TIME TO WALK

Presentation at APBP PDS

June 29, 2017

Nolan Levenson
Project Manager, Pedestrian Projects Group
**PEDESTRIAN PROJECTS GROUP**

**Goals:**
- Safety
- Pedestrian accessibility
- Mobility for all users
- Enhanced quality of life

- 40+ quick, in-house projects a year, small to large
- Projects focus on complex intersection design
DETERMINE NEED

- Community requests (~120 in 2016)
- Crashes
- Partner opportunities

Data Collection
- Volumes
- Observe use
- Speeding
- Congestion
- Signal Plan
- Crash data
- Local concerns

Before

After
DESIGN DEVELOPMENT

Simplify complicated intersections
- Remove traffic movements
- Follow the pedestrian desire line
- Signal timing & phasing

Determine if roadway can be reallocated
- Traffic volumes & analysis
- Lane widths

Before

After

Union Square
TOOL KIT

Geometry

Temporary Materials

- Epoxied gravel / ruby glass
- Colored thermoplastic ("truffle paint")
- Planters
- Granite Blocks
TOOL KIT

Geometry

Concrete Construction

Pedestrian Island

Sidewalk

Curb extension
TOOL KIT

Operations

- Markings
- Signage
- Signals

Stop Signs

Parking Regulations

Enhanced Crossings
IMPLEMENTATION

Signage

Signals
GRAND CONCOURSE, Bronx

Issues:
- Long crossing distances
- Speeding vehicles
- Numerous pedestrian crashes

Solutions:
- Install median tip and curb extensions
- Close slip lane at E 153 St
GRAND CONCOURSE, Bronx
CAPITAL DEVELOPMENT

• Identify future capital improvements
• Project Sponsoring
OUTREACH

New York City has 59 Community Board (CB) Districts that DOT seeks support from.

Outreach strategies:

- Location walk-throughs
- Workshops (charrettes)
- Partner with elected officials, Business Improvement Districts, and community groups
FREQUENT COMPLAINTS

Community Boards:

“These proposals are all fine, but the real problem is the pedestrians ignoring the light”

“Just give them a different time to cross!”

“What we need is a turn signal”

Advocates and Workshop Participants:

“We need more time to cross the street”

“This intersection needs a separate phase for pedestrians”

Everyone:

“What we really need is a traffic light here – why can’t you just put one in?”
Project managers want to accommodate desire to cross street and improve safety and comfort.

Engineers tied to federal standards:
- 13,000 existing signalized intersections
- 3,000+ signal requests per year
INTERNAL ISSUES

Bureaucracy

Deputy Commissioner of Traffic Operations

Director of Signals and Street Lighting

Chief Engineer

Chief of Intersection Control Unit (ICU)

Field Staff

Warrants
Reluctance to install traffic signals at locations simply because a politician or community member requests it.

1989 Study found that unwarranted traffic signals may result in an increase of 65% in crashes.

- Compared to control group of warranted locations where crashes decreased 49%
• Planners should know how warrants work
• Need to **understand** shortcomings of signal warrants to differentiate from typical community requests
  • Do not succumb to “P Warrants”
• Consider signal engineers’ workload
• Use data supplemented by qualitative data (photography, field visits)
CONDUIT BLVD, Brooklyn

Issues:
- Long distances between pedestrian crossings
- Pedestrian desire lines not accommodated
- Speeding
- Data discrepancies in warrant analysis
CONDUIT BLVD, Brooklyn

Solutions:
- Install new traffic signals and crosswalks
- Add sidewalks on median
- Reduce speed limit from 40mph to 30mph

- ICU accepted PPG’s data for warrant analysis
PARK LANE S, Queens

Issues:
- Free flowing elbow traffic movement makes it difficult to find gaps
- Uncontrolled slip lane in front of park entrance stairs
- Desire lines not accommodated
- Poor visibility for pedestrians and drivers
PARK LANE S, Queens

Contractor Data
Midweek Peak Hrs
11/17-11/19/15

ICU Data
Friday Pre-Holiday
Peak Hrs (30 min x 2)
2/11/16

Issues:
- Data discrepancies
- Signal warrants do not address unique nature of geometry and traffic flow
Solutions:
- Presented qualitative and quantitative case to division leadership
- Issue elevated to signals leadership
- On-site meeting scheduled with signals leadership to explain issues
PARK LANE S, Queens

