The SW Ecodistrict

A VISION PLAN FOR A MORE SUSTAINABLE FUTURE

National Capital Planning Commission

JANUARY 2013

National Capital Planning Commission

The National Capital Planning Commission is the federal government's central planning agency in the District of Columbia and surrounding counties in Maryland and Virginia. The Commission provides overall planning guidance for federal land and buildings in the region. It also reviews the design of federal construction projects, oversees long-range planning for future development, and monitors investment by federal agencies.

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The *SW Ecodistrict Plan* was prepared through the collaboration of the federal government and the District of Columbia.

The National Capital Planning Commission had primary responsibility for oversight of the project and ZGF Architects LLP served as the principal consultant.

Chairman's Message

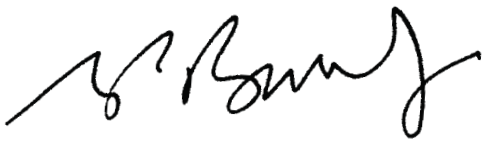
We have a compelling opportunity to revitalize a federal precinct in the heart of the nation's capital into a showcase of sustainability. In collaboration with federal and local partners, and a community of citizens, the federal government prepared a plan that significantly reduces greenhouse gas emissions, stormwater runoff, and waste, and exceeds the goals of the President's Executive Order 13514: *Federal Leadership in Environmental, Energy, and Economic, and Performance*.

The *SW Ecodistrict: A Vision Plan for a More Sustainable Future* is a roadmap for creating a highly sustainable mixed use neighborhood, national cultural destination, and downtown workplace to meet the needs of the next generation of federal workers, city residents, and visitors. It demonstrates how precinct-scale planning for environmental systems achieves significantly better outcomes than individual building-scale strategies. The *SW Ecodistrict Plan* is not only a great vision for Washington; its innovative approaches to maximize efficiency and sustainability can serve as a model to revitalize federal buildings and campuses, and cities across the nation.

The plan addresses the current and foreseeable challenges of our fiscal climate, acknowledging that we need to think beyond traditional approaches to implementation. It provides a framework for coordinating physical development and operational decisions. It fully leverages the federal government's assets to create a more efficient and sustainable work environment that will reduce operating expenses and provide returns on investment over time.

The SW Ecodistrict vision was shaped by a remarkable partnership of 17 federal and District of Columbia agencies, as well as contributions from citizens and property owners. As the chair of the SW Ecodistrict Task Force, I wish to thank these participants for their commitment and participation. In particular, I want to recognize the General Services Administration and the District of Columbia Office of Planning for their leadership in developing key components of the plan. The *SW Ecodistrict Plan* is a significant milestone in the partners' ongoing efforts to transform this area into a highly sustainable community.

Sincerely,



L. Preston Bryant, Jr.
Chairman
National Capital Planning Commission

The 15-block study area in Southwest Washington, DC is bound by Independence Avenue to the north, Maine Avenue to the south, 12th Street to the west, and 4th Street to the east. This area comprises approximately 110 acres and includes privately and publicly owned land.

Unless otherwise noted, all streets are located in Southwest Washington. The 'SW' suffix is presumed.

THE STUDY AREA

- Study Area Boundary
- Maryland Avenue Boundary
- Federal Facilities
- Smithsonian Museums
- Federal Open Space
- District Facilities
- Private Properties

1. U.S. Department of Agriculture (Whitten Building)
2. General Services Administration Central Utility Plant
3. Cotton Annex
4. U.S. Department of Energy (Forrestal Complex)
5. U.S. Postal Service
6. Federal Aviation Administration (Orville Wright Building)
7. Federal Aviation Administration (Wilbur Wright Building)
8. U.S. Department of Housing and Urban Development (Weaver Building)
9. General Services Administration (Regional Office Building)
10. U.S. Department of Education (Johnson Building)
11. Voice of America
12. U.S. Departments of Health and Human Services / Education
13. Smithsonian Castle
14. Smithsonian Institution
15. The National Mall
16. Reservation 113
17. Reservation 115
18. Proposed Eisenhower Memorial
19. Banneker Park
20. Jefferson Elementary School
21. DC Government Offices
22. DC Fire Department
23. DC Forensics Lab
24. Mandarin Oriental Hotel
25. Republic Properties
26. Potomac Center North, Inc.
27. CIM Urban Reit, LLC
28. L'Enfant Plaza Hotel
29. L'Enfant Colony, LLC
30. PN Hoffman/The Wharf
31. NBL Associates
32. Private Residential
33. Boston Properties
34. 300 7th Street, LLC
35. Constitution Center
36. St. Dominic's Church
37. Federal Center Hotel Association

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Electronic copies of this report, and additional materials, are available at www.ncpc.gov/swecodistrict.

The foundation of ecodistrict planning is that implementing and operating at a neighborhood or “district-scale” achieves greater sustainability and financial benefits than traditional building-scale strategies.

overview

The SW Ecodistrict Plan

The *SW Ecodistrict: A Vision Plan for a More Sustainable Future* is a comprehensive forward-looking approach to urban sustainability and redevelopment. In 2010, in partnership with federal and local stakeholders, the National Capital Planning Commission (NCPC), established the SW Ecodistrict Task Force to evaluate how to best transform the 10th Street and Maryland Avenue corridors in Washington, DC, into a livable and highly sustainable mixed-use community.

The *SW Ecodistrict Plan* examines how federal assets and natural resources can be used most efficiently and contribute to the economic vitality and environmental health of the city. The plan is a roadmap that recommends how to achieve these goals by using district-scale sustainable practices to integrate land use, transportation, and environmental planning with high performance buildings, landscapes, and infrastructure. Known as ecodistrict planning, this approach yields greater environmental and economic benefits than traditional building-scale strategies.

The plan recommends how to best accommodate future federal office space needs, establish new cultural destinations, and extend the civic qualities of the National Mall. It proposes expanding transportation choices and creating a new walkable neighborhood of connected parks and plazas. It introduces strategies for capturing, managing, and reusing a majority of the energy, water, and waste among multiple sites and buildings.

The plan includes neighborhood and environmental strategies; a recommended development scenario; and four focus areas that organize site-specific recommendations. Recognizing that there are existing funding constraints, the plan lays out a flexible but critical path to coordinate improvements. It identifies near-and long-term priority projects including pre-development studies necessary to move projects forward. Finally, the plan includes a governance strategy outlining the partnerships, agreements, funding, and legislative tools that can translate the SW Ecodistrict recommendations into action.

NOW IS THE TIME

The confluence of several efforts present a once in a lifetime opportunity to achieve the SW Ecodistrict. A combination of proposed development, federal planning initiatives, and market conditions are putting Southwest Washington at the cusp of change. Now is the time to leverage this momentum.

- The federal government is re-examining its property to meet aggressive sustainability targets.
- The General Services Administration (GSA) is seeking to optimize how federal space is used, to create more efficient workplaces for a modern federal workforce while reducing operating costs.
- The National Park Service (NPS) is improving its operations and the physical condition of the National Mall to sustain it as a national cultural resource.
- The Smithsonian Institution is preparing a master plan to address its future facility needs in this area.
- A multi-billion dollar private waterfront development project is planned; area property owners are investing millions to improve their land and facilities.
- Sponsors are considering the study area for future museums and memorials.
- CSX is spending millions to improve rail-based interstate commerce, while Amtrak and other transit agencies are evaluating how to accommodate the long-term needs for passenger rail service in the growing National Capital Region.

COSTS AND BENEFITS

A high-level economic analysis was prepared to understand and guide the public and private investments necessary to fulfill the SW Ecodistrict vision over a 20-year planning horizon. The *SW Ecodistrict Plan* recommendations will result in measurable and intangible economic, social, and environmental benefits for the federal government, the District of Columbia, property owners, and the American tax payer. These benefits will likely exceed the costs associated with sustainable building, utility infrastructure, and public space improvements, and the investments necessary to expand public-private partnership development opportunities.

Key benefits of the *SW Ecodistrict Plan* include:

- Maximizing efficient use of federal facilities, land, and infrastructure;
- Reducing the federal government's operating costs;
- Increasing savings by moving the federal government out of leased space;
- Increasing land values and land sale revenues;
- Increasing the District's revenue from property, employment, and sales taxes;
- Increasing the net operating income of private development; and
- Conserving natural resources and reducing greenhouse gas emissions.

Important benefits more difficult to quantify include:

- Increasing federal work force efficiency and attracting the next generation of workers;
- Identifying locations for future national museums and memorials;
- Protecting the historic landscape of the National Mall; and
- Improving air and water quality.

PARTNERSHIPS

The plan's focus on public-private partnerships recognizes that economic conditions and competing priorities limit the availability of appropriated federal funds to implement the SW Ecodistrict vision. These partnerships are important because the individual and collective benefits to the federal government, the District of Columbia, and private stakeholders are substantial.

The GSA and the NPS have the authority to establish partnerships to carry out many of the plan recommendations. A few recommendations may require executive or legislative authorization, such as allowing the existing central utility plant to serve nearby private development.

A ROADMAP TO SUSTAINABILITY

The *SW Ecodistrict Plan* is a 20-year roadmap to seize existing momentum and bring together federal, District, and private sectors to redevelop the study area into a fully functioning and model ecodistrict. The plan is flexible, not prescriptive; it should inform planning, guide design decisions, and help identify complex land use, transportation, and infrastructure improvements that require coordination among the area's various stakeholders. The plan should be used to ensure that near-term actions do not preclude implementation of longer-term recommendations. Such an approach can benefit all stakeholders because the value of the whole is greater than the sum of its individual parts.

The recommended ecodistrict projects are designed to be prioritized and carried out over time as federal agencies' missions and space needs change; as funds are available and align with public (federal and local) and private investment priorities; and when the rate of return on investment makes economic sense. The plan contains near-term initiatives that can be achieved in the next few years, while others will require a longer period of time. Projects will require detailed planning and evaluation to comply with a host of federal and local policies and laws. Individually, each recommendation addresses important issues to incrementally realize the SW Ecodistrict vision; collectively, they are transformative.

The Vision

THE SW ECODISTRICT VISION TRANSFORMS THE 10TH STREET AND MARYLAND AVENUE CORRIDORS INTO A LIVABLE AND HIGHLY SUSTAINABLE COMMUNITY THAT IS:

- A revitalized neighborhood and cultural destination;
- A well-connected neighborhood;
- A high performance environmental showcase;
- A successful economic partnership.

Existing view of 10th Street looking north.

ICON KEY

Solar PV

LED light

Flow through planter

Green roof

Solar shade

Green wall

Greywater irrigation

Train

THE SW ECODISTRICT WILL BE A REVITALIZED COMMUNITY AND CULTURAL DESTINATION

10th Street will become a green, mixed-use corridor that infuses the civic qualities of the National Mall and the vitality of the city into this important area in the monumental core. It will serve as the spine of the district water and energy systems, showcasing the ecodistrict's commitment to sustainability.

Existing view of the VRE L'Enfant Station platform and CSX Railway.

THE SW ECODISTRICT WILL BE A WELL-CONNECTED COMMUNITY

An expanded L'Enfant Station will become an intermodal hub, a nexus of commuter rail, Metro, streetcar, and bus service accommodating increasing demand for public transit. The new station will exemplify a commitment to sustainability, integrating a solar canopy to collect energy and impervious surfaces to manage stormwater. A complete and continuous network of sidewalks, bicycle lanes, streets, and transit services will connect the ecodistrict with other points in Washington and the National Capital Region.

Existing view from Reservation 113 toward the U.S. Capitol.

ICON KEY

- Stormwater collection
- LED light
- Flow through planter
- Green roof
- Bikeshare
- Green wall
- Greywater irrigation
- Metro

THE SW ECODISTRICT WILL BE A HIGH PERFORMANCE ENVIRONMENTAL SHOWCASE

Reservation 113, located along a newly established Maryland Avenue, will serve as the primary park for the new neighborhood, offering flexible space for national and local purposes at the nexus of an important intermodal hub. More than a broad expanse of beautiful lawn, walks, and trees, the park will capture stormwater for reuse and include native vegetation and green walls to provide habitat and nature within the city.

Existing view toward Banneker Park from Maine Avenue and 7th Street.

THE SW ECODISTRICT WILL BE LED BY ECONOMICALLY SUCCESSFUL PARTNERSHIPS

Banneker Park will become a civic gateway to the National Mall from Maine Avenue and The Wharf, an adjacent private waterfront development project. The improved park, new cultural facilities, and adjacent private development located atop the Southwest Freeway are examples of the recommended public-private partnerships and intergovernmental cooperation critical to achieving the SW Ecodistrict vision.

The Path to Sustainability

The development scenario is based on the plan's area-wide neighborhood and environmental framework strategies and site-specific recommendations that best achieve the SW Ecodistrict vision. It seeks to improve the efficiency of federal ownership of land and buildings and retain federal agencies in the District of Columbia in locations appropriate to their missions, while integrating a mix of service, hotel, and residential uses.

The neighborhood and environmental frameworks guide the development scenario's land use, transportation, open space and cultural connections, overall character, and energy, water, and waste systems. District-scale and building-scale strategies are incorporated to reduce energy and water use, create energy from renewable sources, improve stormwater management, and increase connectivity. The district-scale approach will achieve greater results and efficiencies than individual improvements site by site.

The development scenario incorporates multiple needed strategies, including rehabilitating, repurposing, infilling with new development, and redeveloping federal buildings to inform the overall development pattern. The scenario:

- Maximizes the use of federal land and buildings;
- Increases development by approximately five million sq. ft.;
- Increases the mix of uses;
- Improves walkability: and
- Reduces the federal government's operating costs and contributes to the city's economy.

To revitalize the area, lightly rehabilitated buildings will be repurposed or redeveloped over time.

MULTIPLE SITE AND BUILDING STRATEGIES WILL LEAD TO REVITALIZATION

EXISTING

REHABILITATION

REPURPOSE

INFILL & REDEVELOPMENT

DEVELOPMENT SUMMARY

	Gross Sq. Ft.
Existing - Full and Light Rehab*	10.8 Million
Repurpose	+ 600,000-1 Million
Redevelopment	+3.0 Million
Infill	+ 2.2 Million
Potential Development Scenario*	= 14.7-15.1 Million

* Since lightly rehabbed buildings will be repurposed or developed, the potential total is not cumulative.

Rehabilitation - Full
Rehabilitation - Light

Full Rehabilitation - Buildings that will remain permanently will be fully rehabilitated by upgrading windows, building skin envelopes, and mechanical systems.

Light Rehabilitation - Buildings that may be repurposed or redeveloped will be lightly rehabilitated in the near-term by improving lighting and water fixtures to reduce energy and water use.

Repurpose

Repurpose - Some existing buildings may be repurposed. Repurposing involves fully rehabilitating the building and changing the building's use. It may also involve adding height and increasing the building footprint and potentially changing the building's ownership.

Redevelopment
Infill

Infill - Infill development will occur on existing sites that are vacant or have small, under-utilized buildings.

Redevelopment - Some existing buildings or sites that are inefficient may be demolished and redeveloped.

The Development Scenario

The Development Scenario

The development scenario can be achieved over time as federal space needs change, as buildings are modernized, or as opportunities arise to leverage federal, local, and private funds. Collectively, the rehabilitation, repurpose, infill, and redevelopment recommendations will transform the study area into a high performance neighborhood and create better land use, transportation, environmental, and economic outcomes.

NEIGHBORHOOD FRAMEWORK

LAND USE

The area will maintain secure federal office space while increasing development density and providing the range of uses expected within a vibrant urban neighborhood. New development will accommodate cultural, educational, residential, retail, and hotel activity.

PUBLIC SPACE

The neighborhood will become a national cultural destination by extending the civic qualities of the National Mall. It will provide a distinguished setting for future national museums and memorials, places for public gatherings, and neighborhood activities.

TRANSPORTATION

New development will break-up oversized superblocks and re-establish the street grid. The area will have a complete and continuous network of sidewalks, bicycle lanes, streets, and transit services ensuring mobility to, from, and within the area for all modes of travel. Maryland Avenue will be established as an urban boulevard and an expanded intermodal station will become the nexus of regional rail, Metro, streetcar, and bus services.

ENVIRONMENTAL FRAMEWORK

DISTRICT ENERGY SYSTEM

Both public and private buildings will be served by a district energy system that relies on the existing central utility plant and future micro-grids. Buildings will be rehabilitated or redeveloped to increase energy efficiency. Renewable energy will be produced onsite and distributed throughout the area.

DISTRICT WATER SYSTEM

All stormwater will be captured, cleaned, and held in cisterns located beneath 10th Street until needed for the area's non-potable water uses such as toilets, mechanical systems, and for irrigation of the area's green streets and public spaces.

WASTE

Recycling and composting programs within each building will significantly divert waste from the landfill.

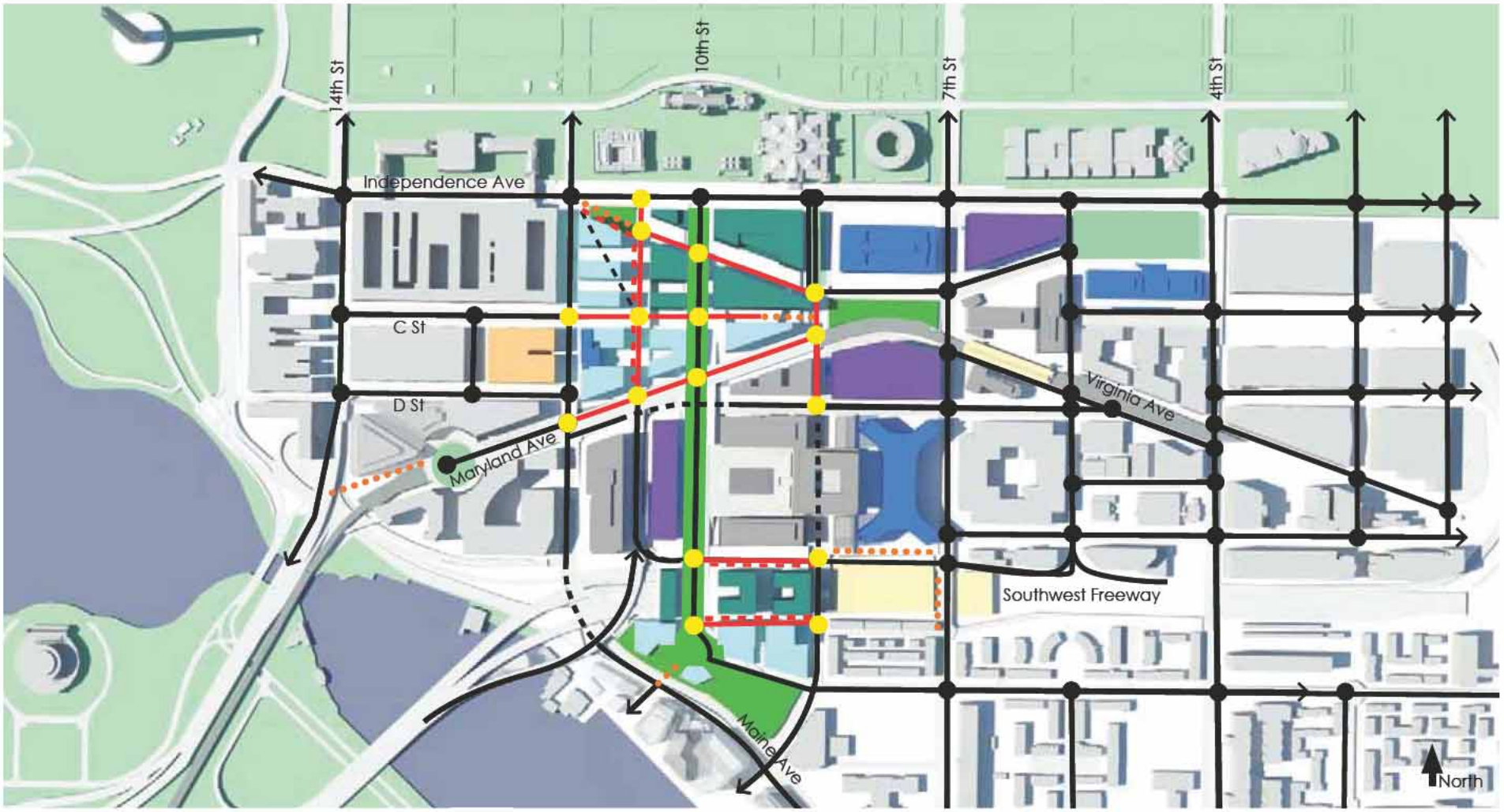
GREEN INFRASTRUCTURE

Green roofs, new parks, bioswales, and streetscapes will reduce the urban heat island effect, provide pedestrian comfort, and enrich community life. This system will provide connected habitat corridors to the Washington Channel and improve the neighborhood's overall visual character.

