



# **BROOKLAND**

## Multi-Modal Transportation & Streetscape Study

Recommended Short- and Long-Term Transportation Improvements

June 28, 2006



T:\211567 - Brookland CO \June 28, 2006 Update

# Executive Summary



The transportation element of the Brookland study consists of various short- and long-term improvements to enhance safety, accessibility, circulation, and efficiency for different modes of travel.

The transportation improvements include three categories of recommendations:

- **Overall Improvements**
- **Corridor Improvements**
- **Specific Intersection Improvements**

# **Community Goals & Objectives**

*“To Provide Streetscape Improvements & Transportation Management Strategies to Improve and Manage Vehicular Movements, Increase Pedestrian Safety, and improve the Aesthetics of the Urban Environment”*

- Reduce Traffic Congestion**
- Promote Pedestrian Safety**
- Minimize Truck Traffic Impact on the Neighborhood**
- Enhance Public Transit & Bicycle Access/Accessibility**

# **Key Participants & Stakeholders**

*The District Department of Transportation has initiated an open and participatory process to encourage involvement of key community representatives, professional organizations, and long-standing institutions within the study area*

- ✓ **ANC's**
- ✓ **Merchants**
- ✓ **CUA Administration**
- ✓ **Trinity Administration**
- ✓ **Providence Hospital**
- ✓ **Hospital for Sick Children**
- ✓ **John Paul II and Basilica**
- ✓ **Brookland Main Street**
- ✓ **Brookland Community Development Corporation**
- ✓ **District Government Agencies**
- ✓ **Federal Government Agencies**
- ✓ **WMATA (Washington Metropolitan Area Transit Authority)**

# *Analytical Approach*

## 1. Review of Public Comments

Safety (vehicular, pedestrian, and bicycles)

Vehicular traffic speeds (need for traffic calming)

Pedestrian and bicycle access and circulation

Parking supply (cars and bicycles)

Violation of traffic regulations (parking, truck prohibition & speed limit)

## 2. Analysis of Base Conditions

## 3. Recommended Strategies

- Short-Term Improvements (Implementation w/in 12 to 24 months)**
- Long-Term Improvements**

# **Brookland Traffic Analysis**

## **Model**

- ✓ Computer Simulation Modeling of Roadway Network Within Study Area Including: Existing Traffic Signals, Regulations, Signs, Pavement Markings, On-Street Parking, and Traffic Volumes
- ✓ Review of Existing Peak-Hour Volumes & Traffic Flow Patterns
- ✓ Incorporation of Community's Vision and Concerns in the Analysis
- ✓ Assessment of "Future" Development/Re-Development Activities in Brookland and Associated Pedestrian Circulation/Safety, Bicycle Traffic/Route Connectivity, Transit Operations, and On-/Off-Street Parking
- ✓ Identification, Evaluation, and Analysis of Constraints & Opportunities within the Overall Framework of Neighborhood Goals
- ✓ Assessment of Feasible and Cost-Effective Alternatives

# **Methodology**

- Pedestrian Safety
- Accident History
- Traffic Volumes and Intersection Levels of Service
- Traffic Control Devices
- Truck Routes and Regulations
- Traffic Calming Strategies

# Consideration of 4-Way Stop Signs

Table 1 - Traffic Volumes (Side Street Approaches)								
<b>12TH STREET, N.E. CORRIDOR</b>								
<b>Intersections</b>	<b>Highest volumes, entering the intersections from side streets, for any 8 hours of an average day</b>							
12th Street, N.E. @ Hamlin Street, N.E.	54	48	40	36	35	33	28	24
12th Street, N.E. @ Irving Street, N.E.	63	51	37	32	30	29	28	26
12th Street, N.E. @ Jackson Street, N.E.	43	35	33	30	27	26	24	23
12th Street, N.E. @ Newton Street, N.E.	70	57	56	43	70*	70*	70*	70*
12th Street, N.E. @ Otis Street, N.E.	181	158	155	130	181*	181*	181*	181*
	* : Assumed worst-case scenario							
<b>MONROE STREET, N.E. CORRIDOR</b>								
<b>Intersections</b>	<b>Highest volumes, entering the intersections from side streets, for any 8 hours of an average day</b>							
Monroe Street, N.E. @ 15th Street, N.E.	26	24	22	20	20	20	15	12
Monroe Street, N.E. @ 16th Street, N.E.	39	34	29	29	26	19	17	15
Monroe Street, N.E. @ 17th Street, N.E.	46	37	28	27	26	24	23	23

