



NORTH CAPITOL STREET **CLOVERLEAF FEASIBILITY STUDY**



District of Columbia
Office of Planning



DISTRICT DEPARTMENT OF TRANSPORTATION

ACKNOWLEDGEMENTS

Sponsoring Agencies

District of Columbia Office of Planning
National Capital Planning Commission
District Department of Transportation

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Pleasant Plains Civic Association
Stronghold Neighborhood
12th Street Business Association
United Neighborhood Coalition
Veterans Affairs Medical Center
Washington Central Parks
Washington Hospital Center
Woodridge Civic Association

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INTRODUCTION

Background

The corridor of North Capitol Street under study has less to do with the formal streets and grand avenues associated with Pierre L'Enfant's 18th century plan for the District of Columbia than mid-20th century engineering for maximal traffic flow. Thus, rather than serving its proper role as one of the monumental entries to the District's historic core, it acts more as a suburban style arterial road focusing on commuter auto traffic. By ignoring its role in the city's fabric, North Capitol Street serves one type of traffic only, auto, rather than addressing the equally important pedestrian, bicycle and transit needs that are so ably handled by the many fine examples of multi-use streets found in the District.

At no place does the contrast between this current suburban form and the surrounding urban context manifest itself as clearly as at the intersection of North Capitol and Irving Streets. At this intersection, a cloverleaf interchange of the type more usually used on suburban highways sits on 19 acres of land, representing an era where traffic "solutions" were proposed that would have cleaved the city's urban fabric with an "inner loop" highway project. While the cloverleaf interchange successfully deals with the flow of traffic, it ignores its context and acts as barrier between the surrounding neighborhoods and the flow of pedestrians, bicyclists and transit.

While the cloverleaf itself acts as a sufficient auto traffic solution, other intersections in the study area suffer from high traffic volumes, and most (including the cloverleaf interchange) suffer from low pedestrian and transit functionality. The significant amount of proposed development approved for the area surrounding the cloverleaf will only exacerbate these traffic issues without a larger scale effort to address alternatives to auto-dominated transit in the area and the inward focus of these proposed developments.

Project Goals

In an effort to proactively explore the traffic and transit issues while also addressing how the character of North Capitol Street and the surrounding public realm can better reflect its symbolic role as a gateway to the historic core of the city, the District of Columbia Office of Planning (DCOP), District Department of Transportation (DDOT), and National Capital Planning Commission (NCPC) launched this North Capitol Cloverleaf Feasibility Study. The following broad goals were set out by DCOP, DDOT and NCPC for this study and served as both a starting point and an overarching framework for the public involvement in this study:

- Explore alternative intersection configurations for the cloverleaf at Irving and North Capitol Streets to create a more urban, pedestrian oriented and transit supportive environment;
- Develop strategies to improve the gateway qualities of North Capitol Street by including accessible open spaces, civic spaces, memorials, and enhancing public streetscapes; and
- Develop recommendations for improving safety, connectivity and transportation options.

Project Boundaries and Scope

Working with the community and local stakeholders, the three agencies refined a project scope that sought input on changing the character of the approximately 1.5 mile stretch of North Capitol Street from Hawaii Avenue to Michigan Avenue, with a focus on the feasibility of replacing the cloverleaf interchange at North Capitol and Irving Streets to improve pedestrian and transit options, create a more urban environment and add to the gateway experience entering into the city. The study also considers short and medium term improvements that might occur in the surrounding area including particular focus on the intersections on Irving Street and Michigan Avenue to the immediately east and west of North Capitol Street.

Report Organization

This report contains an Executive Summary followed by four chapters detailing the Public Process, Existing Conditions and Opportunities, North Capitol Gateway Corridor Improvements, and Short and Medium Term Improvements, respectively. The first chapter on Public Process outlines the public participation model used during this study. The Existing Conditions and Opportunities Analysis documents and analyzes the overall transportation and land use context of the study area in its historical context. For details refer to the Existing Conditions Appendix; based on the conditions and opportunities documentation, further work focused on short, medium and long term improvements to the North Capitol Street Corridor and cloverleaf interchange.

The North Capitol Gateway Corridor chapter focuses on the long term improvements to the corridor to realize the appropriate character and gateway experience for the Corridor, including the explication of options for the replacement of the cloverleaf interchange. The final chapter on Short and Medium Term Improvements lays out a series of solutions that may be incorporated to ease community traffic and transportation concerns during the interim period before larger area-wide transportation studies can be performed and implemented.

A Report Appendix, published separately, provides background information details for the other sections of this report.

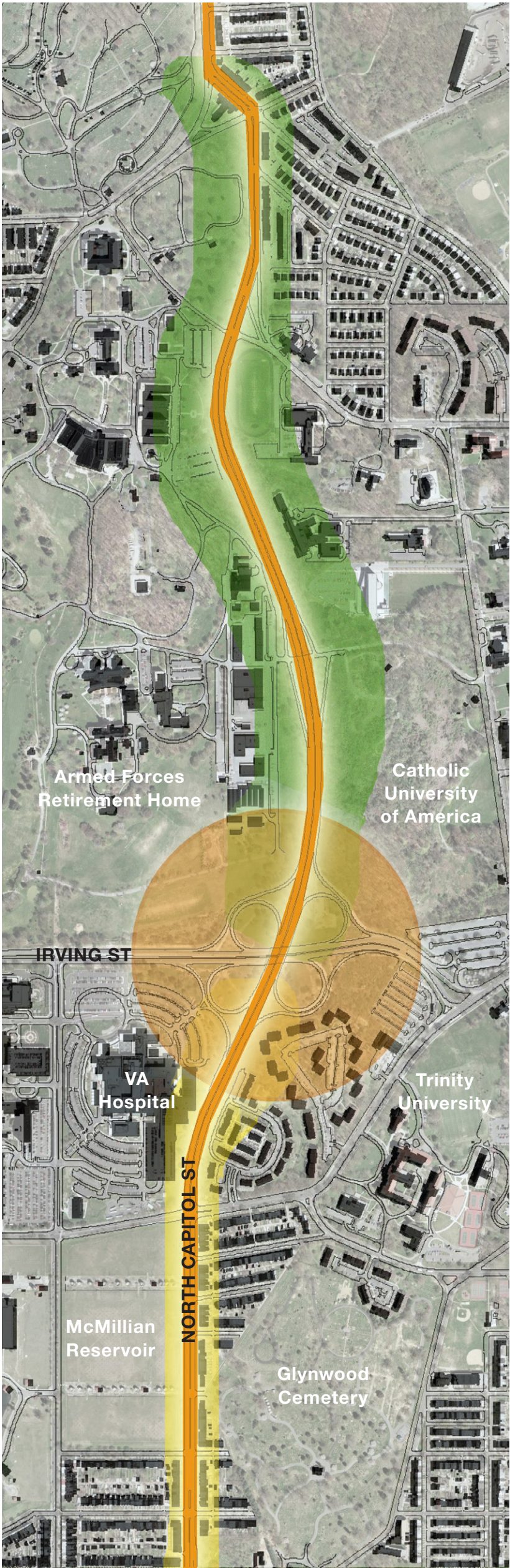
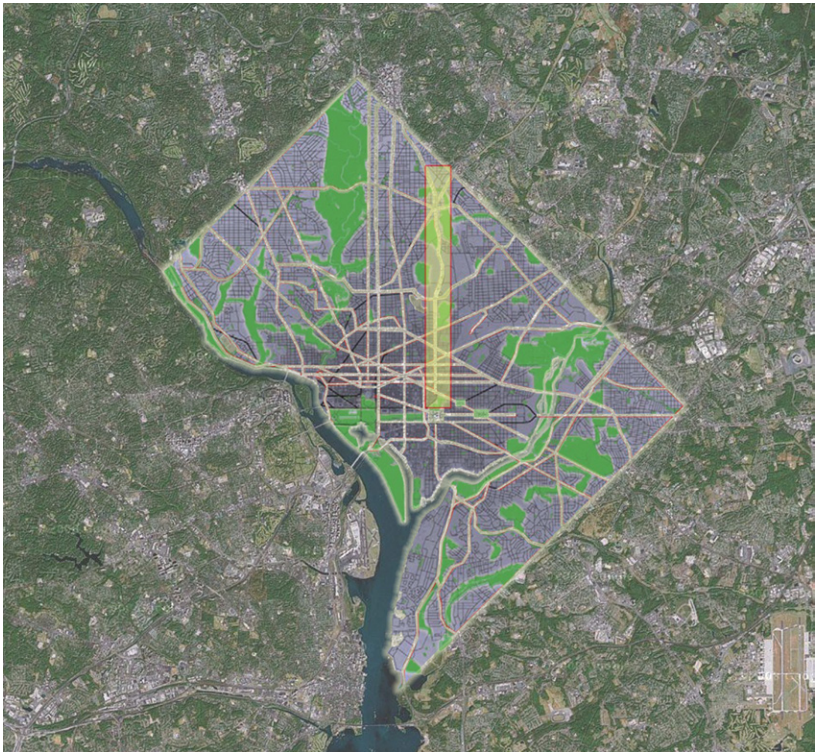


Diagram of Corridor Boundary



Key Plan of North Capitol Street

EXECUTIVE SUMMARY

A COMPREHENSIVE APPROACH TO TRANSPORTATION, URBAN DESIGN AND REAL ESTATE DEVELOPMENT...



Aerial of Surrounding Region with Proposed Development Plans

Challenges

- Few alternative travel routes and transit options exacerbate vehicular congestion
- Highway-style configuration and cloverleaf act as barriers between neighborhoods for pedestrians and bicyclists
- Little accessible green space
- Anticipated increase in usage of roadways resulting from planned development
- Unclear character of North Capitol Street

Opportunities

- Turn the North Capitol Corridor into a gateway to the District's historic core
- Recharacterize upper North Capitol Street as a parkway
- Renovate lower North Capitol Street as a boulevard
- Replace the cloverleaf interchange with a new urban center that combines park space and creates entries to the new developments
- Create a prominent site for a new memorial
- Improve transit, pedestrian and bicycle options
- Provide value to the District and the community

EXECUTIVE SUMMARY

Spanning beyond its original extents as found in the 1791 L'Enfant Plan for the District of Columbia, North Capitol Street suffers from its piecemeal development and more recent focus as a commuter arterial road in detriment to its potential role as a symbolic gateway to the historic city core. North Capitol Street travels from area of denser downtown development to the suburban-style area under study to a more neighborhood-scale zone, without addressing any of these situations well. With its cloverleaf intersection at Irving Street and the highway configuration to the north, the Corridor now serves as a significant barrier to bicycle, pedestrian and transit connections between the surrounding neighborhoods.

With the prospect of significant new development in the area, the city has a unique opportunity to address this anomalous rift in the city fabric by encouraging a recharacterization of North Capitol Street through urban design, road functionality, transportation, streetscape and public realm improvements. This report explores short, medium and long term improvements that will transform North Capitol into a gateway commensurate with its role while also accommodating transportation and transit upgrades necessary for the continued vitality of the greater region.

Study Area

The Project Boundary is defined as the corridor of North Capitol Street running from Hawaii Avenue to the north and Michigan Avenue to the south, with particular focus on the cloverleaf interchange present at North Capitol and Irving Streets. Institutional entities such as the Armed Forces Retirement Home, Catholic University of America, Trinity University and the VA Hospital are large landowners in the surrounding area. While the Project Boundary is generally limited to the properties immediately adjacent to North Capitol Street, the study also encompasses the intersections to the east and west of North Capitol on Michigan Avenue and Irving Street and considers the extension of streetscape improvements on North Capitol Street south of Michigan Avenue.

Public Participation

The Feasibility Study actively engaged the public by providing a series of meetings and workshops for the surrounding community in formulating the various options and improvements proposed in this report. The public participation process involved, residents, community associations, Advisory Neighborhood Commissions, institutional landowners and other local stakeholders in a series of meetings and workshops, the results of which were incorporated into the design process.

Context and History

Until the mid-20th Century, North Capitol Street stopped at Michigan Avenue, first at the border of the Riggs Estate and then the U.S. Soldiers Home (now known as the Armed Forces Retirement Home) established after the Civil War. The Home's land was subdivided in the 1950's, paving the way for the extension of North Capitol through upper Northeast. The mid-20th century focus on auto-dominated transportation shaped this extension into its highway form and allowed the introduction of the suburban style cloverleaf interchange into the urban context creating a barrier between the surrounding neighborhoods.

Existing Conditions and Opportunities

The Existing Conditions and Opportunities Analysis, as further detailed in the separate Existing Conditions Appendix, reviews the land use, traffic and transit patterns, open space, historic context and current character of the Corridor. A major identified challenge to the area rests in the relatively few alternative east-west and north-south routes through the areas. Particularly the limited east-west street connections funnel motorists along Irving and Michigan, creating congestion during peak periods. The current configuration of North Capitol Street and the cloverleaf intersection handles automobile travel, but limits transit options while creating both a physical barrier and an environment unfriendly to bicyclists and pedestrians who might want to traverse the area. Despite a large amount undeveloped land and relatively low density of development, the area suffers from a lack of accessible park or other public use land because of the disconnectedness and inward focus of the surrounding developments.

Anticipated pressure from proposed and approved developments will exacerbate the existing traffic issues while also creating extra demand on the limited transit and alternative transportation options. The key to addressing this issue lies in making transportation improvements for all modes of travel, a key component of which is to facilitate urban development patterns by replacing the cloverleaf at North Capitol and Irving. By creating a vibrant center that handles all forms of transportation (pedestrian, bicycle, transit and auto), the solution for the cloverleaf can also act as a genesis for reversing the trend of inward-focused developments in the area, providing a more appropriate urban fabric that will also increase access to new parks and open space environments.

North Capitol Gateway Corridor

The analysis of the North Capitol corridor from Michigan Avenue to Hawaii Avenue points out that this Corridor suffers from an inconsistent and unsuccessful character. To the north of the cloverleaf interchange, North Capitol acts mostly as a highway with few signalized intersections, wide lanes, generous setbacks, and free flow of traffic. This highway style road is inconsistent with the normal fabric of the city and its goal of fostering streets that handle all modes of transportation, from pedestrians to autos. The cloverleaf itself, encompassing approximately 19 acres of land, is an anomaly in the city and results in a very unproductive use of land that also further serves as a barrier between the surrounding neighborhoods. South of the cloverleaf, where North Capitol joins the more typical urban fabric of the city, the street should fill the role of a symbolic entry to the Capital, but largely fails because of the poor streetscape conditions and unwelcoming pedestrian environment: gaps in the sidewalk network, little or no street furnishings, sparse and inconsistent street trees, chain-link fence, and overscaled, highway-style “cobrahead” light fixtures that leave sidewalks dimly lit. This study recommends that distinct approaches be taken to each of these three zones to create an appropriate gateway to the monumental core and better serve the city as whole by increasing connectivity for pedestrians, bicyclists and transit.

For the area north of the cloverleaf, this study recommends that the best approach is to respect the natural topography of the region and existing tree cover and open space adjacent to the road by transforming the street into a grand parkway, similar to that found in Rock Creek. While existing travel

lanes would be maintained, streetscape improvements, reforestation, and LID development would improve the visual environment and aid in slowing traffic through this zone.

For the cloverleaf area itself, the unique location within the city, emphasized by the multiple landmark views and vicinity to existing and planned developments argues for this area to be realized as a new urban center that mediates between the parkway to the north and the original axial alignment of North Capitol Street to the south. This new place would offer accessible open space as an amenity to the community and provide a center around which the proposed developments could reorient themselves. Finally, the creation of such a center will provide more transportation options by opening the area to bicyclists and pedestrians, as well as an opportunity to connect north-south and east-west transit routes.

For the final stretch of the corridor, south of the cloverleaf, the character of North Capitol lends itself towards becoming a great boulevard worthy of its role as a symbolic entry to the monumental core of the historic city. As the street transitions to its axial alignment with the U.S. Capitol Building, improved streetlighting, furnishings, paving, street trees, and median improvements will allow North Capitol to take its place with such great streets as Connecticut Avenue and East Capitol Street as a gateway to the city.

Short and Mid-Term Improvements

In addition to looking at long term solutions to improve the gateway character of North Capitol Street, replace the cloverleaf interchange, and create a more walkable, pedestrian, bicycle and transit friendly environment, the study also analyzed short and medium term improvements that will enhance the functionality of the North Capitol Street Corridor for all users. These enhancements range from targeted intersection improvements to small scale interventions such as adding speed cameras to North Capitol to help calm traffic speeds.

Value Proposition

The reworking of the North Capitol and Irving intersection, including the removal of the cloverleaf infrastructure will come at significant cost but will also create significant value opportunities. The hope is that the additional value created by this significant public investment can be captured and potentially help to pay for these costs.

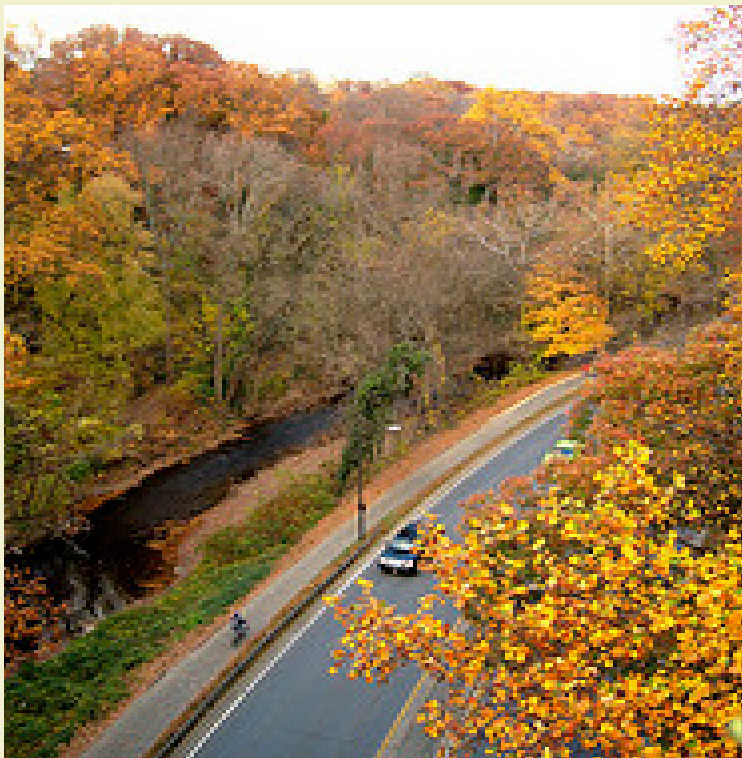
The key methodological components that drive this analysis are as follows:

- Developable acres created under each option
- A hypothetical FAR that considers the likely achievable building densities and parking solutions given the proposed urban design, market forces, and development economics.
- An assumed land value per FAR square foot (SF) based upon hypothetical pro formas of different building types that recognizes both the lower residual value of land and the higher assessed value for higher density product.
- A present valuation of future property tax revenues that assumes a revenue flow of 20 years at a 4.5% discount rate and a phasing in of improvements over time.

An equally important, but more difficult to quantify, potential source of value creation is the impact of improvements to the North Capitol-Irving interchange on surrounding parcels and the broader neighborhood and region. Ultimately, this type of large scale infrastructure project has the potential to transform an area and become a new center for this part of the city.

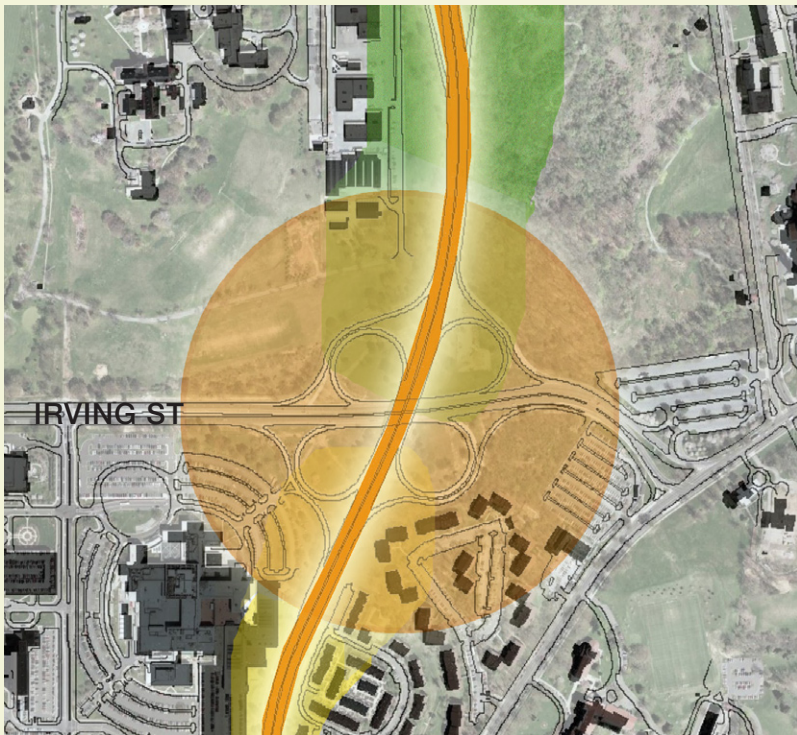
THREE ZONES - The Character of North Capitol

URBAN PARKWAY



Urban Parkway Precedent - Rock Creek Parkway

URBAN CENTER/TRANSITION



Urban Center Precedent - Dupont Circle

URBAN BOULEVARD



Diagram of Corridor Boundary



Urban Boulevard Precedent - East Capitol Street Parkway



Illustrative Parkway Improvements Perspective

GATEWAY - Recharacterize the north part of the corridor from a highway to an urban parkway, similar to Rock Creek Parkway, that respects the existing topographic restraints of the this portion of the corridor while capitalizing on the existing setbacks and vegetation that typify the zone.

TRANSPORTATION - Add transit/HOV dedicated lanes to open the opportunity for a north-south connector transit service that is presently lacking along North Capitol Street. A new hiker-biker trail offers non-

auto transportation options along the corridor that ties into existing and planned trail system.

SUSTAINABILITY - Low Impact Development (LID) featuring reforestation with native species, bio-swales and other on-site stormwater management techniques, and improved transit and non-motorized transportation options all complement the goal of creating a green corridor into the city.

GATEWAY - The underutilized cloverleaf land (approx. 19 acres) becomes a new center for the local community. Offering accessible green space, community amenities and the opportunity for a new memorial site for the city, the zone will serve both as an important new place in the city that emphasizes the visual and physical connections to the many surrounding landmarks.

TRANSPORTATION - Creating a gathering point at the crossroads of two heavily travelled byways offers a unique multimodal opportunity for an area that is currently suffering from a lack of transportation alternatives. The urban center will allow greater access to pedestrians and bicyclists

while also creating a natural node for both north-south and east west-transportation and connections to local transit.

SUSTAINABILITY - By featuring green strategies such as pervious paving, stormwater management, the creation of accessible park space and added transit options, this new center will improve the sustainable functionality of the Corridor. Most importantly, the recapturing of this underutilized land allows for development to occur in a concentrated manner focused on major transit and transportation arteries, rather than in the disperse suburban-style that now typifies the area.



Illustrative Urban Center Site Section







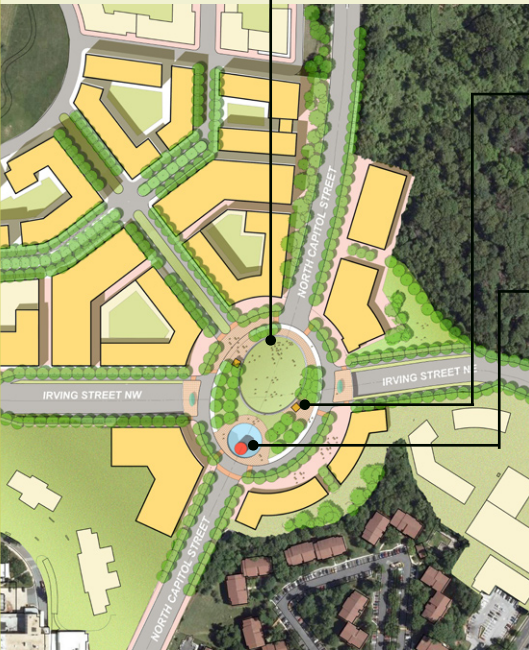

Illustrative Boulevard Improvements Perspective

GATEWAY - The region south of the cloverleaf is typified by a poor streetscape that detracts from North Capitol Street's role as a symbolic entry to the historic monumental core. By addressing street tree coverage, median treatment, outdated and unattractive lighting, and sidewalk and crosswalk paving, North Capitol Street can be upgraded in the manner that has already been achieved or planned for the gateway approaches along East and South Capitol Streets.

TRANSPORTATION - The poor streetscape condition discourages pedestrian and bicycle activity while encouraging unsafe driving speeds. By creating a more active and safe environment for pedestrians and bicyclists, transportation options will be better balanced among automobile and non-automobile options.

SUSTAINABILITY - LID street tree techniques, pervious paving options, street median bio-swales, and increased tree coverage will all add to the sustainability of the area.