ECONOMIC VITALITY

Leveraging public and private investments will maximize benefits and provide a template for reuse of federal properties. These investments will ensure that federal operations and missions are maintained while offering private sector land and development opportunities.

Summary Plan



- Redevelop
- Infill
- Repurpose
- Full Rehabilitation
- Central Utility Plant
- Solar
- Pedestrian Connection
- Proposed Street & Sidewalk
- Proposed Tunnel
- Existing Street & Sidewalk
- Existing Tunnel
- Existing Intersection
- Proposed Intersection
- Proposed Park
- Existing Park
- Private Buildings (in Study Area)

Focus Areas

The development scenario comprises four focus areas as a way to organize the plan's recommendations into building, site, infrastructure, street, and public space categories. Each focus area's recommendations identify opportunities to leverage investments, link critical and functional project components, and address unique and pragmatic near-and long-term phasing conditions. Individually the recommendations address important issues; collectively they are transformative in achieving the SW Ecodistrict vision.

INDEPENDENCE QUARTER

A mixed-use community anchored by a national museum and a new headquarters for the U.S. Department of Energy.

MARYLAND AVENUE AND 7TH STREET CORRIDORS

An urban boulevard centered on a signature park and an expanded L'Enfant Station intermodal center.

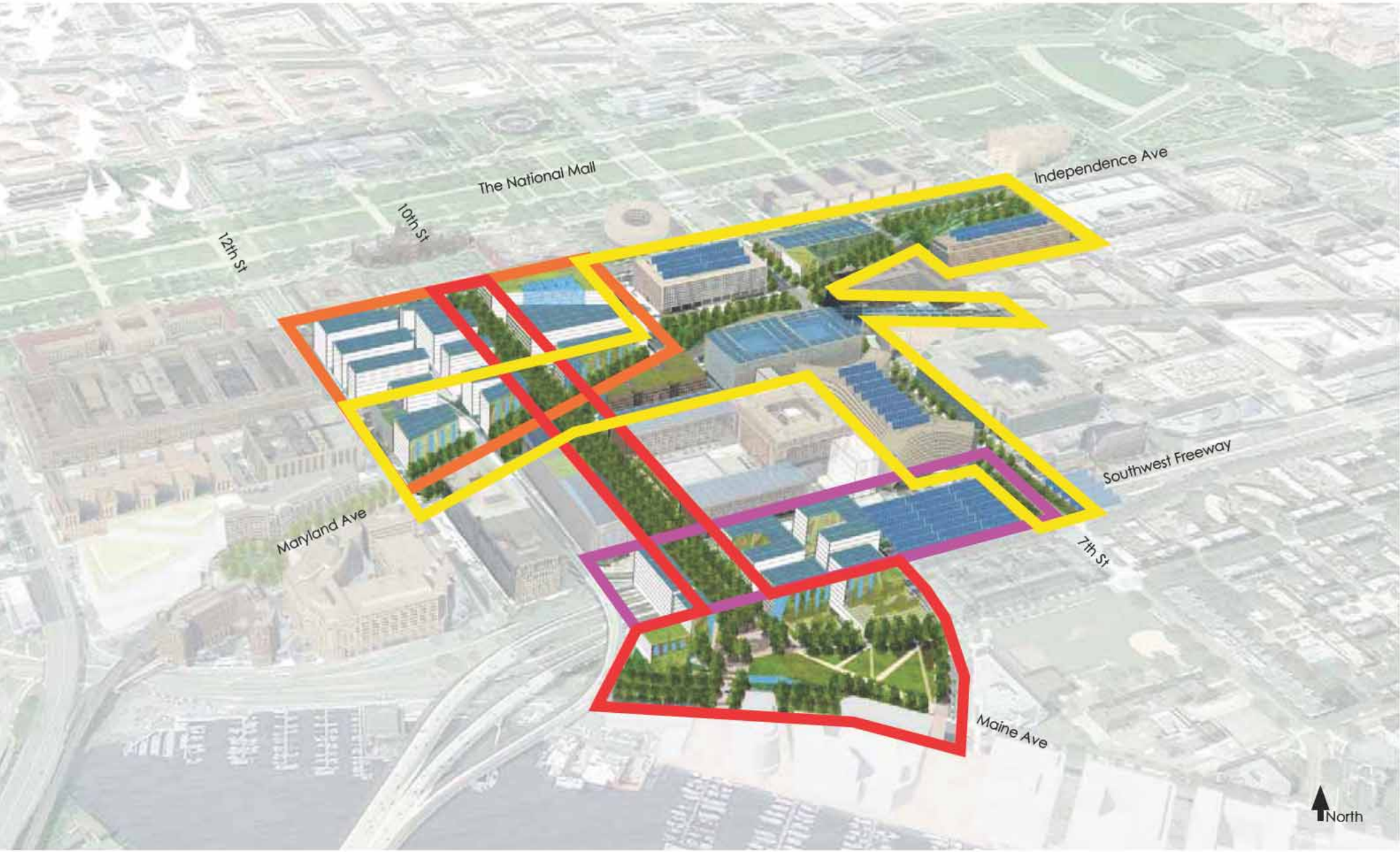
10TH STREET CORRIDOR AND BANNEKER PARK

An inviting civic corridor connecting the National Mall and Smithsonian Museums to the southwest waterfront, anchored by an improved Banneker Park, a nationally significant cultural destination.

SOUTHWEST FREEWAY

A private mixed-use development atop the Southwest Freeway will support new connections between existing Southwest neighborhoods, the SW Ecodistrict, and the National Mall.

Focus Areas


The National Mall
Independence Ave
12th St
10th St
Southwest Freeway
Maryland Ave
7th St
Maine Ave
North

Measuring Success

The development scenario illustrates how an integrated framework of sustainable neighborhood and environmental strategies can achieve the SW Ecodistrict goals. Success will be measured by an increase in neighborhood vitality coupled with a reduction in resource use per capita.

A COMPARISON OF THE STUDY AREA TODAY AND IN 2030

DAILY POPULATION	NEW PEAK HOUR TRIPS	MIXED USE DEVELOPMENT	ENERGY USE	POTABLE WATER USE	WASTE TO LANDFILL	CARBON
33% INCREASE (Employees and res dents)	7% INCREASE (New Metro and auto trips)	21% INCREASE (In GSF, including new residential, hotel, cultural, and commercial)	62% REDUCTION	70% REDUCTION	80% REDUCTION	75% REDUCTION

NEIGHBORHOOD DEVELOPMENT RESULTS

- Retains, reconfigures, or improves efficiency of **7.9** million sq. ft. of federal office space that will accommodate up to **19,000** additional employees than currently work in the area.
- Creates an additional **1.0** million sq. ft. of office space for either private or federal office purposes that will accommodate an additional **5,000-6,000** workers.
- Creates **1.8** million sq. ft. of residential and hotel space for up to **1,200** residences and **600** hotel rooms that will accommodate **1,500** new residents and a total of **246,000** visitors per year.
- Accommodates at least **100,000** sq. ft. of community-serving retail.
- Establishes **4 TO 5** sites for up to **1.2** million sq. ft. of cultural development.
- Creates **14.3** acres of new or improved parks and plazas and establishes up to **5** sites for commemorative works.
- Reconnects the street grid and create **16** new intersections for easy accessibility.
- **EXPANDS** the rail corridor and the L'Enfant Station to **INCREASE** commuter **TRANSIT CAPACITY.**
- Establishes a **GRAND CONNECTION** between the National Mall and the southwest waterfront.

ENVIRONMENTAL RESULTS

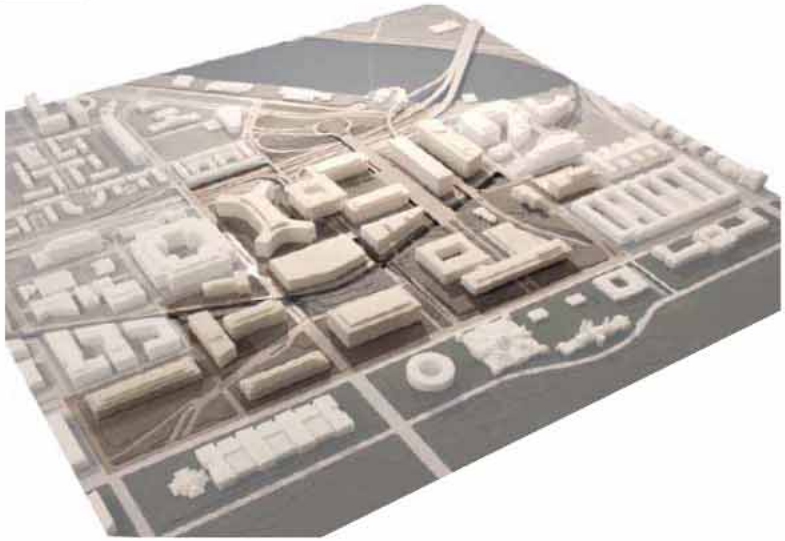
- Demonstrates that district-scale strategies yield greater results.
- Reduces the area's greenhouse gas emissions by **51%.**
- Allows for the capture and reuse of **ALL** the rainwater in the ecodistrict throughout the year.
- Reduces potable water use by **70%.**
- Increases the amount of waste diverted from the landfill **FROM 35% TO 80%.**
- Transforms the federally-owned central utility plant into a **HIGHLY EFFICIENT** and **FINANCIALLY SUCCESSFUL** energy model.
- Contributes to **CLEANER RIVERS** and **IMPROVED WATER QUALITY.**

ECONOMIC RESULTS

- **REDUCES** federal operating and maintenance **EXPENSES.**
- **REDUCES** federal lease **EXPENSES.**
- **GENERATES NEW TAX REVENUE** for the District of Columbia.

The SW Ecodistrict in 2030

Development Scenario



(Top image)
Existing Conditions
Study Model (2012).

(Right image) Recommended
Development Scenario Study
Model (2030).

1

The Context

BACKGROUND

The *SW Ecodistrict Plan* is the outgrowth of various planning activities and related initiatives spearheaded by the National Capital Planning Commission (NCPC). In 1997, NCPC's Legacy Plan outlined a vision to guide development of Washington's monumental core and suggested that federal development serve as a catalyst for enlivening the city. In 2009, in partnership with the U.S. Commission of Fine Arts and consultation with the District of Columbia, NCPC prepared the *Monumental Core Framework Plan* which focused on how to improve the federally dominated precincts surrounding the National Mall, including the area now identified as the SW Ecodistrict.

Additional guidance from the national and local levels informed development of the *SW Ecodistrict Plan*. In 2009, President Obama signed Executive Order 13514, "Federal Leadership in Environmental, Energy and Economic Performance" (E.O. 13514), making the reduction of greenhouse gas emissions a priority for the federal government. In 2012, District Mayor Vincent Gray released "A Vision for a Sustainable DC," a community-designed plan which calls for transforming the District of Columbia into the "greenest, healthiest, and most livable city in the nation."

(Top image) Expansive building setbacks, obstructed views, and a lack of vegetation and pedestrian amenities discourage pedestrian activity along 10th Street.

(Lower image) The railway in the Maryland Avenue right-of-way disrupts the street grid, causing a physical barrier between downtown Washington and the southwest waterfront.

(Top image) May 2011 Task Force/Working Group workshop
(Left image) February 2011 public meeting
(Above image) July 2011 community meeting

THE STUDY AREA

Located immediately south of the National Mall, the 110-acre SW Ecodistrict is bounded by Independence Avenue to the north, Maine Avenue to the south, 12th Street to the west, and 4th Street to the east. The 15-block study area includes eight federal buildings, eight private buildings, and three federal parks. Approximately 56 percent of the land is federally owned, 26 percent is private, and about 18 percent is devoted to streets, freeways, and rail lines under the jurisdiction of either the District of Columbia, the Federal Highway Administration, or the CSX Corporation.

Originally established to support the adjacent waterfront and military arsenal at Fort McNair, the working-class community was the nation's most ambitious Urban Renewal Program following World War II. To make way for this modern development, the community was physically razed and its residents and businesses displaced. The construction of the Southwest Freeway physically separated the neighborhood's residential and office uses. North of the freeway, the predominately federal office precinct remains characterized by oversized superblocks, single-use office buildings, large setbacks, and limited ground floor activity. Buildings and public spaces are designed in the late Modern International style. Tenth Street, later renamed L'Enfant Promenade, became the area's central spine. Extending between the Smithsonian Castle and a circular park overlooking the Washington Channel, the imposing and elevated street crosses an active railroad and freeway. Its design creates a labyrinth of elevated streets, ramps, and stairs that make any form of navigation difficult. The streetscape is oversized and barren with little vegetation and minimal amenities.

The form of the study area's existing buildings, segregated land uses, infrastructure, and condition of the public realm create barriers separating it from the surrounding city. The result is a large, prominent area of the nation's capital that feels isolated and undesirable for improvement and investment.

DEVELOPING THE PLAN

The SW Ecodistrict Initiative is led by NCPC in coordination with the District Office of Planning (DCOP), and is guided by the SW Ecodistrict Task Force, comprised of 17 federal and local agencies (see page 98). The Task Force first convened in spring 2010, and worked together to set goals and develop recommendations for the area. A staff-level working group provided technical support. NCPC had primary responsibility for oversight of ZGF Architects LLP, the project's principal consultant.

An important component of the *SW Ecodistrict Plan* is the *Maryland Avenue SW, Small Area Plan* prepared by the DCOP in consultation with an advisory committee of private property owners and transit and rail operators. Completed in the summer of 2012, the plan addresses how best to reconstruct Maryland Avenue to support a diverse array of land uses and improved public spaces.

Several methods were used to solicit input during preparation of both the *SW Ecodistrict Plan* and the *Maryland Avenue, SW Small Area Plan*. The SW Ecodistrict Task Force and Working Group held a total of 17 meetings. The Maryland Avenue, SW Advisory Committee held four meetings. Seven public meetings designed to obtain citizen input were hosted independently or jointly by NCPC and DCOP. Throughout the process, comments were collected via a District-initiated on-site user survey, an online public comment forum hosted by NCPC, a live chat with the Washington City Paper, and by community blogs.

THE SW ECODISTRICT WILL BE A REVITALIZED COMMUNITY AND CULTURAL DESTINATION

2

The Neighborhood Framework

INTRODUCTION

Washington embraces its dual role as the nation's capital and as a hometown. Its defining character is established by a diversity of cultural venues, distinguished architecture, broad open spaces, an extensive public transit system, and unique neighborhoods. Precedent planning initiatives including The National Capital Planning Commission's (NCPC) Legacy Plan and *Monumental Core Framework Plan* and the District of Columbia's *Center City Action Agenda* envision a capital city with a thriving downtown centered on the National Mall. These plans call for preserving the civic and ceremonial heart of the nation's capital while promoting mixed-use, walkable neighborhoods and work centers. This expanded definition of Washington's downtown looks to overcome the traditional physical and psychological boundaries between the federal and local city.

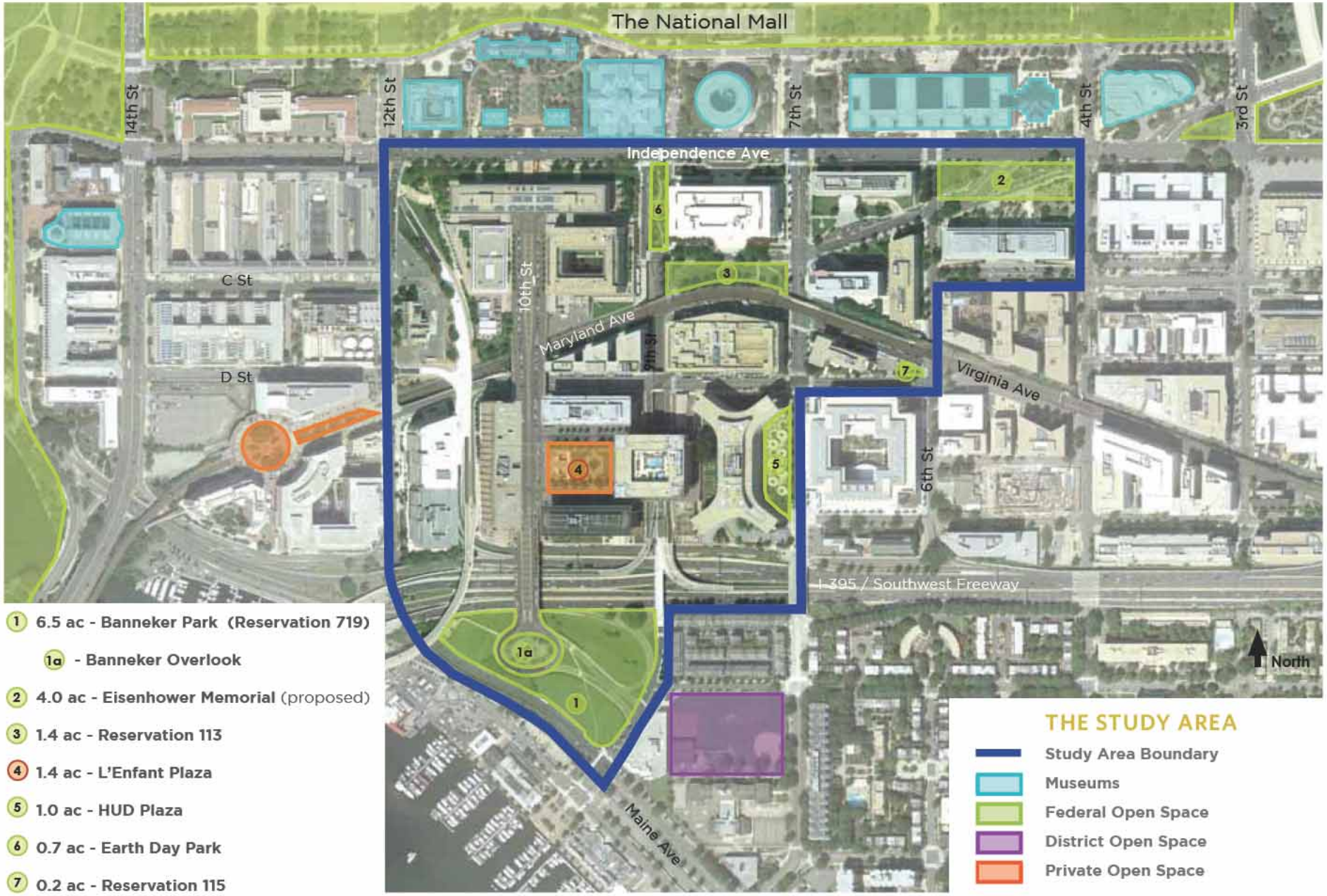
The federal and local governments share aspirations to advance Washington, DC, yet each has distinct missions and interests. The federal government is responsible for using federal lands, facilities, and resources efficiently; providing secure, quality workplaces; recruiting and retaining a talented workforce; and preserving and providing areas for national gatherings and expression, as well as places to honor our country's heritage and heroes. The District is responsible for developing an economically sound, livable, and inclusive city. In the center city, the District and private sector are creating walkable, engaging, and distinctive places to live, work, and shop. Important to all, mobility is the backbone of an efficient government and a livable city. Varied and flexible modes of transport contribute to well-functioning operations, affordability, convenient living, and economic and social vitality.