# Speed Studies

Table 2 - 85th Percentile Travel Speeds							
Corridor	85th Percentile Speed (Miles per hour)						
	Northbound		Southbound		Eastbound		Westbound
	12TH STREET, N.E.	34 MPH		34 MPH			
MONROE STREET, N.E.					37 MPH		38 MPH

# **Bulb-Outs for Traffic Calming**

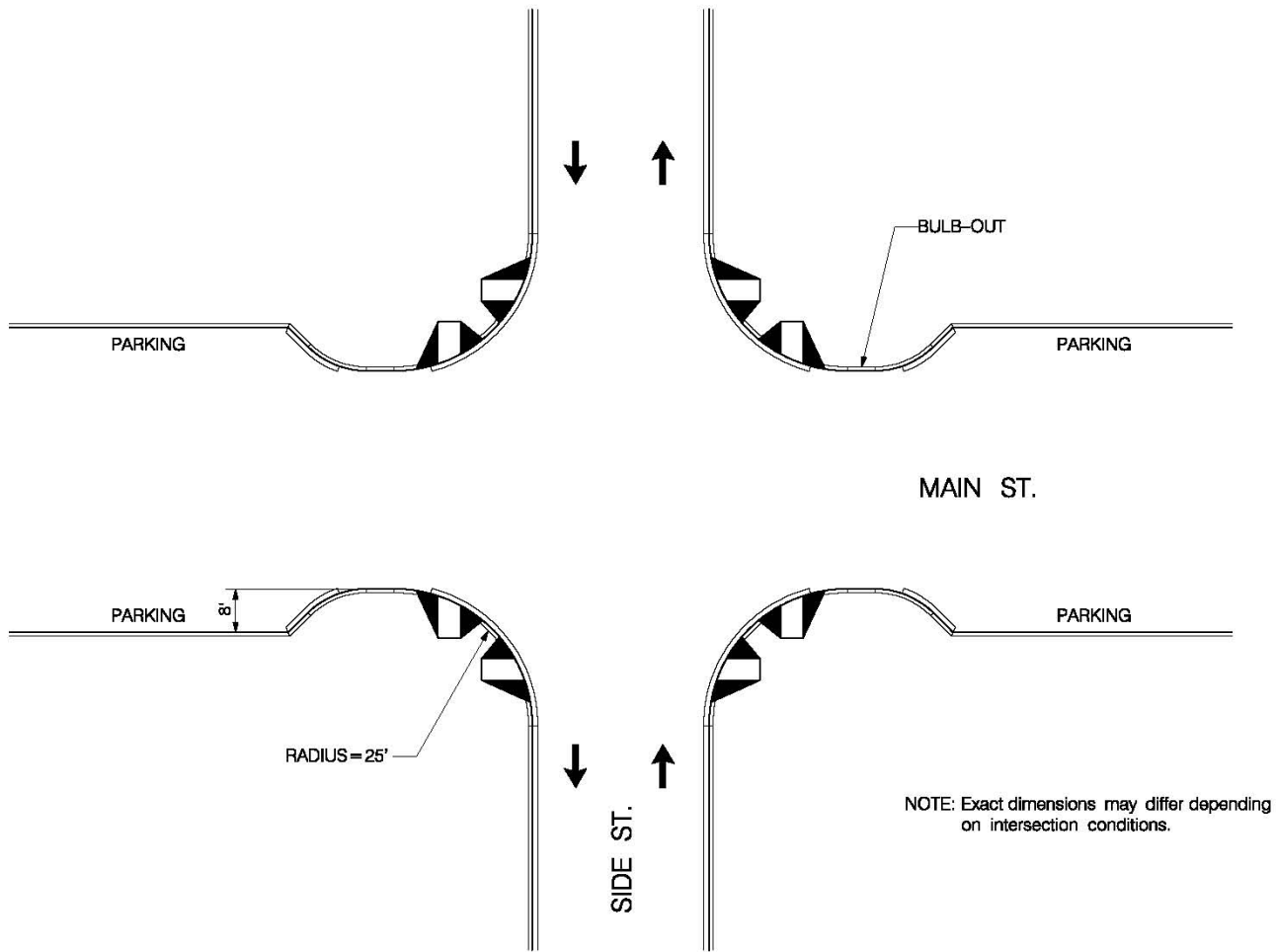
## **Advantages of Bulb-Outs:**

- Shorten the crossing distance for pedestrians
- Can slow down vehicles due to narrowing of the roadway cross-section and shorter turning radius at corners of the intersection
- Provide larger sidewalk area which can be used for unique streetscape features