Solutions:
- Install new traffic signals and crosswalks
- Expand pedestrian space
- Removed parking spaces to provide for right turn storage
VAN SINDEREN AV, Brooklyn

Issues:
- Stop-on-minor intersection
- Crosswalks lead to retaining walls and fences
- No marked crossings on major
- Subway entrance and bus stops
VAN SINDEREN AV, Brooklyn

- Requested that ICU study this intersection
- Denied in December 2016
VAN SINDEREN AV, Brooklyn

Data Review

### MUTCD – Pedestrian Peak Hour Volume Warrant

<table>
<thead>
<tr>
<th>VPH on the major street (Total of both approaches)</th>
<th>PPH for the total of all pedestrians crossing the major street</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>280</td>
</tr>
<tr>
<td>900</td>
<td>325</td>
</tr>
</tbody>
</table>

- Requested additional study and special consideration given to unique context
Solutions:
- Provided photos and description of intersection characteristics
- ICU agreed to re-study
- Signal approved
- Capital project to reconstruct intersection to address accessibility issues
- Interim design TBD
What improvements do you see here?
### SIGNAL TIMING

<table>
<thead>
<tr>
<th>L/S #</th>
<th>1</th>
<th>2</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEMA</td>
<td>1</td>
<td>3</td>
<td>1P</td>
<td>POL1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(2+3)</td>
<td></td>
</tr>
<tr>
<td>PHASE A</td>
<td>G</td>
<td>R</td>
<td>WK</td>
<td>DW</td>
</tr>
<tr>
<td>SPARE</td>
<td>G</td>
<td>R</td>
<td>WK</td>
<td>DW</td>
</tr>
<tr>
<td>FED CL</td>
<td>G</td>
<td>R</td>
<td>FLDW</td>
<td>DW</td>
</tr>
<tr>
<td>VEH CL</td>
<td>A</td>
<td>R</td>
<td>DW</td>
<td>DW</td>
</tr>
<tr>
<td>VEH CL</td>
<td>R</td>
<td>R</td>
<td>DW</td>
<td>DW</td>
</tr>
</tbody>
</table>

#### CITY OF NEW YORK
BUREAU OF TRAFFIC OPERATIONS
34-02 Queens Blvd. Long Island City, NY 11101

NOTES: NON-ACTUATED PC = 3.5 FT/SEC

SURF AVENUE @ STILLWELL AVENUE

INTERVAL PROGRAM
CABINET TYPE: ASTC-6
CABINET ADDRESS: 5C5A

Prep: F. Mikhail  Date: 01/14/15
Appr:  Date:  

1/15 FM INSTALL LPI TO CROSS SURF AVENUE/666
DATE: EY REVISIONS

90 SEC
LEADING PEDESTRIAN INTERVALS

Treatment Description
- Allows pedestrians to get a 7+ second head start in the crosswalk before vehicles begin to move

Applications
- Long pedestrian crossing distances
- High vehicular turning volumes
- Low vehicular thru-movement volumes

Benefits
- Pedestrians can establish right-of-way
- Increases pedestrian visibility in crosswalk
- Reduces pedestrian-vehicle conflicts

Trade-offs
- Can increase vehicular delays

2,081 LPIs installed
(as of 5/31/2017)

Images courtesy of NACTO
LEADING PEDESTRIAN INTERVALS

- **Over 1,700** new LPIs since the start of Vision Zero vs 254 citywide prior to Vision Zero (LPIs began in late 1970s)
- **776** new LPIs in 2016 vs. pre-VZ annual average of 16
- **498** new LPIs installed in 2017 (as of 5/31/17)
LPI CRITERIA

LPI

**Expedited**
(minimal traffic analysis required)

- Vision Zero Priority Intersections
- Vision Zero Priority Corridors
- Failure to Yield Pedestrian and Bike Fatality
- School Intersections
- Senior Intersections
- MTA bus turn locations

**Standard**
(full traffic analysis required)

- 3 or more failure to yield pedestrian or bicycle crashes
- Sum of all turning vehicles onto impacted crosswalk exceeds 200 vph and significant pedestrian volumes
- Traffic analysis to determine where time is “stolen” from
How do you take away time from traffic in a congested environment?
Treatment Description