The Neighborhood Framework provides objectives and strategies for three areas to transform the study area into a revitalized and connected community.

- **Civic Realm** strategies enhance and create a variety of public spaces, establishing attractive settings for future cultural destinations and neighborhood activities.
- **Land Use** strategies accommodate existing federal office space and promote new residential, retail, and cultural uses.
- **Mobility** strategies build on the existing road, rail, and bus infrastructure to enhance transit capacity, improve bike and pedestrian systems, and better connect all modes of travel. These strategies re-establish and improve existing rights-of-way to promote active, walkable streets and provide connections throughout the study area and between the National Mall and the Southwest neighborhoods.

The Neighborhood Framework builds on the SW Ecodistrict goals and federal and District precedent plans and responds to existing conditions and planned projects in and near the study area. Together with the Environmental Framework described in Chapter 3, these strategies inform the development scenario laid out in Chapter 4, and propose a path to a sustainable, well-connected and thriving neighborhood. These strategies should be used to guide future planning, design, and development decisions.

Civic Realm



1. 6.5 ac - Banneker Park (Reservation 719)
   - 1a - Banneker Overlook
2. 4.0 ac - Eisenhower Memorial (proposed)
3. 1.4 ac - Reservation 113
4. 1.4 ac - L'Enfant Plaza
5. 1.0 ac - HUD Plaza
6. 0.7 ac - Earth Day Park
7. 0.2 ac - Reservation 115

THE IMPORTANCE OF THE CIVIC REALM

Washington's network of open spaces and cultural institutions are defining features of the nation's capital that embody our country's democratic ideals of freedom and openness. To extend the civic qualities of the National Mall and the Smithsonian museums and gardens into the study area, it is important to provide a variety of connected public spaces and locations for new cultural and educational destinations. These spaces and facilities should offer interesting and stimulating places for personal enrichment, accommodate large gatherings, support national events, and provide opportunities for daily interaction and relaxation. It is important to locate, configure and design these spaces and buildings to strengthen the relationship between them, and respect their civic character.

THE AREA TODAY

OPEN SPACE AND CULTURAL FACILITIES

Although directly adjacent to the National Mall and several of the Smithsonian Institution's most visited facilities, the plaque celebrating Benjamin Banneker is the only cultural or educational feature within the study area. Although 10th Street was designed to be an iconic pedestrian promenade, it and the surrounding network of public space are disjointed and ill-defined. Existing public space includes building yards, setbacks, plazas, and parks, comprising about 14.3 acres. Within the area, three public spaces are identified in NCPC's *Memorials and Museums Master Plan* as "prime candidate" sites for future nationally significant memorials or museums. One site is located at the intersection of Independence and Maryland Avenues, and is authorized as the future location of the proposed Dwight D. Eisenhower National Memorial. The other two sites are Banneker Park and Reservation 113.

THE CASE FOR GREAT PUBLIC PARKS

Streetscape and open space improvements can increase property values, boost rents, and create a setting attractive to future cultural, residential, and commercial uses.

Case studies show that signature parks in close proximity to development can increase property values between 15-50 percent. Enhancements to Manhattan's Bryant Park increased adjacent property values by 50 percent. Creation of Chicago's Millennium Park boosted nearby property values by 25 percent. In Philadelphia development within 2,000 feet of its enhanced park system increased rent premiums by 15 percent.

Bryant Park, New York City

Millenium Park, Chicago

PUBLIC SPACE AND CULTURAL FACILITIES

To establish the SW Ecodistrict as a livable community and national cultural destination, the area's civic realm must be enhanced by creating and linking a network of high quality, diverse public spaces between the National Mall and the southwest waterfront.

OBJECTIVES

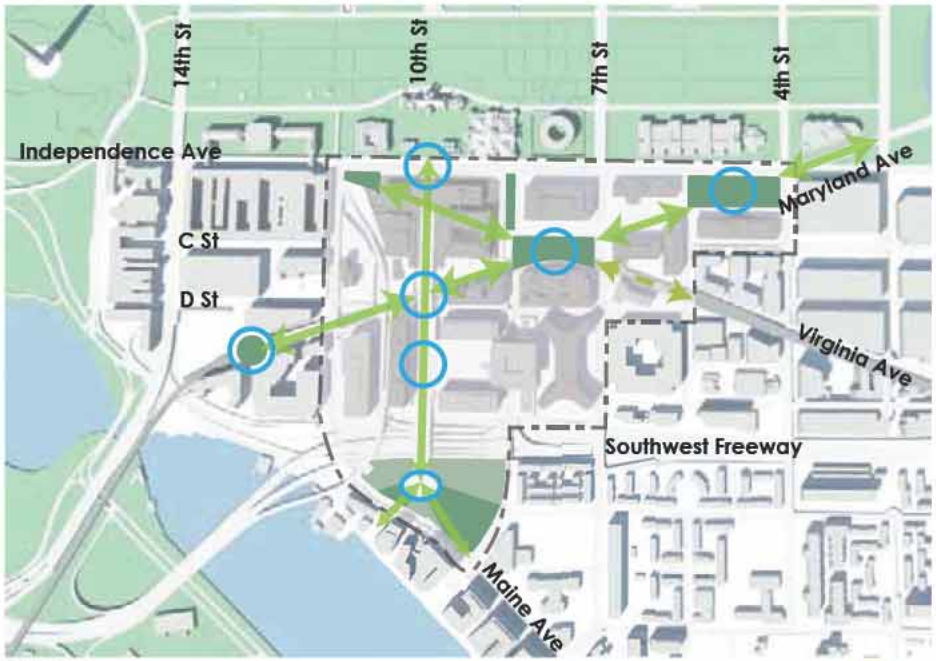
- Dedicate the most important sites for museums, memorials, or other civic institutions of national importance.
- Restore L'Enfant Plan squares, streets, and avenues to reclaim the street grid and open space network.
- Establish an interconnected open space network of multi-purpose public spaces.
- Create distinctive settings for new and redeveloped parks, plazas, and civic sites.
- Enhance visual and symbolic linkages and programmatic relationships among prominent buildings, icons, and public spaces.

DESIGN STRATEGIES

- Use the city's physical framework of major axial views, street grid, prominent termini, reservations, and scenic overlooks to site cultural facilities.
- Use reciprocal views along corridors to create focal points that establish symbolic connections to extend the civic character of the National Mall into the study area.
- Design buildings and landscape elements to define public spaces, frame vistas, establish pedestrian orientation, and encourage ordered movement through the study area.
- Enhance avenues, streets, and public spaces with fountains, public art, landscape features, and other pedestrian amenities.
- Improve street tree canopy to strengthen axial views and extend the park-like character of the National Mall into the study area.
- Design parks and plazas to be accessible, safe, inviting, and flexible for year-round recreation and activity.
- Orient building entrances and plazas to create usable and engaging places for pedestrians.
- Harden the structural and architectural features of buildings to limit perimeter security in the public space or building yards;
- Minimize perimeter security and make it indistinguishable from the landscape.

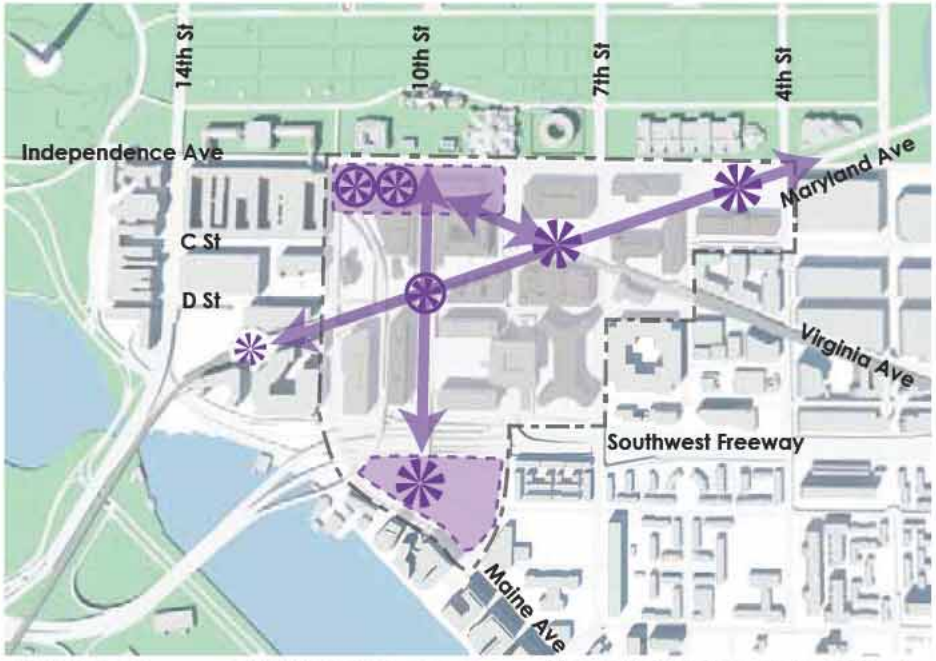
The SW Ecodistrict will have an interconnected open space network.

CIVIC REALM FRAMEWORK



PUBLIC SPACES

Park Space
Green Link
Green Transit Stop
Activity Node



CULTURAL FACILITIES

Cultural Zone
Civic Corridor
Memorials & Museums (2M) Prime Candidate Site
2M Candidate Site
New Prime Candidate Site

PARK SPACES

› Provide a walkable, connected network of parks and plazas to support a variety of experiences: some passive and restorative, some commemorative, and others active and engaging.

GREEN TRANSIT STOP

› Use innovative sustainable practices at the expanded VRE L'Enfant Station to manage stormwater and generate electricity.

GREEN LINK

› Design 10th Street as a park-like boulevard that extends the civic qualities of the National Mall to the waterfront and establishes Maryland Avenue as a green boulevard that strengthens the linkage to the U.S. Capitol. Restore Virginia Avenue to link important civic sites and visually connect the study area to the National Mall.

ACTIVITY NODE

› Use architectural and landscape features to establish activity nodes and to support a variety of activities for formal and casual public congregation.

CULTURAL ZONE

› Concentrate cultural uses in locations that reinforce axial and symbolic relationships among existing and proposed civic places.

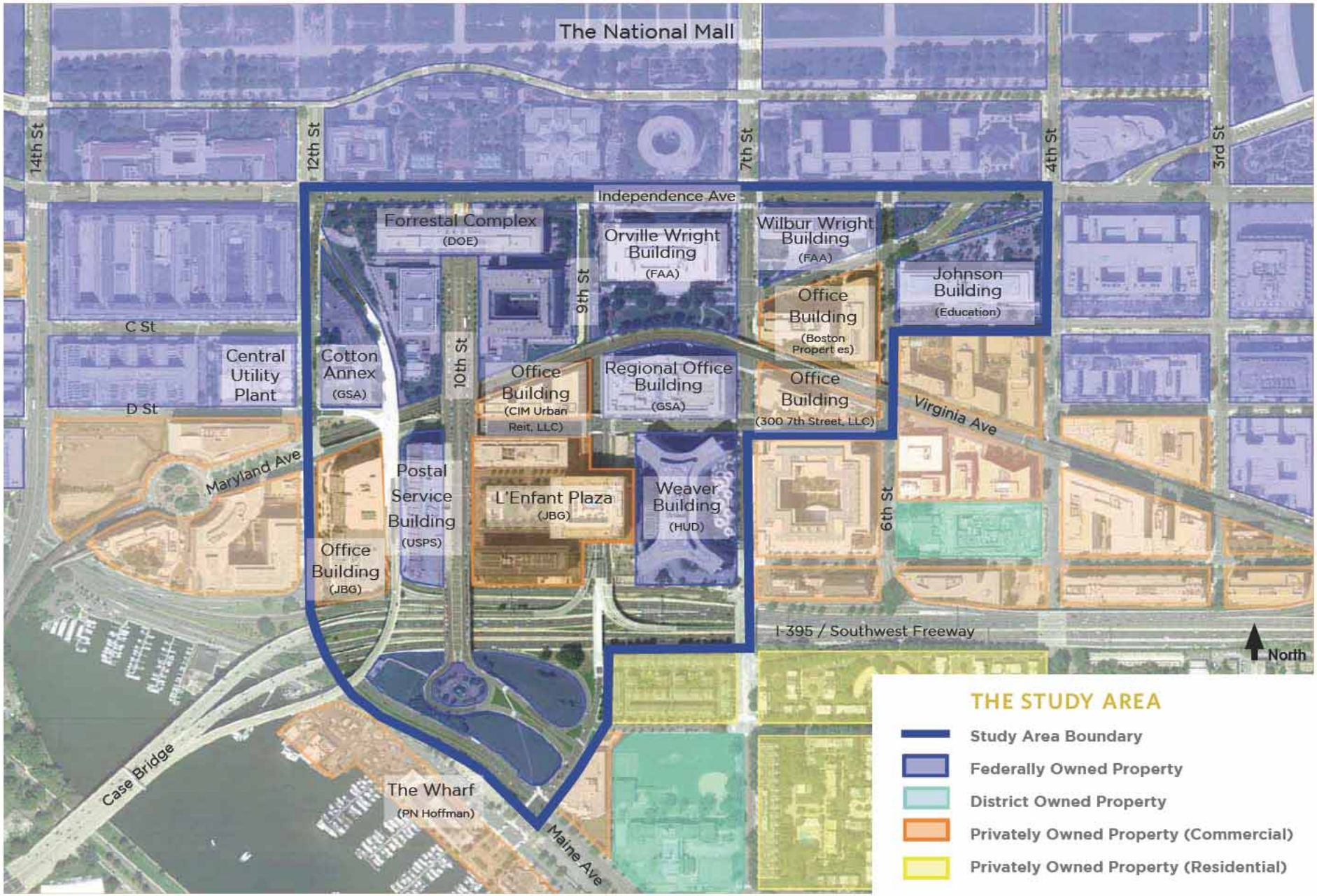
CIVIC CORRIDORS

› Restore historic view corridors and establish walkable and memorable public spaces that reflect a civic quality befitting the nation's capital to strengthen the relationship between new and existing public buildings, museums, memorials, and public spaces.

CULTURAL ANCHORS

› Site new museums, memorials, and civic institutions on axis with, or in proximity to, symbolically important public buildings and places.

Land Use Today



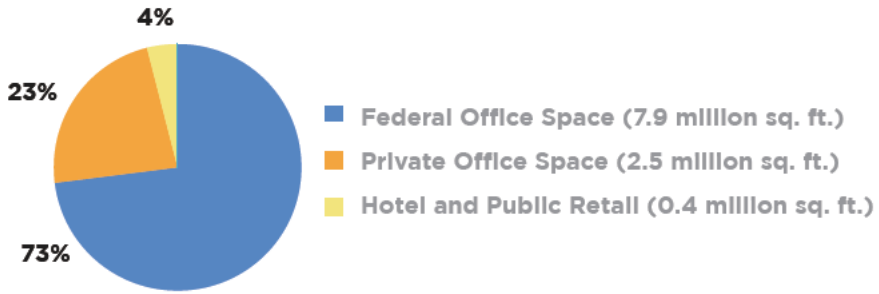
LAND USE

Economic vitality and resiliency is important for the fiscal health of the citizenry and its government. While the concentration of federal agencies is a foundation of Washington's economy and is important to government efficiency, a compact transit-oriented mix of uses is paramount for creating a livable and sustainable urban community within the study area. To blur the boundaries between the federal and local city, it is important to balance the mix of uses to reinforce the monumental core's civic nature while infusing diverse activities to stimulate economic vitality.

THE AREA TODAY

Superblocks filled with single-use office buildings dominate the area. A labyrinth of building entrances, streets, freeway ramps and stairs are the result of a tangled network of elevated viaducts crossing active rail and roadways. An expansive yet poorly defined public realm offers few pedestrian amenities, make walking difficult, uninviting, and generally unpleasant. The form of the buildings, related infrastructure, and inferior public realm contribute to the inefficient use of land and resources.

The study area supports approximately 10.8 million sq. ft. of development. Of this amount, 7.9 million sq. ft. houses five federal agency headquarters and ancillary offices, while the remaining 2.9 million sq. ft. is privately owned and primarily leased to the federal government. More than 32,000 employees work in the study area. Many of the buildings provide below-grade parking, cafeterias, convenience retail and other amenities only available to employees. There is one hotel, and nearly all of the publicly accessible retail is buried within buildings or located in underground shopping concourses.



MARKET STUDY: POTENTIAL BASELINE DEVELOPMENT PROGRAM

In 2011, the DC Office of Planning (DCOP) prepared a market study and survey to identify a potential real estate development program for the study area. The study evaluated demographics trends; the residential, office, hotel, and retail markets; and the projected development pipeline citywide. This study provided the assumptions used to model and identify the baseline land use mix and considerations necessary to inform and analyze the environmental and economic performance of the proposed development scenario.

Land Use	Baseline Assumptions	Considerations
Residential	1,000 minimum residential units to establish neighborhood identity and support ancillary retail	• Current citywide projects planned or in the construction pipeline will likely limit residential demand in this area until 2020. • A well"connected, attractive streetscape and park amenities will be required to attract new residential development to this area. • Density bonuses and housing credits willhelp to incentivize and improvefinancial feasibility.
Hotel	600 hotel units	• In addition to planned hotels in the pipeline, 300 rooms can be absorbed by 2020; an additional 300 can be absorbed by 2030. • Hotels are more feasible than residential in the near term; hotels will contribute to use mix until residential demand can be absorbed
Office	2 million sq. ft.	• Due to center city location, office will likely be absorbed.
Retail	100,000 sq. ft. retail can be absorbed today	• New residential and hotel development will generate demand for retail. • Successful retail will require limiting the number and size of internal employee-only federal cafeterias and convenience services. • Residents, workers, and visitors surveyed desire places to eat and shop.
Cultural	1 million sq. ft. of public or private museums, memorials, or other civic institutions.	• Demand based on private sponsorship. • Trends indicate one new museum every 10 years, one new memorial every one year. (This suggests one to three new museums and more than a dozen memorial sites in the monumental core by 2025.) • Four sites in the study area are called out in NCPC's 2001 Memorials and Museums Master Plan for future commemorative works and cultural facilities.