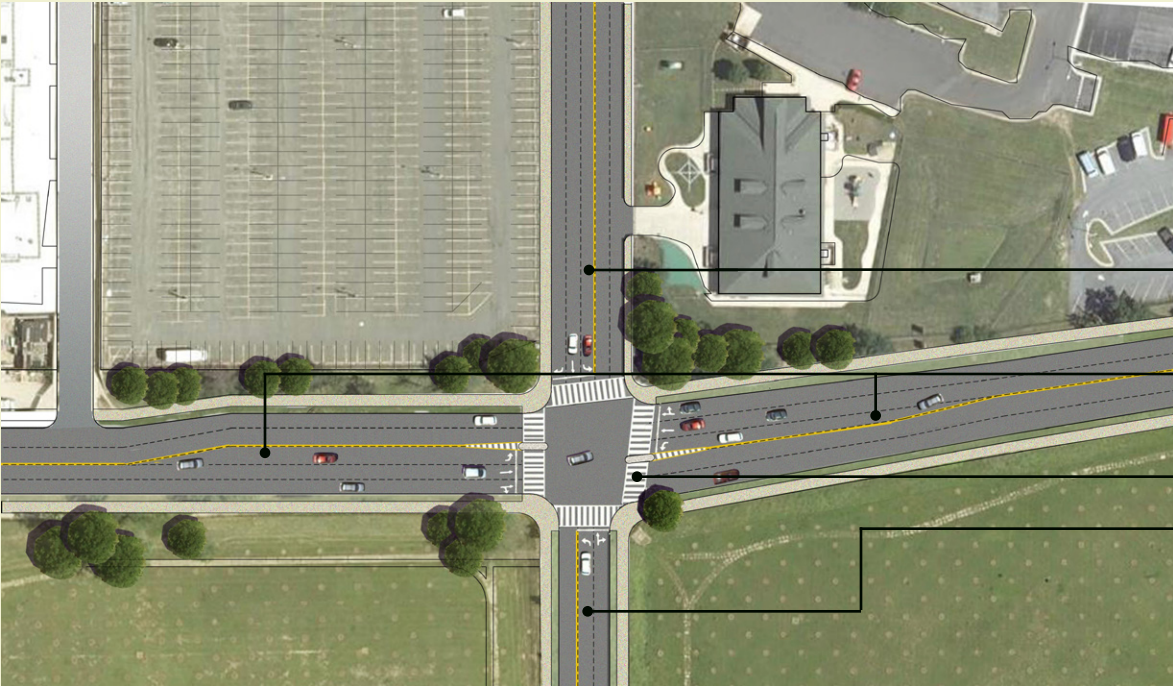

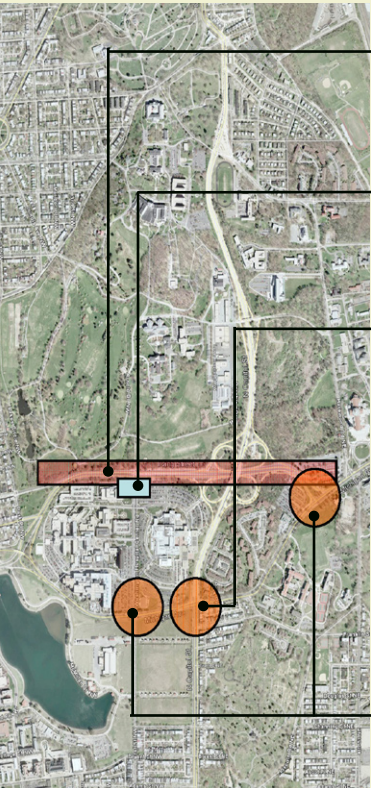
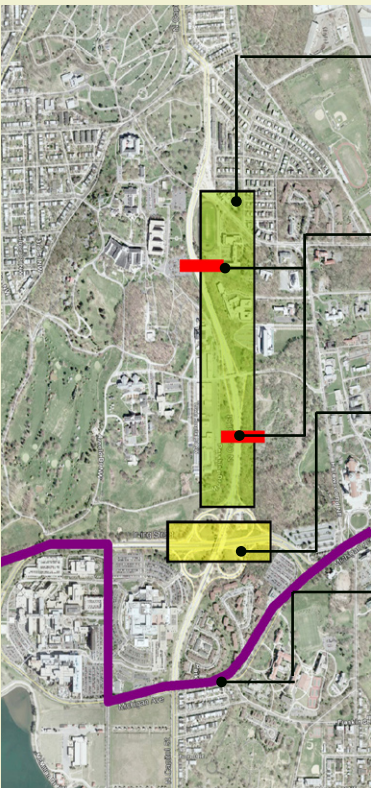
CLOVERLEAF OPTIONS

	Site Plan	Features
MEMORIAL IN THE PARK		<ul style="list-style-type: none">• 7.5 Acre Community Park• New Irving Street Bridge• Realigned North Capitol Street• Large Accessible Open Space• Prominent Memorial Site• Community Amenity  <p>Illustrative Site Section - Memorial in the Park</p>
FOUR CORNERS		<ul style="list-style-type: none">• 10 Acre Park• Intermodal Transit Opportunity• Maintains Existing Alignment and North Capitol Street Bridge• Lowest Infrastructure Costs• Larger Memorial Site• Easiest to Stage  <p>Illustrative Site Section - Four Corners</p>
CENTER OF CENTERS		<ul style="list-style-type: none">• 2.6 Acre Community Park• Additional Development Parcels• Intermodal Transit Opportunity• Clear Sense of Place• Community Amenity• Prominent Memorial Site• Builds on Existing Infrastructure  <p>Illustrative Site Section - Center of Centers</p>

Value Potential* (2009 Dollars)	Cost Estimate (2009 Dollars)	Rendering
\$21+/- Million	\$54+/- Million	
\$27+/- Million	\$39+/- Million	
\$188+/- Million	\$51+/- Million	

* Value of Captured Development Parcels and 20-Year NPV of Annual Property Tax

TRANSPORTATION AND CONNECTIVITY IMPROVEMENTS

	Features	
MICHIGAN AVE. & FIRST ST. NW	<div></div> <div>Proposed Intersection Improvements Detail</div>	<div>Reconfigure intersection to reduce congestion created by inefficient turning movements:</div> <ul style="list-style-type: none">• Restrict parking close to the intersections• Consider modifying the signal phasing• Add a southbound exclusive left turn lane• Minor street widening• Extend the westbound left turn lane• Extend the eastbound left turn lane• Install ladder-style crosswalks• Extend the northbound left turn lane <div>Cost Estimate: \$2.3+/- Million (2009 Dollars)</div>
MICHIGAN AVE. & IRVING ST. NW	<div></div> <div>Proposed Intersection Improvements Detail</div>	<div>Reconfigure intersection to calm traffic and create pedestrian-friendly crossings:</div> <ul style="list-style-type: none">• Realign the Irving Street to meet Michigan Avenue at a 90-degree angle• Remove free-flowing right turns• Install ladder-style crosswalks• Install streetscape improvements• Reduce green-light time for the southbound Irving Street approach <div>Cost Estimate: \$2.9+/- Million (2009 Dollars)</div>
OTHER IMPROVEMENTS	<div></div>	<div></div>

2

PUBLIC PROCESS

PUBLIC PROCESS

The Public Participation process for the Feasibility Study sought community and stakeholder input in shaping the options and recommendations that are the study's outcome. A series of meetings and workshops involving residents, Advisory Neighborhood Commissions (ANC) and Commissioners, institutional landowners and other community organizations and stakeholders were held that allowed for stakeholder input to infuse and inform each phase of the study. The Study sponsors, DCOP, DDOT and NCPC, actively advertised for public participation at scheduled meetings and created a website where all meeting materials could be accessed.

Stakeholder Meeting 1:

Institutional landowners, ANCs, and other key stakeholder groups were invited to a meeting on January 8, 2009 to solicit feedback and supplemental information on existing conditions. The stakeholders provided further information regarding future planned development and the challenges experienced in the area. This feedback was used to further develop the existing conditions and opportunities analysis and frame issues for the first Public Meeting.

First Public Meeting:

All stakeholders and the general public had the opportunity to participate in a January 13, 2009 meeting introducing the scope of the Study and the initial impressions observations of the consultant team. After a presentation, break-out sessions were held on Urban Design and Transportation issues to solicit community input. The breakout sessions resulted in a number of observations and recommendations that helped guide the consultant team's analysis.

Stakeholder Meeting 2:

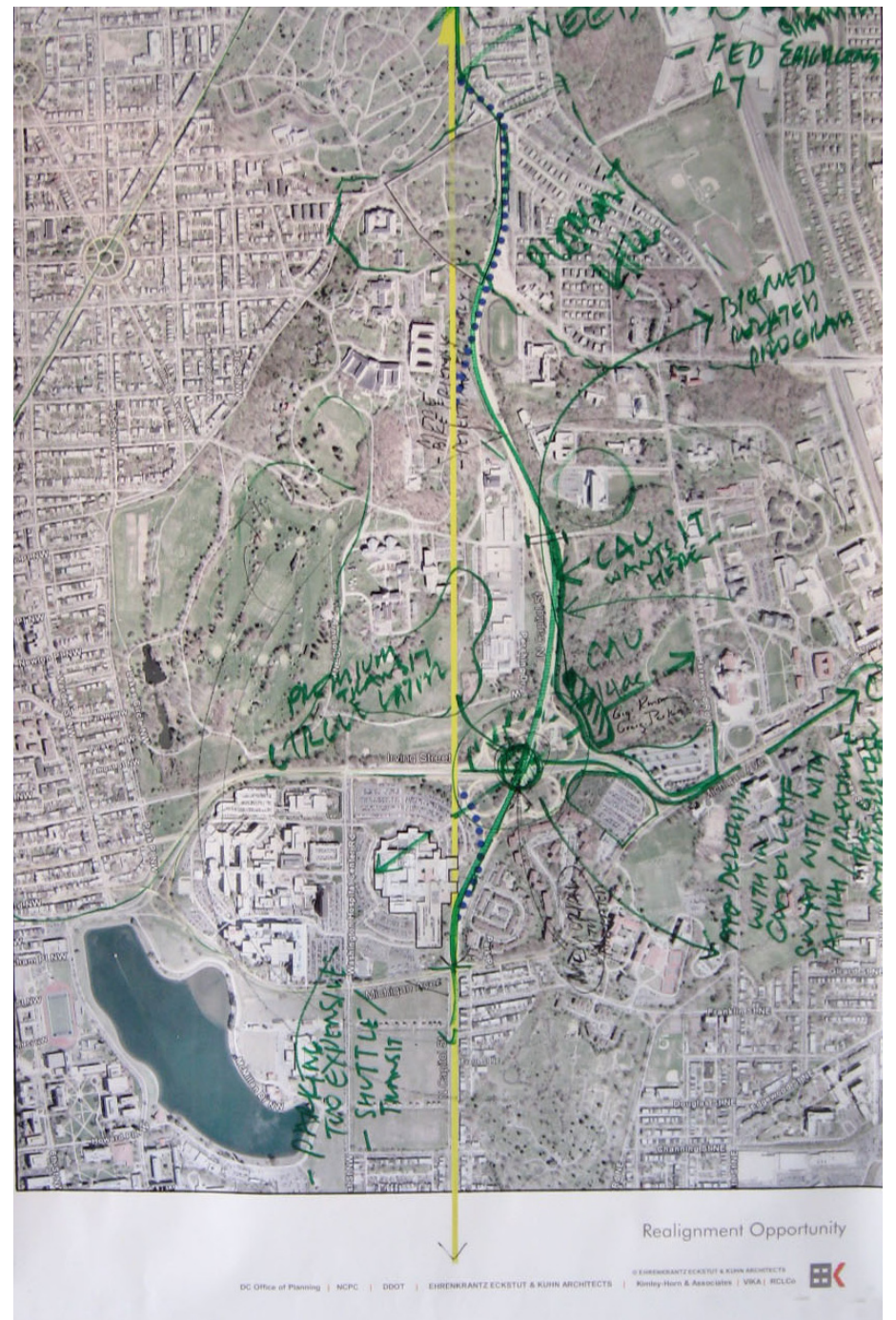
A February 9, 2009 Stakeholder Meeting provided an opportunity for stakeholders to review the findings of the Existing Conditions and Opportunities Analysis, recap the community recommendations, and introduce the initial cloverleaf replacement options and gateway improvements. Stakeholders provided feedback on the options and helped frame the format for the next public meeting.

Public Workshop:

The March 14, 2009 Public Workshop offered an interactive format for interested parties to provide direct feedback on the cloverleaf replacement options and other corridor improvement strategies. The meeting opened with a review of the work to date and an introduction of the three different cloverleaf options. After the presentation and a question & answer period, the project team staffed four workstations addressing the three options and transportation improvements. The consultant team provided graphic representations and physical models of three options for replacement of the cloverleaf intersection at North Capitol and Irving Streets. The workstations allowed participants to provide specific feedback on the options and each group reported their findings at the end of the workshop.

Final Public Meeting:

The April 29, 2009 meeting presented the draft cloverleaf replacement option designs, transportation improvements and corridor character strategies along with cost estimates for the recommendations. Comments were made expressing support for pursuing a long term solution to the cloverleaf interchange in the context of area-wide traffic and transportation improvements.



Site Aerial with Community Feedback Comments from First Public Meeting



Consultant Presentation at First Public Meeting

Schedule

- January 5, 2009: **Project Kickoff Meeting**
- January 8, 2009: **Stakeholder Meeting:** *Document Existing Conditions and Opportunities*
- January 13, 2009: **First Public Meeting:** *Document Existing Conditions and Opportunities*
- **EXISTING CONDITIONS AND OPPORTUNITIES ANALYSIS**
- February 9, 2009: **Stakeholder Meeting 2:** *Review Existing Conditions and Opportunities Analysis and Preliminary Recommendation Options*
- March 14, 2009: **Public Workshop:** *Review Existing Conditions and Opportunities Analysis and Options Workshop*
- **DEVELOP CLOVERLEAF OPTIONS, TRANSPORTATION RECOMMENDATIONS AND GATEWAY IMPROVEMENTS**
- April 29, 2009: **Final Public Meeting:** *Review Draft Cloverleaf Options, Transportation and Gateway Improvements with Costs*
- **INCORPORATE PUBLIC COMMENTS AND FINALIZE RECOMMENDATIONS WITH COST ESTIMATES AND VALUE PROPOSITION**



Cloverleaf Option Workstation at Public Workshop



Community Feedback Presentation at Public Workshop



Cloverleaf Option Models

EXISTING CONDITIONS & OPPORTUNITIES ANALYSIS

Historical Context of Alignment

Existing Conditions: Analysis & Opportunities

EXISTING CONDITIONS & OPPORTUNITIES ANALYSIS



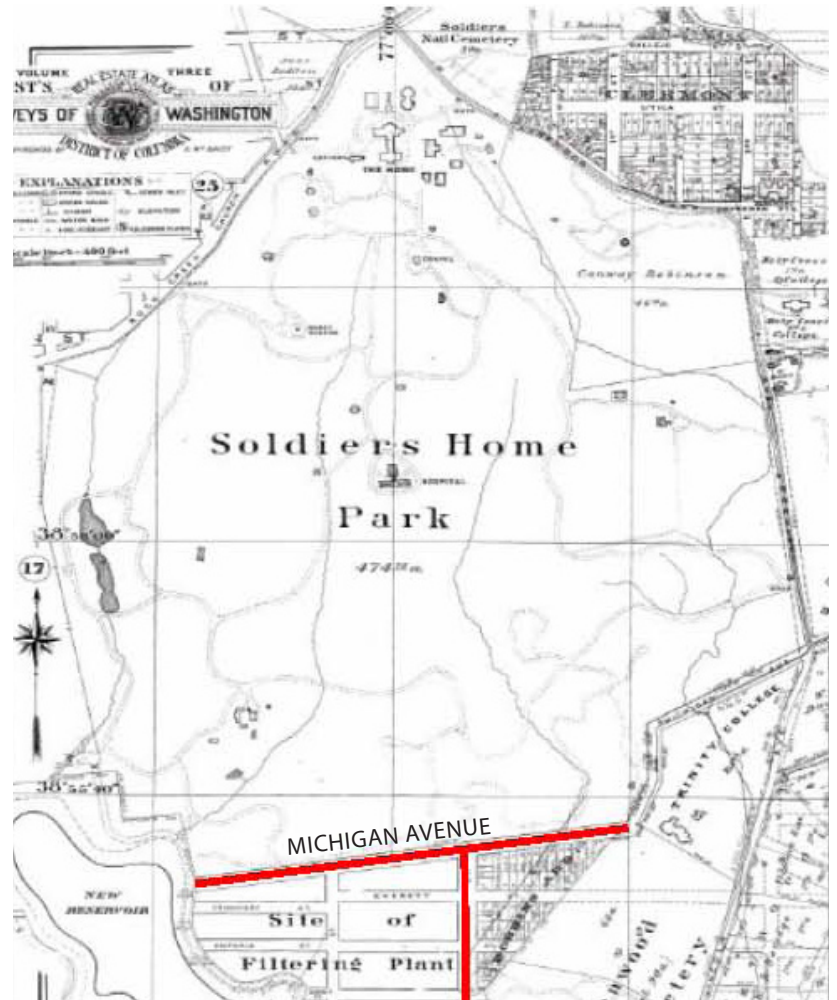
1791 L'Enfant Plan

Historical Context of Alignment

The original path of North Capitol Street, pursuant to the 1791 L'Enfant Plan, ended at Florida Avenue. As the city expanded to the north, North Capitol Street terminated at Michigan Avenue, on the southern border of the historic Riggs Estate, which became the location of the Lincoln Cottage and the U.S. Soldiers' and Airmen's Home at the time of the Civil War. The Soldiers Home (now referred to as the Armed Forces Retirement Home) spanned the land that is now on both sides of North Capitol Street and, with the adjacent Soldiers' Home National Cemetery, up to Hawaii Avenue. This configuration lasted until the mid-20th century when the Home subdivided its land to allow for the building of the VA Medical Hospital south of the new Irving Street.

During this period, coincident with the rise of the automobile as a major driver for road design both in and out of the city, North Capitol Street was extended to connect the extent portions to the south and north of the AFRH. In an era which also saw the introduction of major highways into urban areas across the country, this portion of North Capitol Street was engineered akin to a highway rather than a typical urban street, even including the cloverleaf intersection at North Capitol and Irving Streets, the only one of its kind within the District's borders. This grade separated intersection put North Capitol Street on a bridge spanning over Irving Street, allowing both streets to have a free flow of traffic. With wide lanes, free-flow traffic and a marked lack of street trees, sidewalks and other typical urban street amenities, this zone of the North Capitol is typified by traffic speeds commensurate with suburban highways, rather than the 45 mph posted speed limit.

As recent approved plans for further development on the lands surrounding North Capitol Street lead to anticipated pressure on the area's transportation network, the city has recognized that while this zone of North Capitol does a reasonable job of handling auto-traffic, it does so at the expense of pedestrians, bicyclists and transit opportunities. The configuration has also sponsored developments that are inward focused, robbing the streets of the life and activity that make a sustainable urban environment and creating a barrier between the surrounding neighborhoods. This study offers an opportunity to rethink this orientation and make the streets work for pedestrians, bicyclists and transit.



Termination of North Capitol Street at Michigan Avenue, 1903



AFRH - Lincoln Cottage and Sherman Building



AFRH - Forwood Building

Existing Conditions Analysis & Opportunities

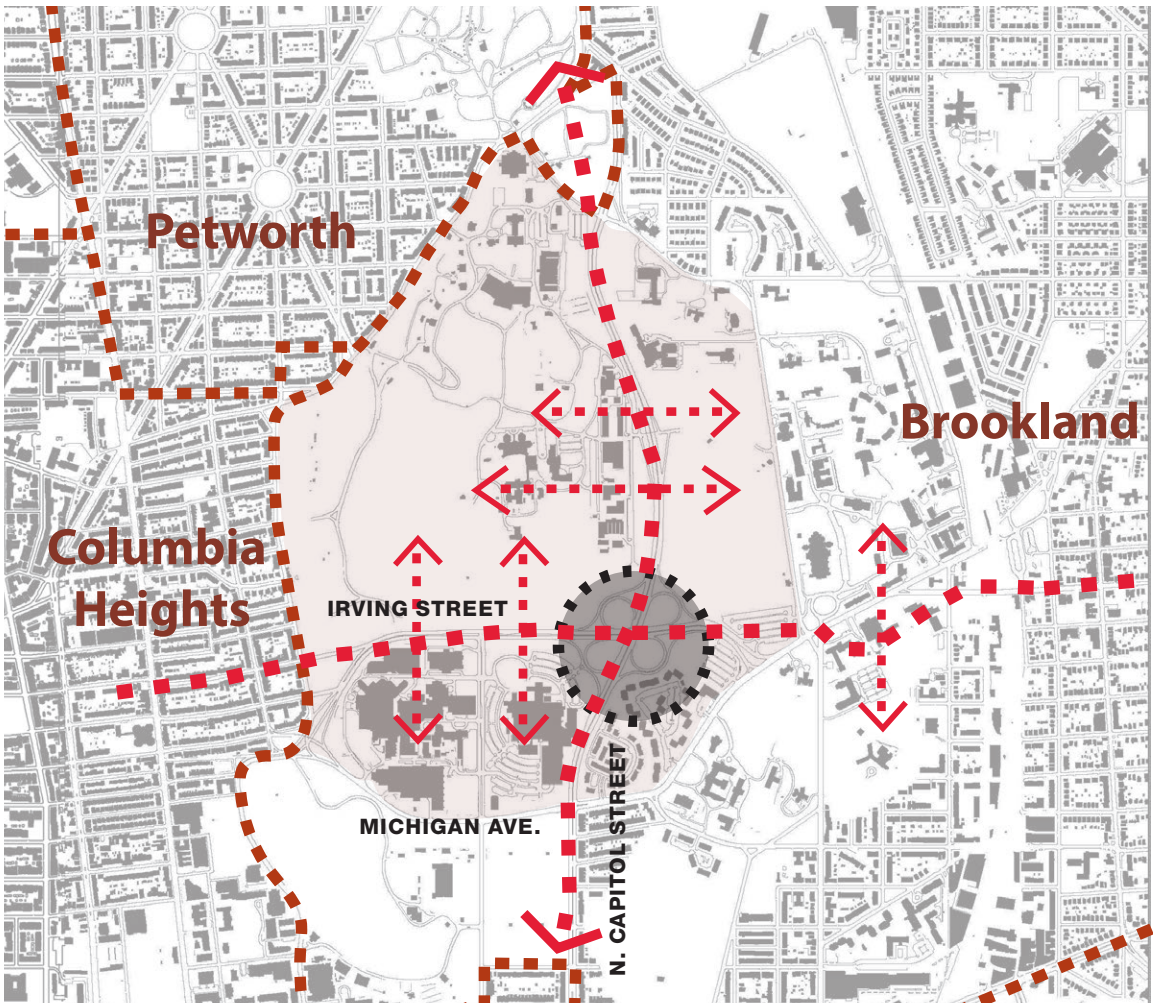
Additional details of the Existing Conditions Analysis can be found in Appendix A

FIGURE/GROUND

The existing urban fabric of the North Capitol Street corridor suffers from several problems:

- Suburban-style low density development
- Inward-focused development that creates few public amenities
- No urban street grid and few cross streets keep surrounding neighborhoods separated from one another

These issues can be addressed by creating more density within the study area and establishing new north-south and east-west connections, as well as improving those that currently exist. In this way, North Capitol Street can be re-envisioned as a connector rather than a barrier, and new development can be oriented toward streets and the public realm.



LEGEND:

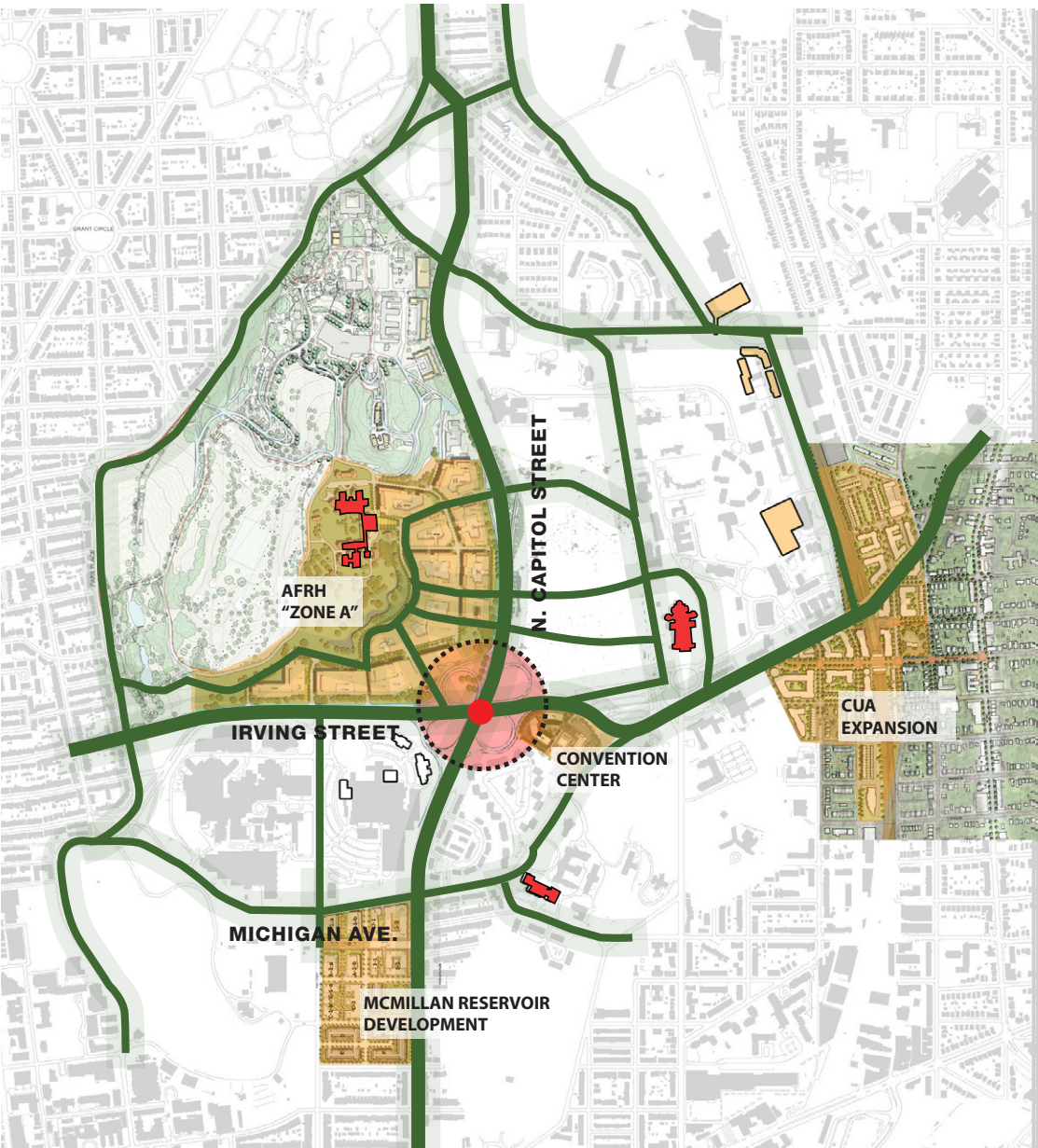
- Neighborhood Boundaries
- Potential Connectivity
- Extent of Old Riggs Estate

PLANNED DEVELOPMENT

Although 6 million SF of development is planned and/or approved for the North Capitol Street corridor area, the new development still poses several problems:

- New development continues pattern of inward focus rather than facing on existing street network
- Few connectivity improvements are planned, further isolating new developments from one another and from existing neighborhoods

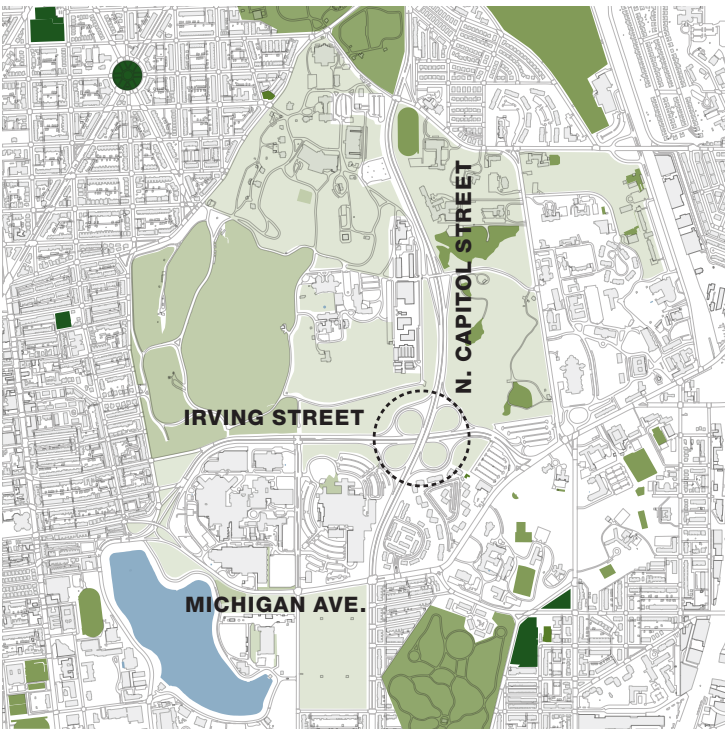
The current economic climate provides an opportunity to revisit these decisions and effect the urban framework around which these developments will occur. Creation of a new development “hub” at the center of the proposed projects would improve access and connectivity among them. The “hub” may include mixed-use development, publicly accessible open space, and/or transit stops. Additionally, creative solutions for transit connections and alternative travel routes should be encouraged.



