Developing Dedicated Bus Lane Screening Criteria in Baltimore, MD

Rail~Volution 2018 Conference
Move this Bus! Allocating Space and Time to Transit
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Overview

- Background
- Literature & Peer Agency Review
- Selected Screening Criteria
- Preliminary and Detailed Screening
- Full Analysis
- Results
- Lessons Learned
BaltimoreLink Includes Transitways

- City installed unpainted bus/bike lanes in 2009 with limited evaluation or benefits
- BaltimoreLink was launched in October 2015 as a comprehensive restructuring of the local bus network combined with a series of infrastructure investments to improve safety, efficiency, reliability, and customer service
- BaltimoreLink included $6M of funding for Dedicated Bus Lanes as one component of the $135M budget
Literature & Peer Agency Review
Selected Screening Criteria

- **Mobility**
  - Buses/hour
  - Person throughput
  - Person delay
  - Volume/frequency
  - Passengers per hour
  - Average speed
  - Auto delay and v/c

- **Access**
  - Parking and Loading Impacts
  - Population near routes
  - Transit dependent population near routes
  - Job Accessibility
  - Connectivity/Transfers
  - Emergency Routes
  - Freight Routes

- **Design Adequacy**
  - Lane width
  - Right turns at intersections
Study Corridors

- 20 Streets
  - High frequency
  - Higher levels of delay
  - 14 operate as one-way couplets in downtown
Preliminary Screening

- **Bus Frequency**
  - Number of buses per hour
  - Includes
    - Updated BaltimoreLink Network
    - MTA Regional Commuter
    - Charm City Circulator
    - Local University Shuttles (UMB, UB, JHU, MICA, Collegetown)
Preliminary Screening

- **Bus Frequency**
  - At least 18 buses/hour in peak periods
  - Some downtown streets experience 40+ buses per hour
Detailed Screening

- Person Throughput
  - Number of people per lane per hour
  - **Auto**: Average regional occupancy per vehicle x turning movement count volumes, distributed across lanes
  - **Bus**: average peak period ridership x frequency in single lane
Detailed Screening

- **Person Throughput**
  - **Number of people traveling in dedicated bus lane must carry ≥80% of adjacent auto lane**
  - Most downtown streets carried significantly more people per lane by bus than car
  - Several downtown streets included peak-period parking restrictions
Detailed Screening

- Corridors Recommended for Full Analysis
- 9 streets

Selection Process

1. 205 Streets Identified
2. Bus frequency
3. Number of people in potential bus lane
4. 9 Streets selected
Full Analysis (i.e., How do we make this work?)

- Remaining 9 streets (4 corridors) evaluated using ALL original measures
- Key measures
  - Existing Curbside Parking Restrictions
  - Traffic Delay and volume-to-capacity ratio
  - Design constraints
  - Other
Full Analysis (i.e., How do we make this work?)

- Parking
  - AM and PM parking restrictions
  - AM parking restrictions
  - PM parking restrictions
  - Full-time parking
  - Loading and unloading
  - Special event parking
Full Analysis (i.e., How do we make this work?)

- Traffic operations
  - Queuing impacts on intersections
  - Accommodating heavy right-turning volumes
  - Minimizing delay
  - Traffic diversion
  - Signal timing
Full Analysis (i.e., How do we make this work?)

- Design constraints
  - Available lane widths
  - Overlap with bicycle network
  - Pavement conditions
Segments Recommended for Design

- Full-time segments largely confined to the CBD
- Portions of Pratt & Lombard Streets implemented early by City in July/August 2016
- Other segments cut based on traffic operations & lane transitions
Final Implementation

- **Charles St**: PM peak period only (no red paint)
- **St. Paul St**: Combination of peak period, curbside, and offset based on several factors
- **Baltimore St**: Two blocks of Peak-Only Lanes based on existing permits
- **Curbside parking modifications throughout**
Before/After Evaluation

- Measuring impacts on:
  - Transit reliability, speed, on-time performance
  - Traffic congestion
  - Bus operators
  - Public perception
  - Enforcement
North Avenue Rising

- TIGER funded project adding 7 additional miles of Dedicated Bus/Bike Lanes along major east/west corridor north of the CBD
- Overwhelming majority of lanes are adjacent to parallel parking
- Gaps in lanes necessitated by traffic operations on major truck route
Lessons Learned

- Data-driven decision making can work
- Ongoing coordination between City DOT and State Transit Agency was ESSENTIAL
- Person throughput is extremely valuable to change typical narratives and bridge divides
- Look carefully at truck loading needs
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