- Allows pedestrians (and bicyclists on bike routes) to get a 7+ second head start before turning vehicles begin to move
- Only turns are held during LPI phase. Thru vehicles permitted to move
- Requires turn bay/lane

Applications

- Long pedestrian crossing distances
- High vehicular thru volumes
- Low vehicular turning movement volumes and/or short storage lengths

Benefits

- Same benefits for pedestrians as LPI
- No impact to thru vehicle delay, provided sufficient queuing space for turns

Trade-offs

- Increases delay for turning vehicles
- Potential loss of parking thru lane

66 Split-LPIs installed
(as of 6/12/2017)
22 Split-LBIs installed
(as of 6/12/2017)
Left Turn Pedestrian & Bicycle Crash Study

SPLIT-LPIS – ONE-WAY VS TWO-WAY STREETS

- Fewer trade-off with one-way cross streets
- Two-way cross streets require determination of most critical movements or additional turn lanes and signals
Northbound steady red/flashing yellow left turn arrow allows for northbound split LPI and protected crossing time for pedestrians crossing Atlantic Avenue.

Southbound left turn ban to reduce pedestrian and vehicle conflict.

LPI Phase

Flashing Yellow Turn Phase
SPLIT-LPIS – TWO-WAY STREETS

CATON AV, BROOKLYN

No eastbound left turn signal or left turn lane creates rushed turn and pedestrian conflict.
No eastbound left turn signal or left turn lane created rushed turn and pedestrian conflict
SPLIT-LPIS – TWO-WAY STREETS
CATON AV, BROOKLYN

Before

12 second Split-LPI installed for eastbound left turn

After
CATON AV, BROOKLYN

Community Concerns

• Community members and local elected official were not initially supportive of the Split-LPI once it was implemented
• Claims that flashing yellow was not calming turns
• In particular, parents were concerned about the interaction between aggressive turns and school children
• Asked for full split phase signal

NYC DOT Concerns with Split Phase

• Pedestrian non-compliance given the short crossing distance (~27’)
• Reduced pedestrian crossing time
• Storage space for turning queue
• Asked for an evaluation and adjustment period

After receiving additional complaints, NYC DOT will be changing phasing to a full split
Treatment Description

- Fully splits crossing pedestrians from turning vehicles
- Permits non-conflicting thru movements during pedestrian phases
- Turns only allowed during green arrow phase
- Requires turn bay/lane

Applications

- High pedestrian volumes
- High turning volumes
- High speed roadways
- Multiple turn lanes

Benefits

- Removes all turning vehicle-pedestrian conflicts
- Allows turning vehicles to proceed without having to find gaps
- No impact to thru vehicle delay

Trade-offs

- Reduces pedestrian crossing time
- Pedestrian non-compliance
- Requires storage space for turn lane

111 Split Phases installed
(as of 6/12/2017)
Treatment Description

- Signal phase where only pedestrians cross
- Pedestrians may cross in all directions, however the signal is not necessarily timed specifically for the diagonal crossing

Applications

- High pedestrian volumes
- Low traffic volumes
- High pedestrian signal compliance
- Intersections with complex geometry
- Turns are predominant traffic movement
- High demand for diagonal crossing

Benefits

- Removes all pedestrian-vehicle conflicts (during all-pedestrian phase)

Trade-offs

- Can reduce pedestrian crossing time
- Pedestrian non-compliance
- Increases vehicular delays

473 All Pedestrian Phases (includes 92 “Barnes Dances”) (as of 6/5/17)
Skewed geometry
Shortest distance to cross is diagonal
Desire to cross diagonally to and from subway

Diagonal crosswalk to be added in Summer 2017*

Northern Blvd and Broadway, Queens
• Skewed geometry
• Low traffic volumes
• Desire to cross diagonally to and from LIRR station

Pedestrian signals and diagonal crosswalk to be added in Summer 2017*

Lefferts Blvd and Grenfell St, Queens
Skewed geometry
No thru movements – all vehicles turning
Both legs of Beaver St go “away” from intersection
Low traffic volumes

Broad St and Beaver St, Manhattan
THANK YOU!

Questions?

Nolan Levenson
Project Manager, Pedestrian Projects Group
NYC DOT
nlevenson@dot.nyc.gov