LEGEND:

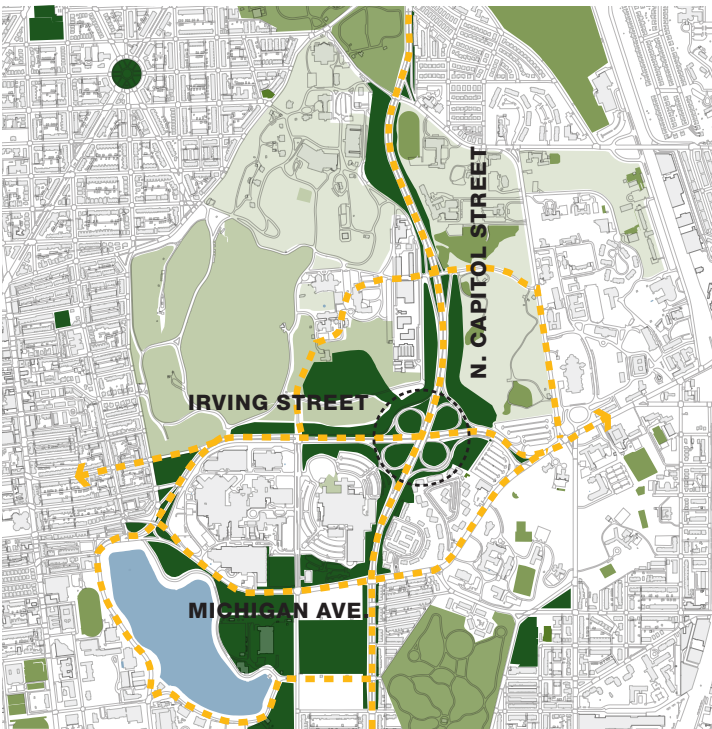
- New and/or Improved Connections
- Planned or Approved Developments
- New Development Center

OPEN SPACE



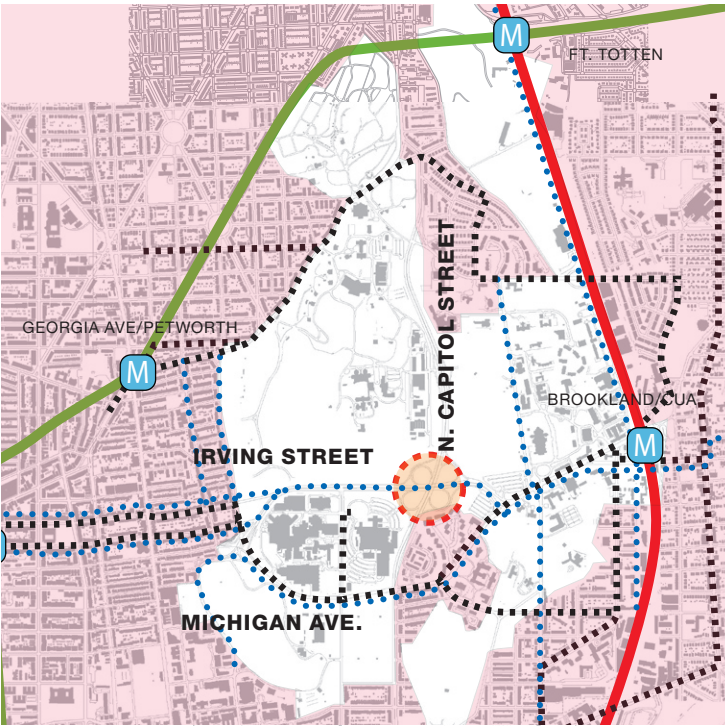
Although there is a significant amount of open space in the North Capitol Street corridor area, current conditions do not take advantage of its full potential:

- Very little of the open space is publicly accessible
- There is no network of movement or connectivity among the open space area
- The existing open space areas are often unplanned, “leftover” spaces



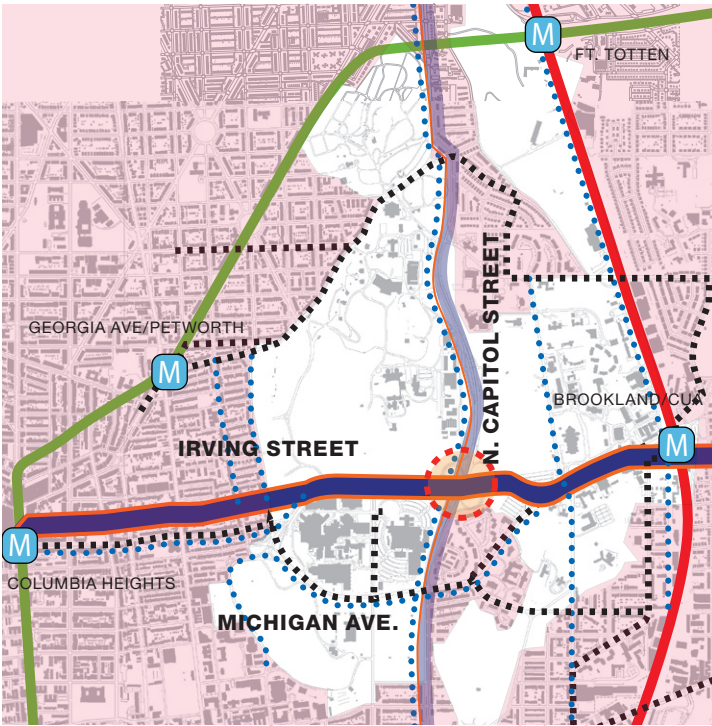
Any new plan for the area should focus on maximizing the potential of that underutilized land, returning it to the community in the form of a new park with public amenities. Furthermore, by introducing streetscape improvements on North Capitol Street north and south of Irving Street, it is possible to create a green “spine” that will link the open spaces together, and integrate them into the proposed Capital Spaces Plan (see Appendix A). New and improved pedestrian and bicycle routes to increase access to existing and enhanced green spaces is also encouraged.

TRANSPORTATION GAPS (TRANSIT, BICYCLE, PEDESTRIAN)



The North Capitol Street corridor area is currently served by an inadequate transportation network that further isolates the study area and adjacent neighborhoods from one another:

- Discontinuous and poor quality sidewalk do not serve pedestrians
- Few dedicated bicylce routes
- North Capitol Street serves only as an auto corridor with no north south transit option
- Current bus routes do not meet existing demand; necessitating private shuttles to serve institutional uses



Improvements to the study area should enhance the existing networks and provide more transportation options by filling these identified gaps. For example: connecting sidewalks, allowing for dedicated bike lanes, creating a hiker/biker trail along North Capitol Street. A premium transit service could be introduced between the Columbia Heights and Brookland Metro stations along Irving Street, linking CUA, the medical center, and the new public amenities at the cloverleaf site. North-South transit options along North Capitol Street should also be explored. In addition, development projects which facilitate multimodal travel should be encouraged.

TRAFFIC VOLUME: CURRENT & PROJECTED

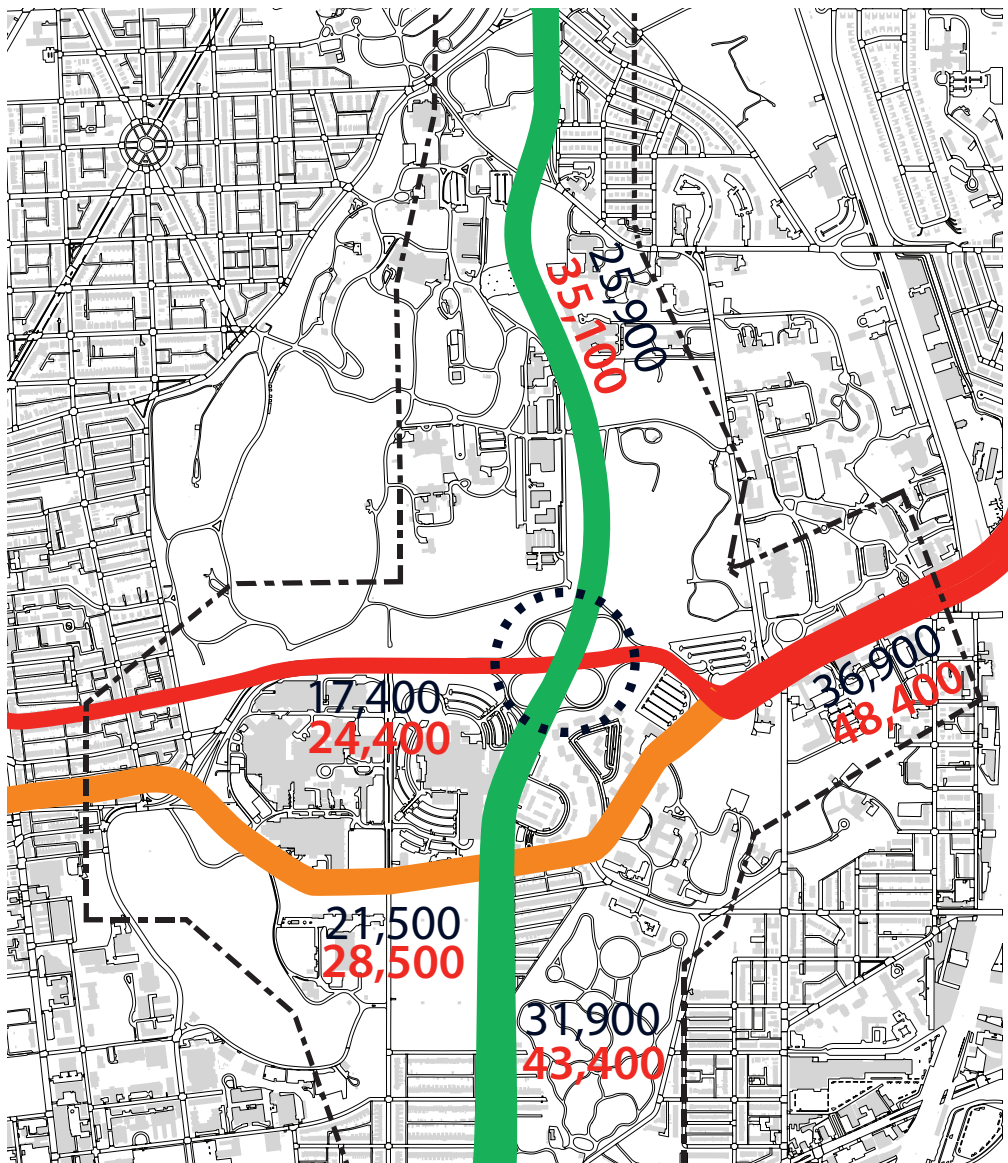
The cloverleaf interchange overcompensates in capacity when compared to the surrounding intersections and actual and projected need:

- Current traffic levels are similar to other major roads in city that do not rely on highway configuration
- Much of the peak hour traffic volume is caused by commuters who are not district residents
- No street grid exists to disperse motorists from the main roads (N. Capitol, Irving, & Michigan)

Additional cross-street connections will help improve access and connectivity while also reducing the number of vehicles on the main roads. Recharacterizing North Capitol and Irving Streets as multimodal streets (transit, auto and pedestrian/bicyclist) encourages mass transit and alternative transportation, also reducing the number of vehicles on the road, particularly pass-through traffic.

LEGEND:

- Area of Traffic Study
- 17,400 Existing Traffic Volume
- 28,500 Projected Traffic Volume
- North Capitol Street
- Irving Street
- Michigan Avenue



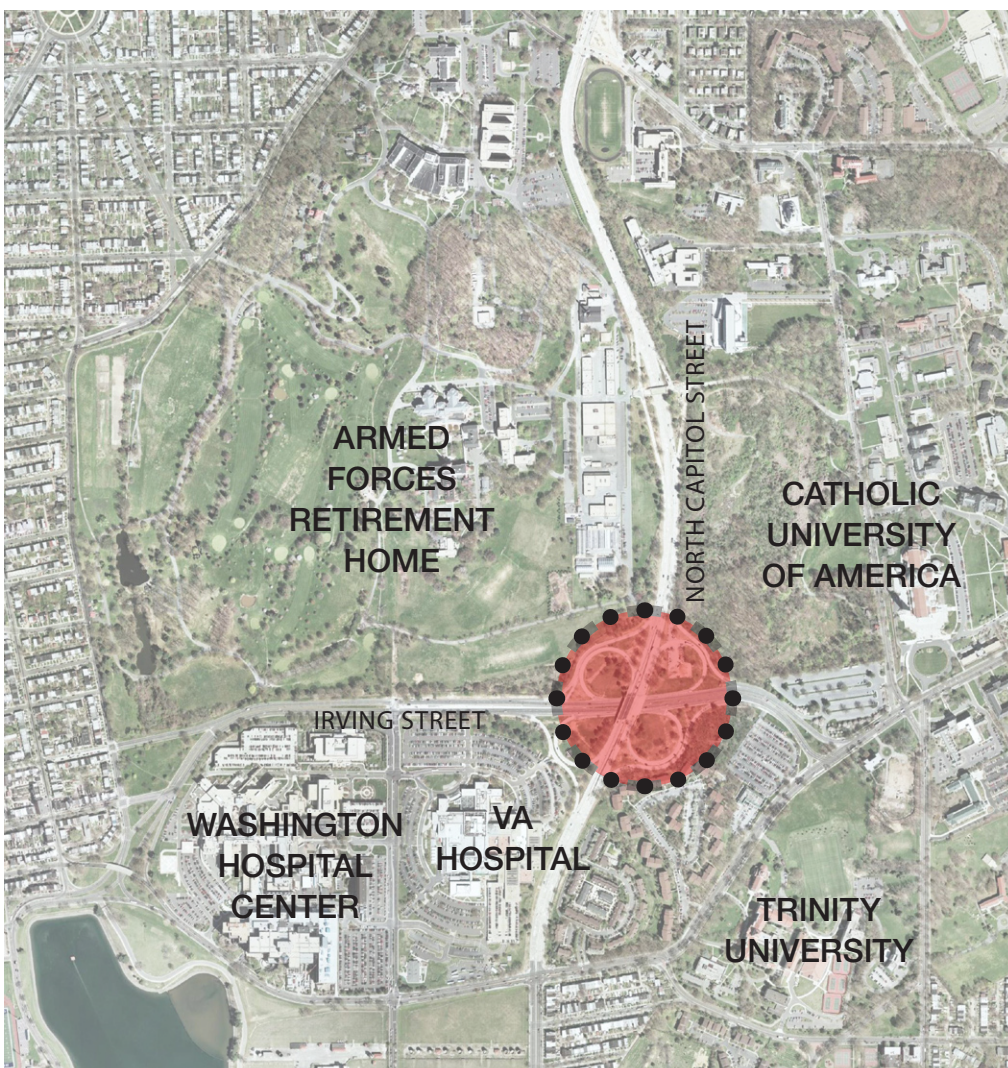
NOTE: Projected traffic volumes based on significant completion of the 6 million SF of planned and/or approved development in the study area.

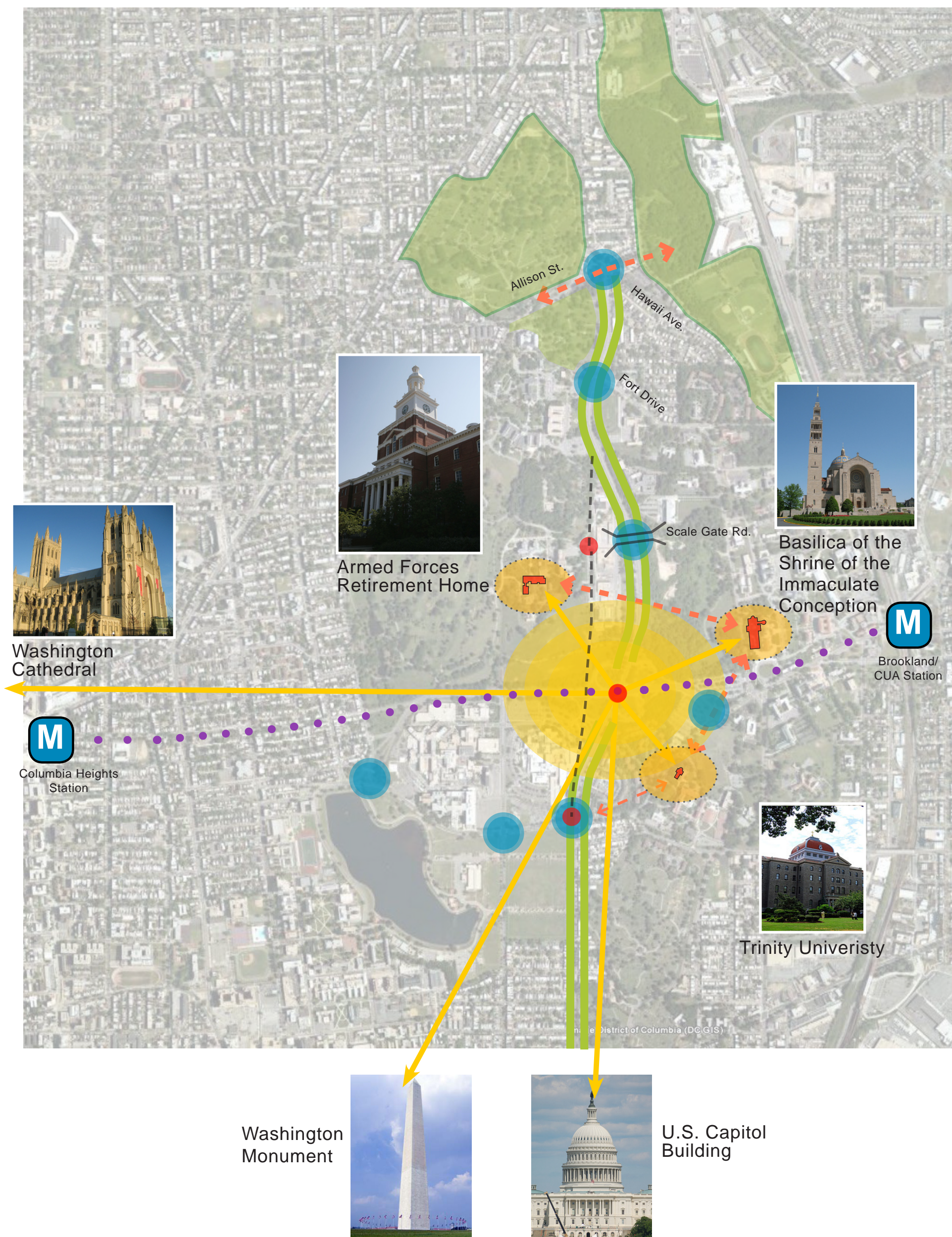
VIEWS & CONNECTIONS

The study area occupies a prime location within the District, however the current uses and existing configuration of the area do little to capitalize on the proximity of major DC resources and landmarks:

- Cloverleaf sits at the center of important city resources such as the Armed Forces Retirement Home, Washington Hospital Center, Catholic and Trinity Universities
- Area has surprising views to landmarks such as the Washington Monument, the Basilica of the National Shrine, the National Cathedral, and the U.S. Capitol Building, as well as prominent, landmark buildings on the Armed Forces Retirement Home and the two university campuses

Development in the area must recognize the unique capacity that this location has to become a signature place within the city. This new place has the opportunity to become a center of connectivity between resources and accentuate the spectacular views of the surrounding landmarks.





4

THE NORTH CAPITOL GATEWAY CORRIDOR IMPROVEMENT STRATEGIES

Realignment of North Capitol

At-Grade Intersection Analysis

Analysis of Potential Memorial Sites

Creating the North Capitol Gateway Corridor

Corridor Upgrades - Irving Street to Hawaii Avenue

Corridor Upgrades - Irving Street to Channing Street

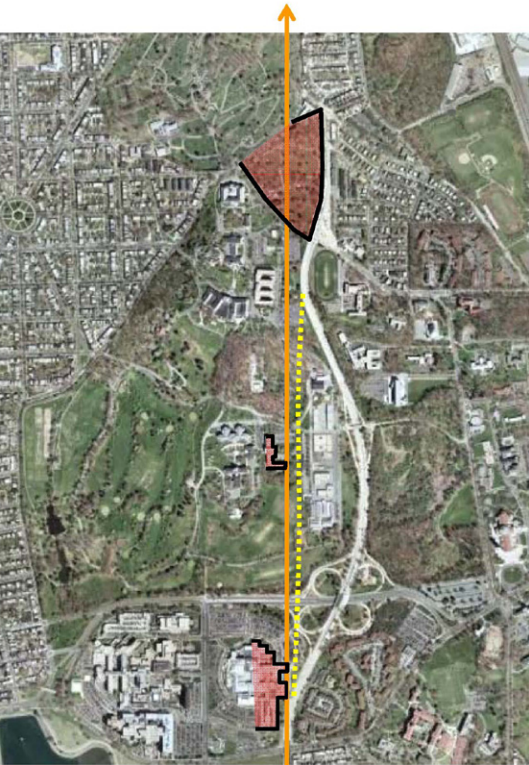
Corridor Upgrades - Cloverleaf Interchange at Irving Street
and North Capitol Street

Option 1: Memorial in the Park

Option 2: Four Corners

Option 3: Center of Centers

NORTH CAPITOL GATEWAY IMPROVEMENT STRATEGIES



Realignment Conceptual Diagram

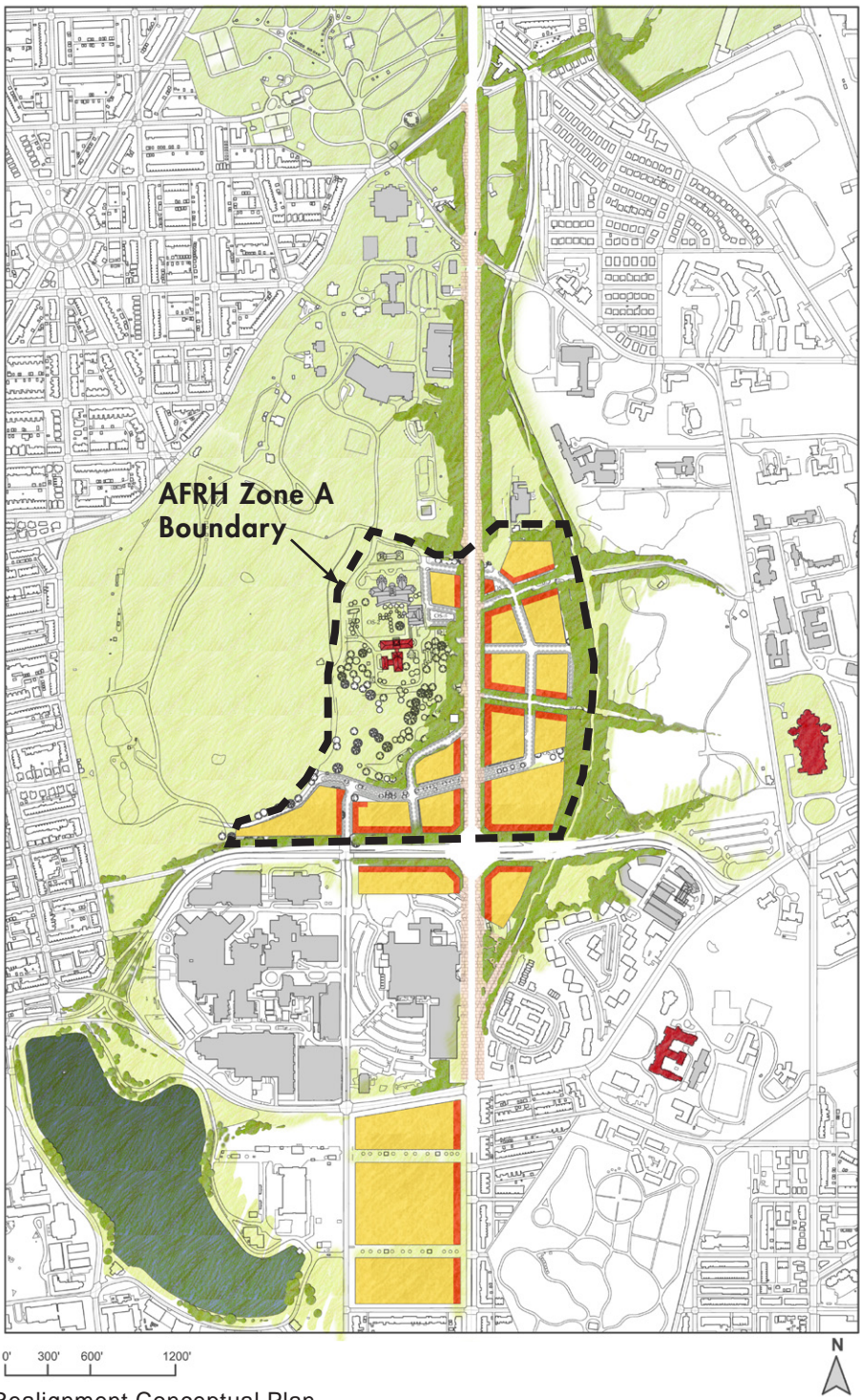
Realignment of North Capitol

An initial task of the study was to test the feasibility of realigning North Capitol from its present course to join the portions south of Michigan Avenue and North of Hawaii Avenue in a direct line. Although this portion of North Capitol Street is beyond the L'Enfant Plan boundary, expanding the axial reach of the street in its alignment with the U.S. Capitol Building could provide a response to enhancing the street's relationship to the monumental core of the city. The implementation of such realignment, however, poses significant practical and financial challenges that outweigh the apparent benefit of the realignment.

