OUTLINE

• Introduction
• Goals
• Methodology
• Analysis Tool
• Evaluation
• Challenges
INTRODUCTION

- **BaltimoreLink**
  - A complete overhaul and rebranding of the core transit system operating within the city and throughout the greater Baltimore region.
  - Launched June 2017
B-LINK TSP FEASIBILITY STUDY

- **Step 1:** Prescreening 700 signals in Baltimore City
- Several operational & geometric factors were defined to develop a pre-screening formula to prioritize signalized intersections/corridors for TSP.
PRESCREENING FACTORS

Intersection TSP Feasibility Score \( (FS_i) = 100 \sum_{j=1}^{13} (f_{ij} \ast w_j) \)

1. Dedicated Bus Lane on CityLINK Route
2. Existing Average Bus Speed on CityLINK Route
3. Bus frequency
   1. No. of CityLINK buses /hr on **approach** direction
   2. No. of CityLINK buses /hr on **conflicting** direction
   3. No. of **Non-CityLINK** buses /hr on approach direction
   4. No. of **Non-CityLINK** buses /hr on conflicting direction
4. Approach LOS
5. Conflicting Direction LOS
6. Overall V/C
7. Nearside vs. Farside bus stops
8. Slack time to accommodate TSP
9. Ridership
10. Pretimed vs. Actuated
PILOT AREA / CORRIDOR SELECTION

• **Corridors with the highest average score**
• Implementation considerations
• CBD limitations in cycle length change, too many buses, etc.
• Traffic signal software system & Comm status

• Loch Raven Blvd
  • 18 signals; 12 TSP signals
• Greenmount Ave / York Rd
  • 29 signals; 14 TSP signals
TSP DETAILED ANALYSIS

- Updated scores based on:
  - Updated our Synchro models
  - New traffic counts
  - Nearside stops
  - Detection status
TSP IMPLEMENTATION

- Upgrade traffic controllers
- Transfer controller database
- Establish cellular comm
- Set up central system (ATMS.now)
- Tested and coded TSP parameters
NORTH AVE RISING

• **Goal**: to support economic revitalization along North Avenue through increased mobility and to broaden access for residents of the corridor to economic opportunity throughout Baltimore.

• **Funding**:
  - Collaboration between Federal, State, and local funding.
  - The State of Maryland and Baltimore City won funding for the project from the US DOT through the TIGER program (Transportation Investment Generating Economic Recovery).
  - The total project budget is $27.3 million. The $10 million from the TIGER grant compliments $14.7 million in funds committed by MDOT, $1.6 million from US DOT’s FHWA, and $1 million from Baltimore City.
NORTH AVE RISING

- Sidewalk improvements,
- Dedicated bus lanes,
- Transit signal priority,
- Enhanced bus stops,
- Roadway repaving,
- Bikeshare stations.
North Avenue Intersections Traffic Volumes, AM

Vehicles Through Intersection
- Less than 1200
- 1201 - 1500
- 1501 - 2000
- 2001 - 2500
- 2501 - 4115

Source: SAI October 2018
PASSIVE TSP

- Install TSP-enabled ATC controllers and cell modems
- Download (NextEdit Laptop) & Upload (ATMS.Now) controllers’ database
- Signal timing optimization
  - Evaluate cycle length
  - Recalculate PCT and FDW
  - Split optimization
  - Optimize offsets for the dominant approach
- Improve transit travel time
  - Lower running speed
  - Variable dwell time
  - Nearside stops
AM PATTERN CYCLE LENGTH

North Avenue Signals

Existing Cycle

Proposed Cycle

Source: SAI October 2018
PM PATTERN CYCLE LENGTH

North Avenue Signals

Existing Cycle

Proposed Cycle

Source: SAI October 2018
EVALUATION

- Bus Travel Time: Before vs. After Study
- MTA transit data collected by Swiftly
Eastbound PM Delays
Westbound AM Delays

Source: SAI October 2018
Westbound Midday Delays

Source: SAI October 2018
CHALLENGES

- Too many near-side bus stops
- Highly variable boarding/alighting times
- Broken vehicle detections
- Broken ped push buttons
- Occasional comm failure

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<tr>
<th></th>
<th>Nearside Stops</th>
<th>Farside Stops</th>
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<tbody>
<tr>
<td>EB Direction</td>
<td>15 (48%)</td>
<td>16 (52%)</td>
</tr>
<tr>
<td>EB Direction</td>
<td>19 (63%)</td>
<td>11 (37%)</td>
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NEXT...

- Continue fine-tuning,
- Perform “After” travel time/delay evaluation
- Active TSP
  - GTT Opticom phase selector
  - TSP design
QUESTIONS/COMMENTS