# *Bulb-Outs for Traffic Calming*

## **Disadvantages of Bulb-Outs:**

- May present difficulties for large vehicles that are turning adjacent to the bulb-out. Therefore, each location at which bulb-outs are proposed must be carefully designed to accommodate the geometric requirements of large vehicles.
- Extension of curb line may have a negative impact on drainage (i.e., runoff of rain water). Appropriate drainage design features have been employed in the past to address this issue.



NOTE: Exact dimensions may differ depending on intersection conditions.



FIGURE 1- TYPICAL LAYOUT OF BULB-OUTS

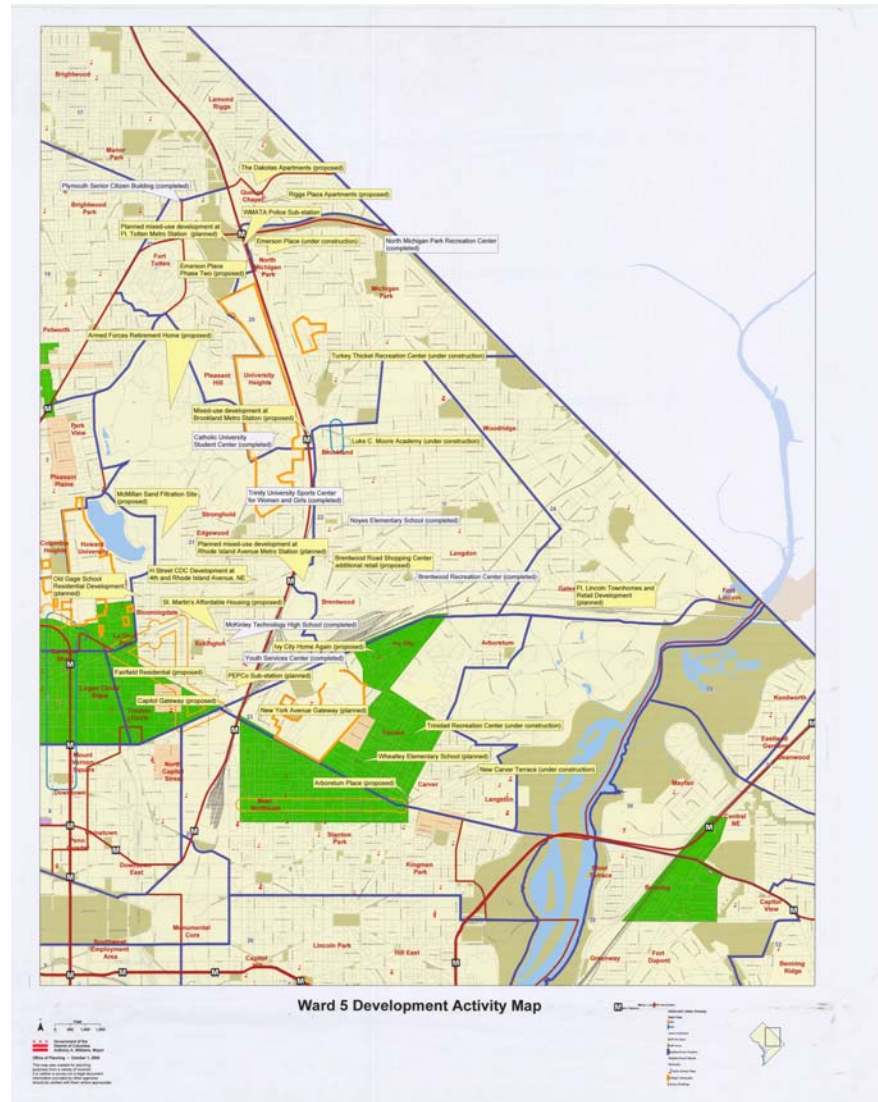
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BROOKLAND TRANSPORTATION  
 & STREETSCOPE STUDY  
 WASHINGTON, D.C.