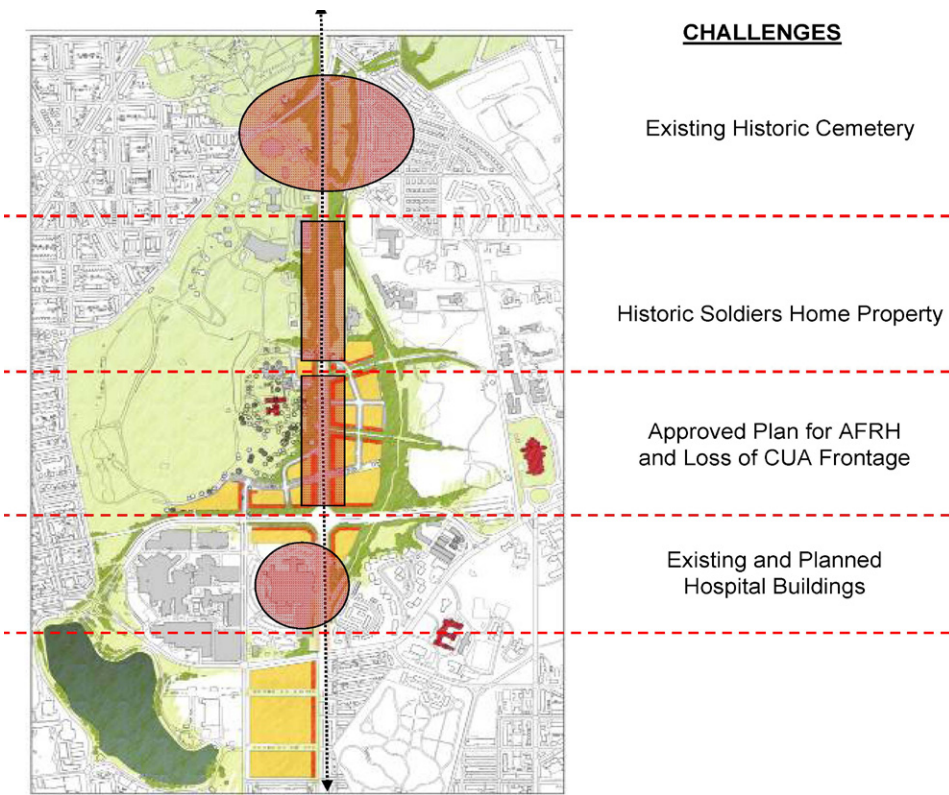
The benefits realizable from an axial realignment rest mainly in the integration of the proposed development on Zone A of the Armed Forces Retirement Home into the more typical city grid. The proposed AFRH plan inwardly focuses developments on new streets. Under the realignment, Zone A would now have accessible frontage on one of the major streets of the city, and would open greater possibilities of establishing a grid system to the east, towards Catholic University of America. Under this scenario, the existing North Capitol Street right-of-way would be dedicated as a park that would maintain a system of greenery with an associated hiker/biker trail through the zone.

From a practical standpoint, the presence of historic buildings and the intrusion of the realigned right-of-way through the retained portions of the Armed Forces Retirement Home and adjacent Soldiers' Home National Cemetery provide obstacles that are hard to quantify. It seems very unlikely, however, that such historic assets would be allowed to be disturbed. Additionally, from a more easily quantifiable standpoint, the demolition of buildings on the VA Medical Hospital campus and a significant redesign of the proposed Zone A development of the Armed Forces Retirement Home would add significant costs to the base construction costs under this scenario.

The recommendation of this report is that, for both financial and practical considerations, the axial realignment of North Capitol Street does not provide a feasible option for the city to pursue.



Realignment Conceptual Plan



Realignment Challenges Diagram

Cost Estimate: \$150+/- Million (2009 Dollars)
(See Appendix B for details)

At-Grade Intersection Analysis



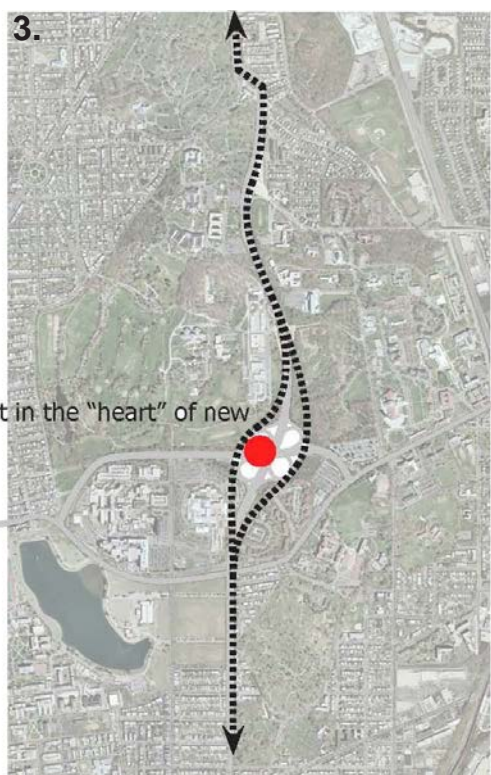
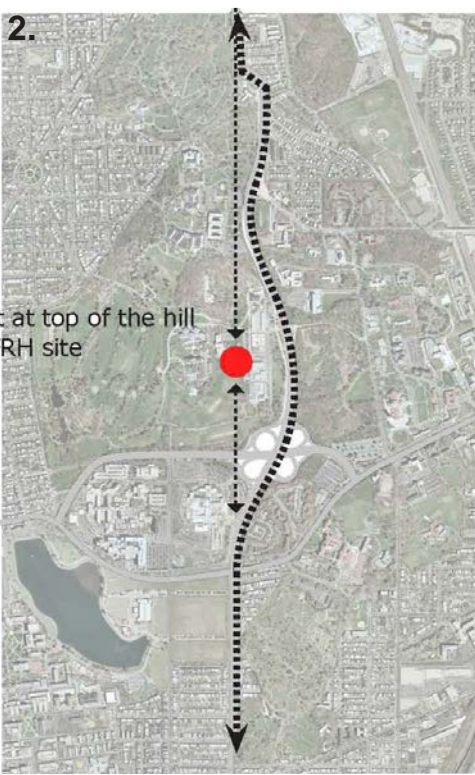
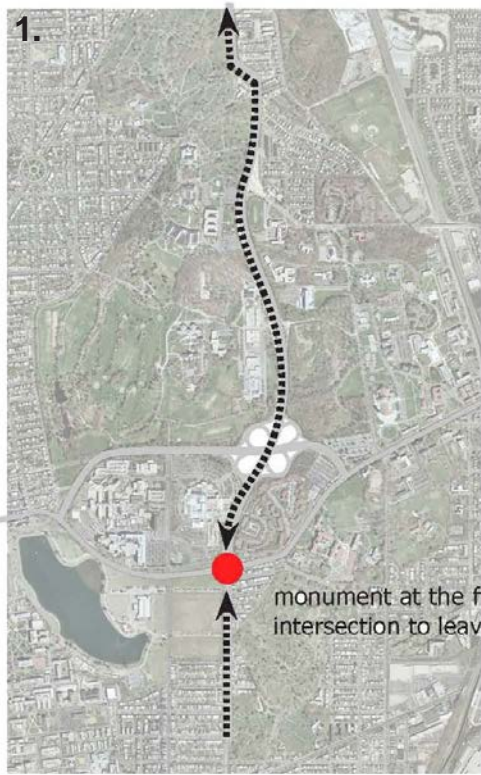
Diagram of At-Grade Solution for North Capitol & Irving Streets

Separate from the realignment issues, this study explores the basic configuration of the intersection of North Capitol and Irving Streets. The traffic levels on North Capitol and Irving match those found on many of the other major streets and avenues of the city, many of which either rely solely on at-grade intersections or a combination of at-grade and grade-separated intersections. The option of replacing the cloverleaf with a more standard at-grade intersection was studied. However, due to the lack of street grid in this area, the traffic movements between the two roads pose particular challenges to reconfiguring the intersection in this way:

- a large number of interchanges occur between Irving and North Capitol
- an at-grade solution would require multiple dedicated left-turn lanes in all directions
- the right-of-way would have to expand from six lanes to 9 lanes (+/- 120' curb-to-curb) on each street to achieve even minimal functionality.

Even with refuge islands, the resulting road layout would create long crossings, and an environment generally unfriendly to pedestrians and bicyclists, detracting from the overall goal of creating a multimodal and pedestrian-friendly environment. Thus, it is this report's recommendation that only grade-separated options be further studied for this intersection.

Analysis of Memorials and Museums Master Plan Sites



Memorial Site Options Diagrams

The opportunity to review the optimal placement for a new memorial site in this area of the city provided added momentum for rethinking the cloverleaf intersection. In NCPC's Memorials and Museums Master Plan, the Commission designated two potential memorial sites for this area. The first site identified sits in the midst of the McMillan Reservoir site, currently slated for future development. The memorial site would be set off of North Capitol in the interior of the development. The second identified site sits deep within the Armed Forces Retirement Home, adjacent to the area planned for future development. Feedback from the community meetings reflected a general consensus that both of these sites were too "private" and would thus feel more of a part of the proposed developments than an amenity available for enjoyment by the general population of the city and visitors.

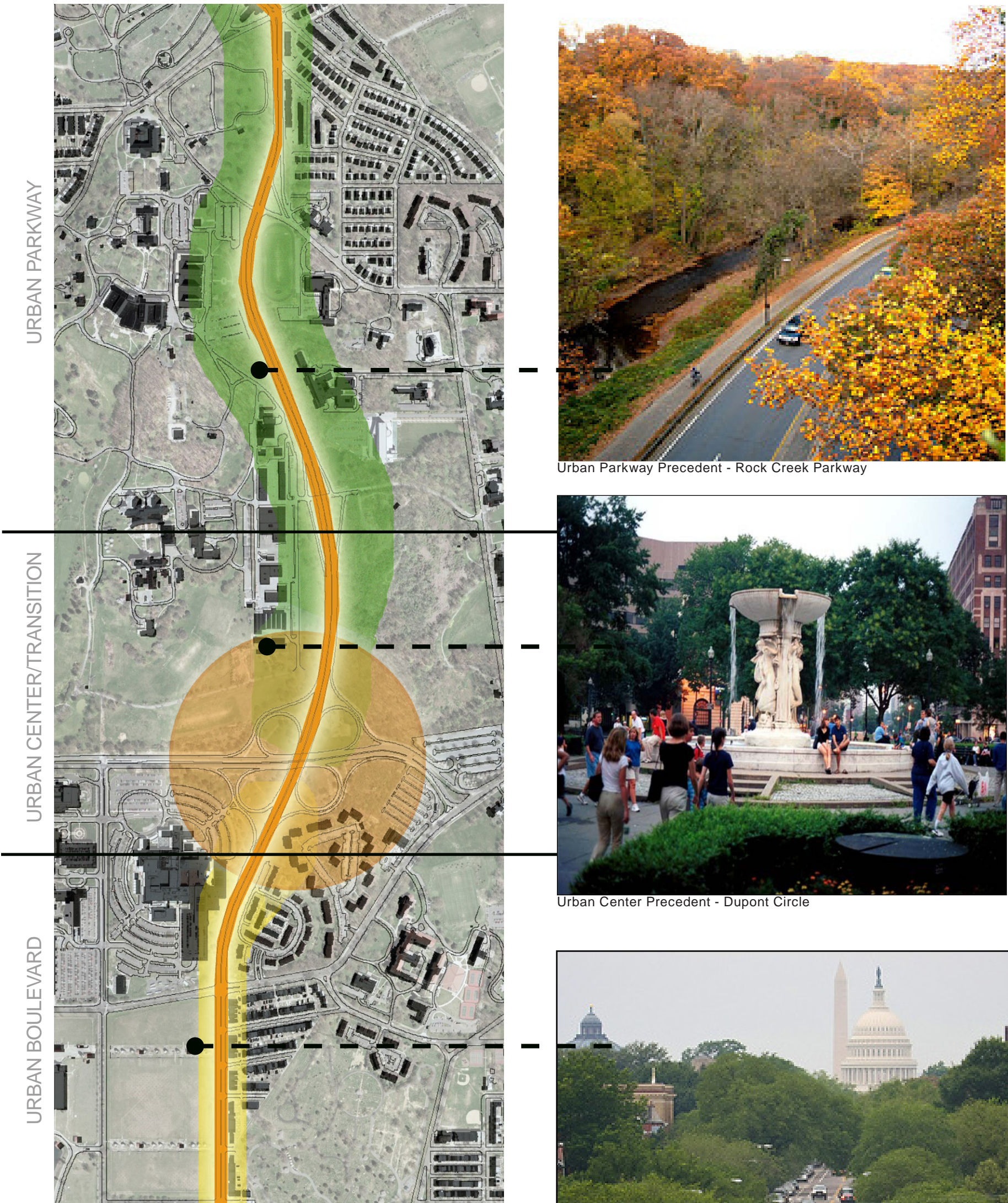
Based on this feedback, the study identified three new potential locations:

1. Placing a memorial at the intersection of North Capitol and Michigan, marking the transition into the "old city" and the point where the dome of the U.S. Capitol building comes

into view. This option provides significant challenges due to the need to reconfigure the intersection to contain a memorial site and the impact on existing development around the intersection that would be necessary to accommodate the reconfiguration.

2. Placing the memorial amidst the new AFRH Zone A development. This option would increase the visibility and access to the memorial, but would still result in too "private" a location by community standards unless a realignment of North Capitol occurred. As discussed above, such realignment is not recommended.
3. Placing the memorial in a new park created as part of the redevelopment of the cloverleaf intersection at North Capitol and Irving Streets into a more urban, pedestrian and bicycle friendly, and transit supportive environment. This option maximizes the potential of the reconfigured North Capitol Street while also leveraging the substantial investment necessary to create both a memorial site and an improved North Capitol Corridor.

Creating the North Capitol Gateway Corridor

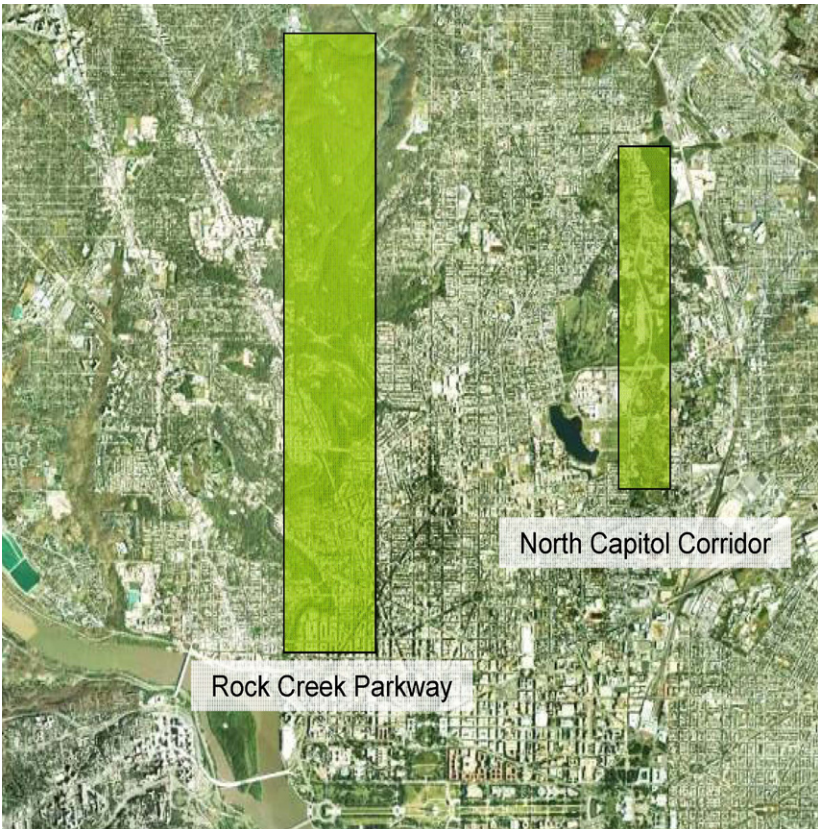


If the realignment of North Capitol poses too many obstacles to remain as a practical alternative, the question then shifts to how to best treat the North Capitol Corridor to reach the Study’s goals. The Existing Conditions and Opportunities Analysis identified three strategies that could address the varying contextual conditions that exist along the North Capitol Corridor. In the zone to the north of the cloverleaf interchange, North Capitol Street lends itself to being treated as a green “Urban Parkway.” To the south of the cloverleaf, where North Capitol rejoins its axial alignment with the U.S. Capitol Building, the street has the basic structure of an “Urban Boulevard” and this character can be enhanced through thoughtful public realm improvements. Finally, the cloverleaf zone itself, including North Capitol Street immediately to the north and south of Irving, will need to act as a transition between these two conditions.

This offers a unique opportunity to create a great new “Urban Center” for the city that more elegantly handles the various traffic movements through the intersection while creating more accessible open space, the potential for beneficial development, and a pedestrian and transit-friendly environment.



Parkway Bridge Image



"Green Corridor" Diagram - Comparing Rock Creek Parkway as an entry to downtown to the potential "Urban Parkway" treatment of North Capitol Street to create another green entry to the city



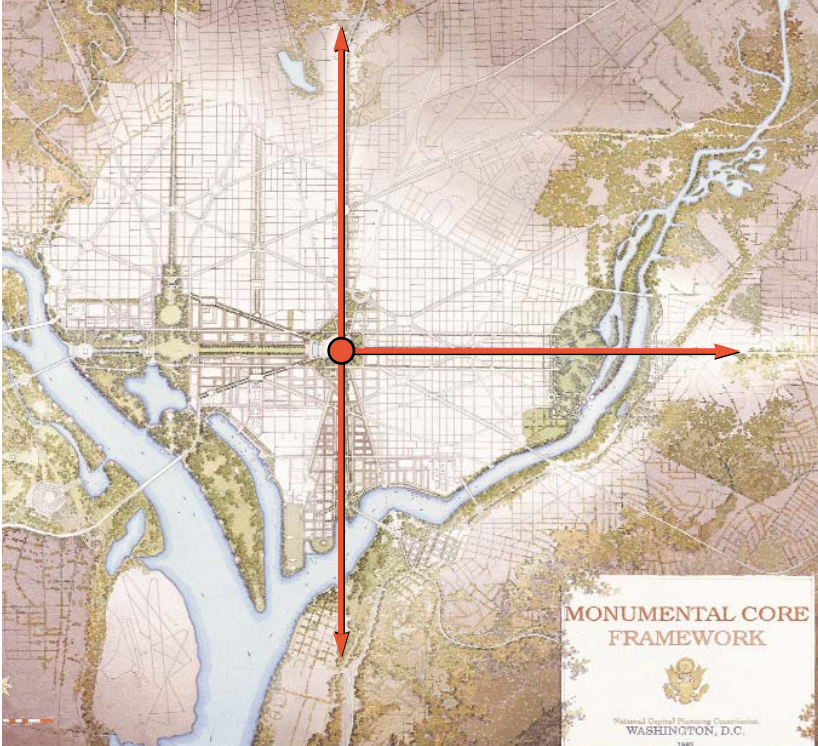
Scale Overlay of Cloverleaf on Dupont Circle - Traffic can be handled in a more compact and pedestrian-friendly environment that offers opportunities for community open space and beneficial development



Scale Overlay of Cloverleaf on P Street Bridge and Rock Creek Parkway- The ratio of open space to development area can vary while still offering bicycle and pedestrian access as well as a feeling of connectedness between surrounding communities



Urban Boulevard Retail Streetscape Precedent - Bethesda, MD



NCPC Legacy Plan - Refocusing the Monumental City on the U.S. Capitol Building supports an approach that treats the the three "Capitol" streets as symbolic gateways to the city's core

Corridor Upgrades - Irving Street to Hawaii Avenue

For the area north of the cloverleaf, this study recommends that the best approach is to respect the natural topography of the region, existing tree cover and open space adjacent to the road by transforming the street into a grand parkway, similar to that found in Rock Creek. While existing travel lanes would be maintained, streetscape improvements, reforestation, and LID development would improve the visual environment and aid in reducing vehicular speed through this zone to a safe and efficient level, resulting in a multi-use street offering a stately entrance to the city.

These improvements would also add to the safety and functionality of the corridor. The street presently reads like a suburban highway and suffers from traffic that travels at highway speeds. This situation leads to unsafe driving that discourages pedestrian and bicycle crossings and interferes with the potential for North Capitol to serve as a transit corridor. Adding transit/HOV dedicated lanes opens the opportunity for a north-south connector transit service that is presently lacking along North Capitol Street as well as providing an incentive for commuters to carpool. Additionally, a new hiker-biker trail will offer non-auto transportation options along the corridor that ties into existing and planned trail systems.

The parkway improvements also add to the overall health and sustainability of the region. Low Impact Development (LID) featuring reforestation with native species, bio-swales and other on-site stormwater management techniques, and improved transit and non-motorized transportation options all complement the goal of creating a green corridor into the city and create environments welcoming to local wildlife and flora.

Proposed Improvements

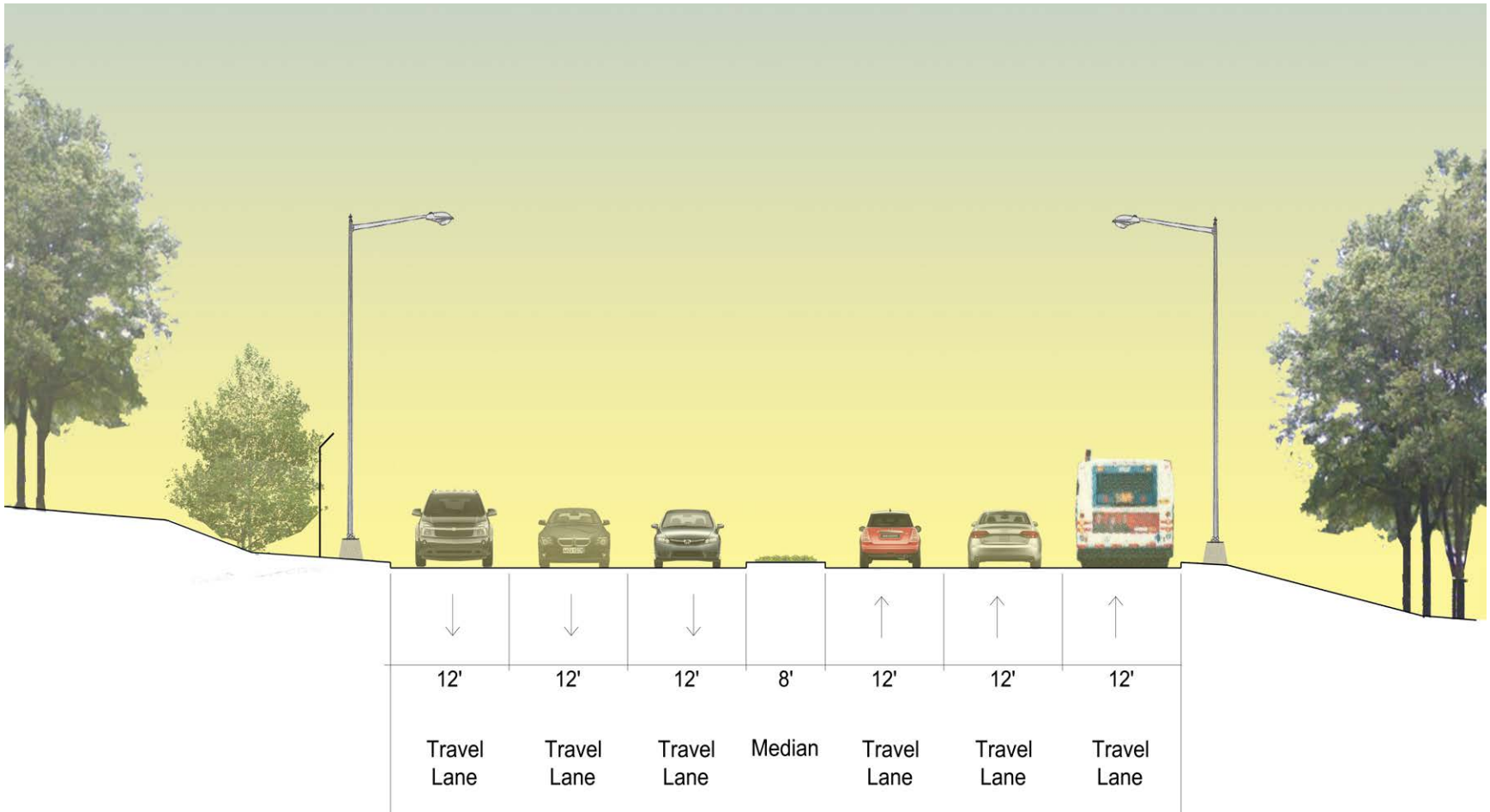
- Replace existing roadside Cobrahead lights with Decorative Teardrop lights
- Add hiker/biker trail and planting zone (as buffer between trail and road) to west side of North Capitol
- Perform targeted reforestation and creation of understory vegetation
- Introduce stormwater management through bioswales and wetland environments at appropriate locations
- Implement bioswales, xeriscape vegetation and street trees to median
- Provide protective decorative low stone walls along road edges
- As practical, repurpose driving lane as transit and/or HOV only
- Explore possibility of reducing lane widths within emergency route designation to slow traffic, accommodate pedestrian/bicycle amenities and green features

Cost Estimate: \$13.3+/- Million (2009 Dollars)

