / 4 routes
- NE 20\textsuperscript{th} St / 4 routes
- N. Miami Ave / 3 routes
BUS TURNING MOVEMENTS

- Concentration of bus turns
  - NW 2nd St and SW 1st St
  - NE / NW 6th St
  - NE Biscayne Blvd (access to Omni bus station)
Higher passenger volume streets
- Biscayne Blvd
- NW / NE 1st St
- SW / SE 1st St

Higher volumes on streets in downtown core
BUS SPEEDS (AM-PM PEAK)
BUS SPEEDS

- Lower bus speeds in SE of study area – downtown core
- Trends similar for both AM and PM peak periods
- Streets with lowest peak bus speeds (<10 MPH)
  - NE / NW 1\textsuperscript{st} St
  - SE 1\textsuperscript{st} St
  - Biscayne Blvd
  - NE 2\textsuperscript{nd} Ave
  - NW / SW 2\textsuperscript{nd} Ave
MDT STREET SUPERVISOR INPUT

1. Bus routes turning at NE 14th St and Biscayne Blvd conflict with traffic exiting the MacArthur Causeway.
2. Biscayne Blvd closings during special events result in detours to NE 1st and 2nd Avenues causing delays.
3. Little activity and its relative distance to Biscayne Blvd limits use of Miami Ave as an alternate when Biscayne is closed during special events.
4. Intersection at NE 1st Ave and NE 5th St is regularly blocked.
5. Significant delays on NE 2nd Ave due to Brickell Avenue Bridge opening.
6. On-street parking on both sides of NE 2nd Ave results in damage to buses.
7. Queue of cars accessing I-95 ramps at Miami Ave and SE 1st St causes delays and conflicts with bus stop at this location.
8. Pedestrian / car / transit conflicts at SW 1st St between SW 2nd Ave and SW 1st Ave.
9. Evaluate possibility of extending NW 1\textsuperscript{st} Ave south of NW 10\textsuperscript{th} St to provide access to Overtown Metrorail Station

10. Access to new Downtown Terminal from Biscayne Blvd will potentially require transit only designation to an east-west street (NE 6\textsuperscript{th} St, NE 5\textsuperscript{th} St, NE 3\textsuperscript{rd} St, NE 2\textsuperscript{nd} St, NE 1\textsuperscript{st} St, SE 1\textsuperscript{st} St)

11. On-street parking on NW 7\textsuperscript{th} Ave is restricted to off-peak hours. However, not vacate on time causing conflicts

12. Critical Mass (bike event – last Friday every month) causes significant delays at NW 1\textsuperscript{st} St at Government Center

13. NW 2\textsuperscript{nd} Ave and NW 3\textsuperscript{rd} Ave present a significant conflict for bus drivers during peak travel periods. Peak traffic coming from I-95 and presence of Law Enforcement Officers Memorial High School present challenges for bus operations.

14. More enforcement is needed downtown to prevent passenger and commercial vehicles from blocking bus stops
ANALYSIS METHODOLOGY – HOT SPOTS

- Average during peaks of three variables
  - Bus speed (MDT only)
  - Bus vehicle volume
  - Bus passenger volume
- 50th Percentile speed given weight of x 2
- Scoring system
HOT SPOT LOCATIONS

- North – South
  - Biscayne Blvd
  - NE / SE 1<sup>st</sup> Ave
  - NE / SE 2<sup>nd</sup> Ave
  - NW 2<sup>nd</sup> Ave
- East – West
  - NE / NW 1<sup>st</sup> St
  - SE / SW 1<sup>st</sup> St
  - NE / NW 6<sup>th</sup> St
**BUS LANE WARRANTS**

### VOLUME WARRANTS FOR CURB BUS LANES

<table>
<thead>
<tr>
<th>Curb Bus Lane</th>
<th>Minimum Daily Bus Volume</th>
<th>Range in One-Way Peak-Hour Volume</th>
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<tbody>
<tr>
<td>Concurrent flow</td>
<td></td>
<td>Bus</td>
</tr>
<tr>
<td>In CBD</td>
<td>200</td>
<td>20–30</td>
</tr>
<tr>
<td>Outside CBD</td>
<td>300</td>
<td>30–40</td>
</tr>
<tr>
<td>Contraflow</td>
<td></td>
<td>Passengers</td>
</tr>
<tr>
<td>Short segment</td>
<td>200</td>
<td>800–1,200</td>
</tr>
<tr>
<td>Extended segment</td>
<td>400</td>
<td>1,600–2,400</td>
</tr>
</tbody>
</table>

Source: NCHRP Report 155, Table 43 (2).
CBD = central business district.
POTENTIAL BUS LANE IMPROVEMENTS

- Concurrent flow lane
  - NE / SE 2nd Ave
  - NE / SE 1st Ave (move streetcar operations to Miami Ave)
    - NE 6th St
    - NE 1st St
    - SE 1st St
- Contraflow lane option?
  - N Miami Ave (streetcar operations along NE 1st Ave)
INTERSECTION PRIORITY WARRANTS

• Intersection priority warrants
  • Transit signal priority (green extension / red truncation)
    ◦ LOS in C-D range
    ◦ Special bus turn need

• Queue jump
  • Availability of auxiliary lane
  • Green time available for special phase

POTENTIAL INTERSECTION PRIORITY TREATMENTS
FURTHER EVALUATIONS

- Bus travel time savings analysis
- Intersection operations analysis
  - Queue jump / TSP impacts
- Parking / local access analysis
  - More extensive parking occupancy survey
  - Loading zone assessment
- MDT / Miami Trolley route modification assessment
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