FIGURE 1  
 TYPICAL LAYOUT OF BULB-OUTS

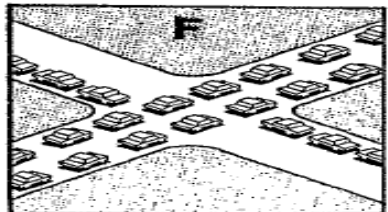
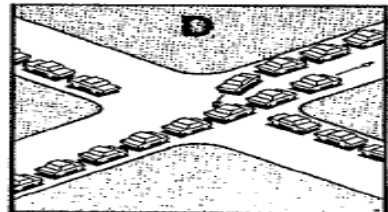
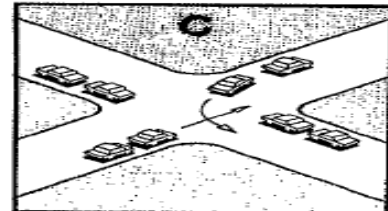
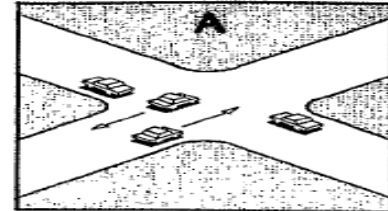
# Ward 5 Development Activity



# Intersection Capacity Analysis Methodology

## LEVEL OF SERVICE DEFINITIONS

L.O.S.	ROADWAY SEGMENTS OR CONTROLLED ACCESS HIGHWAYS	INTERSECTIONS
	<b>A</b>	Free flow, low traffic density.
<b>B</b>	Delay is not unreasonable, stable traffic flow.	On a rare occasion motorists wait through more than one signal indication.
<b>C</b>	Stable condition, movements somewhat restricted due to higher volumes, but not objectionable for motorists.	Intermittently drivers wait through more than one signal indication, and occasionally backups may develop behind left turning vehicles, traffic flow still stable and acceptable.
<b>D</b>	Movements more restricted, queues and delays may occur during short peaks, but lower demands occur often enough to permit clearing, thus preventing excessive backups.	Delays at intersections may become extensive with some, especially left-turning vehicles waiting two or more signal indications, but enough cycles with lower demand occur to permit periodic clearance, thus preventing excessive back-ups.
<b>E</b>	Actual capacity of the roadway involves delay to all motorists due to congestion.	Very long queues may create lengthy delays, especially for left turning vehicles.
<b>F</b>	Forced flow with demand volumes greater than capacity resulting in complete congestion. Volumes drop to zero in extreme cases.	Backups from locations downstream restrict or prevent movement of vehicles out of approach creating a storage area during part or all of an hour.



**SOURCE:** A Policy on Design of Design of Urban Highways and Arterial Streets - AASHTO, 1973 based upon material published in Highway Capacity Manual, National Academy of Sciences, 1965.

Note: Intersection levels of service range from “A”, representing very low vehicle delay (very good conditions) to “F” describing excessive delay (failing conditions). In most jurisdictions, a level-of-service “D” or better is considered as minimum acceptable operational standard.

# Capacity Analysis Results

*(Intersections Operating Below LOS 'D')*

## Level of Service

<u>Intersection</u>	<u>AM Peak</u>	<u>PM Peak</u>	<u>Comments</u>
Monroe St. at South Dakota Ave., N.E.	C	E	C/C with retiming
Michigan Ave. at South Dakota Ave., N.E.	E	F	C/C with retiming
Michigan Ave. at Monroe St., N.E.	B	F	B/A with retiming & Actuation
Michigan Ave. at Harewood Rd., N.E.	D	E	D/D with retiming & Actuation

# Overall Improvements for Various Modes of Travel

## Short-Term Recommendations

- Conduct maintenance activities sidewalks, signs, and pavement markings. [P, M]
- Provide consistent truck prohibition signs for the Brookland area. Currently, there are different types of signs in use. This effort will help mitigate the impact of truck traffic within the Brookland community (the District currently uses white signs for regulation and green signs as guides for trucks traffic). [M]
- Encourage local businesses to utilize smaller trucks, if possible, for delivery of supplies and materials. This would minimize visual impacts of truck activity, curb space requirements, and impact on sight distance at intersections. [M]
- Install pavement markings along on-street parking spaces to better define parking areas and adjacent travel lanes. [M]
- Provide additional designated loading zones within the 12th Street, N.E. corridor to facilitate delivery services for area businesses. [M]
- Install updated traffic signal timing with appropriate phasing adjustments reflecting current traffic conditions to improve traffic operations. [M]
- Install pedestrian-level lighting along 12<sup>th</sup> Street, N.E. on existing utility poles to enhance safety – use twin tear-drop fixtures. [P]