FEDERAL FACILITIES: WORKPLACE, CAFETERIAS, AND SECURITY

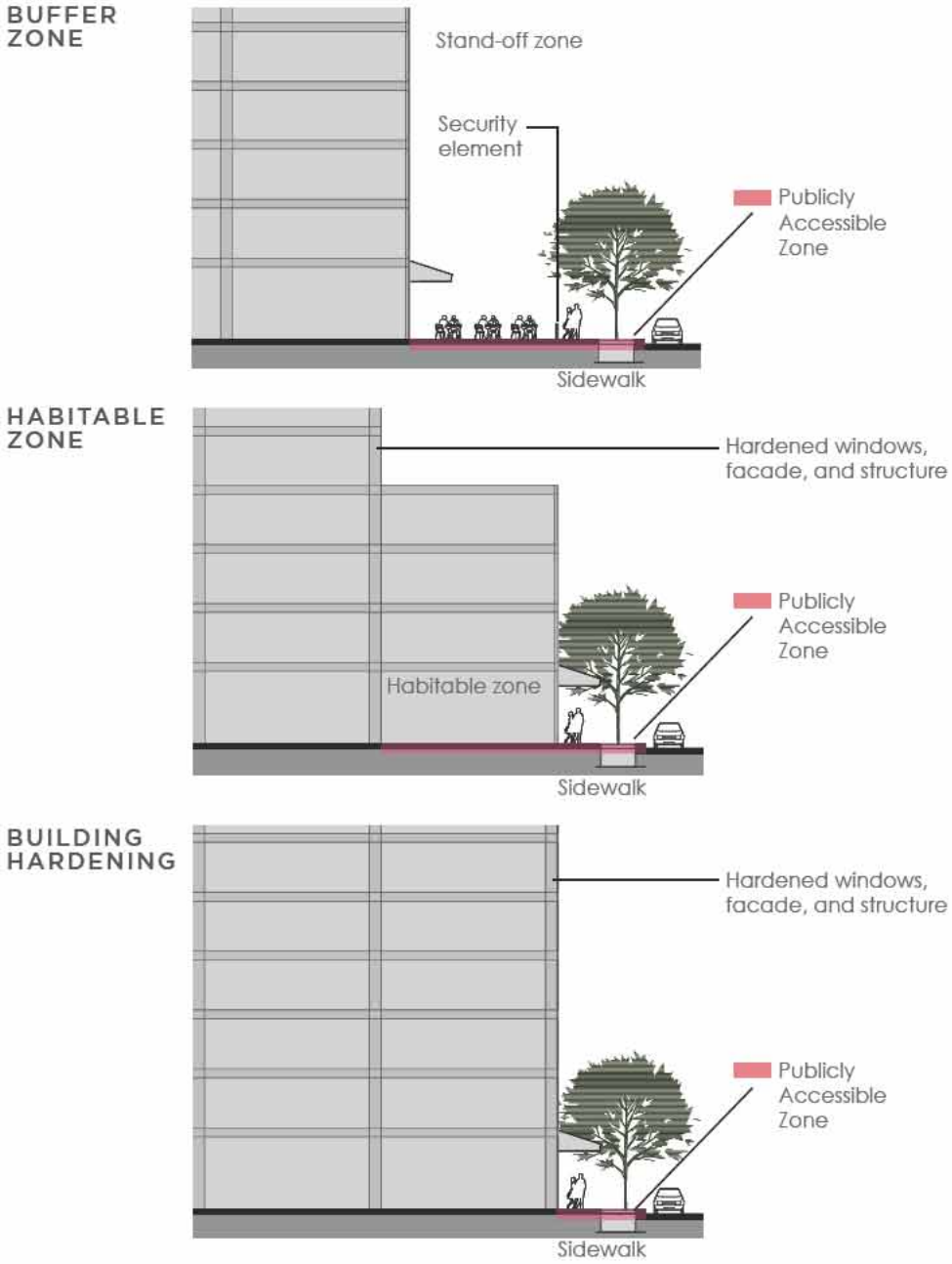
Some of the federal facilities within the study area are nearing the end of their useful life. As funds are available, the federal government is investing in modernizing structures to make energy and space efficiency improvements to reduce operating costs. These energy improvements respond to Executive Order (E.O.) 13514 directives to reduce greenhouse gas emissions, conserve natural resources, and save money. Space efficiency improvements address changing agency missions and respond to technologies that support greater employee productivity and mobility. In 2011, the study area provided approximately 333 sq. ft. of space per employee. The General Services Administration (GSA) seeks to cut this in half, while assessing ways to modernize the workplace to attract and accommodate the next generation of federal employees.

Many of the federal buildings contain cafeterias, gymnasiums, child care centers, and commercial services within the building interior that are only available to federal employees. While this practice is convenient to these employees, it impacts economic vitality and reduces active street life around the federal facilities. In recent years, the GSA and the NCPC encouraged the relocation of these facilities from the interior to the buildings exterior so they are visible and accessible to the general public. Employing this space planning principle devotes more facility area to usable office space, improves the public realm, supports economic development, and contributes to active streets and a more attractive, secure facility.

Since the 1995 and 2001 terrorist attacks, the federal government has invested in perimeter security measures to secure facilities. These security improvements respond to the Interagency Security Committee's Risk Management Process for Federal Facilities, which allows facilities to customize setbacks based on agency need, security threats, and location. Large setbacks or barriers placed within sidewalk can hinder walkability and access to buildings. While security is necessary, the emphasis on perimeter barriers creates the perception of an inaccessible and defensive bureaucracy and conflicts with democratic ideals of an open and transparent society.

Smart security design practices can meet multiple objectives. One method is to harden the building structure and skin, and provide kiosk retail and public accessible uses in the setback zone. Another is to integrate an independently hardened structure along the front of the building or within the ground floor to accommodate public accessible uses. Bio-retention areas within the sidewalk area can form a moat-like feature that seamlessly provides perimeter security, manages stormwater, and improves the quality of the streetscape.

BUILDING SECURITY STRATEGIES



PRIVATE INVESTMENT

Private property owners in the area are making improvements to their real estate holdings. More than 2 million sq. ft. of Class A leasable office space was renovated between 2007 and 2012, and an additional $2 billion in investment is planned. Projects include extensive alterations and infill development at L'Enfant Plaza, such as upgrades to the underground shopping concourse, as well as a new hotel and new office buildings. In addition, "The Wharf," a new multi-block neighborhood along the southwest waterfront, is scheduled to break ground in 2013.

The area's potential transformation as envisioned by the *SW Ecodistrict Plan*, the momentum of the community's private development, proximity to the National Mall, and the availability of land prime for development is beginning to gain the interest of memorial and museum sponsors looking to site new facilities and commemorative works.

HISTORIC PRESERVATION

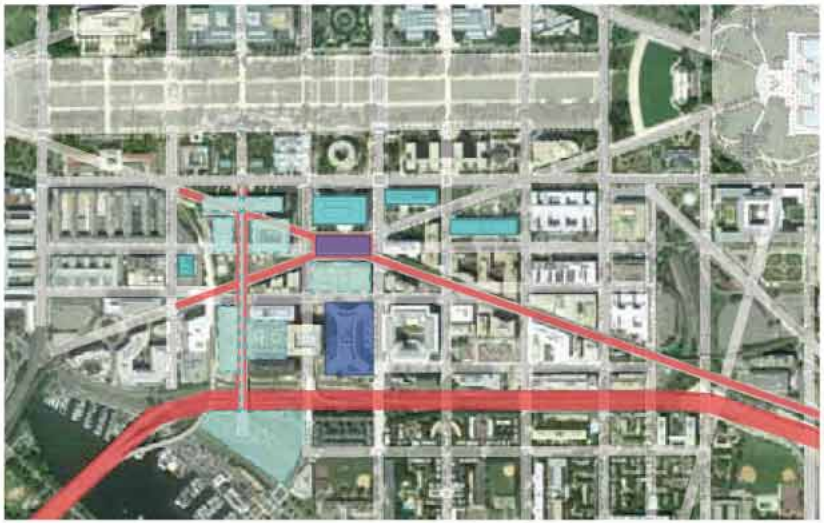
Juxtaposed within the study area are two eras of city planning. The urban context established through the L'Enfant and McMillan Plans for the City of Washington, commonly referred to together as the L'Enfant Plan, remain discernible. However, the mid-20th century Urban Renewal Plan dramatically altered this framework. While completely different in approach, each initiative represents important periods in American planning, urban design, and architecture.

The 1997 National Register of Historic Places (NRHP) nomination for the L'Enfant Plan lists its contributing and non-contributing elements or components. Generally, the L'Enfant extant street and open space system, and the views and vistas it defines are designated contributing elements. The non-contributing elements are components added since 1942 to construct the Southwest Freeway, related transportation network, and Modern-era superblocks.

At or approaching 50 years of age, the Mid-century Modern buildings and landscapes within the study area are being evaluated for eligibility for listing in the NRHP. The Department of Housing and Urban Development Headquarters (1963-1968) designed by Marcel Breuer was listed in the NRHP in 2008. While appreciation for Modern buildings is growing, the mid-century alterations to the historic street grid complicate the task of reconnecting severed rights-of-way and undoing grade separations. It is difficult to integrate the large scale Modern building typology undertaken during Urban Renewal with the fine-grain historic urban context established by the L'Enfant Plan. It is also challenging to upgrade aging mechanical systems and other inefficient features of these mid-century facilities.

Federal agencies are required to comply with the National Historic Preservation Act in the development of proposals to sell, alter, repurpose, or redevelop resources determined eligible for or listed in the NRHP.

NATIONAL REGISTER OF HISTORIC PLACES



LAND USE AND ACTIVE BUILDING FRONTAGE

To establish the SW Ecodistrict as an attractive place to live, work, and visit, the plan seeks to balance the study area's predominantly office only development by adding new residential, cultural, and commercial uses that will support an economically viable, livable, and walkable neighborhood and cultural destination.

OBJECTIVES

- Promote compact mixed-use transit-oriented development and active streets.
- Maximize efficient use of urban land and federal facilities. Retain agency headquarters, federal office space, and cultural uses near transit, the seat of government, and the National Mall.
- Program and design streets and buildings in a way that integrates the civic qualities of the National Mall with the vitality of the city.
- Relieve pressure to build on the National Mall by providing alternative locations and maximizing the use of nearby federal parkland for cultural purposes.

DESIGN STRATEGIES

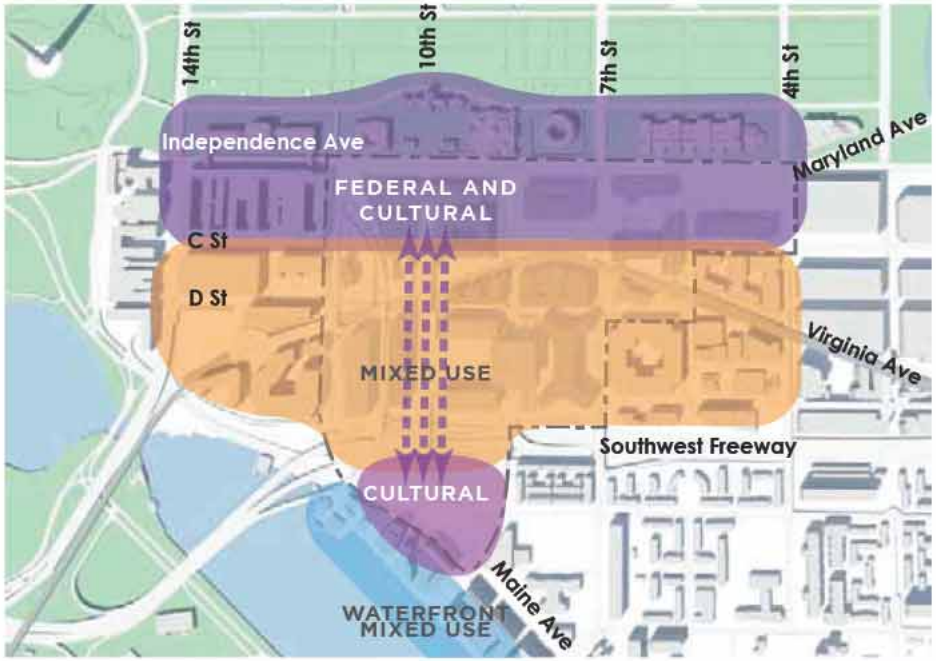
- Rehabilitate and repurpose buildings and redevelop and infill underused areas with new development.
- Locate and design new buildings along the avenues and primary streets in a manner that respects the monumental core's civic qualities.
- Increase the diversity of uses by mixing complementary uses vertically within a building or horizontally within a block.
- Cluster museums, memorials, and civic institutions to establish new nationally significant cultural destinations.
- Cluster residential development to establish an identifiable neighborhood and community identity.
- Design public spaces and building frontages that are publicly accessible, visually engaging, and accommodate street level restaurants, retail, cultural uses, public services, and other activities and amenities.
- Relocate (or eliminate) employee-only interior cafeterias and tenant amenities to the exterior of federal buildings to allow for public access to these establishments.
- Integrate sustainable building and landscape practices within public space, and use as features for interpretive opportunities.
- Encourage complementary programs between museums and civic institutions to strengthen educational programs and activities.





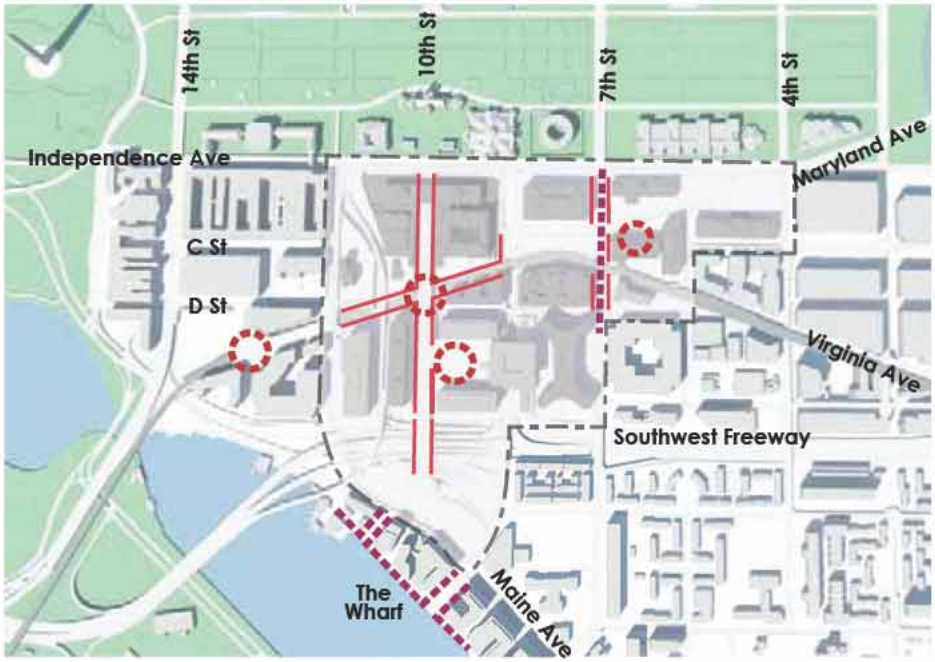
The SW Ecodistrict will retain and attract agency headquarters, mixed-use development, and active building frontages. The renovation of GSA Headquarters and the U.S. Department of Transportation Headquarters (top two images at right) are good examples of providing active street level uses while also addressing security requirements.

RECOMMENDATIONS



LAND USE

- Federal and Cultural
- Mixed Use
- Cultural
- Waterfront Mixed Use
- Enhanced Civic Link



COMMERCIAL NODES AND ACTIVE BUILDING FRONTAGES

- Commercial Node
- Commercial Frontage
- Active Building Frontage

FEDERAL AND CULTURAL ZONE

› Orient buildings and public spaces to focus on Independence Avenue. Program and design them to accommodate a mix of uses, such as museums, civic and educational institutions, plazas, residences, and offices to complement the Smithsonian Institution buildings and other federal agency headquarters in a setting befitting the monumental core.

MIXED USE ZONE

› Concentrate federal and private offices, residences, and commercial activity within a neighborhood-workplace setting.

CULTURAL ZONE

› Establish a concentration of museums, memorials, cultural uses, and educational institutions that offer the civic qualities and visitor experience as found at the National Mall and Smithsonian museums.

COMMERCIAL NODES AND FRONTAGES

› Concentrate street fronting retail activity near transit hubs and key intersections adjacent and accessible to public sidewalks and plazas.

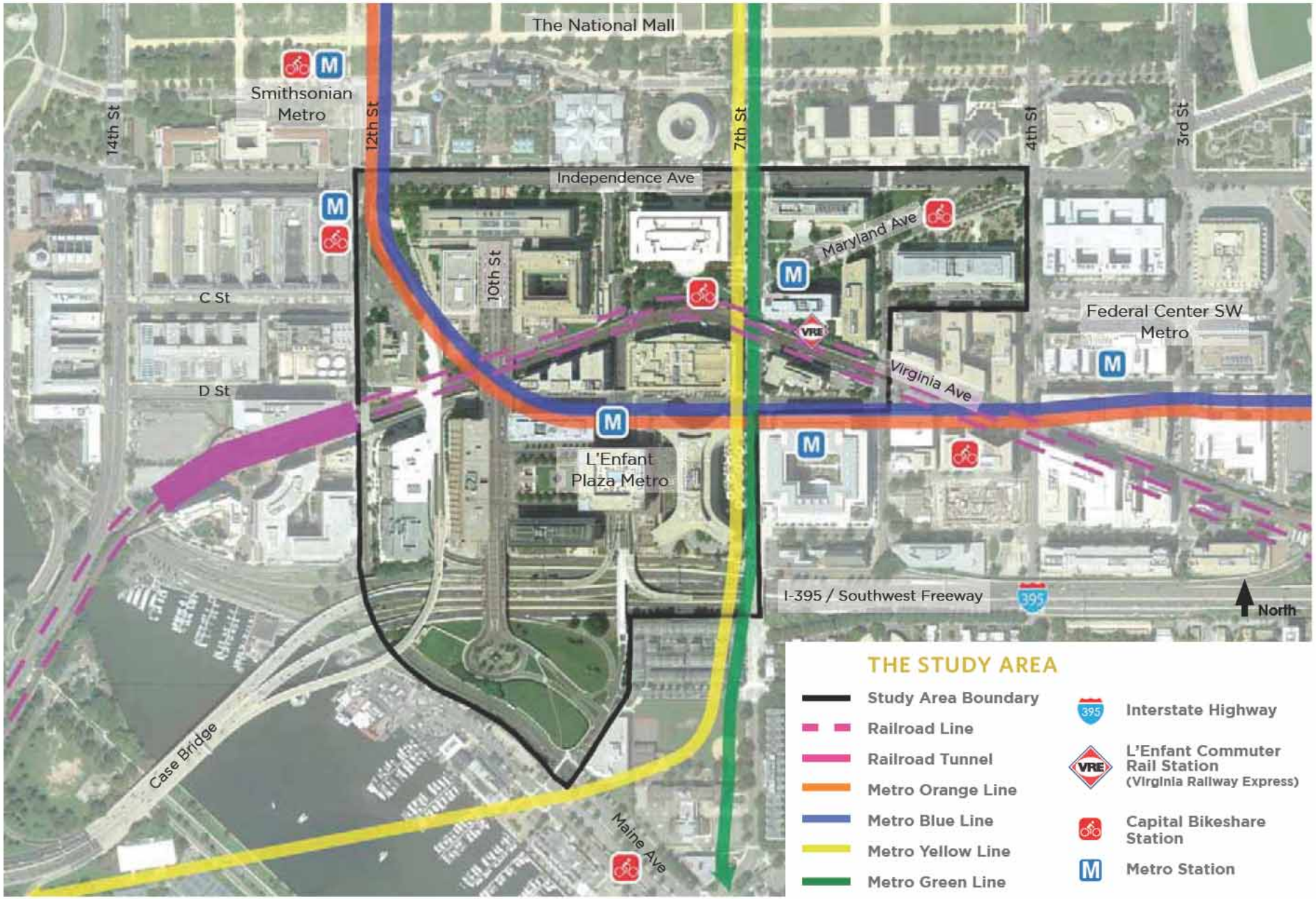
ACTIVE BUILDING FRONTAGES

› Locate publicly accessible institutional, educational, cultural, or commercial uses in all or a portion of the ground floor of buildings to establish active frontages and enliven streets.