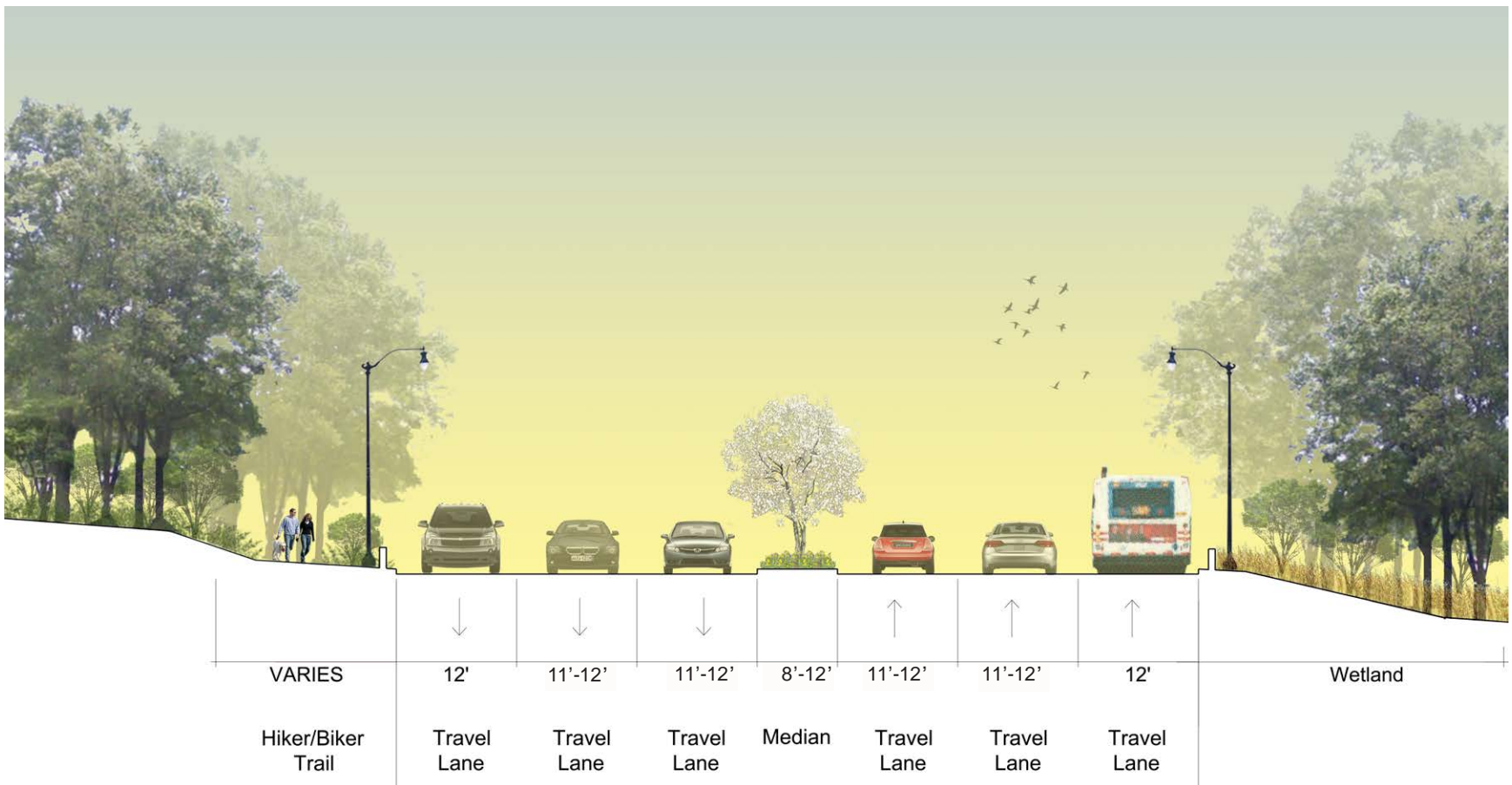
(See Appendix B for details)



Parkway Boundary Diagram



Existing North Capitol Street Section A-A Looking North - Between Irving Street and Hawaii Avenue



Proposed North Capitol Parkway Improvements Section A-A Looking North - Between Irving Street and Hawaii Avenue

Corridor Upgrades - Irving Street to Hawaii Avenue

Before & After



Existing North Capitol Street Photo Looking North at Section A-A - Between Irving Street and Hawaii Avenue



Proposed North Capitol Parkway Improvements Perspective Looking North at Section A-A - Between Irving Street and Hawaii Avenue



Corridor Upgrades - Irving Street to Channing Street

For the stretch of the corridor south of the cloverleaf the character of North Capitol lends itself towards becoming a great boulevard worthy of its role as a symbolic entry to the monumental core of the historic city. As the street transitions to its axial alignment with the U.S. Capitol Building, improved streetscape improvements will allow North Capitol to take its place with such great streets as Connecticut Avenue and East Capitol Street as a gateway to the city.

The region south of the cloverleaf is typified by a poor streetscape conditions and an unwelcoming pedestrian environment: discontinuous sidewalks, little or no street furnishings, sparse and inconsistent street trees, a quarter-mile of chain-link fence at the McMillan Reservoir filtration plant, and overscaled, highway-style “cobrahead” light fixtures that leave sidewalks dimly lit. These conditions detract from North Capitol Street’s role as a symbolic entry to the historic monumental core and degrades the pedestrian experience. By addressing street tree coverage, median treatment, outdated and unattractive lighting, and sidewalk and crosswalk paving, North Capitol Street can be upgraded in the manner that has already been achieved or planned for the gateway approaches along East and South Capitol Streets. The poor streetscape condition discourages pedestrian and bicycle activity while encouraging high vehicle speeds. By creating a more active and safe environment for pedestrians and bicyclists, transportation options will be better balanced and mass transit is more likely to be used.

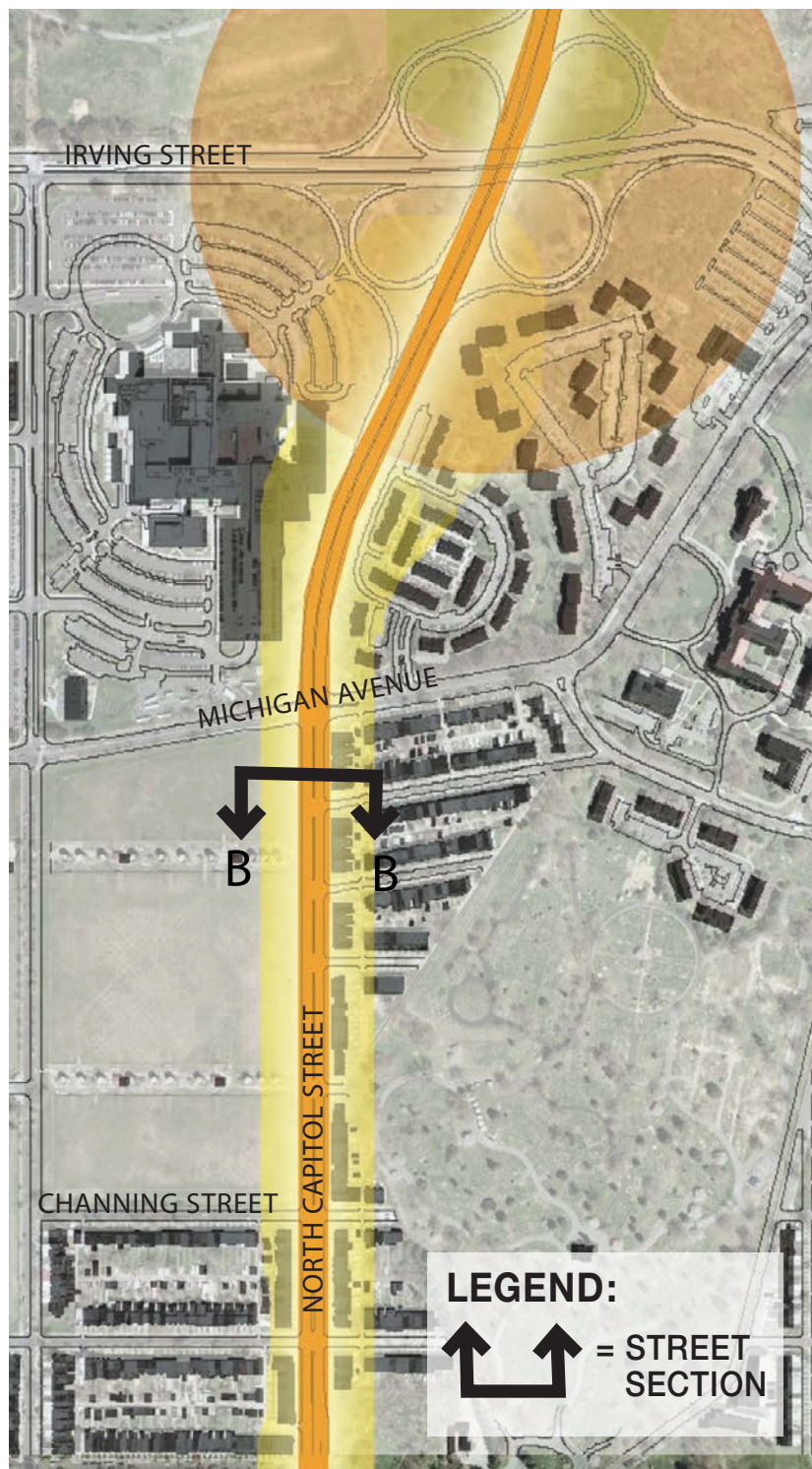
The application of sustainable landscaping techniques such as LID street tree boxes, pervious paving, street median bio-swales, and increased tree coverage will decrease the burden on the city’s water and sewer systems.

Proposed Improvements

- Replace existing roadside Cobrahead lights with Decorative Teardrop lights
- Introduce Washington Upright 14/16/18 lights and city standard furnishings at regular interval in furnishing area
- Add Washington Upright Twin-20 lights to median strip at regular interval
- Supplement median with porous paving, bioswales and xeriscape vegetation elements
- Improve sidewalk paving to brick standard similar to East Capitol Street
- Enhance crosswalks with decorative paving or thermofoil application as appropriate
- Implement comprehensive street tree and transit shelter improvement campaign
- Encourage sidewalk café zones in new commercial/ mixed use development

Cost Estimate: \$2.1+/- Million (2009 Dollars)

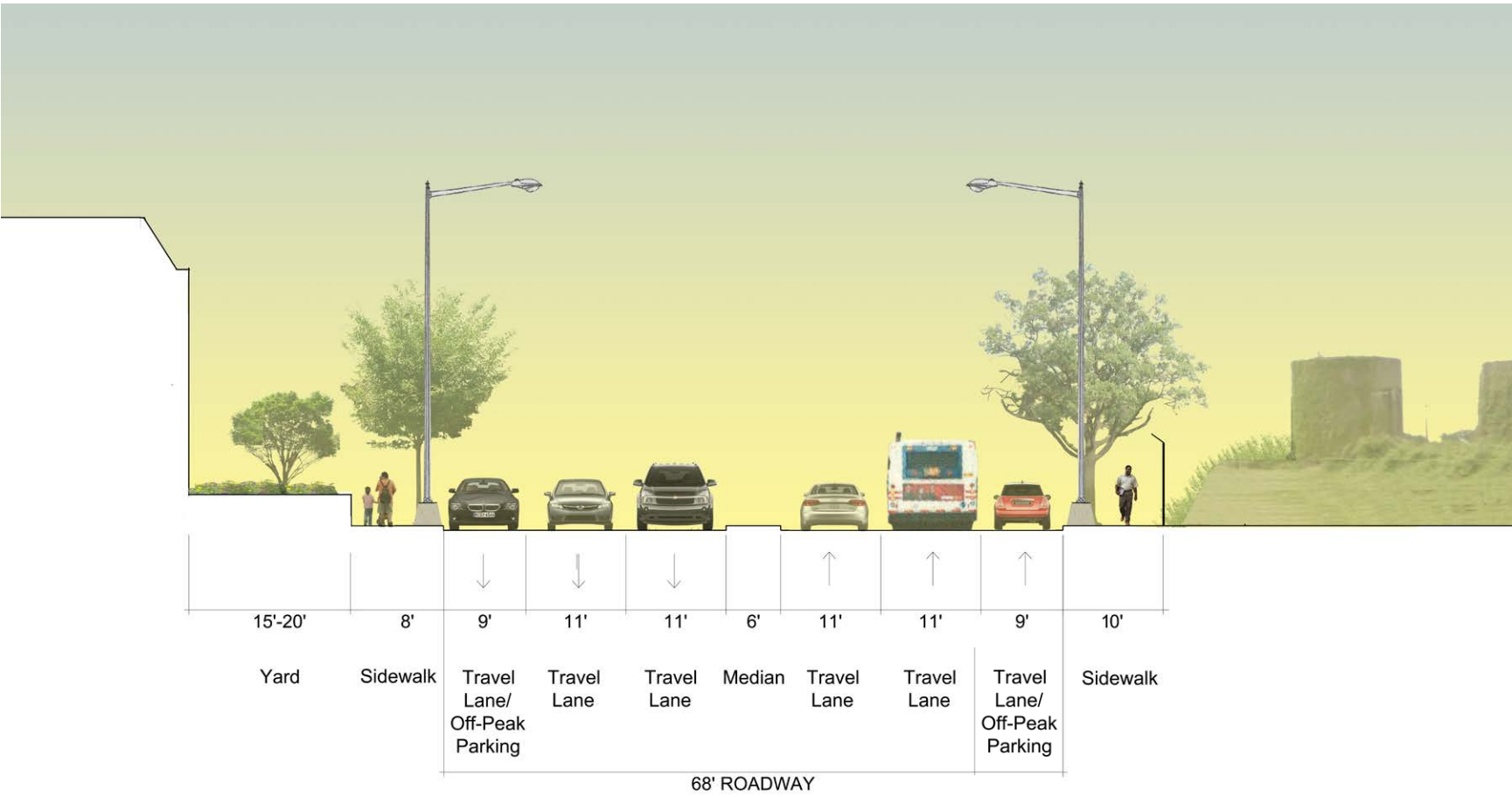
(See Appendix B for details; note that the cost estimate is for the approximately 945’ from the Michigan Avenue north to the south border of the cloverleaf interchange - This study recommends that the Urban Boulevard the urban boulevard treatment be extended the entire length of North Capitol Street to the south, and incremental linear costs can be found as part of the analysis in Appendix B.)



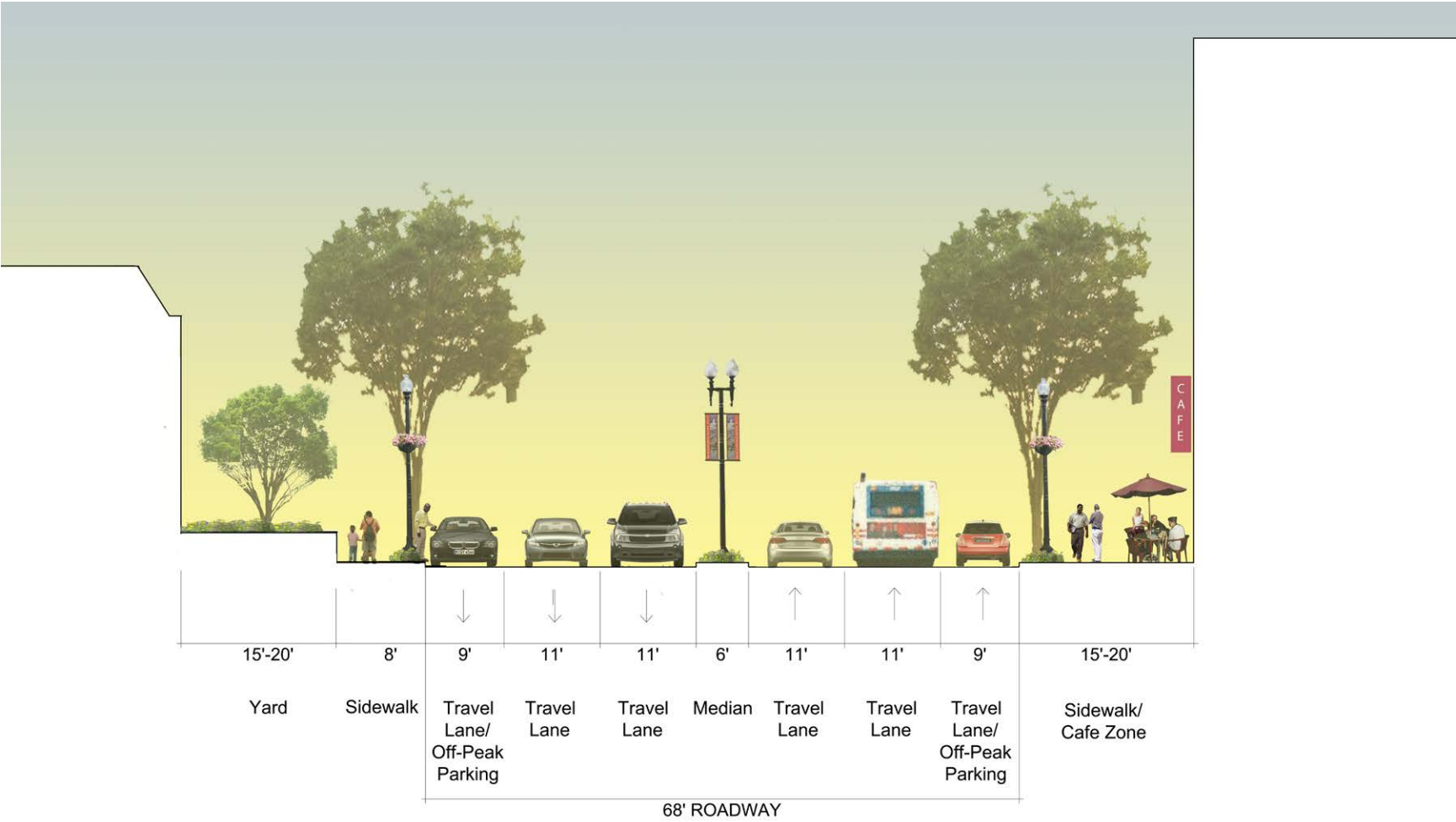
Boulevard Boundary Diagram



Monumental View of U.S. Capitol Building from East Capitol Street



Existing North Capitol Street Section B-B Looking South - Between Irving Street and Channing Street



Proposed North Capitol Parkway Improvements Section B-B Looking South - Between Irving Street and Channing Street

Corridor Upgrades - Irving Street to Channing Street



Existing North Capitol Street Photo Looking South at Section B-B - Between Irving Street and Channing Street



Proposed North Capitol Parkway Improvements Perspective Looking South at Section B-B - Between Irving Street and Channing Street



Corridor Upgrades - Cloverleaf Interchange at Irving Street and North Capitol Street

For the cloverleaf that sits on 19 acres around the intersection of North Capitol and Irving Streets, the unique location within the city, emphasized by the multiple landmark views and vicinity to existing and planned developments, argues for this area to be realized as a new urban center that mediates between the parkway to the north and the boulevard to the south. This new place would offer accessible open space as an amenity to the community and provide a center around which the proposed developments can reorient themselves, to become part of the city fabric.

The current cloverleaf configuration takes a large area of land and renders it essentially unusable to anything other than the automobile. What open space remains is inaccessible to pedestrians and the cloverleaf as a whole serves as a barrier to pedestrian and bicycle movement through the region. By making the intersection a center, rather than a point to pass through, the city can recapture a special place that has unique visual and physical connections to the many surrounding landmarks.

Creating a gathering point at the crossroads of two heavily travelled byways also offers a multimodal transit opportunity for an area that is currently suffering from a lack of transportation alternatives. A DDOT study has already identified a conceptual route for improved cross-town transit service (east-west) that would connect Columbia Heights Metro to Brookland/CUA Metro, crossing along Irving Street, to better service existing travel demand. For example, the Washington Hospital Center runs shuttles to both of these metro stations to meet its own internal demand. While current planning has not identified the use of North Capitol Street as a north-south transit route, this study anticipates that increased demand associated with proposed developments in the area will support filling the north-south transit gap in this part of the North Capitol Street Corridor to facilitate local and regional connections. The creation of a mixed-use urban center will provide greater pedestrian/bicyclist access and an opportunity for transit stops that can serve as a natural node for connections between north-south and east-west mass transit and to local transit options.

By featuring green strategies such as pervious paving, stormwater management, the creation of accessible park space and added transit options, this new center will improve the sustainable functionality of the Corridor. Most importantly, the recapturing of this underutilized land allows for development to occur in a concentrated manner focused on major transit and transportation



Cloverleaf Intersection Diagram

arteries, rather than in the disperse suburban style that now typifies the area.

This study explores three distinct options for the reconfiguration of the cloverleaf area: the “Memorial in the Park,” “Four Corners,” and the “Center of Centers.” On the following pages, the urban design solution offered by each of these options will be explained in greater detail. In addition to the urban design exploration, the study also provides an analysis of the costs associated with implementing each of the three option and the value potential for the city and the community.



Precedent Images of Urban Center Uses - Community Outdoor Movies, Retail and Restaurants, and Transit



LAND DEVELOPMENT CONCEPTUAL COST ESTIMATE OVERVIEW

DESCRIPTION	GRAND MEMORIAL	CENTER OF CENTERS	FOUR CORNERS
CLEARING & DEMOLITION	\$ 5,201,180	\$ 5,201,180	\$ 5,201,180
EARTHWORK AND GRADING	1,585,301	1,727,008	426,552
SEDIMENT CONTROL	183,922	180,263	191,643
SILT CONTROL MAINT & REMOVAL	45,980	45,066	47,911
SANITARY SEWER	0	331,607	512,748
WATER SYSTEM	0	367,297	577,249
STORM SEWER	1,890,095	1,719,066	1,922,017
CURB & GUTTER	362,254	240,345	460,172
SIDEWALKS & TRAILS	3,432,418	2,999,203	3,363,874
PAVING/STONE BASE	557,548	569,639	695,249
PAVING/ASPHALT BASE/PRIME	696,936	729,894	873,318
FINAL PAVING	1,371,334	1,388,563	1,463,535
BRIDGE/TUNNEL CONSTRUCTION	14,375,000	13,612,500	4,050,000
PAVEMENT STRIPING	75,000	75,000	95,000
STREET LIGHTS	1,931,790	1,166,722	1,808,354
SIGNS	607,155	1,504,472	758,050
RETAINING WALLS	762,143	621,219	1,062,487
LANDSCAPING	1,520,043	528,203	280,238
COMMON FACILITIES	45,323	45,323	45,323
DRY UTILITIES ALLOWANCE	5,067,106	4,685,291	4,673,726
SUBTOTAL	\$ 39,710,528	\$ 37,737,859	\$ 28,508,627
7% DEISGN FEES	2,779,737	2,641,650	1,995,604
30% CONTINGENCY	11,913,158	11,321,358	8,552,588
GRAND TOTAL	\$ 54,403,423	\$ 51,700,866	\$ 39,056,819

Please see the individual estimates for quantity and cost details.

Cost Estimate

Cost estimates for each of the three options were developed as part of this study. These estimations reflect a baseline interpretation of the conceptual urban design plans presented as part of this study and thus themselves are conceptual in nature and should be considered as providing order of magnitude costs. The costs addressed include basic site, streetscape, and other infrastructure costs associated with implementing the urban design concepts, but do not include the costs of developing the individual building parcels that will be opened as part of each option. Detailed plan development of the options will result in a more precise quantification of the actual costs associated with each option.

Real Estate Value and Value Capture

The reworking of the North Capitol and Irving intersection, including the removal of the cloverleaf infrastructure will come at significant cost but will also create significant real estate opportunities. The hope is that the additional value created by this significant public investment can be captured to offset these costs. While real estate value can be created in a number of ways, this study analyzes two prominent forms of real estate value creation for each of the proposed options: 1) the “creation” of developable parcels due to the removal of the existing cloverleaf infrastructure and the resulting land value that could be captured through land disposition or land lease; and, 2) the property taxes that will result from the eventual real estate improvements of these developable parcels.

A third potential source of value creation is the impact of improvements to the North Capitol-Irving interchange on surrounding parcels and the broader neighborhood. This form of value creation is much harder to quantify (and therefore to capture and incorporate into a public financing mechanism), and thus is not expressly quantified as part of this analysis; however, the likely impacts of each of the proposed options in this broader context will be discussed below. The table below provides a summary of the results of the real estate value creation analysis for each of the proposed options.

Per this analysis, the Center of Centers option creates the most significant value capture. The value created by this rests mainly in the significant acreage of development parcels created by the removal of the existing cloverleaf and redesign of the intersection, and the assumption that the density of improvements under this option will be the highest of all the options, thus driving significant property tax revenues. The Center of Centers option, of the four proposed options,

has the greatest potential to create a viable, higher-density urban node where the buildings frame the more compact open space and active ground-floor uses (such as retail) is possible. Such a node will also have a significant positive indirect value impact on surrounding parcels, as it will create a strong urban center for this neighborhood.

The value created by the Four Corners option varies significantly depending on whether building parcels are created within the center. Buildings in the center will be able to achieve a relatively high-density urban form. Still, even with buildings in the center, this option – relative to the Center of Centers option – does not have as strong a market potential to create a true urban node, as the center space is significantly larger, buildings do not frame the center on all sides, and the open space created in the center is relatively isolated by the presence of the center buildings. Even without buildings in the center, the created open space is bisected by road infrastructure, and while the space can certainly be programmed to maximize its utility as public open space, and it will likely be of lesser indirect value for the broader area.

The Memorial in the Park option creates relatively little new development parcels, and thus relatively little direct real estate value. However, the design of the center creates a grand, public open space that will likely create significant indirect real estate value for adjacent land owners and the broader neighborhood. However, as mentioned above, indirect value creation is difficult to quantify, and therefore very difficult to capture and incorporate into a public financing mechanism. In this context, the Memorial in the Park option will likely be perceived as a highly valuable public investment, but it will be challenging to find a mechanism where this plan can “pay for itself.”

	Four Corners (Buildings in the Middle)	Four Corners (No Buildings in the Middle)	Center of Centers	Memorial in the Park
Developable Acres Created	8.1	3.2	10.1	2.5
Hypothetical FAR	3.2	2.0	4.0	2.0
GSF of Development	1,128,204	278,784	1,751,112	213,444
Land Value per FAR SF	\$42	\$50	\$44	\$50
Total Land Value	\$47,916,000	\$13,939,200	\$77,048,928	\$10,672,200
Assessed Value per GSF	\$356	\$300	\$413	\$300
Total Assessed Value	\$402,167,700	\$83,635,200	\$722,333,700	\$64,033,200
Annual Property Tax	\$4,383,628	\$911,624	\$7,873,437	\$697,962
20-Year NPV at 4.5% DR	\$65,458,027	\$13,612,717	\$111,526,211	\$11,168,154
Land Value + NPV of Property Taxes	\$113,374,027	\$27,551,917	\$188,575,139	\$21,840,354

Table - Summary of Real Estate Value Creation

Valuation Methodology

The key methodological assumptions that fed into this analysis are as follows:

- Developable acres created under each option were identified from conceptual plans.
- The hypothetical FAR is a market-driven assumption, taking into account the likely achievable building densities and parking solutions given the proposed urban design, market forces, and development economics.
- The land value per FAR square foot (SF) is an assumption based upon hypothetical pro formas of different building types; higher-density buildings with more expensive parking solutions have lower land value per FAR SF due to higher construction costs relative to potential increases in revenues.
- The residual land value for higher-density product (4.0 FAR) is lower than the lower-density building form (2.0 FAR), given the higher construction costs (including movement into below-grade parking) -- \$40 per FAR SF for the 4.0 FAR buildings and \$50 per FAR SF for the 2.0 FAR buildings. Given the higher replacement costs and higher market positioning, assessed values of the higher-density product is higher (\$375 per SF) versus the lower-density product (\$300 per SF).
- In order to determine the present value of future property tax revenues, we have assumed a revenue flow of 20 years at a 4.5% discount rate (which roughly equates to public sector bonding capacity). Improvements were phased in over time to reflect that buildout will occur over time.