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### Travel Modes Improved

P: Pedestrians (Walking)  
PT: Public Transportation

B: Bicyclists  
M: Motor Vehicles

# Overall Improvements for Various Modes of Travel

## Long-Term Recommendations

- **Discuss the following items with Washington Metropolitan Transit Authority (WMATA):**
  - Installation of appropriate directional signs (way finding) at the Brookland/CUA metro station to guide transit riders who want to reach key destinations and area attractions such as the Catholic University of America, the National Shrine, and Trinity College. [P, PT]
  - New and expanded bike racks, and preferably bicycle lockers, are needed at the Brookland Metro station. The existing bike racks are deteriorated and not properly used. [B]
  - Community representatives have requested that WMATA review pedestrian accessibility to the metro station and make appropriate improvements to enhance safety and facilitate access from adjacent neighborhoods, especially along Perry Street, N.E. (pedestrian gateway to Brookland from the Metro Station). [P, PT]
  - There is a number of existing bus shelters within the Brookland area. These are standard WMATA shelters and do not have include seating for passengers. It would be desirable to replace the shelters with “decorative” models including appropriate seating. [PT]

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### Travel Modes Improved

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# Overall Improvements for Various Modes of Travel

## Long-Term Recommendations (Cont'd)

- **Install additional pedestrian-scale street lighting fixtures along Monroe and 12th Streets, N.E. to provide higher levels of illumination. [P]**
- **Upgrade the existing traffic signals to conform to the latest DDOT design guidelines and practices, as well as those contained in the 2003 edition of the Manual on Uniform Traffic Control Devices (MUTCD). Signal modifications are necessary at virtually all signalized intersections within the study area with the exception of Michigan Avenue, N.E. from 18th/Varnum Street, N.E. to Eastern Avenue, N.E. In addition, pedestrian phasing and pedestrian signal heads should be added at signalized intersections where they do not currently exist. [M]**
- **Install handicap ramps at intersections that currently do not include this feature to accommodate disabled pedestrians i.e., to meet current DDOT design standards, which adhere to ADA guidelines. [P]**
- **Designate additional parking spaces for Zipcar/Flexcar programs. [M]**
- **Consider reconfiguration of the intersections of Michigan Avenue, N.E. @ 12th and Randolph Streets, N.E. [P, M, B]**