WATERFRONT MIXED USE - THE WHARF

› A mixed-use waterfront neighborhood.

Mobility - The Transportation Network Today



MOBILITY - TRANSPORTATION AND STREET NETWORK

Washington is recognized for its walkable neighborhoods and its regional transit system. However, achieving the SW Ecodistrict's goal to improve mobility to, from, and within the area will require reconnecting the street grid, expanding transit capacity, encouraging multimodal transportation services, and enhancing intermodal connections. This is critical to support high-density compact development and is essential for a pedestrian-oriented community. Expanded transit also helps reduce roadway congestion and air pollution, lessens dependence on fossil fuels, improves public health and business productivity, and makes it easier to access jobs and contribute to the local and regional economy.

TODAY

The study area's greatest assets are its transit and road connectivity to the city and the region, and convenient location directly adjacent to the National Mall, the most visited Smithsonian museums, and the southwest waterfront. The area is easily accessible from the Southwest Freeway and is well-served by numerous local and commuter bus routes, Metrorail, and Virginia Railway Express (VRE) commuter rail. Freight rail serving the Mid-Atlantic and Midwestern states also traverse the area. As demand grows for freight, passenger, and commuter service, the rail system is increasingly constrained. In addition, the disconnected street grid and multiple levels of streets and sidewalks make walking and bicycling unpleasant and difficult.

Freeway access is provided via the 9th and 12th Street freeway ramps. These roads serve about 15,000 vehicle trips during the PM peak hour with 13,000 allocated to office trips. Although the SW Ecodistrict development scenario proposes substantial new development, it will likely have minimal impact on peak hour traffic since most trips will be added to the transit system. As more housing is introduced, automobile trips could decline because of greater live-work opportunities and increased reliance on transit. In the study area there are approximately 700 on-street parking spaces and approximately 4,964 spaces within garages; approximately 2,500 spaces are on federal property, equating to about 1 space for every 13 federal employees. Most federal buildings and private offices provide below-grade parking for their employees. Public parking is provided on-street and below L'Enfant Plaza.

The Federal Highway Administration is studying how to reduce congestion and improve connections over the 14th Street and Case Bridges. The District Department of Transportation (DDoT) is conducting the M Street Corridor Transportation Study to assess transportation improvements in Southwest Washington. The District of Columbia, the National Park Service (NPS), and the Washington Metropolitan Area Transit Authority (WMATA) are considering future transit improvements that affect the study area. DDoT proposes to extend a Circulator route and a new streetcar line along 7th Street and seeks to improve intercity and tour bus operational issues that impact adjacent neighborhoods and businesses. Nearby, the NPS is planning a National Mall Circulator route, and is studying how to address tour bus operations on the National Mall. WMATA is evaluating improvements to long-term rail service, including how to relieve congestion on the Green Line and at the L'Enfant Plaza Metro Station, and ways to improve access to this Metro station.

Physical and operational constraints outside and within the study area will limit the ability to improve regional commuter rail and interstate freight services. Several initiatives are underway that have the potential to improve freight transportation and transit capacity. The District Department of Transportation is conducting a study of the Long Bridge to determine how best to increase rail capacity. The Union Station Redevelopment Corporation is studying how to improve rail operations and the user experience at Union Station. CSX, owner of the rail corridor, is improving the rail line as part of the National Gateway project to increase freight capacity between the Mid-Atlantic and the Midwest regions of the United States. These initiatives provide an opportunity to make improvements within the rail corridor to enhance commuter service as well as deck the rail line to reconstruct Maryland Avenue above.

The number of stakeholders, their operational requirements, and the jurisdictions that cross neighborhood, city, and state borders makes rail solutions complex. Decisions made by one provider could hinder or support robust commuter rail service in the Mid-Atlantic region over the next 50 years. Constrained rights-of-way, growing ridership, and competing operational needs call for strong partnerships and coordination among all transit service providers.

TRANSPORTATION

To establish the SW Ecodistrict as a well-connected community, the plan seeks to improve mobility and accessibility to, from, and through the study area.

OBJECTIVES

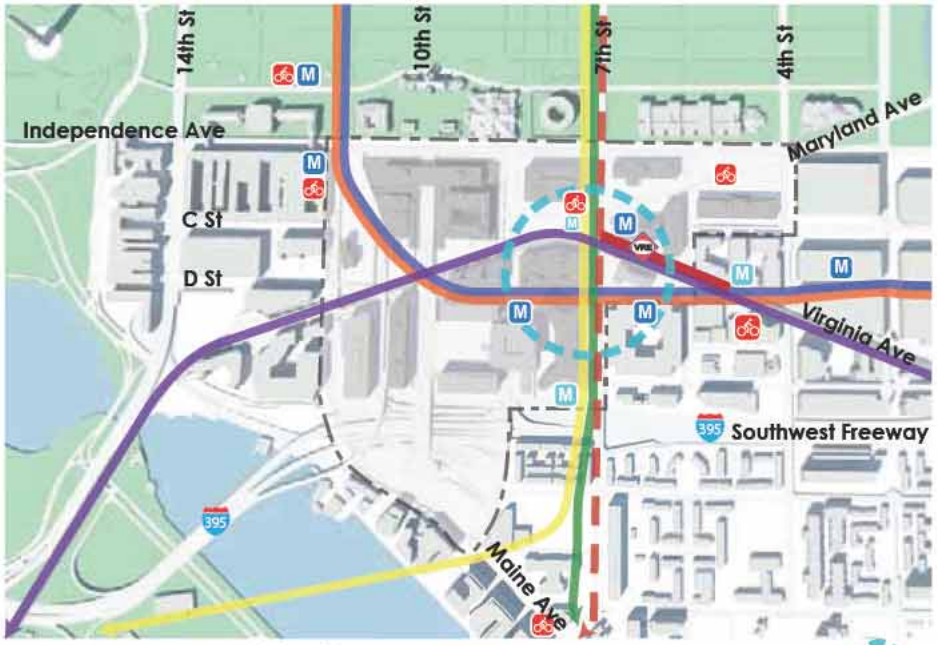
- Maximize transportation choices.
- Minimize garage parking to encourage use of public transportation.
- Maximize use and efficiency of the existing rail corridor and transit network.
- Provide accessible and clearly identified pedestrian connections to connect all modes of transit.
- Accommodate tour bus parking in appropriate locations.

DESIGN STRATEGIES

- Expand the rail line to four tracks to maximize freight and commuter rail services.
- Increase the number and size of passenger platforms at the L'Enfant Commuter Rail Station to accommodate expanded VRE, MARC, and Amtrak service.
- Cluster transit services to ensure that local and regional networks are efficient and well connected.
- Ensure easy, convenient, and intuitive pedestrian access between transit modes.
- Provide for electric vehicle use, car sharing, and bike sharing.
- Employ parking management strategies to maximize convenient car parking and encourage alternative forms of transportation.
- Design the lower level of 10th Street to accommodate tour bus parking. If parking below Banneker Park is determined appropriate, it must not limit, discourage, or prevent the development of future national museums or commemorative works from locating on site and shall be designed to prevent tour bus routes from traversing adjacent residential neighborhoods.
- Increase the number of bicycle lanes to provide connections to nearby neighborhoods and the citywide network of dedicated lanes.
- Provide bicycle parking facilities at L'Enfant Commuter and Metro Station to increase multimodal transit opportunities.

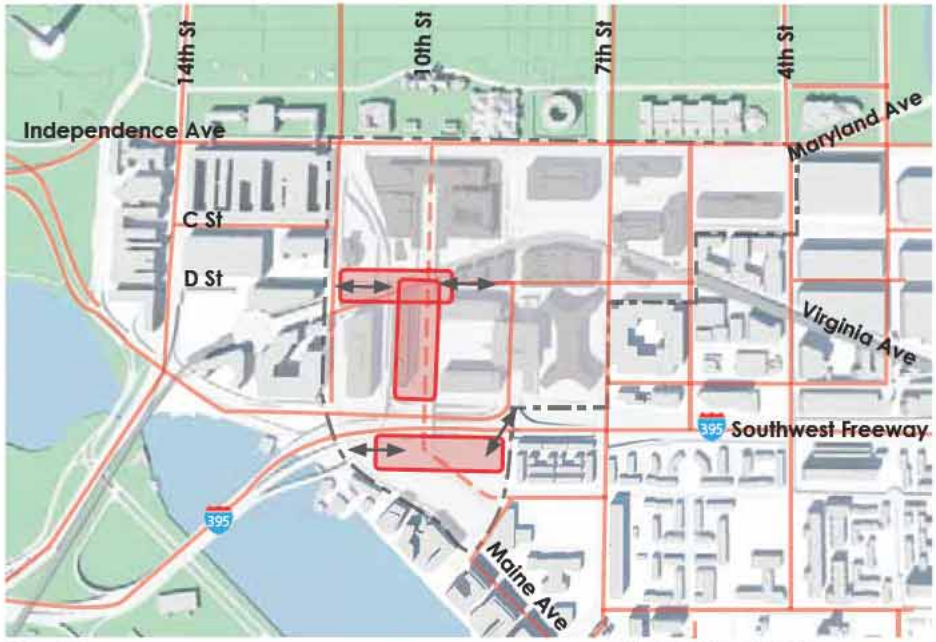
The SW Ecodistrict will offer multiple transportation choices for employees, residents, and visitors.

TRANSIT FRAMEWORK



TRANSIT

- Metro Orange
- Metro Blue
- Metro Yellow
- Metro Green
- VRE
- Commuter Rail Expansion
- Transit Hub
- Improved Metro Access
- New Metro Access
- Existing Metro Access
- Future Streetcar
- Bikeshare



BUSES

- Metro Bus Route
- Potential Bus Route
- Potential Tour Bus Layover
- Potential Tour Bus Layover Ingress and Egress
  (To minimize circulation through neighborhoods.)

TRANSIT HUB EXPANSION

› Expand and design the rail corridor and L'Enfant Station to accommodate the growing commuter ridership and better accommodate MARC, VRE, and Amtrak services. This can be achieved by increasing the number of tracks and the number and size of passenger platforms; designing for low- and high-passenger loading platforms; and providing infrastructure for electric trains.

› Locate future streetcar, Circulator, and bus services near Metrorail and the commuter rail stations, and improve pedestrian connections among all modes.

METRORAIL

› Locate new Metro entrances or improve existing entrances to improve Metro access from the Southwest neighborhood and connections between Metro, commuter rail, and surface transportation. Improve platform capacity to accommodate growing Metro ridership.

BICYCLE INFRASTRUCTURE

› Increase the number of bike lanes and bikeshare stations and facilities, including directional signage and bicycle parking, storage, and repair.

TOUR BUS PARKING AND ROUTES

› Conduct a tour bus parking and route circulation study to determine the appropriate locations and design for potential underground tour bus layover parking. Accommodate bus layover parking in appropriate locations where bus access and loading functions and routing do not impact locations for future cultural development or impact residential neighborhoods.

STREET NETWORK, FUNCTION AND CHARACTER

To improve mobility and livability, it is important to increase physical linkages and the quality of connections for pedestrians, bicyclists, and drivers within the study area and to adjacent neighborhoods. Streets establish the structure and character of the neighborhood; as public space they contribute to the neighborhood's functionality and the pedestrian experience.

OBJECTIVES

- Restore the L'Enfant Plan street network.
- Provide streets that accommodate a range of functions that facilitate local and federal needs.
- Design streets to establish an identity and create a sense of place that reinforces their function and character within the neighborhood.

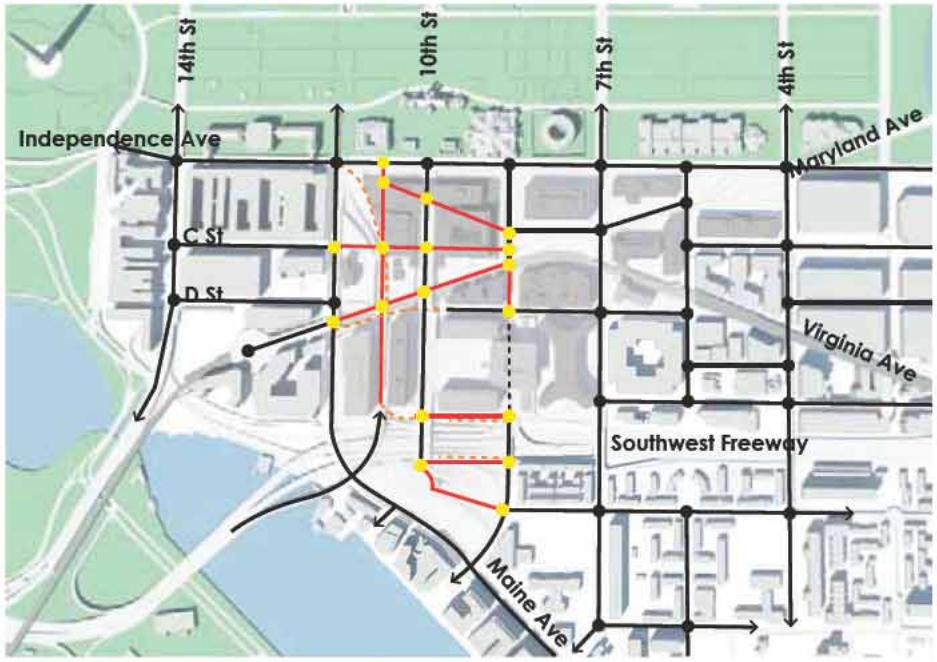
DESIGN STRATEGIES

- Establish a network of streets that are walkable, beautiful, distinguished, green, and lively.
- Design streets for a range of functions that facilitate traversing the city, loading and parking, daily activities, and special events.
- Design streets to improve connectivity for pedestrians, bicyclists, transit users, and motorists.
- Design streets to provide inviting and continuous sidewalks, reduce curb cuts, and incorporate transit-friendly wayfinding and infrastructure.
- Design streets to capture, cleanse, and transport stormwater.
- Design the street network to improve connectivity and link desirable activities along building frontages and public spaces.
- Improve intersections to maximize pedestrian and bicyclist accessibility and safety.
- Improve crosswalks and employ traffic calming measures, such as curb extensions, on-street parking, and minimizing right-on-red turns.
- Ensure easy, convenient, and intuitive pedestrian access between buildings and elevated streets.
- Improve overpasses and underpasses to include trees, vegetation, lighting, and public art to enhance the pedestrian experience.
- Employ operational strategies to restrict the size or types of vehicles that can access certain streets, blocks, or loading areas.



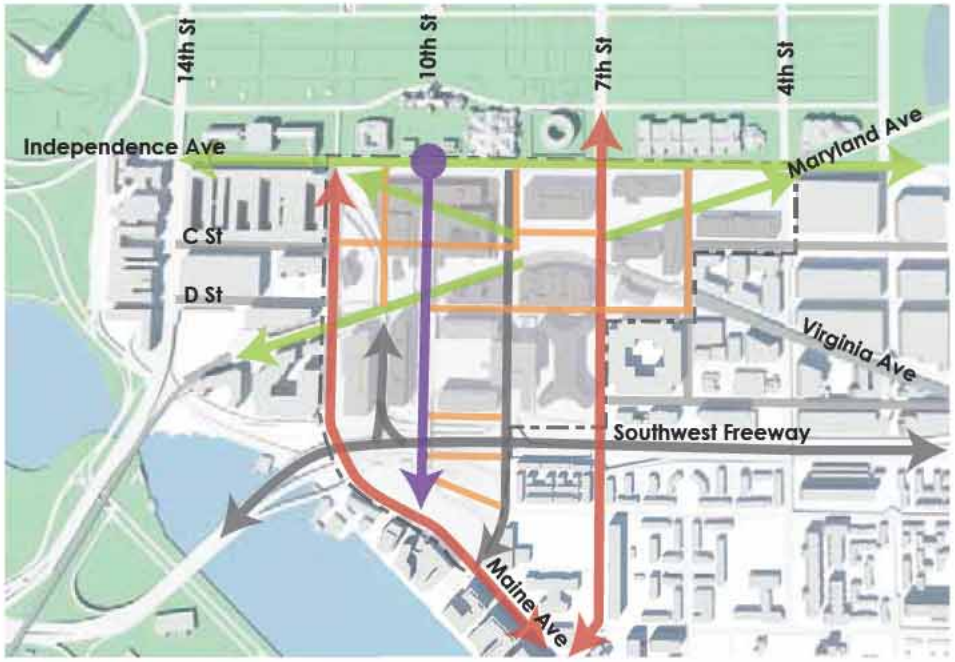

The SW Ecodistrict street network will serve a range of functions and create a sense of place.

STREET FRAMEWORK



STREET NETWORK

Existing Streets & Sidewalks
Existing Tunnel
Proposed Streets & Sidewalks
Proposed Highway Access
Existing Intersection
Proposed Intersection



STREET FUNCTION AND CHARACTER

Monumental
Civic
City
Local
Freeway

PROPOSED STREETS AND INTERSECTIONS

› Restore the street grid to reestablish the street network and improve vehicular, pedestrian, and bicycle connectivity throughout the study area.

MONUMENTAL STREETS

› Design their streets to respect the monumental core's ceremonial and cohesive character and to accommodate large special events. Orient, mass, and articulate buildings and landscapes along monumental streets to establish signature architecture, strong-edged, tree-lined view corridors, and cohesive symbolic linkages.

CIVIC STREETS

› Design these streets to accommodate daily activities and large, special events. Anchor streets with signature cultural uses linked by a series of public spaces, activities, and mix of uses that prioritize the civic experience.

CITY STREETS

› Design local connector streets to accommodate cross-town commuting, and significant pedestrian use and activity.

LOCAL NEIGHBORHOOD STREETS AND ALLEYS

› Design local neighborhood streets to accommodate daily activities, strengthen east-west connections, and provide locations for operational requirements for adjacent buildings.

SOUTHWEST FREEWAY

› Redesign access ramps as urban interchanges where necessary to accommodate air-rights development of new buildings and access roads.

The Neighborhood Framework

Recommended Development Scenario
Study Model (2030)

CONCLUSION

The Neighborhood Framework links civic realm, land use, and transportation strategies to promote a revitalized, mixed use, and connected neighborhood that balances the needs of the federal and local city. Federal buildings are seamlessly integrated with new cultural, residential, and retail uses. Well-defined and inviting public spaces attract visitors and residents alike, and physically connect the National Mall to the southwest waterfront. An expanded street network and transit system connect to the larger region, and support a walkable, bikable community.