The ability to most easily capture value relies on two factors: 1) the developable land that is created by the redesign is controlled by the District of Columbia or a related entity; and, 2) the land and improvements on these development parcels is taxable. Depending on the eventual disposition of the new parcels, an alternative mechanism for capturing value, such as using entitlements to negotiate land value payments and/or a PILOT (payment in lieu of taxes) to claim some measure of property taxes might be required.



Final Model - Memorial in the Park Option



Final Model - Center of Centers Option



Final Model - Four Corners Option

Option 1: Memorial in the Park

- Large community park with prominent memorial location
- Reconfigures roads with new Irving Street bridge and at-grade North Capitol Street
- Park/Street frontage for surrounding properties
- Transit Opportunities
- Pedestrian/bike friendly environment

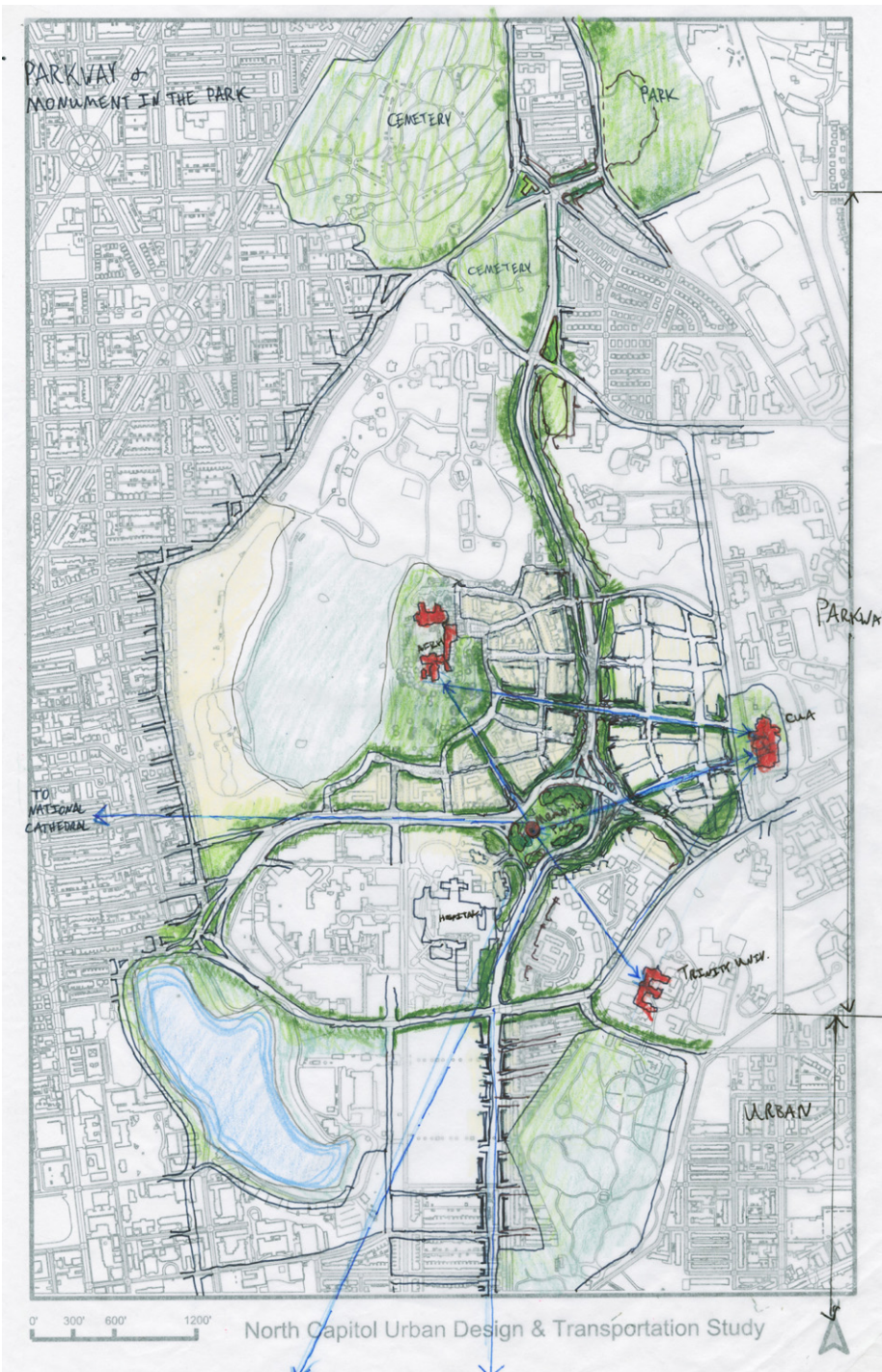
Responding to community desire for accessible green space, Option 1 offers a 7.5 acre park at the heart of the former cloverleaf. This “Memorial in the Park” option reflects precedents such as Rock Creek Park, Lincoln Park, and the National Mall in proposing a park that has both informal and programmed spaces to serve as an important civic amenity. The existing roads are reconfigured by creating a new Irving Street Bridge bordering the southern edge of the park over a lowered North Capitol Street. Both streets are curved to calm traffic to safe and efficient speeds through the new center.

The park features space for a significant memorial design with spaces for gathering and passive recreation. The memorial would be situated to be equally experienced by pedestrians, transit riders, and automobile riders. The park would serve as a new and accessible green oasis in this part of the city and offer the opportunity to introduce on-site stormwater management features. The reorientation of the streets would offer valuable park and/or street frontage to all four quadrants of the former cloverleaf. These frontages could serve as new front doors, both symbolically and physically, to these properties.

While centralizing intermodal transportation transfers would be challenging, an east-west transit line would easily work with the new road structure and the Irving Street Bridge would provide enhanced views to riders. Pedestrian and bicycle access would be improved by the calmed traffic, and “eyes on the street” development frontage along the park’s edges.

Community response to this option was very positive. Many enjoyed the idea of the introduction of such a large and accessible park to the area and commented that the form of the park seemed appropriate for the area and not like it was something that was copied from some other part of the city. It was also noted by one participant that the park acted very well as a transition between the less dense areas to the north and the urban grid to the south.

Value Proposition - With 2.5 acres of developable land surrounding the 7.5 acre park, this option creates a modest amount of direct real estate value, given the small amount of developable land created and the likely lower-density of development that will be supported by the urban design. However, the design of the park is the grandest of all of the options, and access from the parcels will be strong. Access to this grand park and potential to create a very significant memorial presence will have a very strong indirect value creation on adjacent parcels and the surrounding neighborhood. Particularly, the large memorial park could act as a very important open space anchor for planned redevelopment.



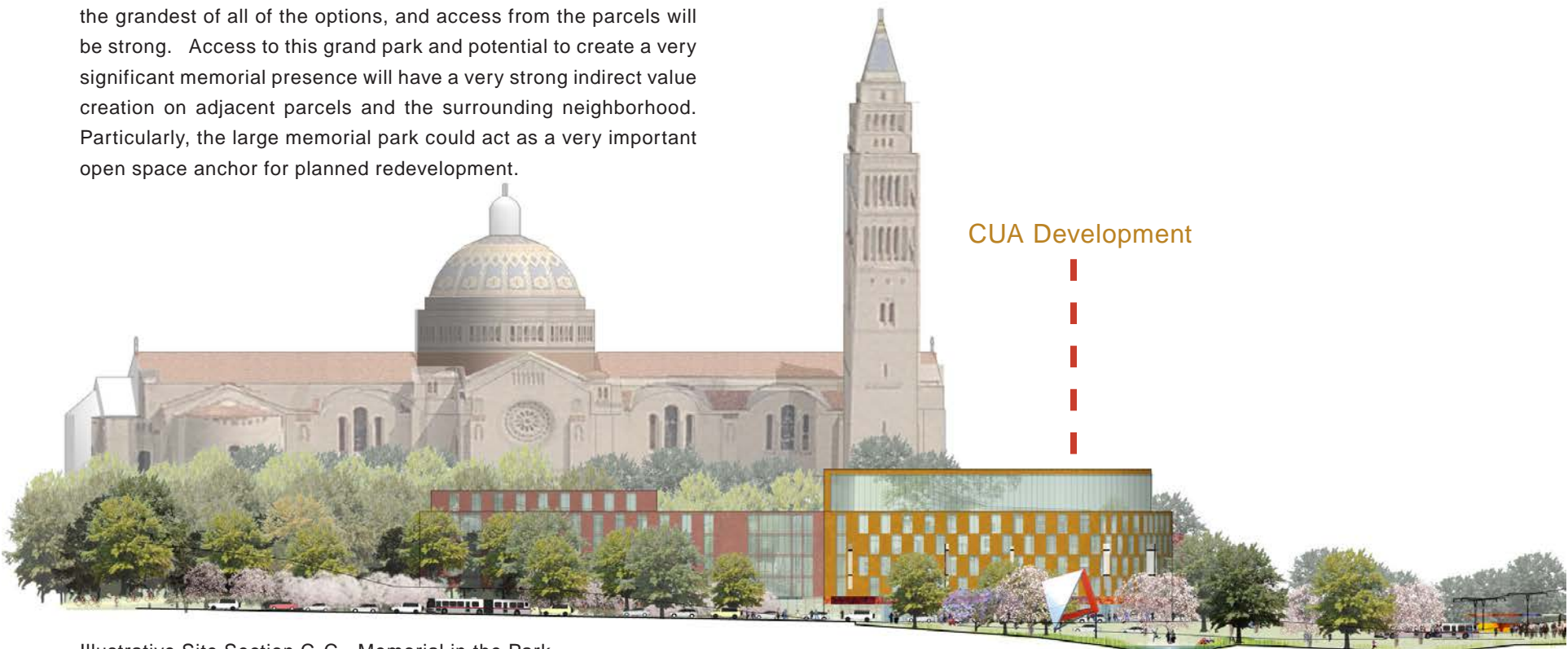
Initial Concept Sketch - Memorial in the Park



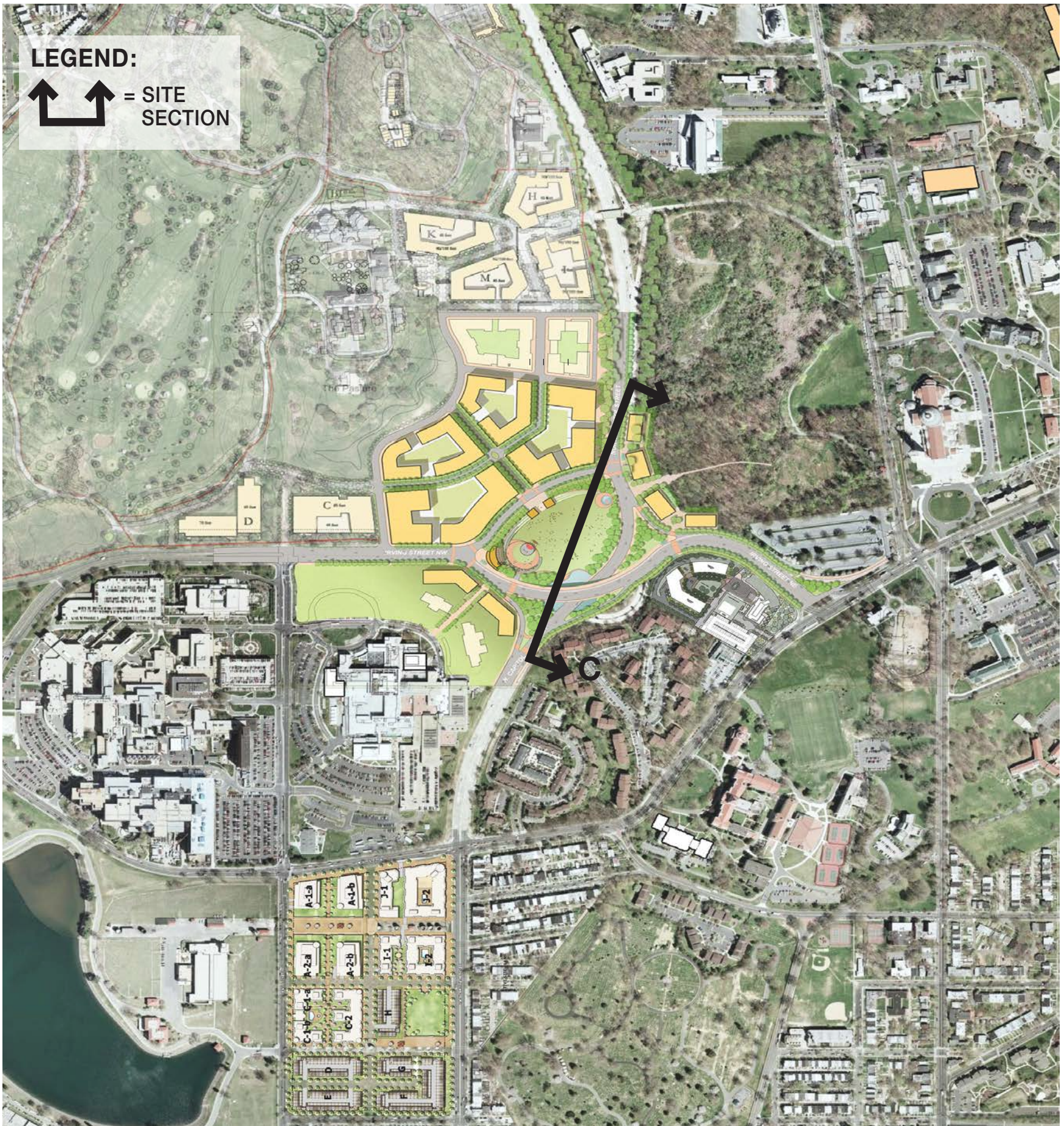
Precedent Image - Lincoln Park, DC



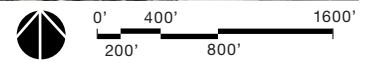
Precedent Image - Constitution Gardens, DC



Illustrative Site Section C-C - Memorial in the Park



Illustrative Site Plan - Memorial in the Park

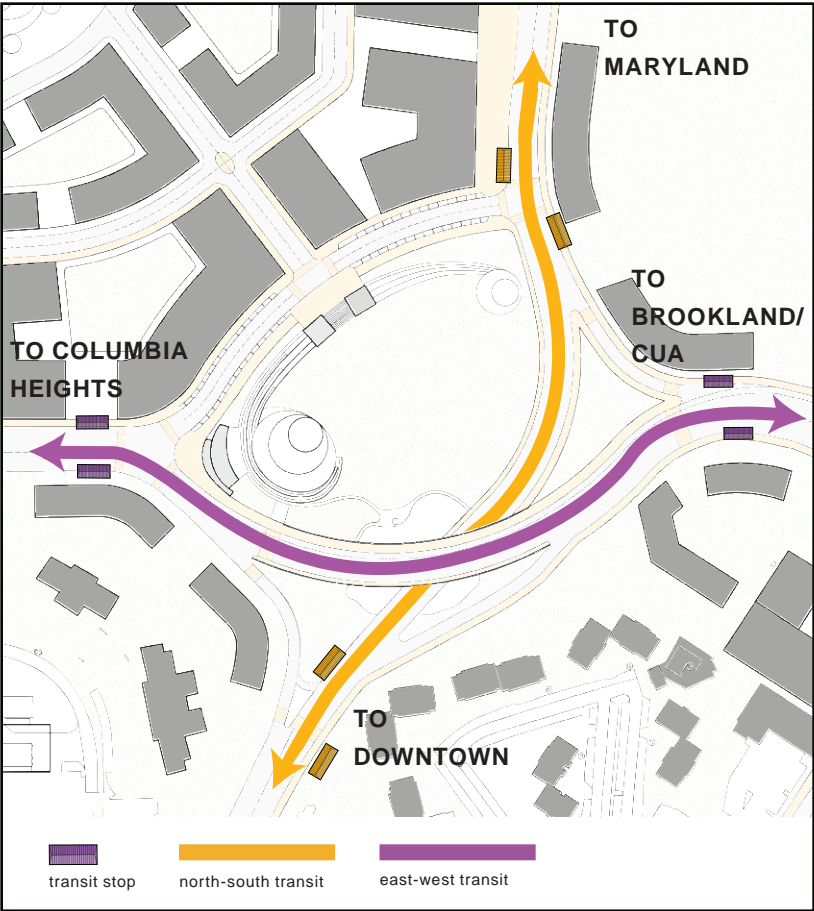


Cost Estimate: \$54.4+/- Million (2009 Dollars)

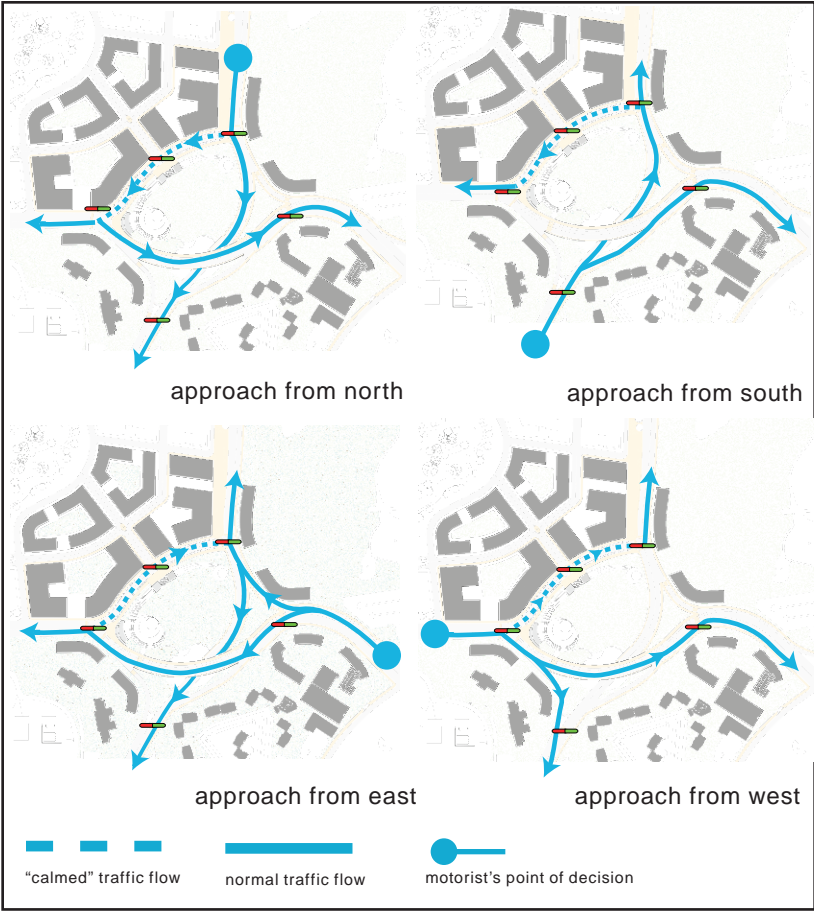
Value Potential: \$21.8+/- Million (2009 Dollars)

(See Appendix B for details)





Proposed Transit Routes & Stops



Proposed Major Traffic Circulation



Scale Comparison with Lincoln Park



Lincoln Park, Capitol Hill
Park Size: 7.6 acres



amphitheatre



retail frontage



memorial fountain



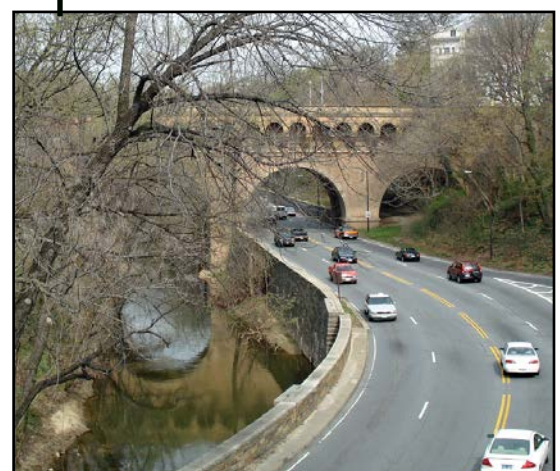
Illustrative Plan - Memorial in the Park



cafe pavilion



great lawn



natural landscape & overpass



Illustrative Rendered Perspective of Memorial in the Park Option in Regional Context (Looking South)



Option 2: Four Corners

- Large park plaza with memorial ‘island’
- Maintains and builds upon existing infrastructure
- Strong intermodal opportunities
- ‘All park’ or ‘park & building’ options
- Easiest option to phase with new developments

The “Four Corners” option was presented to the public with two alternatives: 1) the first arrangement allows for four building development parcels within the former cloverleaf zone; and, 2) the second arrangement (presented in this report, and preferred by the public) retains the majority of the cloverleaf area for park space. At approximately 10 acres, the second alternative offers the largest park, but in a more structured plaza form than the prior option.

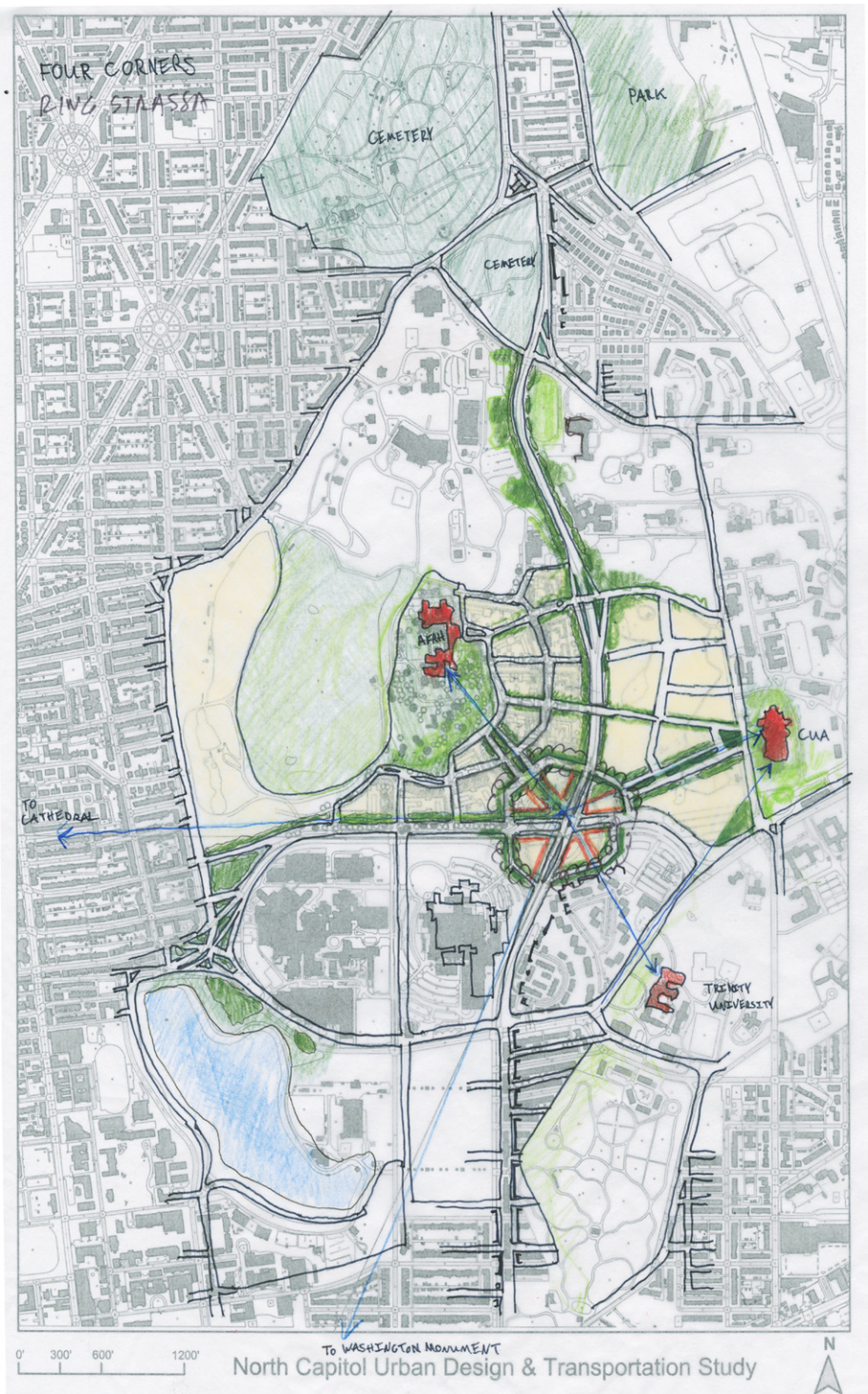
This option requires the least alteration of infrastructure, and has the lowest cost. The plan maintains and expands the existing North Capitol Street bridge to allow for the park space to connect across and above Irving Street. The former on/off-ramps are consolidated into local streets that handle the traffic through a series of right-turn only movements. Traffic is calmed both through the introduction of a median island memorial site and the replacement of the off-ramps with streets.

The park provides room for programmed and un-programmed spaces, as well as the opportunity for a multimodal transit transfer station. With space for concerts, farmers markets and other events, the park could also sponsor small pavilion retail. This park configuration offers frontages to the land adjacent to all four quadrants of the former cloverleaf, offering the opportunity for the institutional owners to create entries to their parcels. Pedestrian and bicycle paths would be integrated into the hardscape portions of the raised plaza park and would pass by the memorial site in the center of the park. Paving elements and the median memorial park would integrate the two sides of the street.

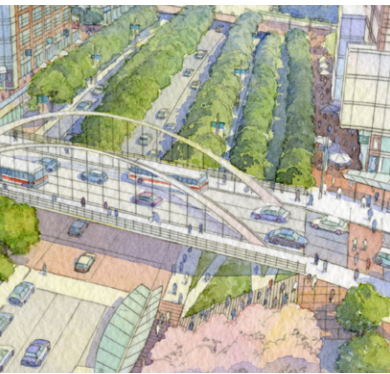
Community response to this option was not as strong as for the other two options. It was noted that this option might be the most achievable because of the relative ease of staging and more limited changes to existing infrastructure. The “all park” arrangement garnered more support than the option containing buildings on the interior of the former cloverleaf zone.