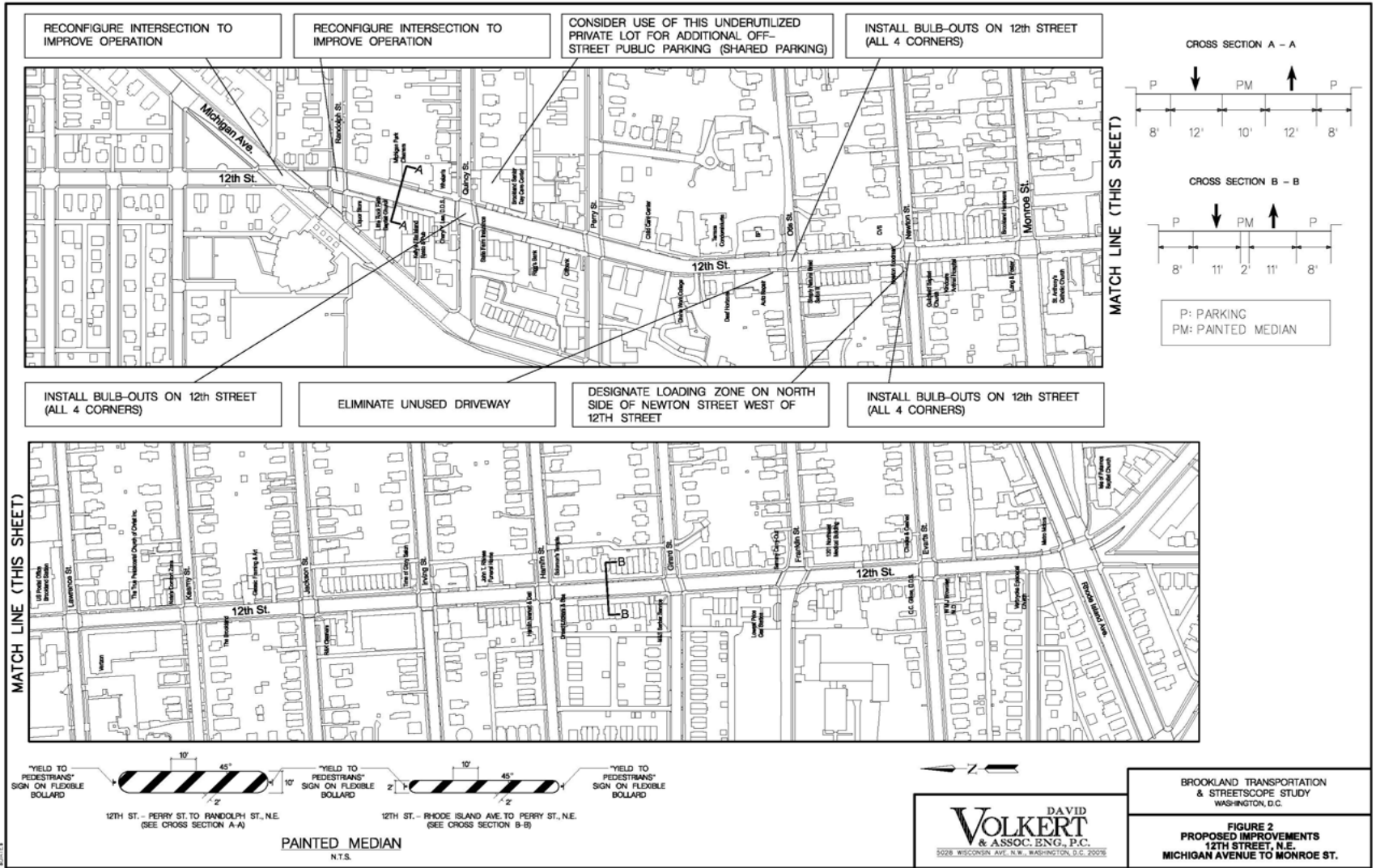
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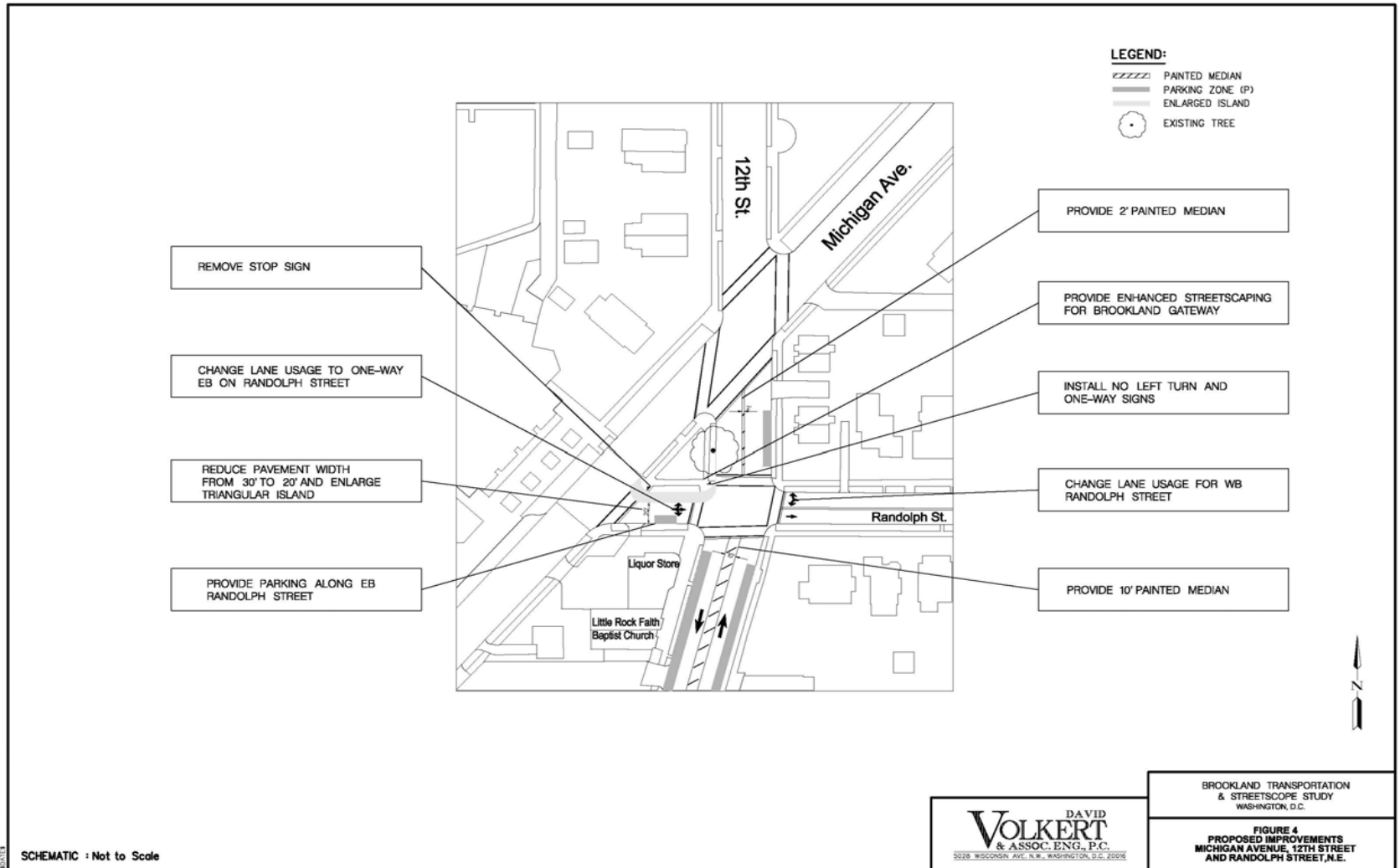
# 12<sup>th</sup> Street, N.E. Corridor Improvements