CIVIC REALM AND LAND USE

- **Retain, reconfigure, and improve space efficiency of 7.9 million sq. ft. of federal office space that will accommodate up to 19,000 more employees than currently work in the area.** This is achieved by rehabilitating and redeveloping buildings to increase their space efficiency. This helps retain federal headquarters in the monumental core, consolidates agency functions, and reduces reliance on lease space.
- **Create an additional 2.8 million sq. ft. of private development that will accommodate 1.8 million sq. ft. of residential and/or hotel development and 1 million sq. ft. of private or federal office space.** This is achieved by infilling development on vacant or underused parcels, using air rights, or repurposing potentially excess federal building space. New development will accommodate 5,000–6,000 additional workers, 1,250 residents, and up to 246,000 hotel guests annually.
- **Accommodate at least 100,000 sq. ft. of convenience retail.** Community-serving retail should be located at the ground floors of private and secured federal buildings at key intersections along 10th Street and Maryland Avenue. This provides the opportunity to privatize and relocate employee-only cafeterias to the street frontage and make them directly accessible to the public.
- **Establish up to 1.2 million sq. ft. of cultural and educational development for up to five identified museum sites.** Most could be accommodated upon existing National Park Service land. Redevelopment of the Forrestal Complex and adjacent land will provide the opportunity to locate up to two additional museums and a new memorial site in close proximity to the National Mall and Smithsonian Castle. Together, these new destinations would attract an additional 1.5 to 2.5 million visitors annually.
- **Create more than 14.3 acres of new or improved public parks and plazas and improve or create up to five memorial sites.** This is achieved by rehabilitating Banneker Park and Reservation 113, constructing the Dwight D. Eisenhower National Memorial, establishing an urban park along the 10th Street and Maryland Avenue corridors, and establishing new public spaces on smaller parcels or at important intersections of streets and avenues.
- **Improve the quality of the public realm.** This is achieved by reconnecting the street grid, orienting publicly accessible uses toward the street, and improving the function and quality of the streets and sidewalks, including vehicular viaducts and underpasses crossing active rail and freeways.

MOBILITY

- **Increase accessibility.** This can be achieved by improving access to and between all transit modes, expanding the VRE platform at L'Enfant Station, providing transit lanes along the city's streets, and providing for carshare parking.
- **Improve active walking and biking.** This can be achieved by connecting the street grid; prioritizing pedestrian and bicycle paths; providing attractive stairs and ramps between vertical grade separations; improving intersection crossing distances and traffic signalization; improving the quality of underpasses and overpasses, minimizing parking, and providing dedicated bike lanes, bike sharing stations, bike parking, and other bike-friendly amenities.
- **Establish a primary transit center at the VRE Platform of L'Enfant Station and improve commuter rail ridership.** This can be achieved by accommodating a four track rail corridor and expanding the width, length, and platform heights; maximizing surface transit along 7th Street; establishing new Metro station entrances in the vicinity of L'Enfant Station; and improving pedestrian connections to and between all transit modes.
- **Improve vehicular circulation.** This can be achieved by connecting the street grid, retaining easy north/south access to the freeway, and providing adequate circulation for cars and buses that minimizes impact on adjacent residential neighborhoods.

THE SW ECODISTRICT WILL BE A WELL-CONNECTED COMMUNITY

3

The Environmental Framework

ENERGY, WATER, WASTE, AND GREEN INFRASTRUCTURE

Over the last two decades, both the public and private sectors achieved measurable results reducing greenhouse gas emissions and natural resource consumption by integrating sustainability early into the building design process and throughout building operations. While this approach is now standard and widely used, these efforts can only achieve so much. Today, each person or building may use less water and energy than in the past, but the world's overall development footprint continues to grow and impacts the ecosystem. Depleting scarce natural resources also limits the nation's success at being internationally competitive. As a result, people must be even smarter about how they develop their neighborhoods and cities.

The financial and sustainability benefits that can be achieved with district-scale systems that operate beyond the individual building and site scale are increasingly acknowledged. These systems yield greater results by taking advantage of economies of scale while still being small enough to adapt to new technologies.

The federal government's footprint within the SW Ecodistrict presents the opportunity for it to be a leader in supporting district-scale strategies. These strategies also support efforts to achieve Executive Order 13514: *Federal Leadership in Environmental, Energy, and Economic Performance* (E.O. 13514), signed by President Obama in 2009.

E.O. 13514 requires all federal agencies to reduce greenhouse gas emissions, manage stormwater, and reduce water use and waste. Each presents challenges for buildings in urban areas. Through district-scale planning the Ecodistrict has the opportunity to transform a resource-intensive environment into one that is able to capture, manage, and reuse a majority of its resources. Through district, block, and building strategies, the Ecodistrict can create energy from renewable sources, capture and use rainwater for its non-potable water needs and divert a majority of its waste from landfills. It can also support connected, living corridors of green infrastructure, with green roofs and walls, streetscape and tree plantings, and public open spaces contributing to improved human health and urban biodiversity. These strategies can provide cost savings over the long run, and enable federal agencies to exceed the goals and requirements of E.O. 13514.

E.O. 13514 also requires agencies to prepare for the effects of climate change—a process known as climate adaptation. The U.S. Climate Change Science Program examined the potential effects of climate change in the National Capital Region in 2009. Washington, DC is particularly vulnerable to threats associated with sea-level rise. Because its topography is substantially elevated from the Washington Channel near-term impacts with regard to sea-level rise and intermittent flooding are not an immediate concern for the study area.

This chapter first describes the overall modeling process. Then, strategies for energy, water, and waste at the building-scale are proposed. These strategies are often integrated and focus on ways to reduce a building's overall use of resources. Following the building-scale discussion, are sections on energy, water, waste and green infrastructure at the block and district-scale.

Conceptual Modeling of the Development Scenario

The development scenario (which is described in greater detail in Chapter 4) was created through the conceptual modeling of potential development alternatives, urban design, and sustainability strategies. The conceptual modeling measured the resource use of energy, water, and waste on an annualized basis within the study area. The modeling of improvements was done at the building, block, and district scale.

Through an iterative process, the conceptual designs were refined as modeling results were identified. The modeling results were compared against national baselines for energy, water, and waste use. The modeling also included the potential cost of proposed improvements based on a conservative estimate of near term construction costs.

Resource use was measured on a square foot basis. For example, gallons per square foot for water and energy use were used to illustrate building system outcomes. As the design for the study area was developed, the value of an improvement at each scale of the study area was assessed. For example, as the population in the study area increases through redevelopment, the relative use of resources is reduced. The cost trade-off for these potential outcomes informed refinement of the development scenario.

The baseline for the SW Ecodistrict included an assessment of existing conditions for water, waste, and energy at the building scale. This was the starting point to measure compliance with the Executive Order as new building strategies were employed. Year over year reductions in energy and water use will be required from the existing condition to meet the executive order. In the future, reductions in resource use will be achieved by exceeding the baseline indices as building occupancy changed. The baseline establishes the point beyond which the likely cost and benefits of higher levels of resource use efficiency are reasonable. For example, energy use for new buildings in the study area can be measured against other buildings nationally in the Commercial Buildings Energy Consumption Survey (CBECS) of 2003. This is a national index of energy use in commercial buildings. In early phases, it is feasible to achieve a 30 percent reduction overall in the Ecodistrict below the CBECS survey indices. In later phases, an 80 percent reduction below the CBECS can be achieved. For perspective, Leadership in Energy and Environmental Design (LEED) Platinum certified buildings in DC have achieved a 30 to 40 percent reduction in energy use from the CBECS survey. Modeling of water and waste will similarly measure success against the baseline.

At the block-scale, the model quantified how streets, open space, and buildings will share resources. A key strategy in reducing stormwater runoff is to collect it for reuse. Here, a collection of buildings on a block, or group of blocks, share a single stormwater system to clean and then convey stormwater to a storage tank for reuse. The measurement of this block strategy included the likely loss of stormwater to evaporation as well as the loss of water through the transpiration of water through plants. Roof, streets, and open space areas were quantified. In the block scale modeling, the amount of pervious or impervious area was measured to quantify the amount of potential rainwater harvesting.

At the district scale, the resource use and cost of all building, street, and open spaces improvements were quantified for different development alternatives. Where blocks were redeveloped the model accounted for changes in land use and the intensity of activity. Across the study area, modeled building systems included rehabilitated and redeveloped buildings, and buildings with new uses.

It was assumed that the existing central utility plant will supply buildings across the district with power, cooling, and heat. In the near term, natural gas will be used to create power, heating, and cooling in the central plant. The carbon emissions from gas fuel use can be offset with carbon credits. In the future, the fuel source for the central utility plant can be changed from natural gas to another fuel that does not release as much carbon into the atmosphere.

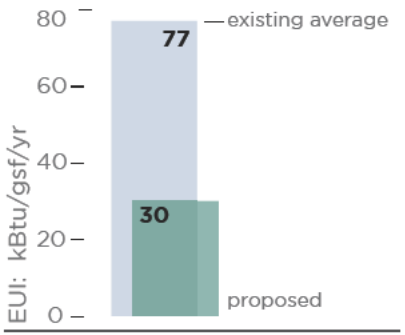
By separating potable and non-potable water systems in the Ecodistrict, non-potable water can replace potable water for specific uses. For example, potable water will no longer used for toilets. It will be limited to potable uses such as showering or drinking. To accomplish this, the greywater and stormwater will be treated onsite to extract water for non-potable uses. As a result, DC's wastewater system will be used less.

The following strategies were informed by the conceptual modeling to define the development scenario and to help achieve standards in accordance with E.O. 13514.

CONCEPTUAL MODELING

TOTAL ENERGY USE

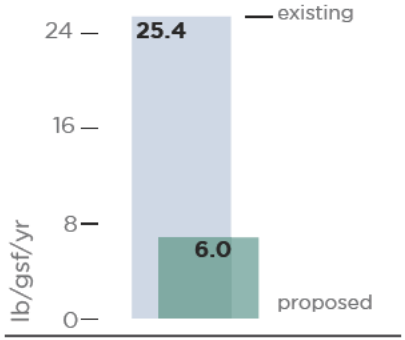
Modeling of improvements to existing buildings identifies significant reductions in energy use.



EUI, or energy use intensity, is a unit of measurement that describes a building's energy use. A building's EUI is calculated by taking the total energy consumed in one year (measured in kBtu) and dividing it by the total floorspace of the building. Generally, a low EUI signifies good energy performance

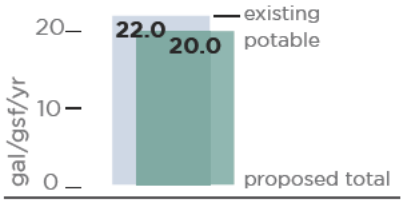
SCOPE 1 & 2 CARBON

Improvements to existing buildings' energy use will lead to a reduction of carbon prior to decarbonization at the central utility plant.



TOTAL WATER USE

Currently, all water used in the study area is potable. The modeling identified a reduction in total water use, with a significant reduction in potable water use and the potential for using non-potable water. where appropriate

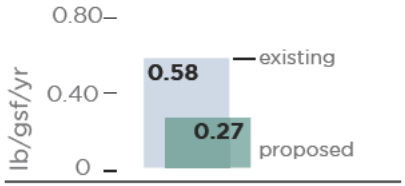


potable use will be reduced to 11 gal/gsf/yr

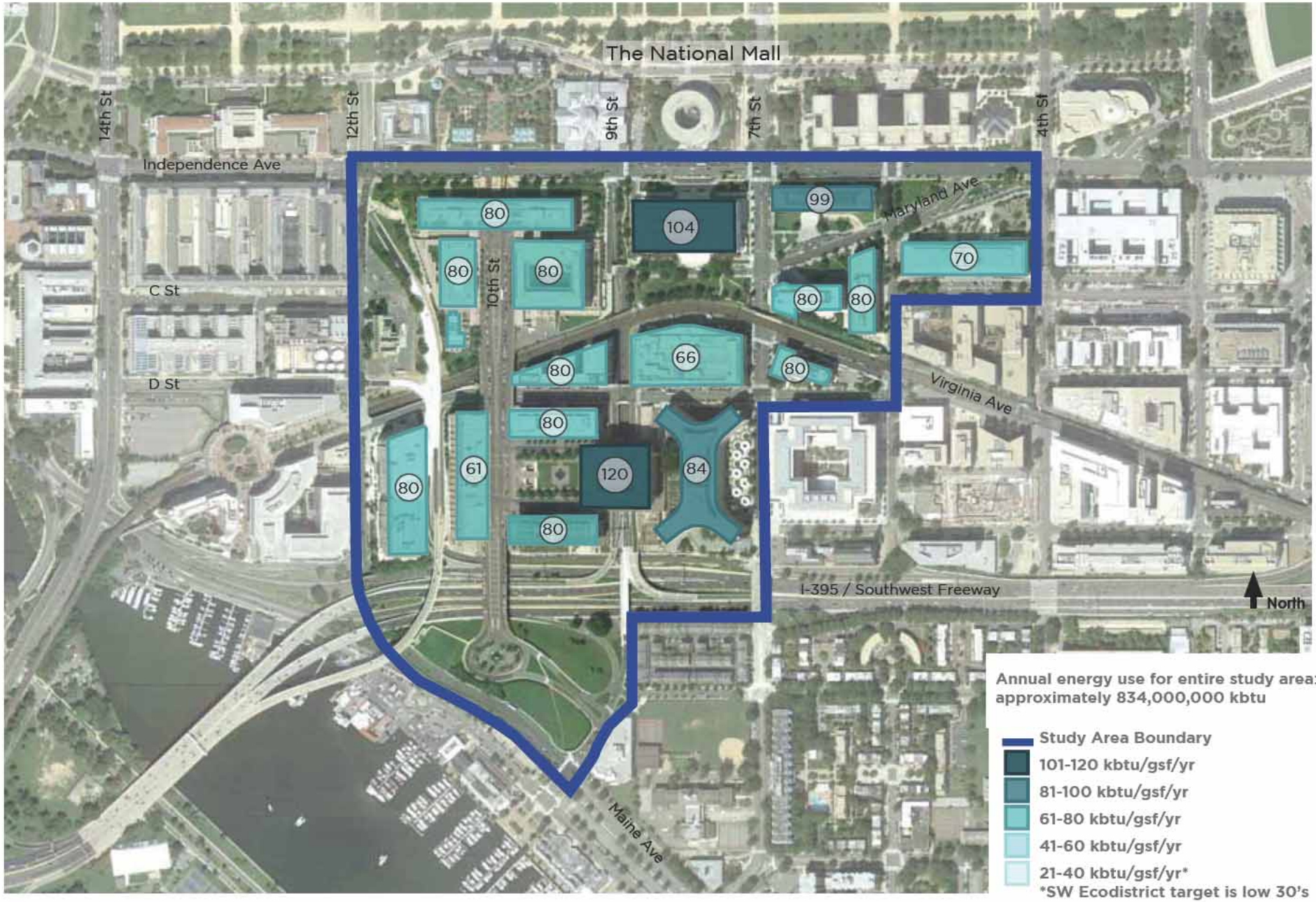
non-potable will provide 9 gal/gsf/yr

TOTAL WASTE IMPACT

Improvements to the recycling program will lead to a reduction in waste going to the landfill.



Existing Energy Use



Energy, Water, and Waste at the Building Scale

CONCEPTUAL STRATEGIES

While energy, water, and waste strategies at the district-scale often result in greater sustainability improvement, building-scale strategies can be considered "low-hanging fruit." Often simple improvements to buildings can vastly improve energy, water, and waste performance without substantial cost. Other, more costly improvements can also be made, yielding even better performance.

Due to their design and antiquated infrastructure systems, existing federal buildings in the study area are not energy or water efficient. When possible, the federal government is making improvements such as installing low-flow fixtures and energy efficient lighting. These measures save money and resources; however, to meet the energy, water, and waste objectives (described in the following sections) greater improvements will need to be done in the future.

An important component of formulating the development scenario was modeling individual buildings and sites. The conceptual modeling for the individual buildings identified a potential 47 percent reduction in energy use with a light rehabilitation (upgrading controls and lighting) of existing buildings. By fully rehabbing or constructing new buildings, the Ecodistrict can expect a 72 percent reduction in energy use compared to how the existing buildings perform today.

The modeling considered the amount of water, waste, and energy that will used at each building, street, or open space. The modeling also identified sources of power, heating, and cooling to be supplied across the study area. This analysis provided the content for initial cost estimates to determine the value of individual improvements in meeting E.O. 13514. The matrix on this page provides the guidelines for building improvements.

BUILDING SCALE DESIGN STRATEGIES

	Building Strategy				
	Light Rehab	Full Rehab	Repurpose	Infill	Redevelop
Energy					
Tenant Improvement					
Lighting system upgrade	X	X	X	X	X
Plug load reduction	X	X	X	X	X
Sustainable and certified materials	X	X	X	X	X
Radiant heating and cooling		X	X	X	X
Low volume air distribution		X	X	X	X
Core and Shell					
Upgrades to building systems during natural cycle of obsolescence.	X				
New mechanical and electrical system - hydronic thermal energy distribution.		X	X	X	X
High performance building envelope.		X	X	X	X
Maximize the use of renewable energy resources (PV) and shared energy technology.		X	X	X	X
Maximize building energy use efficiency.		X	X	X	X
Capitalize on ground source heat below building site.				X	X
Capitalize on ground source heat below open space and streets.					X
Water					
Replace existing plumbing fixtures with high efficiency fixtures.	X	X	X		
Install high efficiency plumbing fixtures.		X	X	X	X
Collect rainwater.		X	X	X	X
Install non-potable water system.		X	X	X	X
Waste					
Provide waste sorting stations at point of use locations.	X	X	X	X	X
Reclaim, recycle, and compost the majority of waste (solid and organic) generated within the area.		X	X	X	X
Minimize construction waste		X	X	X	X

Energy

THE IMPORTANCE OF ENERGY

The majority of global energy consumption comes from non-renewable fossil fuels such as coal, oil, and natural gas which produce greenhouse gas emissions, known to cause global warming. As a result of greenhouse gas emissions, our planet is experiencing climate change and extreme weather events, which are permanently damaging the ecosystem. There are various types of greenhouse gas emissions, with carbon considered the primary cause of global warming. To curb climate change and its detrimental effects, it is necessary to reduce energy consumption and switch to renewable "carbon-free" sources of energy that do not produce greenhouse gas emissions.

THE AREA TODAY

ENERGY USE

In terms of energy use, the federal buildings within the study area are inefficient. These buildings have thin walls and windows; are oriented north/south which maximizes heat gain; have little natural light because of large interior hallways and extremely large footprints; and have antiquated mechanical systems. When possible, the U.S. General Services Administration (GSA) has made energy efficient improvements, but the overall design and layout of the buildings continue to prevent significant improvements in energy efficiency. An existing federally-owned central utility plant provides heating and cooling to the federal buildings within the area, but is not authorized to provide service to non-federal users. The private buildings are more energy-efficient because property owners made investments. However, none can benefit from use of the central utility plant because it is not available to private property owners.

ENERGY SOURCE

Today, the majority of the energy used in the study area comes from coal-fired electricity plants. Coal is highly inefficient and one of the most polluting energy sources. Burning coal is a significant contributor to global warming and releases toxic pollution into the air and water. Approximately 74 percent of the energy used within the Ecodistrict is provided by Pepco and comes from burning coal.

Natural gas, a cleaner and more efficient form of energy, produces 26 percent of the Ecodistrict's energy supply and is provided by Washington Gas. While natural gas is a cleaner alternative to coal-fired electricity, it is also a non-renewable source of energy and produces carbon dioxide and other emissions that contribute to global warming. Less than one percent of the Ecodistrict's energy use is currently generated from renewable resources within the study area.

THE OBJECTIVES

The SW Ecodistrict objective for the study area is to create a zero net energy district, as measured in carbon. This means that in addition to producing all of the energy it consumes on site, the Ecodistrict must not produce any carbon emissions or must pay for offsetting carbon credits. This objective is derived from E.O. 13514, which requires all new federal buildings entering the design phase in 2020 or later, be designed to achieve zero net energy by 2030.