Value Proposition - The value opportunities for this option vary based on which of the alternate arrangements are pursued. The alternative with interior building alternatives creates more buildable parcels (8 acres), with a smaller open space (4.9 acres), that are likely to be developed at a relatively high density. The larger park option (9.75 acres), results in a modest 3.2 acres of developable land at a lower density.

This first arrangement creates an opportunity to develop a relatively dense urban cluster. However, the ability to create an urban node remains a challenge because of the constraints imposed by the road infrastructure and direct adjacency of the new buildings. The relatively limited amount of developable land created under the second arrangement limits the direct value creation. The significant open space should provide significant indirect value creation for adjacent parcels and the broader neighborhood, although the bisection of the park by North Capitol Street could limit somewhat the utility and appeal of the park space.



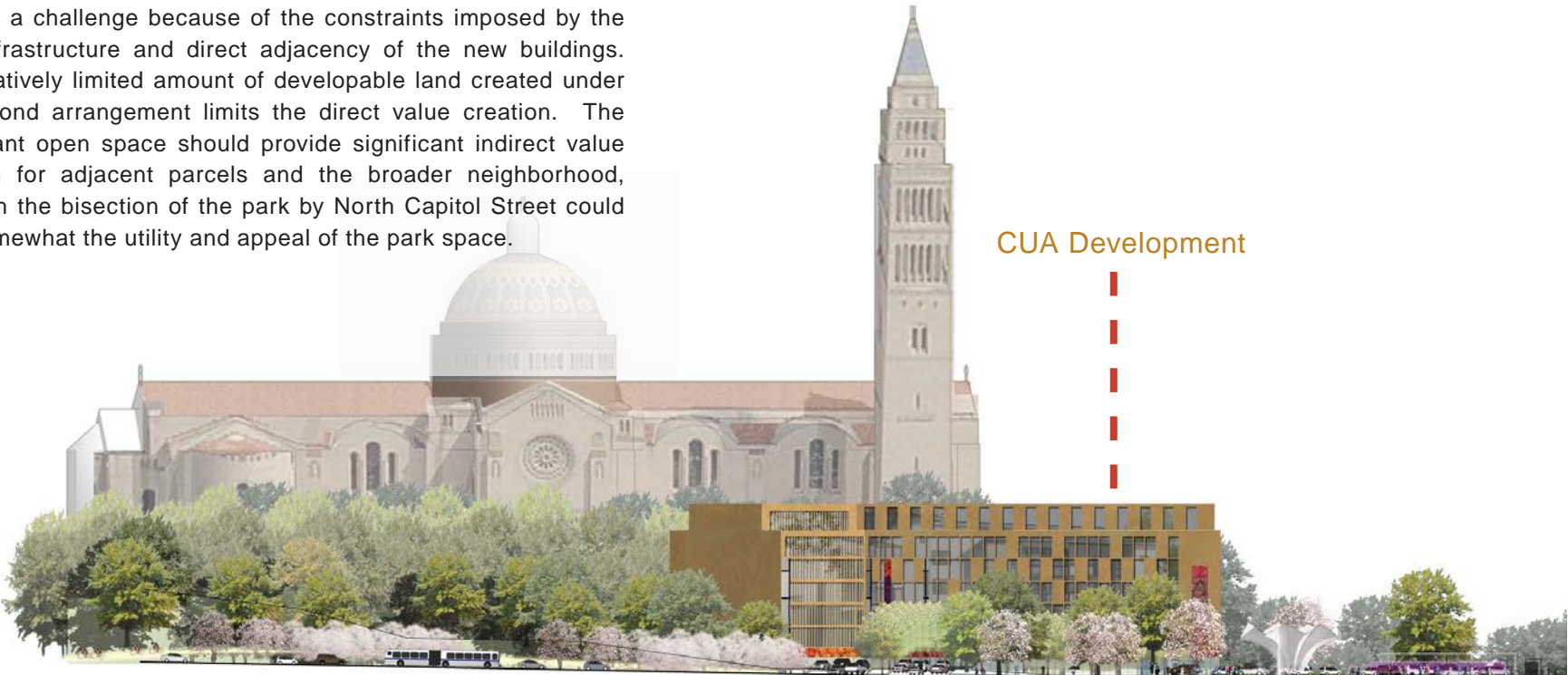
Initial Concept Sketch - Four Corners



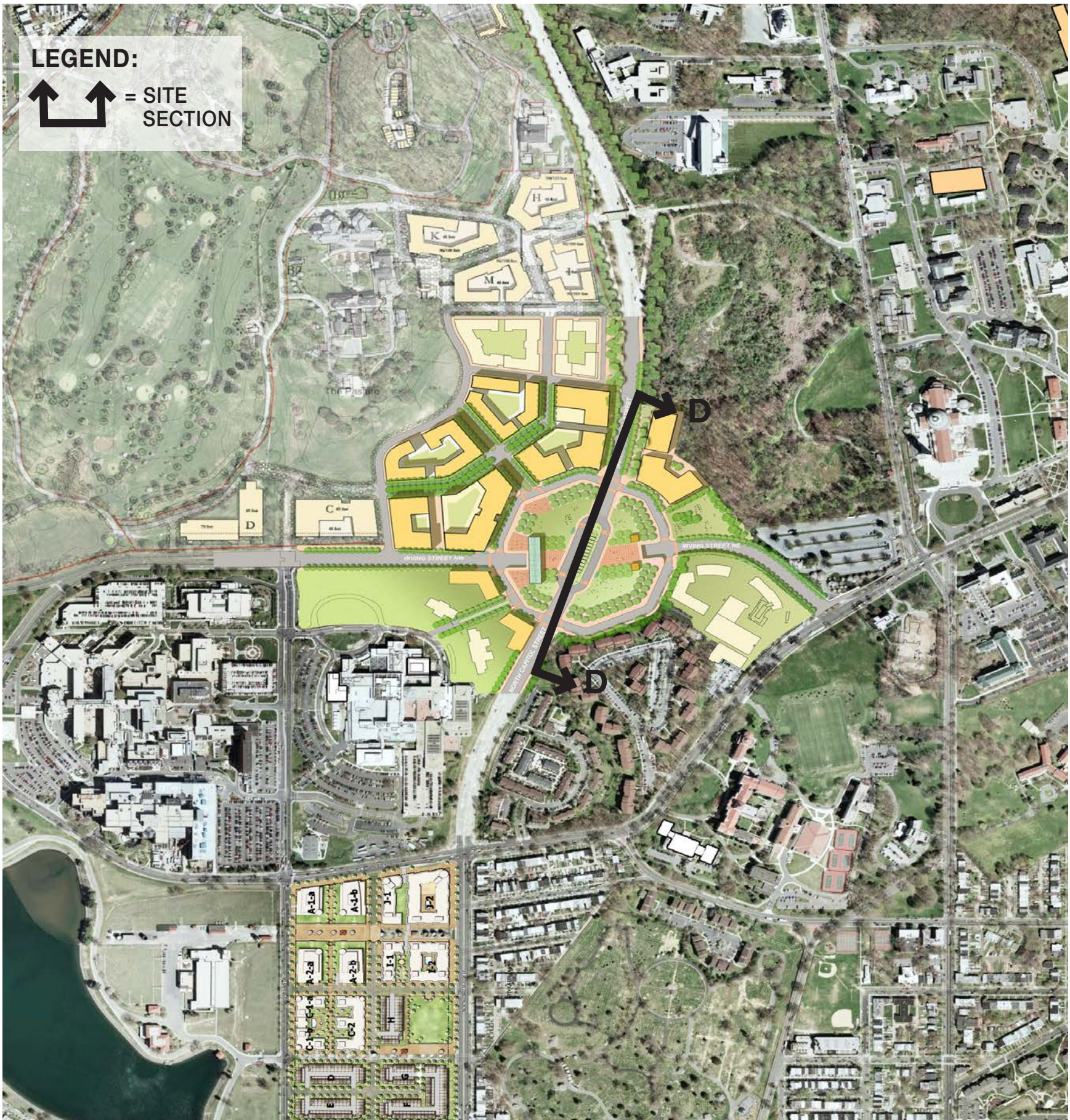
Precedent Image - Van Dorn Study



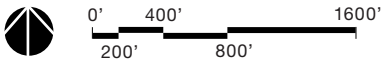
Precedent Image - McPherson Sq., DC



Illustrative Site Section D-D - Four Corners



Illustrative Site Plan - Four Corners



Cost Estimate: \$39.0+/- Million (2009 Dollars)

Value Potential: \$113.3+/- Million (Building + Park); \$27.5+/- Million (All Park) (2009 Dollars)

(See Appendix B for details)

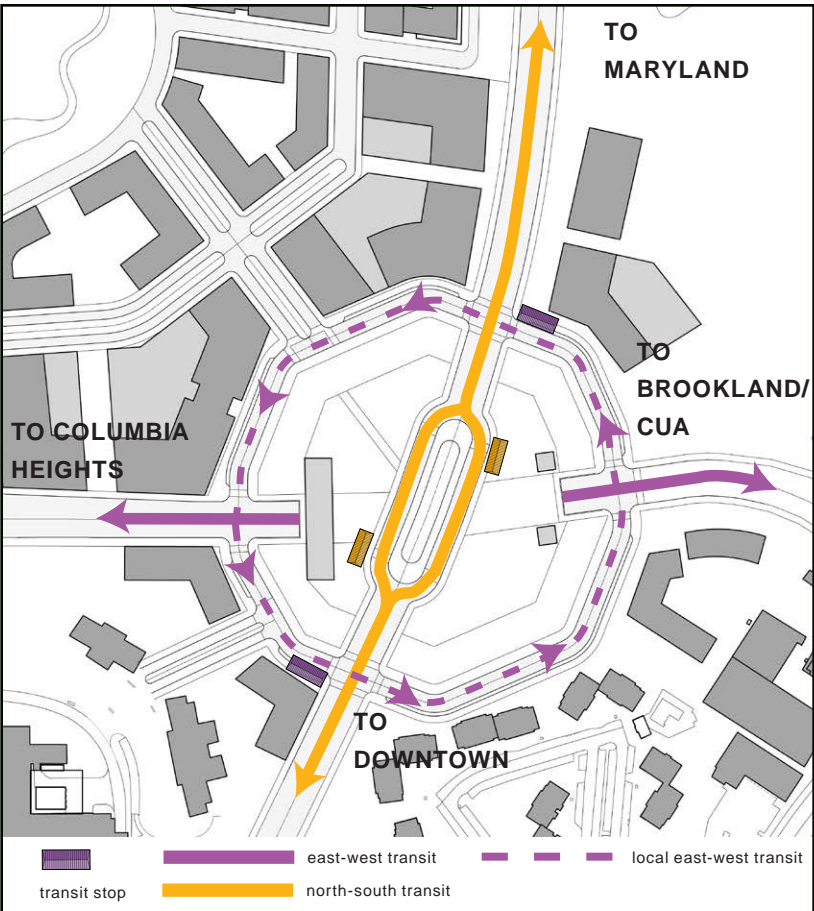
North Capitol St.

Conference Center Development

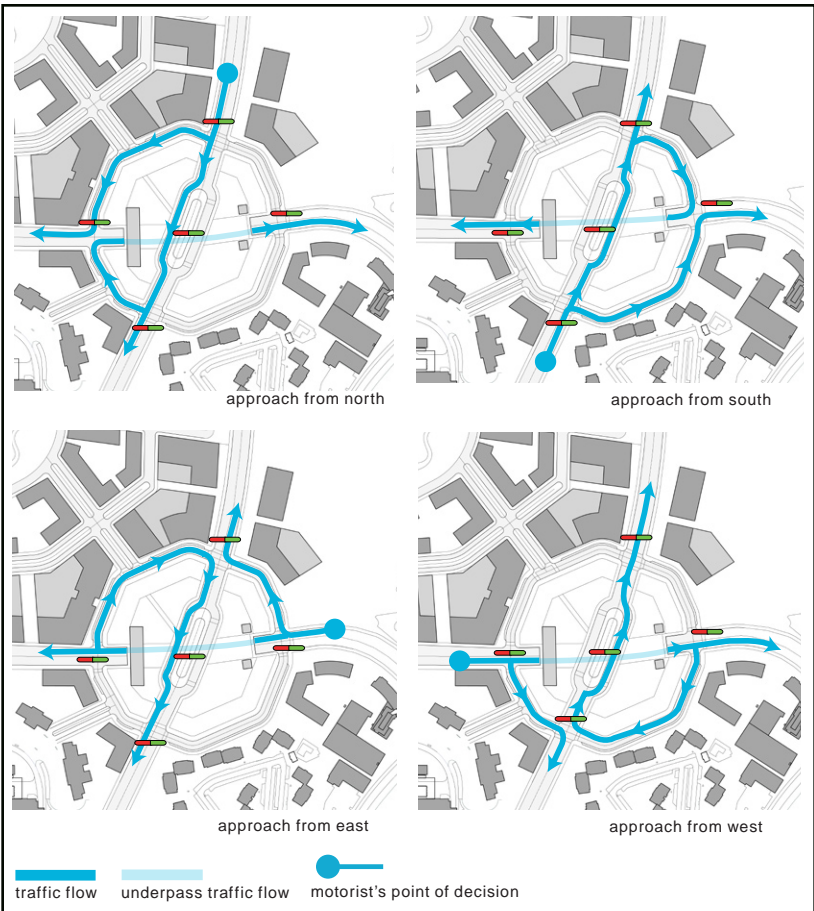
Irving Street Transit Line/Tunnel



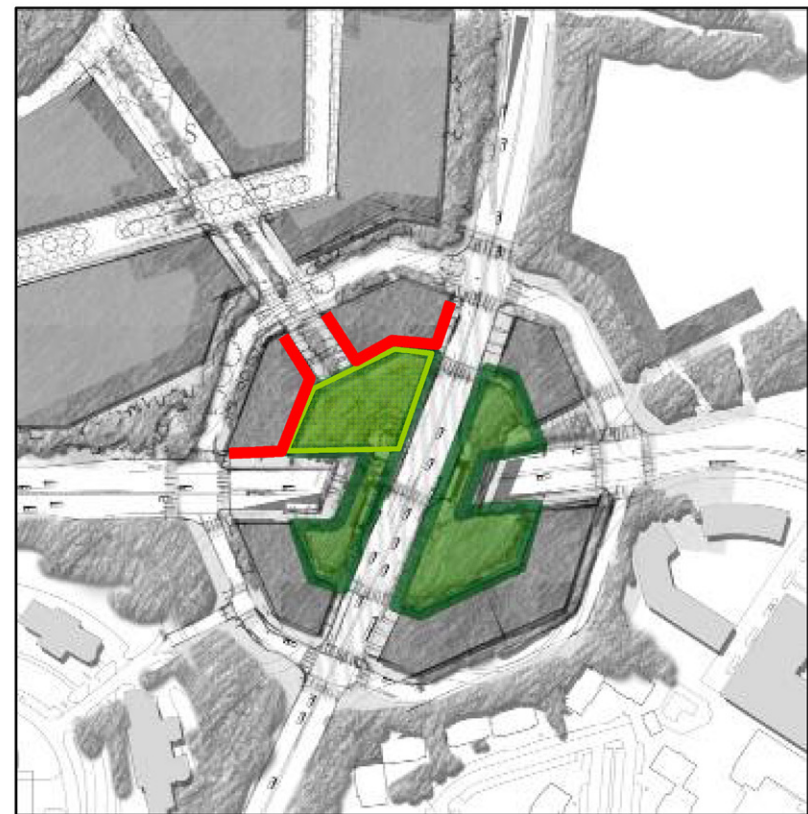
North Capitol Street Cloverleaf Feasibility Study



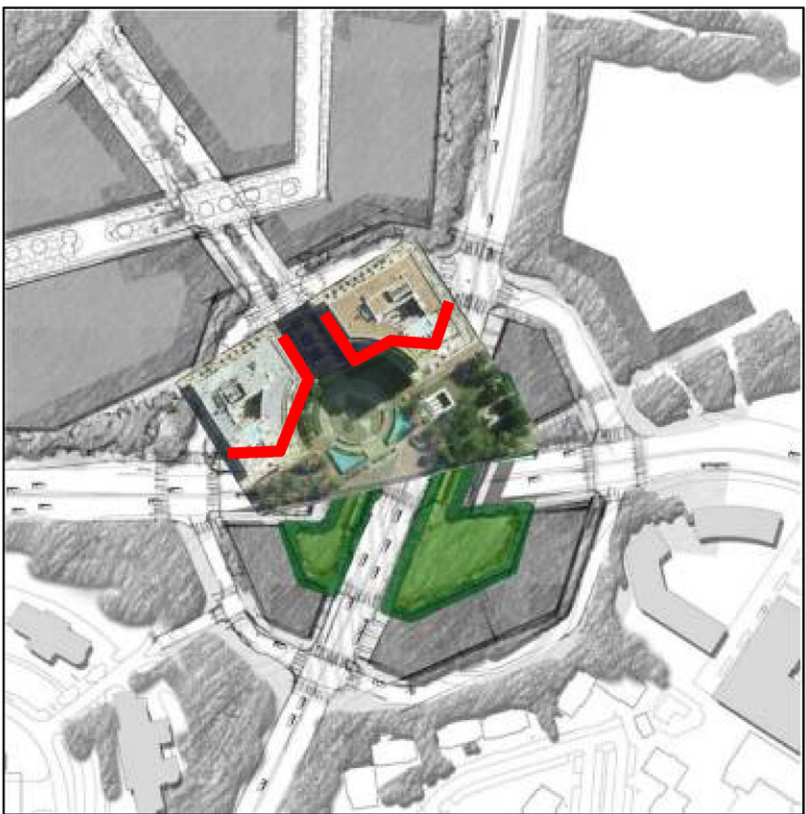
Proposed Transit Routes & Stops



Proposed Major Traffic Circulation



Scale Comparison with Navy Memorial



Navy Memorial
Plaza Size:1.0 acre



retail frontage



transit stop



kiosk



Illustrative Plan - Four Corners



intermodal pavilion



memorial & traffic



urban lawn



Illustrative Rendered Perspective of Four Corners Option in Regional Context (Looking South)



Option 3: Center of Centers

- Compact neighborhood park with prominent memorial location
- Existing bridge integrated into traffic circle infrastructure
- Optimizes form for higher-density development
- Strong intermodal opportunities

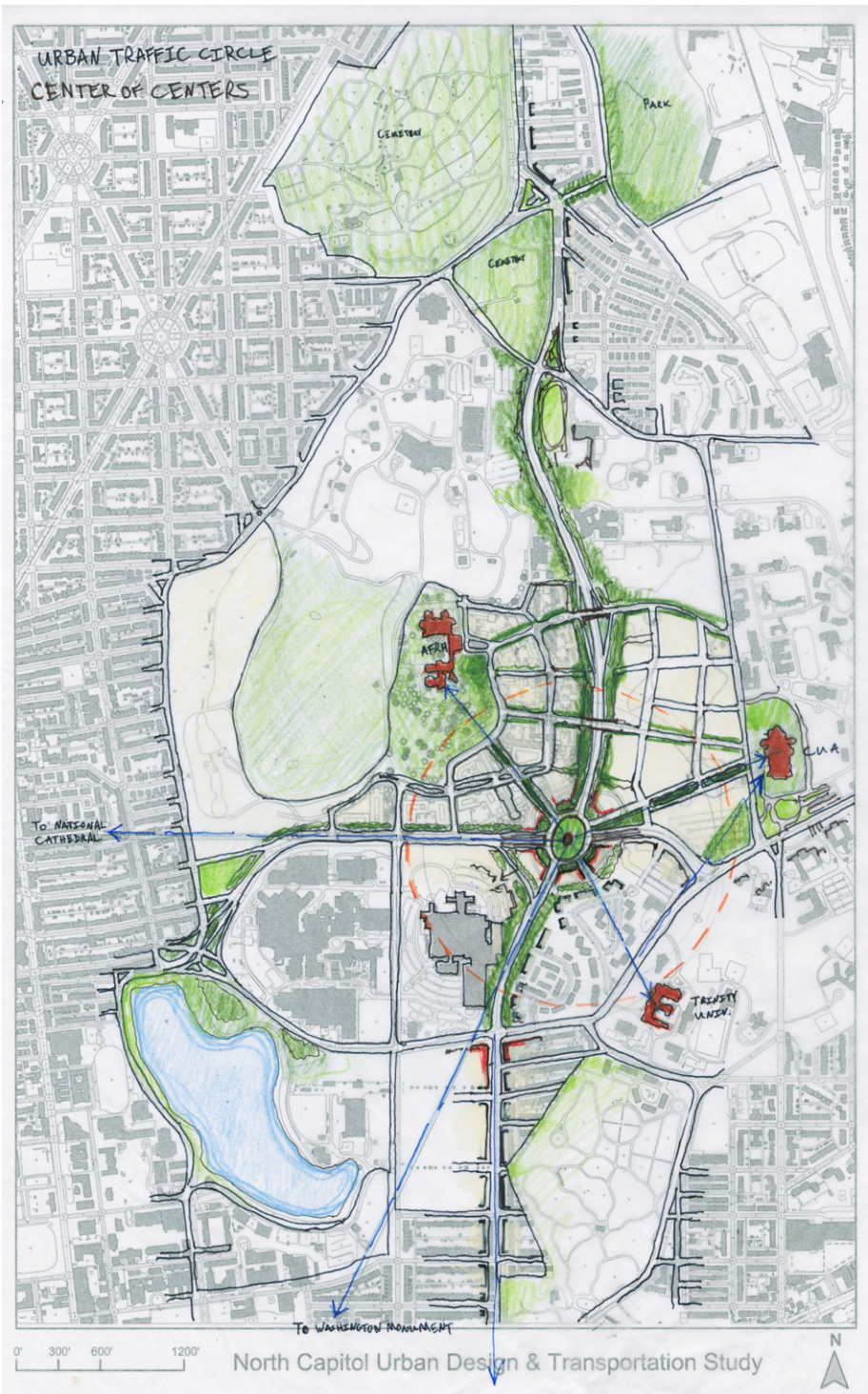
Providing the most potential for new development and a neighborhood scaled 2.6 acre park, the “Center of Centers” option provides a common District form to the intersection of North Capitol and Irving Streets. This option creates a grade-separated traffic circle interchange similar to the District’s Dupont and Thomas Circles, providing a clear gateway marker element at the transition point to the historic city core. The North Capitol Street bridge is retained and integrated into the traffic circle infrastructure so that North Capitol passes around the circle and Irving Street passes below. New “tight-diamond” interchange ramps from Irving allow for the traffic movements to the circle.

The park provides a prominent memorial site that could be aligned with the line of North Capitol Street and a large open green provides room for passive recreation or urban events such as open air movies and concerts. Special paving treatment of the sidewalks, park hardscape and traffic lanes would unify the space from building face to building face. The relatively smaller size of the park provides room for development within the former cloverleaf area and creates the most urban of environments, suitable for street retail and mixed-use buildings.

The enclosed nature of the park, street frontage and narrower roadways will calm traffic and add to the sense of pedestrian and bicycle comfort while traveling through this area. This option also provides for easy intermodal transfer options, including an opportunity to create a multimodal transit station.

Community response to this option was also supportive. The appropriate amount of development for this area is a continuing dialogue for this community, but this option is a familiar form within the city that is known to sponsor great urban spaces that serve as a community amenity.

Value Proposition - This option creates 10 acres of developable land surrounding a 2.6-acre oval park, supporting a relatively larger total development at a higher density. This option may have the greatest potential to create a true urban core with high-density building form and active ground-floor uses framing a tight urban park. This expected urban form will justify the higher density projected on all newly created development parcels and has the greatest fit with a transit-oriented urban form. The potential to create this active, vibrant urban center will also have a strong indirect positive impact on values of adjacent parcels and the broader neighborhood.