# Michigan Ave., N.E. @ 12<sup>th</sup> & Randolph Streets, N.E. (Alternative I: Narrowing of Randolph St)



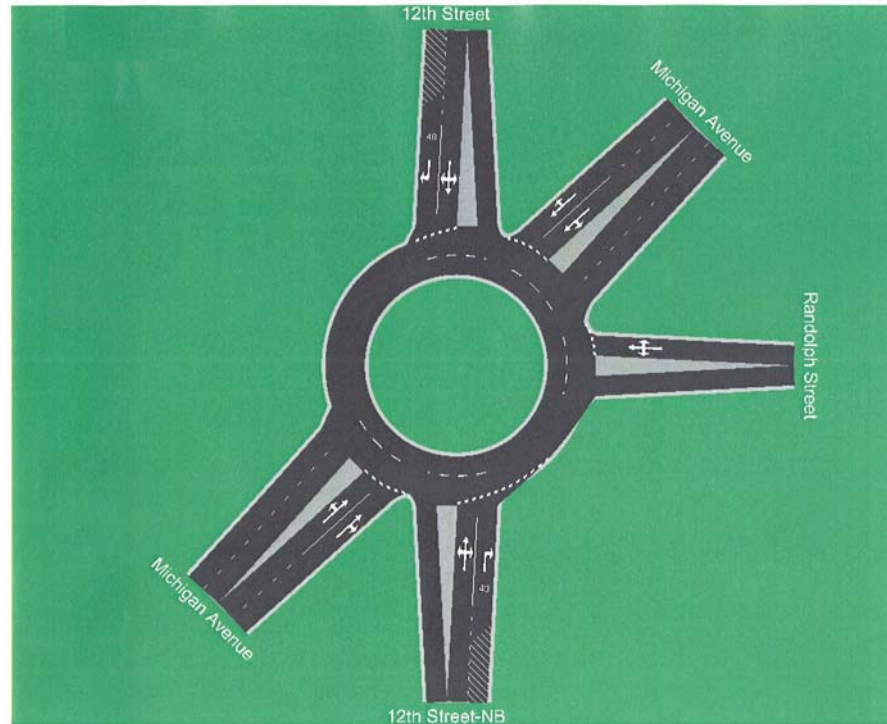
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**FIGURE 4**  
PROPOSED IMPROVEMENTS  
MICHIGAN AVENUE, 12TH STREET  
AND RANDOLPH STREET, N.E.