Buildings in warm climates on large sites have the opportunity to harness a significant amount of renewable energy from the sun. If the buildings are also energy efficient, it is possible that they will be able to operate on the solar energy that the site generates (thus becoming a zero net energy building). Achieving this objective on a site-by-site basis within a dense urban environment, where solar exposure is usually limited to small rooftops, is more difficult. Dense urban areas such as the SW Ecodistrict can, however, move closer to achieving this objective by taking advantage of energy planning at the block and district-scale.

ZERO NET CARBON BY THE YEAR 2030

Solar panels on the roof of the U.S. Department of Energy Building.

BLOCK SCALE STRATEGIES

BLOCK-SCALE ENERGY SYSTEMS

There are several strategies that will allow both public and private buildings within any block to produce and share energy.

SOLAR THERMAL - Solar thermal equipment heats water using solar energy.

› Use solar thermal on both new and rehabilitated buildings. Office buildings that do not need a lot of hot water can share excess hot water with adjacent residential/hotel buildings that may need more than they can produce individually.

SOLAR PHOTOVOLTAICS (PV) – Solar PV equipment may be placed on building rooftops or integrated with a building's skin to harness solar energy for building use.

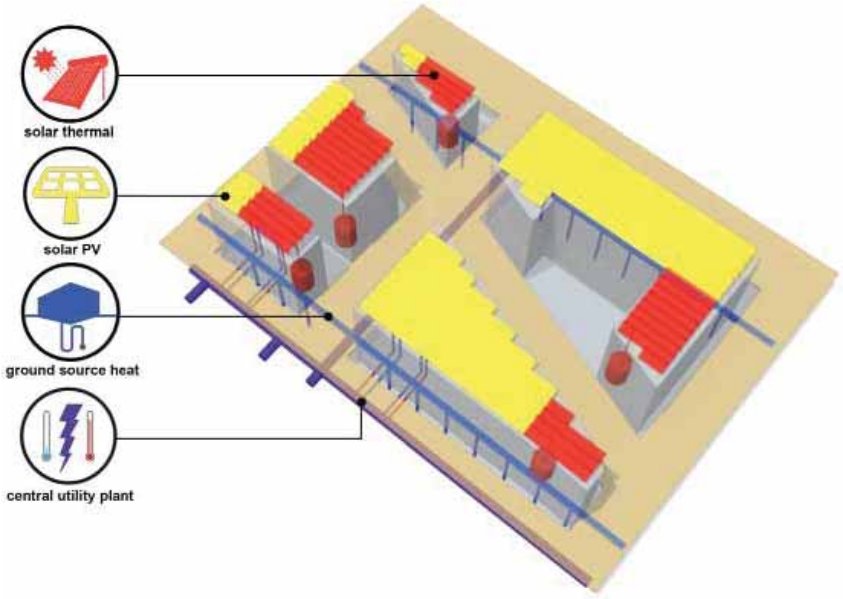
› Install solar PV on all building roofs and over the Southwest Freeway between 7th and 9th Streets. The energy from the freeway installation can support energy use in the adjacent block and district.

GROUND SOURCE HEAT – The earth's relatively constant temperature under ground is used to provide heating and cooling for buildings.

› Use ground source heat technology for new buildings north of C Street on land where large blocks will allow subsurface wells that do not conflict with existing elevated structures.

CENTRAL UTILITY PLANT (CUP) – At the block-scale, the central utility plant (also see district-scale strategies) allows the sharing of heating and cooling between buildings. For example: excess heat from an office building can be used in an adjacent residential or hotel building.

› All new and rehabilitated buildings (both public and private) should connect to the existing central utility plant.



BLOCK-SCALE
ENERGY SYSTEMS

DISTRICT SCALE STRATEGIES

There are three district-scale strategies that will significantly curb energy consumption and generate and share renewable energy.

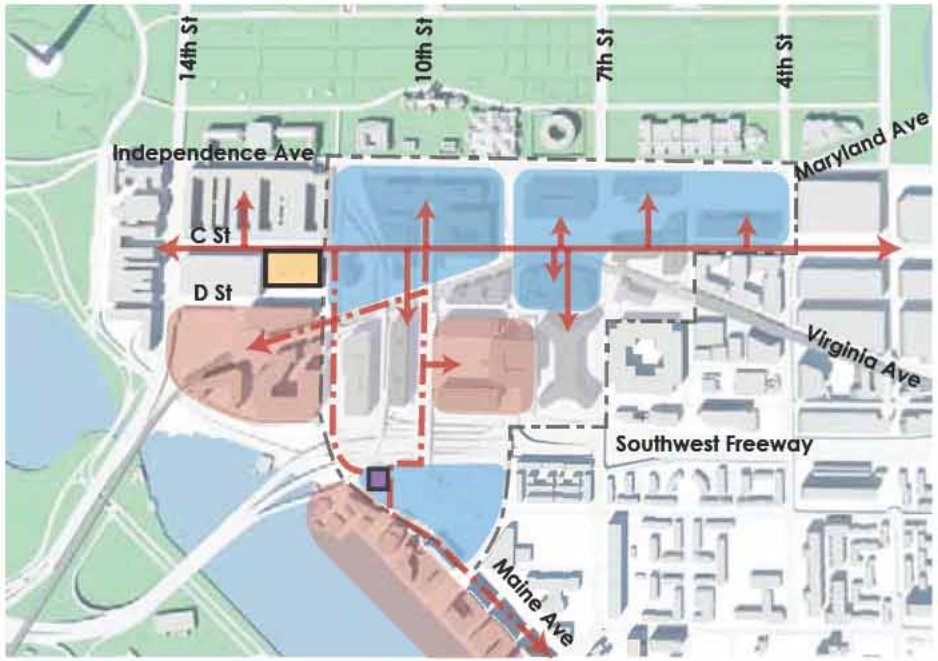
CENTRAL UTILITY PLANT

In 1933 the federal government built a central utility plant at 12th and C Streets, SW to provide heat to federal buildings in downtown Washington, DC. Today the plant predominantly provides heating through steam and also a small amount of cooling to a majority of the federal office buildings within the study area and other parts of downtown, in addition to several buildings of the Smithsonian Institution. GSA owns and operates the facility. By law, they can only provide service to federal users. Nearing 80 years old, the plant is in need of modernization and as a result is not very efficient compared to today's standards.

Central utility plants, sometimes called combined heat and power or cogeneration, are integrated systems that provide both electricity and heat. These plants have an advantage over conventional single-source electricity plants because they capture waste heat as electricity is produced (from natural gas in this case) and recycle it to provide heat to buildings. Conventional systems simply exhaust heat into the environment, requiring additional fuel to heat the buildings.

Key strategies to maximize efficiency of the central utility plant include:

- Invest in the existing central utility plant for heating and cooling. Modernize the plant's equipment.
- Increase efficiency by adding new residential and commercial uses throughout the study area and upgrading equipment to support new users. Adding residential uses to the central utility plant will balance loads between day and evening use.
- Change the central utility plant to a less carbonized energy source when the technology is available. While natural gas is significantly better than coal as an energy source, it still produces carbon emissions. Anhydrous ammonia (that is generated through a renewable power source) is an emerging technology under study by the U.S. Department of Energy, which shows promise as a future renewable, decarbonized energy source.



DISTRICT-SCALE ENERGY SYSTEMS

MICRO-GRIDS

Micro-grids are small-scale power grids that allow electricity to be produced and used locally within a small area. The advantages are numerous: micro-grids optimize heat energy. Between 60 and 80 percent of a typical power plant's energy consumption never becomes usable electricity, but is instead lost through production and transmission. Energy produced and distributed locally through a micro-grid has a variety of uses including heating of water. Renewable energy produced within the study area can be distributed through a micro-grid to other nearby buildings. This creates opportunities for property owners to sell excess power to the regional grid. Adding additional energy sources increases electrical reliability within the area and reduces dependence on the regional power grid. As new areas are redeveloped in locations remote from the central utility plant, they may develop a micro-grid district to balance loads among day and evening users.

› Establish micro-grids, grouped by development areas of both private and federal buildings, within the Ecodistrict. These micro-grids can be connected together with other buildings that might share power and energy.

SEWER-MINING

Sewer heat-mining uses the constant temperature of sewage from buildings to create even warmer heat for nearby buildings. It is a below ground, completely enclosed process that requires no combustion and works well in densely built areas with high heat consumption, such as residential buildings.

› Build a sewer-mining facility in the southern area of the Ecodistrict to provide heating to new residential and cultural buildings immediately north and south of Banneker Park.

ENERGY - PROJECT RECOMMENDATIONS

	Summary Description	Phasing	Potential Partners Federal – F District – D Private Sector –P Public Utility - PU
1. Solar Thermal	Use solar thermal on both new and rehabilitated buildings.	As buildings develop/redevelop or on existing buildings	F,P
2. Solar Photovoltaics	Install solar PV on all building roofs and over the freeway between 7th and 9th Streets (this will need further study)	Freeway solar array must be coordinated w th the m crogrid.	F,D,P,PU
3. Ground Source Heat	Use ground source heat technology for new buildings north of C Street on land where large blocks will allow subsurface well f elds that do not conflict with existing elevated structures.	As buildings develop/redevelop	F,P
4. Central Utility Plant (CUP)	Connect new and rehabilitated buildings to the CUP to allow for the sharing of heating and cooling between buildings. Modernize the CUP's equipment. Add res dential and commercial uses to increase effic ency. Sw tch the CUP to a less carbonized energy source when technology is available.	Make improvements to CUP pr or to major redevelopment in the Study Area. Connect buildings as they develop/redevelop.	F,P
5. Microgrids	Establish micro-grids grouped by development areas for both private and federal buildings.	Pr or to solar arrays and in coordination with CUP improvements	F,P,PU
6. Sewer Heat Mining	Build a sewer heat-mining facility in the southern area of the Ecodistrict to prov de heating to new residential and cu tural buildings immediately north and south of Banneker Park. This needs further study.	In coordination with new residential development	P,PU

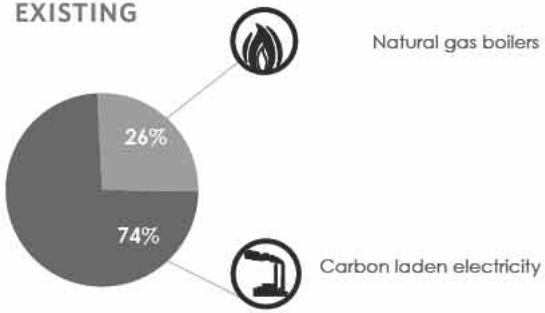
RESULTS

Strategies identified for the development scenario will lead to an increase in use of alternative energies and a reduction in greenhouse gas emissions and operating costs.

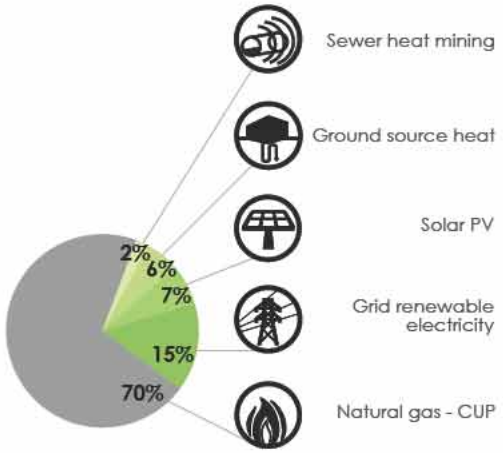
Greenhouse gases will be reduced 51 percent. The SW Ecodistrict will eliminate its greenhouse gas emissions when the central utility plant switches to a non-fossil fuel source.

ENERGY SOURCE

EXISTING



DEVELOPMENT SCENARIO



THE CASE FOR DISTRICT ENERGY

ENERGY District-scale energy systems help communities reduce their operating costs and keep more energy dollars local by reducing the need to import fuel for heating and cooling. The environmental impacts of heating and cooling systems are significantly reduced because these district-wide systems improve efficiency. Developing district energy/central heating plant systems can ease the transition of the power sector as older, polluting coal plants are closed and removed from the grid. District cooling can cut peak electrical demand that typically occurs in the late afternoon, thus reducing strain on the grid and avoiding peak costs.

BEST PRACTICES

CENTRAL BUSINESS DISTRICT – ST. PAUL, MN District Energy St. Paul provides heating to more than 80 percent of St. Paul's central business district and cooling to more than 60 percent. District Energy St. Paul meets 70 percent of its customers' annual heating from a biomass central heating plant which reduces greenhouse gas emissions by over 200,000 tons annually.

DOWNTOWN CLEVELAND Cleveland Thermal's district energy network provides 30 percent of the heating and cooling needs of the city's business district. The pipeline spans more than 30 million square feet, bringing steam and chilled water to commercial, institutional, and municipal buildings in downtown Cleveland. Customers reduced their peak power demand, thereby reducing their cost per kilowatt hour.

SW WATERFRONT, WASHINGTON, DC The Wharf, a new waterfront mixed-use development project by Hoffman-Madison Marquette, will have a three-story central utility plant designed to serve the energy needs for the project. The new plant will significantly reduce the neighborhood's greenhouse gas emissions compared to traditional systems contained within each individual building.

THE CASE FOR GROUND SOURCE HEAT GSA recently installed ground source heat in the Mary E. Switzer Building, two blocks from the SW Ecodistrict. Heating and cooling loads are expected to be 30 percent more efficient with this technology.

Water

THE IMPORTANCE OF WATER

People, plants, and urban wildlife depend on water for their existence. People also depend on water to heat and cool buildings. There are five types of water that are important to the sustainability of the Ecodistrict:

Potable Water – water that has been processed and treated so that it is clean enough to drink. It is pumped to buildings within the district from the municipal water system.

Stormwater – rainwater that falls onto the Study Area. It eventually runs into the municipal storm system where it is pumped to the water treatment plant for treatment and discharge.

Greywater – water that is generated from domestic activities such as laundry, dishwashing, and bathing.

Recycled Stormwater/Greywater – combined stormwater and greywater that is captured and reused for irrigation and/or toilet use.

Blackwater – water that is discharged from toilets.

Traditionally, these five types of water function independently. Potable water is currently used for all water needs in the study area. Stormwater, greywater, and blackwater are all pumped to a wastewater treatment plant. While this has worked in the past, it is becoming increasingly clear that it is cheaper and more sustainable to integrate systems. Highly treated and energy intensive potable water is unnecessary for all of the area's water needs, especially when the stormwater and potable water rates (paid by property owners) are scheduled to increase substantially by 2032. The monetary savings will increase as the study area captures stormwater, reuses it for non-potable uses, and decreases its dependence on potable water.

THE AREA TODAY

While this area is not part of the District of Columbia's combined sewer system, where stormwater and sewage use the same pipes and frequently overflow into the rivers during heavy rains, it is still important to capture and treat stormwater.

Approximately 92.4 million gallons of rainwater falls on the study area each year. With 82 percent of the land area comprised of hard surfaces, a majority of rainwater flows directly off the area's buildings and streets into the municipal combined stormwater/ sewage discharge system. On its way, it picks up pollutants such as oil, gasoline, and pesticides. Once in the system, it must be pumped eight miles south to the Blue Plains Treatment Plant where significant amounts of energy are used to clean the water before it is released. None of it is reused. The Blue Plains Treatment Plant is owned and operated by DC Water, the water and sewer authority that provides water and wastewater treatment services to the District of Columbia and parts of region.

Today, all of the water that is used in the study area is potable - meaning it has been processed and treated so that it is clean enough to drink. Potable water is unnecessary for many uses, including irrigation, building mechanical systems, and toilet flushing since rainwater and greywater can be used instead.

THE OBJECTIVES

The targets for stormwater and potable water come from E.O. 13514.

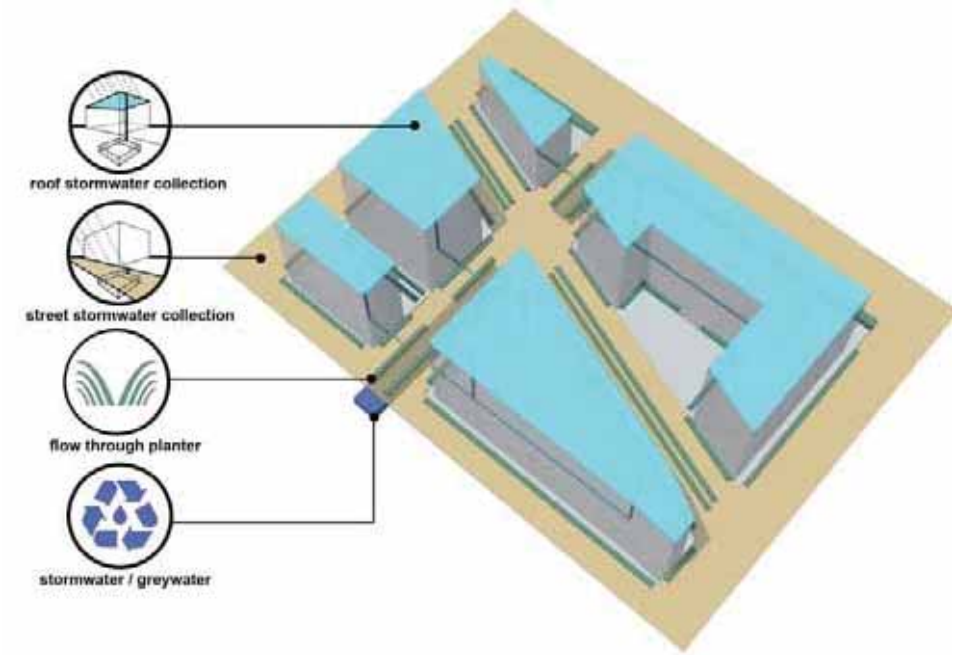
STORMWATER - RETAIN 95TH PERCENTILE RAIN EVENT

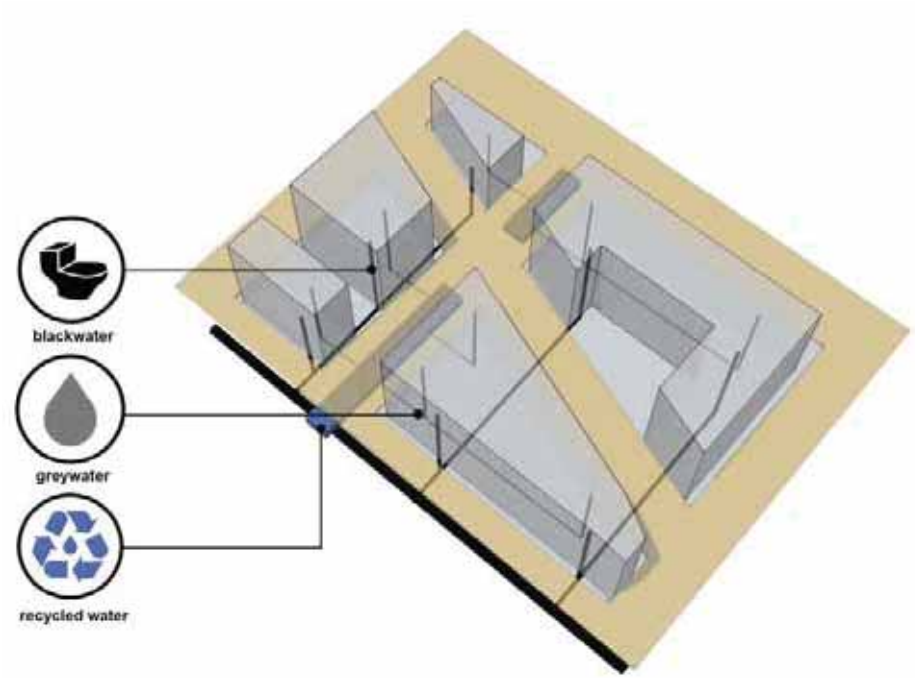
POTABLE WATER USE - REDUCE BY 50 PERCENT

The stormwater objective is to retain a 95th percentile rain event. In Washington, DC this means all rain events that produce up to 1.7 inches of rain in 24 hours. Few rain events in Washington, DC actually produce more than this amount so the objective is to essentially retain and reuse all of the rain that falls in the area throughout the year. This is very challenging in a dense urban area with little pervious surface.