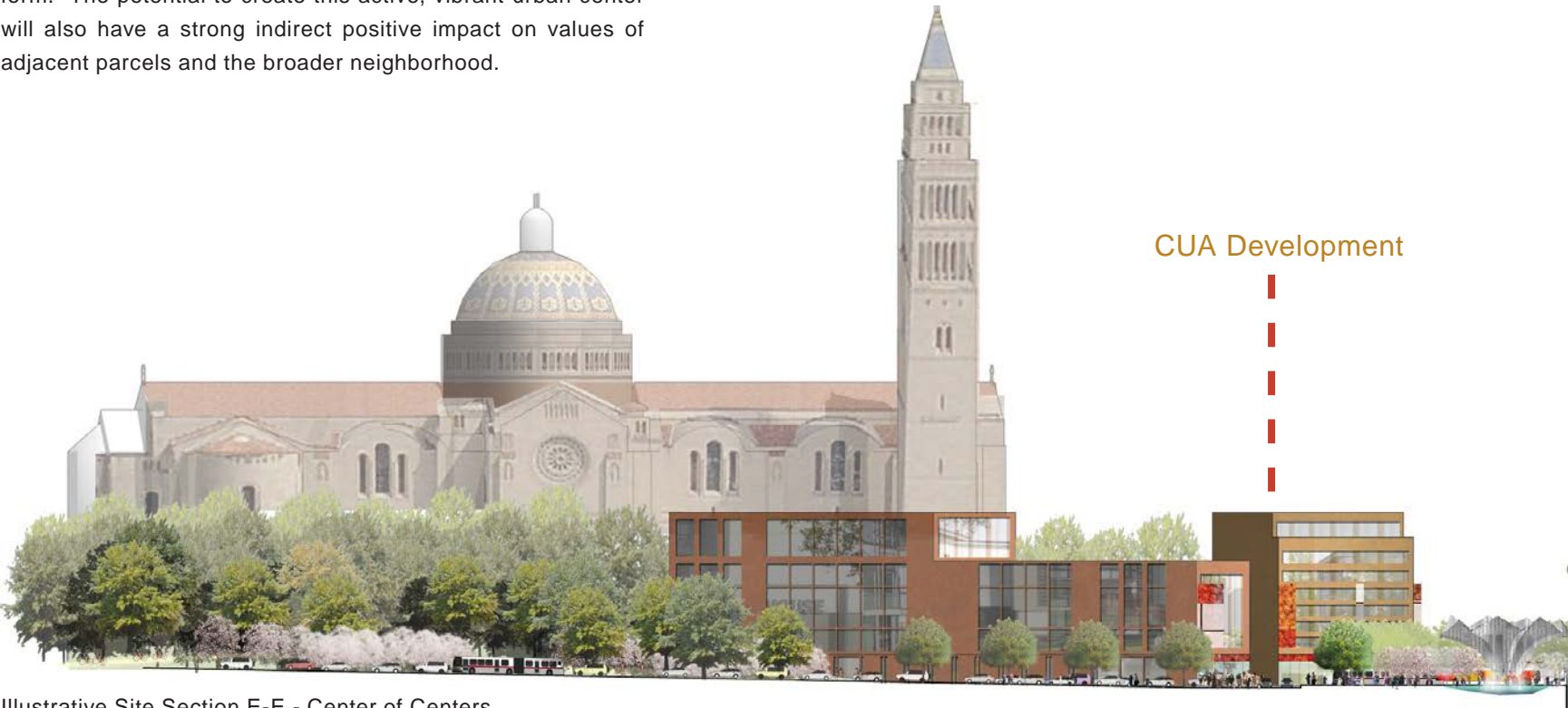
Initial Concept Sketch - Center of Centers



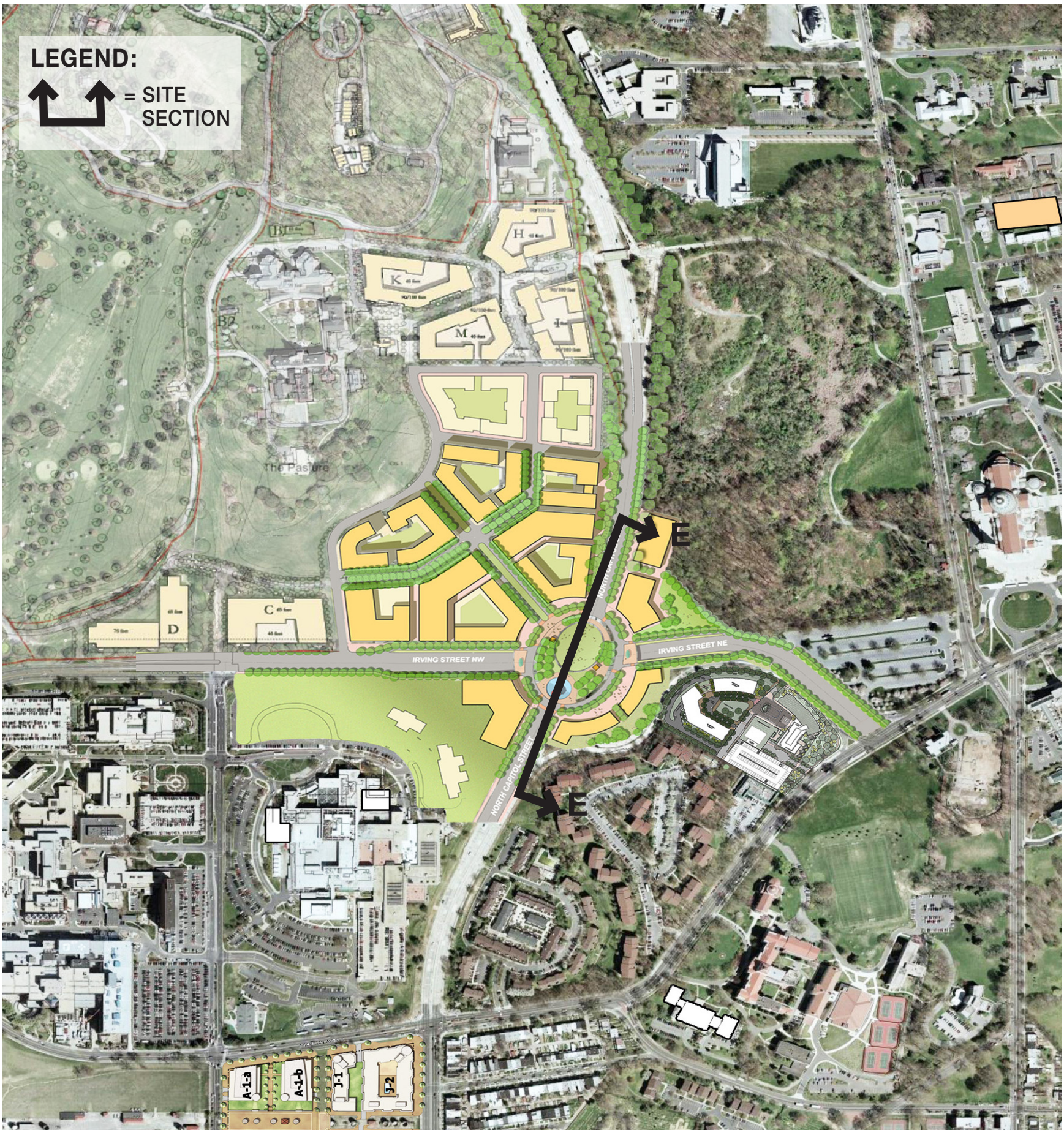
Precedent Image - Scott Circle, DC



Precedent Image - Dupont Circle, DC



Illustrative Site Section E-E - Center of Centers



Illustrative Site Plan - Center of Centers

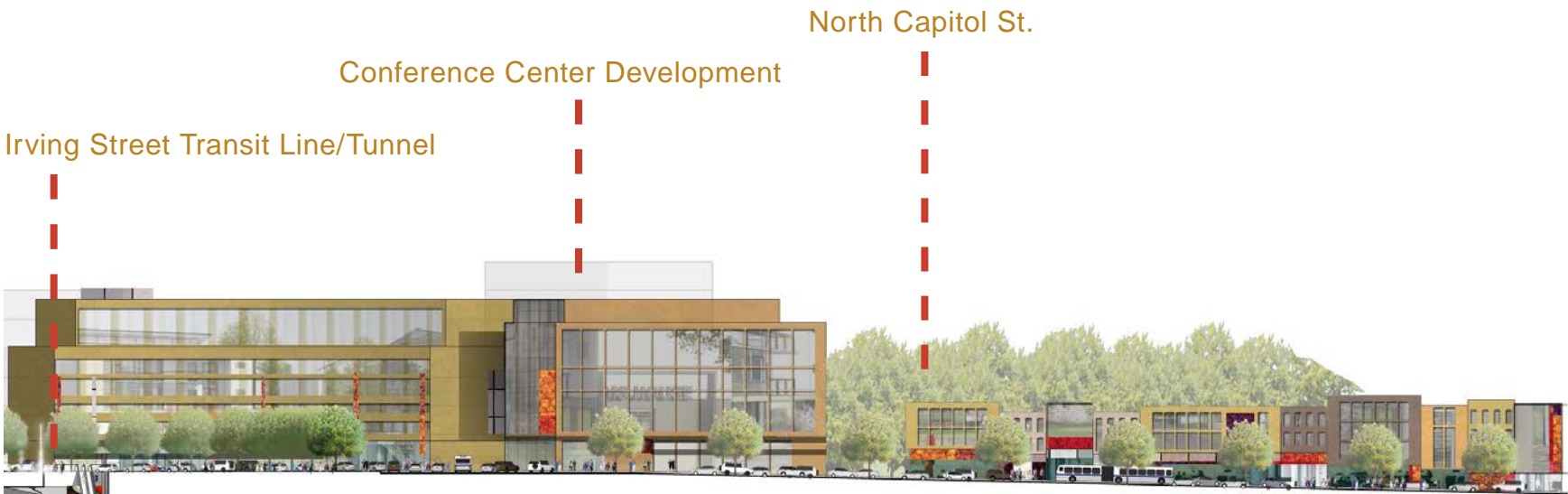


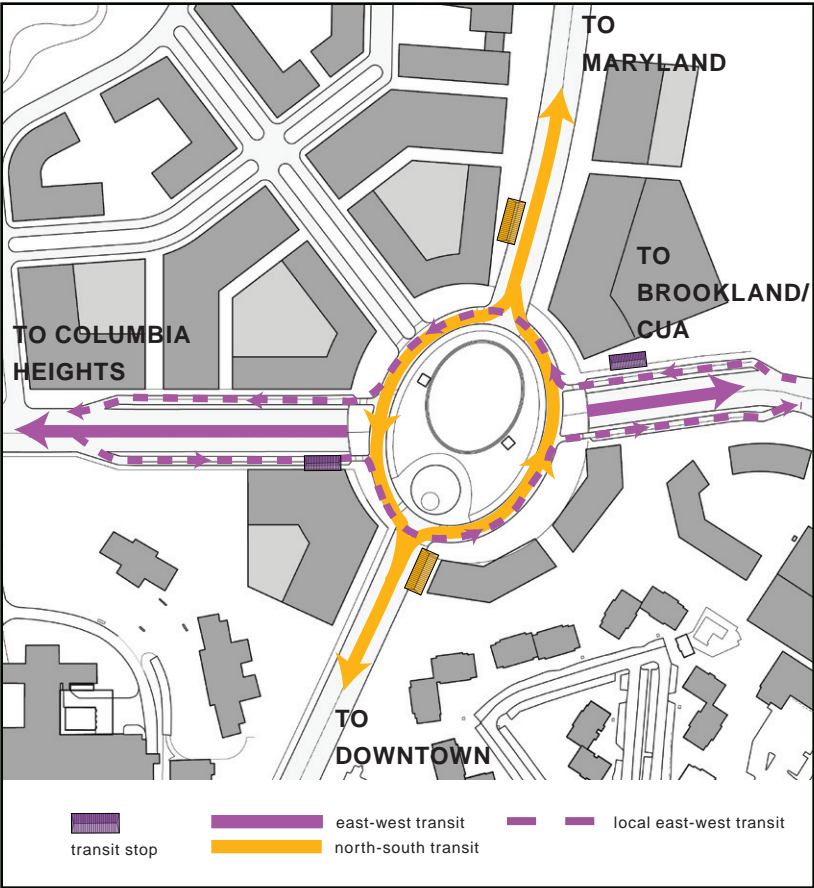
0' 400' 1600'
200' 800'

Cost Estimate: \$51.7 Million (2009 Dollars)

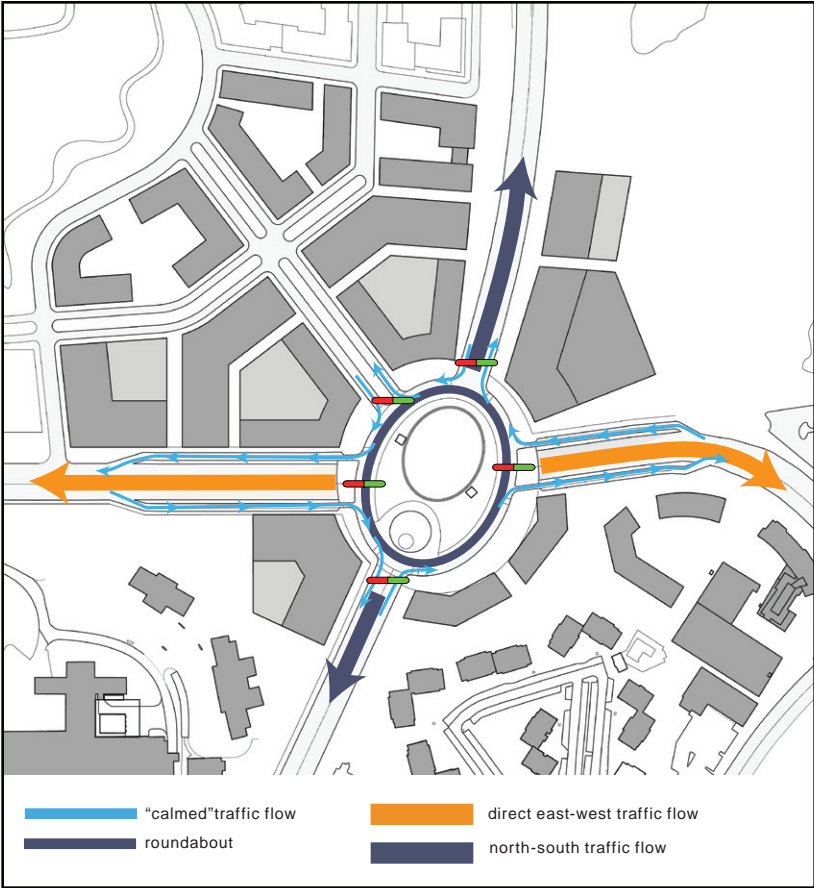
Value Potential: \$188.5+/- Million (2009 Dollars)

(See Appendix B for details)

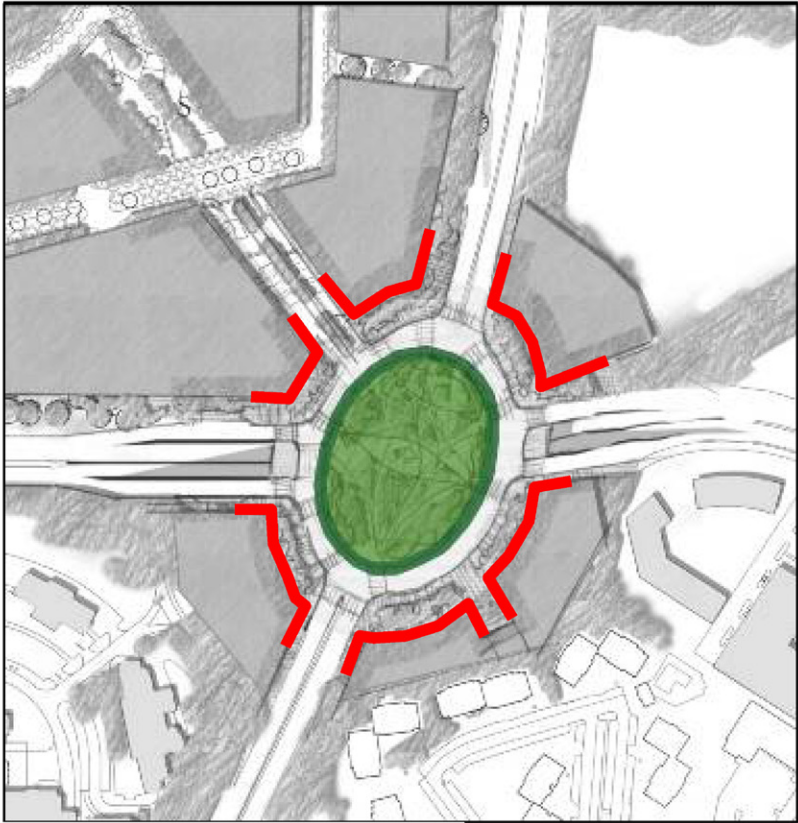




Proposed Transit Routes & Stops



Proposed Major Traffic Circulation



Scale Comparison with Dupont Circle



Dupont Circle
Inner Circle Size: 2.3 acres



retail frontage



tree border



flexible public space



Illustrative Plan - Center of Centers



memorial & traffic



formal fountain



intermodal entry



Illustrative Rendered Perspective of Center of Centers Option in Regional Context (Looking South)



5

TRANSPORTATION & CONNECTIVITY IMPROVEMENTS

Key Intersection Improvements

Short and Mid-Term Transportation Improvements

TRANSPORTATION & CONNECTIVITY IMPROVEMENTS

Key Intersection Improvements

In addition to exploring the potential gateway aspects of North Capitol Street and the replacement of the cloverleaf interchange, this study also examined short- and medium-term improvements of North Capitol Street and of connecting roads. These measures, ranging from infrastructure improvements at targeted intersections to small-scale interventions, will enhance the overall functionality of the North Capitol Street corridor.



Existing Intersection Configuration at Michigan Ave. and First St., NW

Cost Estimate:

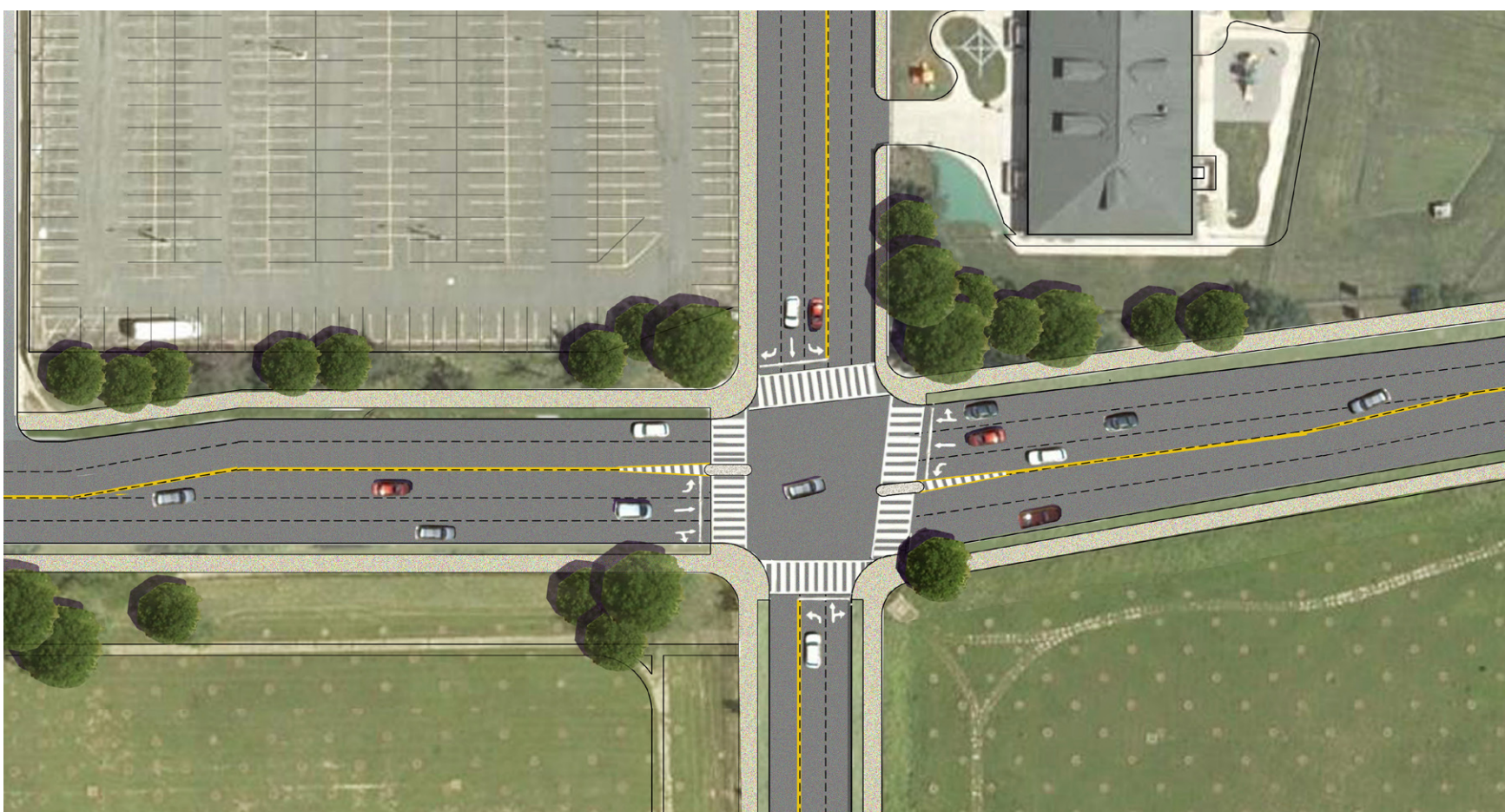
\$2.3+/- Million (2009 Dollars)

(See Appendix B for details)

Michigan Avenue at First Street, NW

The current configuration of the intersection at Michigan Ave. and First Street does not efficiently handle turning movements, causing congestion approaching the intersection. Proposed Improvements:

- **Widen Michigan Avenue:** provides the width needed to extend the eastbound and westbound left turn lanes
- **Extend the left turn lanes for the northbound, eastbound, and westbound approaches:** provides more room for queueing of left-turning vehicles, and remove those vehicles from the through lanes
- **Provide an exclusive southbound left turn lane:** removes left-turning vehicles from the through travel lanes and increase the number of vehicles that can get through the intersection during one signal cycle
- **Modify the signal phasing to provide exclusive left turn phases:** improves intersection vehicle operations by reducing the average delay that each vehicle experiences; under existing conditions, northbound and southbound through and right-turn movements are impeded by vehicles waiting to turn left; adding the exclusive southbound left turn lane and protected phases will allow the intersection to service more vehicles but will increase the time pedestrians will wait for a walk signal
- **Restrict on-street parking along First Street south of the intersection:** provides the space needed to extend the northbound left turn lane, and allow more room for left-turn queueing and more room for through traffic and right-turning vehicles to move into their lane rather than waiting for vehicles to turn left
- **Install ladder-style crosswalks across each approach:** more visible to drivers, and will also alert drivers to expect pedestrians at the intersections



Proposed Intersection Improvements Detail

Michigan Avenue at Irving Street, NE

The current configuration of the intersection at Michigan Ave. and Irving Street, with wide turning radii and fluid movement, functions more like a highway on-ramp and does little to slow traffic at this location, creating a wide intersection and unsafe conditions for pedestrian crossings. Proposed improvements:

- **Realign the Irving Street approach to intersect with Michigan Ave. at a 90-degree angle, and remove the free-flowing right turns:** creates more of a compact urban, pedestrian-friendly intersection; pedestrians will have shorter distances to cross and vehicles approaching this intersection will have to slow down to make turning movements
- **Reduce the amount of green-time currently provided for the southbound Irving Street approach:** based on field observations, the southbound approach currently receives more green time than needed to service all vehicles; more analysis would be necessary to confirm, but reducing the amount of green time for this approach will allow more green time to be provided where it is needed, and allow the intersection to service more vehicles and operate more efficiently
- **Install ladder-style crosswalks across each approach:** more visible to drivers, and will also alert drivers to expect pedestrians at the intersections
- **Install streetscape improvements:** landscaping and sidewalk improvements minimize pedestrian crossing distance



Existing Intersection Configuration at Michigan Ave. and Irving St., NE

Cost Estimate:

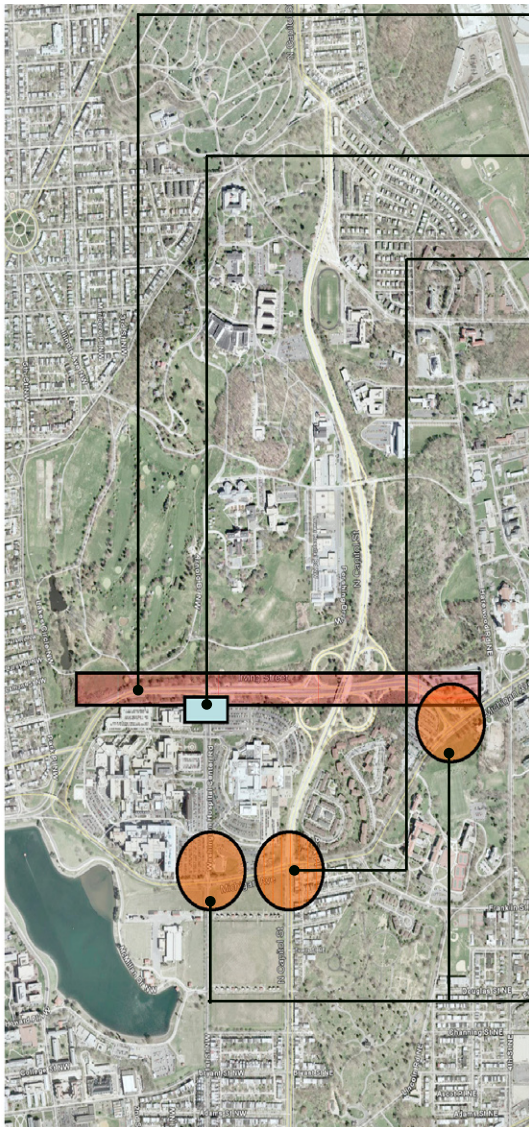
\$2.9+/- Million (2009 Dollars)

(See Appendix B for details)

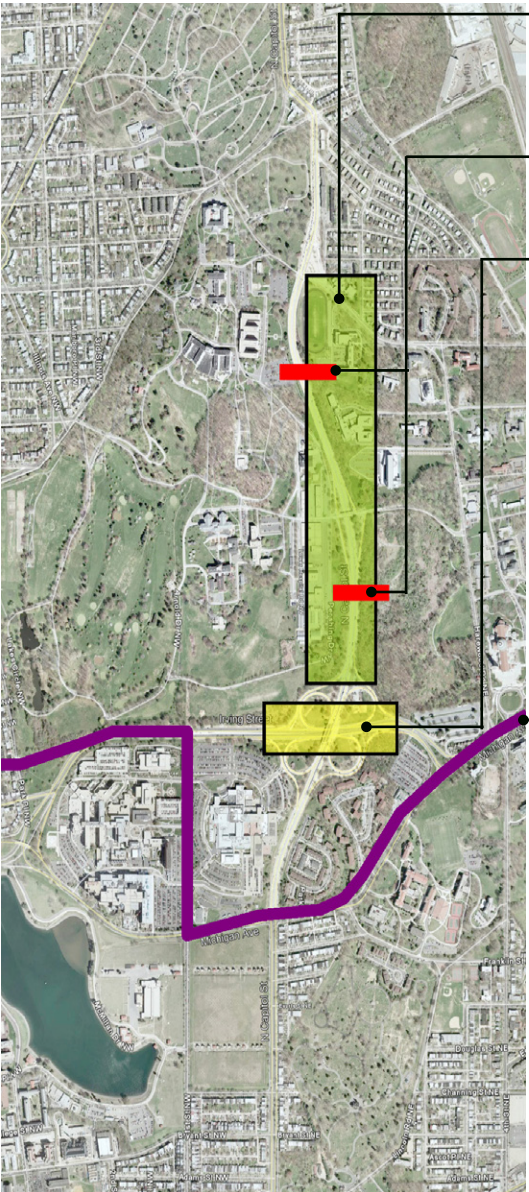


Proposed Intersection Improvements Detail

Short and Mid-Term Transportation Improvements



- Explore “Road Dieting” of Irving Street to create a bike lane connecting the neighborhoods east and west of North Capitol.
- Evaluate strategic locations, such as the hospital core, for bus stop improvements.
- Improve pedestrian functionality at the intersection of Michigan Avenue and North Capitol Street
- Implement intersection improvements for Michigan Ave./First St. NW and Michigan Ave./Irving St. NE



- Consider an off-street bike trail system along North Capitol Street from the area north of Harewood Road to Michigan Avenue.
- Install speed cameras on North Capitol Street to slow vehicles.
- Install pedestrian lighting under the North Capitol Street/Irving Street Bridge to provide a safer walking route.
- Investigate existing shuttle services and improve transit connectivity between the Brookland and Columbia Heights via Irving Street, to 1st Street through the hospital campus, and along Michigan Avenue to the east

NORTH CAPITOL STREET

CLOVERLEAF FEASIBILITY STUDY