# Michigan Ave., N.E. @ 12<sup>th</sup> & Randolph Streets, N.E. (Alternative II: 2-Lane Urban Roundabout )

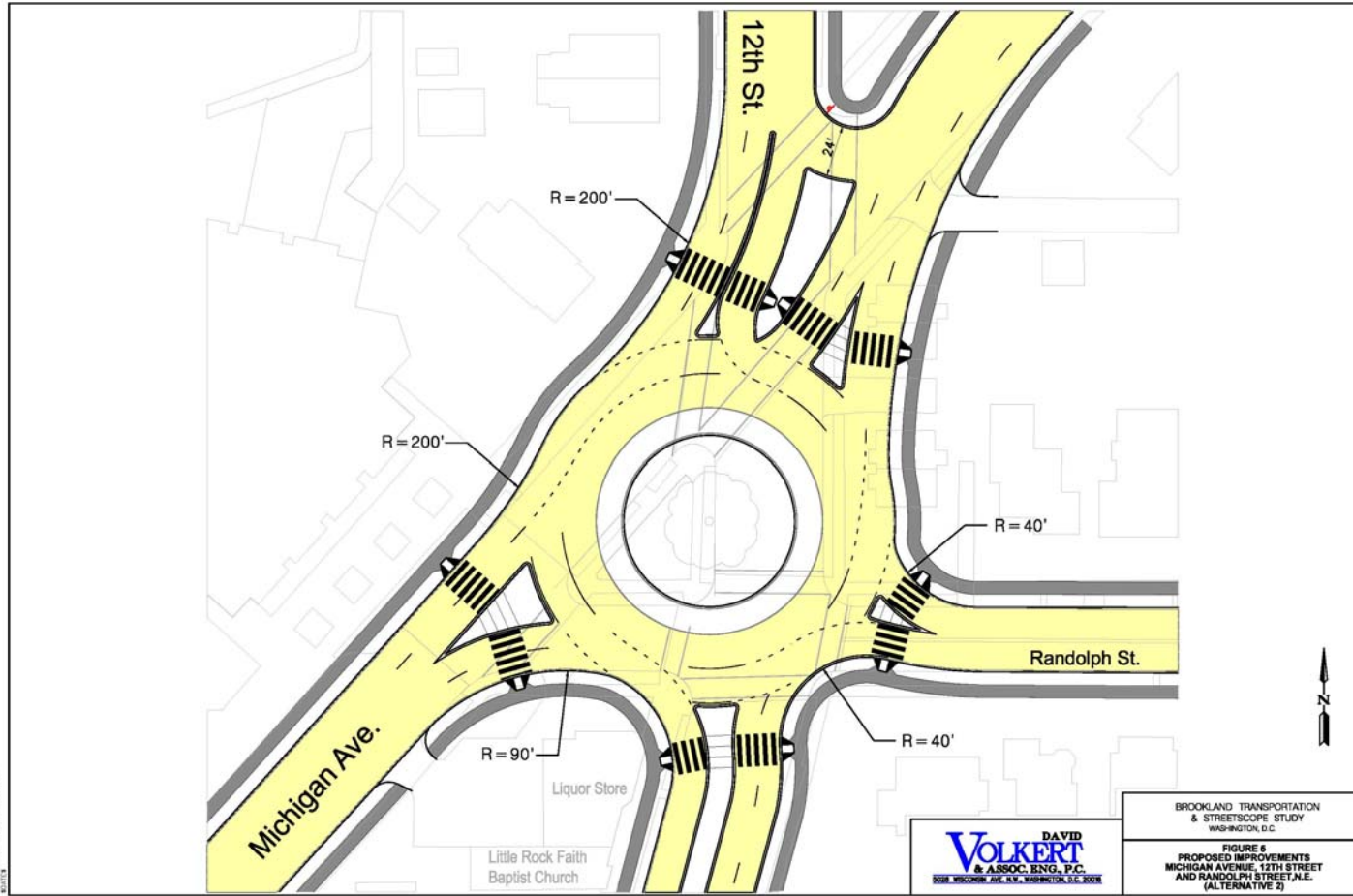


Source: aaSIDRA Software

## Level of Service

	<u>AM Peak</u>	<u>PM Peak</u>
Existing Configuration	C	C
2-Lane Roundabout	B	B

# Conceptual Layout of 12<sup>th</sup> Street 2-Lane Urban Roundabout



**Questions, Comments &**  
**Suggestions**