The potable water objective is to reduce potable water use by 50 percent (as measured per square foot). Today, the area uses potable water for all of its water needs. This amounts to approximately 22 gallons of water/sq. ft./year. The objective is to reduce potable water use to 11 gallons/sq. ft./year.

BLOCK SCALE STRATEGIES





BLOCK-SCALE WATER COLLECTION SYSTEMS

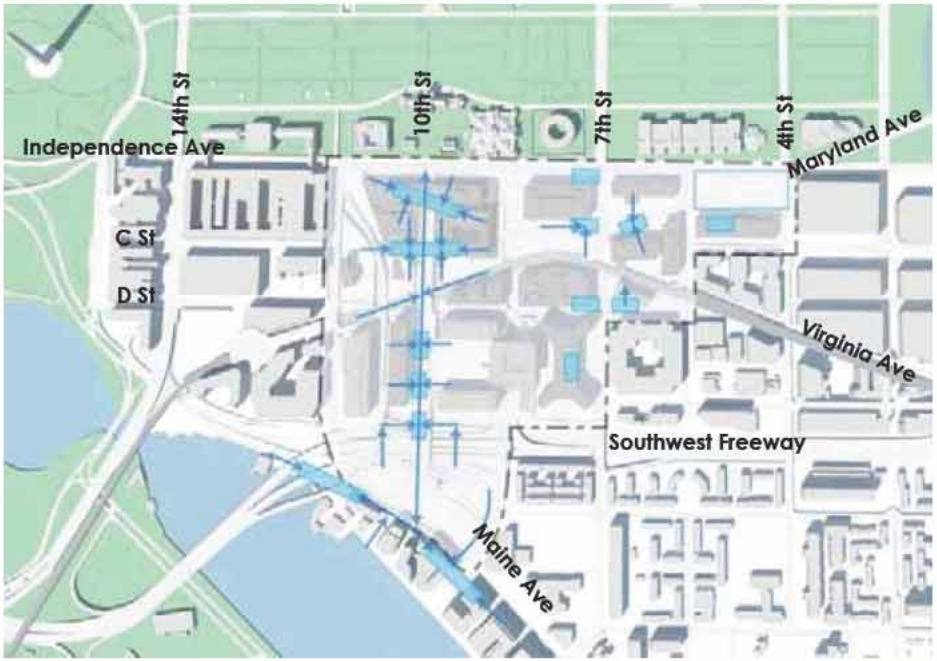
A key strategy in reducing stormwater run-off is to collect it for reuse. Here, a single block or group of blocks share a stormwater system to clean and then convey stormwater to a storage tank for reuse. Our modeling at the block-scale indicates that the project can maximize the capture and reuse of naturally occurring rain and the treatment of wastewater leaving the Ecodistrict.

- **ROOF STORMWATER** - Collect rain water from building rooftops and send to the district-scale water system.
- **STREET STORMWATER** - Collect stormwater runoff from streets/ plazas and send to the district-scale water system.
- **FLOW THROUGH PLANTERS** - When possible, pretreat as much stormwater in vegetated flow-through planters prior to sending to the district-scale water system.
- **RECYCLED STORMWATER/GREYWATER** - Reuse collected stormwater/greywater for all non-potable water needs and landscaping.

BLOCK-SCALE WASTE WATER SYSTEMS

- **WASTE WATER** - Solids captured from wastewater can ultimately reduce the Ecodistrict's greenhouse gas emissions while providing an alternative energy source through anaerobic digestion. It is not technically or financially feasible to do this in the near future in the Ecodistrict. The solids in wastewater will continue to be pumped to the DC Water Blue Plains Treatment Plant. The anaerobic digestion facility that DC Water is building will offer a regionally scaled process that is effective in capturing its latent energy, resulting in usable fertilizer and a low carbon energy source.

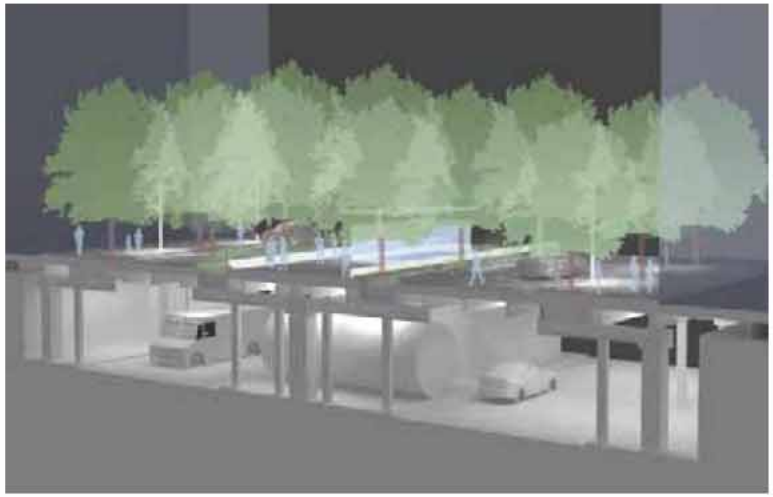
DISTRICT SCALE STRATEGIES



DISTRICT-SCALE WATER SYSTEMS

Water Storage

Water Collection



Potential stormwater storage (tank or cistern) under 10th Street

DISTRICT-SCALE STRATEGIES

- All stormwater and greywater will be sent to cisterns under 10th Street. Reuse of this water in buildings and landscapes can provide 71 percent of the total water used in the Ecodistrict. It can also provide a free water source to the central utility plant (described in the Energy Section), which uses significant amounts of potable water annually.
- Recycled stormwater and greywater strategies are important for meeting the area's potable water reduction goals. Potable water use can be reduced by 63 percent and stormwater runoff can be eliminated.

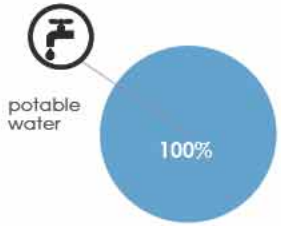
WATER - PROJECT RECOMMENDATIONS

	Summary Description	Phasing	Potential Partners Federal – F Distr ct – D Private Sector –P Public Utility - PU
1. Roof Stormwater	Capture all rainwater from building rooftops in the study area and send to the district system under 10th Street.	As buildings develop/redevelop	P,D,F
2. Street Stormwater	Send stormwater on streets in the study area through flow through planters to the district system under 10th Street.	Existing streets as district system is built New streets in coordination with construction	P,D,F
3. Ground Source Heat	Send greywater from buildings to distr ct system under 10th Street.	As buildings develop/redev	P,D,F
4. Waste Water	Send all waste water to DC Water in Blue Plains for treatment.	As new buildings develop (existing buildings already do this)	P,PU
5. Distr ct Water System	Construct cisterns underneath 10th Street to hold and treat stormwater and greywater for reuse.	Construct prior to any parcel development and in coordination w th permanent improvements to 10th Street.	F,D,P
6. Greywater/ Stormwater Reuse	Plumb all new buildings and fully rehabilitated buildings with pipes for greywater reuse.	As buildings develop/redevelop	F,D,P

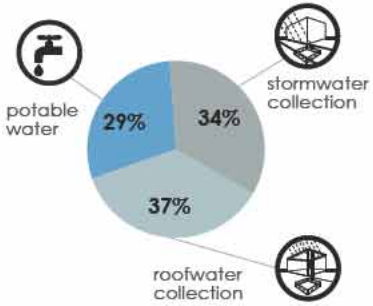
RESULTS

Strategies identified for the development scenario will lead to a 63 percent reduction of potable water use.

WATER SOURCE EXISTING

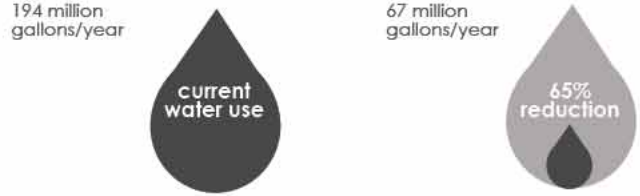


DEVELOPMENT



WATER USE

WASTE WATER



THE CASE FOR DISTRICT WATER

While the exact value proposition for a district-wide water system requires detailed research, it is clear that stormwater-related fees for property owners will become increasingly more expensive. DC Water's Clean Rivers Impervious Area Charges (IAC) and the District Department of the Environment's (DDOE) stormwater fees are projected to grow significantly between 2012 and 2018. The IAC helps fund DC Water's investment to reduce pollution in the Anacostia and Potomac Rivers and Rock Creek. It applies to all lots, parcels, properties, and private streets within the District of Columbia. DDOE assesses a stormwater fee to control pollution from stormwater runoff. This fee is based on the average amount of impervious surface on properties.

In 2012, federal property within the area paid approximately $6,800/month in combined fees. This is projected to increase to approximately $32,000/month or $384,000/year by 2018. Together, federal and private development in the area will pay approximately $48,000/month or $576,000/year by 2018.

Both programs are looking at ways to provide credits and rebates for property owners who manage their stormwater. DDOE is currently developing a stormwater fee discount program that will provide the opportunity to receive up to a 55 percent discount off the stormwater fee to rate-paying property owners who implement measures to manage and reduce stormwater runoff. While rebates alone may not cover the initial cost of infrastructure for a district-water system in the near term, the savings from reduced potable water use and associated reduction in energy use could make this project economically feasible over the long-term.

BEST PRACTICE

The Wharf will have an elaborate 675,000 gallon cistern system that will be constructed to capture more than 25 million gallons of stormwater each year that currently drains into the Washington Channel due to the lack of permeable surfaces. The captured runoff will be recycled to the greatest extent possible, including the provision of chilled water for the development's cogeneration plant.

Waste

THE IMPORTANCE OF WASTE

Reducing overall waste is critical to the success of the Ecodistrict because processing waste uses a lot of energy and if it cannot be reused, the waste is trucked to a landfill where it consumes large amounts of land, making it unusable for anything else. This section discusses two kinds of waste:

- **Building waste** – the waste that is produced in buildings every day such as waste from food and paper.
- **Construction waste** – the waste that results from building materials that can't be reused when an existing building is demolished or when a new building is constructed.

THE AREA TODAY

Today, it is estimated that 60 to 70 percent of the study area's overall waste is sent to the landfill outside of Washington, DC. This means that approximately 30 to 40 percent of its current building waste—predominately paper, plastics, and glass — is recycled. There are limited composting opportunities for food and landscape residuals. For comparison, the City of San Francisco in 2012 diverted 77 percent of all waste from the landfill. This means that it is recycling and/or reusing 77 percent of its waste and that only 23 percent is sent to the landfill.

THE OBJECTIVES

There are two waste-related targets that are achievable in this plan.

SOLID WASTE TO LANDFILL - REDUCE BY 80 PERCENT

(No waste should be incinerated in the study area)

CONSTRUCTION WASTE - RECYCLE 75 PERCENT AS BUILDINGS ARE REHABILITATED OR REDEVELOPED

WASTE STRATEGIES

DISTRICT SCALE

The Ecodistrict can effectively reduce waste generation through collective community action. In this regard, sorting waste at the point of use or altering procurement protocols is best orchestrated at a district scale.

USE REGIONAL WASTE AND RECYCLING SYSTEMS FULLY

The study area strategies utilize the regional waste and recycling system because currently it is not financially or technically feasible to process and reuse waste within the area itself.

Operational improvements such as designated composting and recycling stations at all of the buildings will go a long way towards meeting the 80 percent diversion rate from the landfill.

IMPROVED RECYCLING PROGRAM

› Engage federal and private building occupants in robust recycling programs. Provide recycling bins throughout buildings, in parks, and on the streets. Measure and inform residents and employees of annual progress.

PILOT COMPOSTING PROGRAM

› In addition to continue bolstering recycling programs in federal and private buildings, the federal agencies and private buildings will significantly benefit from a pilot composting program for food and landscape residuals.

CONSTRUCTION WASTE MANAGEMENT STRATEGIES

Operational improvements during the demolition and construction of buildings are the key to meeting the Ecodistrict's construction waste goals. Construction waste management strategies include:

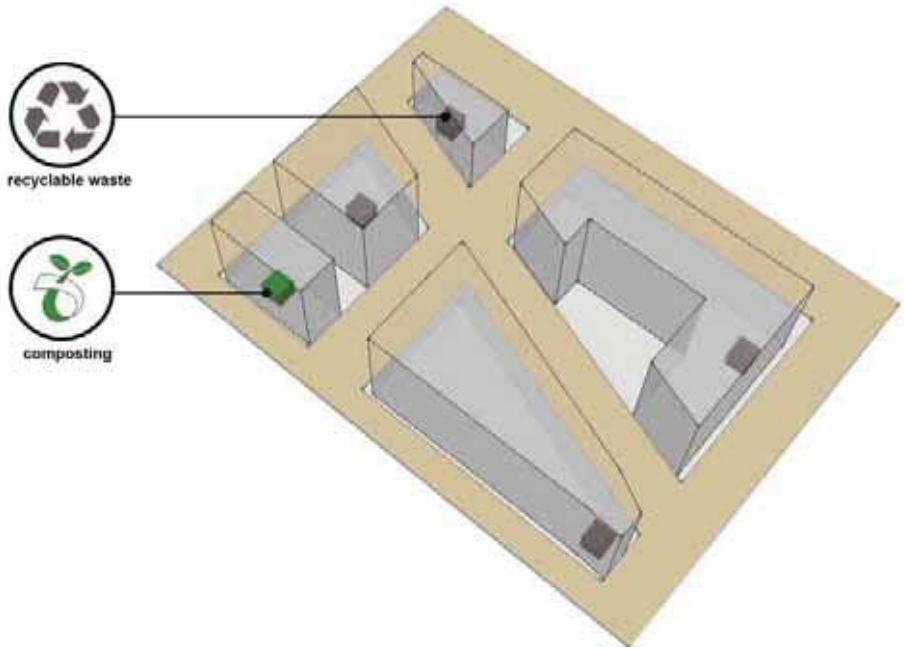
› Early planning to set targets and adopt waste prevention plans.

› Requiring that reusable wood and other materials are used before new ones.

› Purchasing reused, recycled, or recycle-content materials and equipment.

› Finding creative ways to reuse items already existing within the project site.

BUILDING & BLOCK-SCALE STRATEGIES



WASTE - PROJECT RECOMMENDATIONS

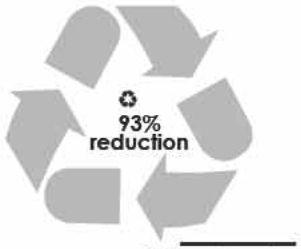
	Summary Description	Phasing	Potential Partners Federal – F District – D Private Sector –P Publ c Utility - PU
1. Recycling	Improve recycling programs and facilities throughout the study area.	Immediately	F, D, P
2. Composting	Implement a pilot composting program.	Immediately	D (part of the DC Sustainabil ty Plan effort)
3. Construct on Waste Management	Use construction waste management strategies during demolition and construction of new buildings.	As buildings develop/redevelop	P

RESULTS

The development scenario strategies will lead to recycling of 80 percent of solid waste and 75 percent of construction waste.

EXISTING SOLID WASTE

DEVELOPMENT SCENARIO



CONSTRUCTION WASTE RECYCLING

BEST PRACTICES - WASTE

In 2010 San Francisco exceeded its goal to divert 75 percent of materials away from the landfill. Residents and businesses can utilize the green/blue/black bin system that is picked up at each property and allows people to recycle and compost easily. The city's goal is to be zero waste by 2020. Zero waste means products are designed and used according to the waste reduction hierarchy (prevent waste, reduce and reuse first, then recycle and compost) and principle of highest and best use, so no material goes to landfill or high-temperature destruction. Reaching this goal means sending zero discards to the landfill, instead all discards generated in San Francisco are either reused, recycled, or composted.

Green Infrastructure

THE IMPORTANCE OF GREEN INFRASTRUCTURE

Green infrastructure is defined as a connected system of landscaped elements such as parks, living walls, green roofs, streetscape plantings, bioretention such as rain gardens, and mature tree canopies. When linked together, green infrastructure can provide a unified, resilient urban ecosystem that improves both ecological and human health. Green infrastructure, particularly in the form of parks, can also increase property values and contribute to the overall economic health of a community. The most successful systems seamlessly blend these elements into energy, water and waste infrastructure, and enhance the built environment for improved human connections with nature.

Integrating a green infrastructure system into the buildings, sites, and utility infrastructure will result in cost-effective improvements through a living system that:

- **Cleans** the air and stormwater to enhance urban ecology and improve human health.
- **Cools** the overall temperature of the area, reducing the heat island effect, decreasing energy costs, and improving habitat and pedestrian comfort.
- **Connects** contiguous green spaces along the ground, up living walls, and over green roofs, creating diverse habitat opportunities and connecting people to nature.

There are three green infrastructure elements that work together to improve the urban ecology of the SW Ecodistrict.

- **Permeable surfaces** – areas on the ground and on roofs that are able to absorb water and oxygen. Permeable surfaces increase the health and vitality of vegetation.
- **Tree canopy** – the overall area covered by trees. Extensive tree canopy coverage helps reduce the heat island effect, offers greater habitat opportunities, and provides a more comfortable pedestrian experience.
- **Parks and plazas** – publicly accessible spaces that provide vegetation, increase habitat opportunities, and improve human health. They also contribute to the cultural character of a neighborhood.

THE AREA TODAY

Typical of many urban areas, the study area is a low-functioning ecosystem. This is caused by a number of factors:

- Approximately 80 percent of the surface is impervious, a state where the ground is unable to absorb water and oxygen.
- About 50 percent of the study area is built above the ground. Due to weight restrictions, older elevated structures often limit the ability to retrofit streetscapes with a large tree canopy and vegetation.
- The few areas that are vegetated, including the 10 acres of parks and plazas, are mostly small spaces between a building and the sidewalk that are unsuitable for habitat. They suffer from severely compacted soil, are not properly maintained, and contain non-native invasive species.
- Only about 8.6 percent of the study area is covered by tree canopy, and the surviving trees have limited growth potential. As a comparison, about 37 percent of Washington is covered by tree canopy.

As of November 2012, there were no green roofs, living walls, or bioretention areas that collect and treat stormwater, or other green infrastructure elements in the study area. However, the District of Columbia's 2012 update to the Zoning Regulations requires parcels to calculate and maintain a Green Area Ratio (GAR), a calculation that compares the permeable surfaces, tree canopy and landscaped areas to the overall site area. Based on the District's underlying land use for the study area, the GAR is 0.30.

THE OBJECTIVES

The target for green infrastructure in the study area is to achieve a minimum Green Area Ratio of 0.45, well above the District of Columbia's minimum GAR of 0.30. This will be accomplished by using green roofs and living walls; bioretention in parks, plazas, sidewalks and medians; edible gardens and improved parks; and permeable pavements and sidewalks that allow for greater tree canopy and vegetation.

Green roofs significantly contribute towards increasing the Ecodistrict's GAR, and provide a variety of benefits to urban ecology and human health. They reduce energy use by providing superior insulation qualities, increase permeable surfaces, and establish vegetated areas that provide habitat opportunities for pollinators and rooftop gardens for occupants. However, the SW Ecodistrict must balance the benefits of green roofs with the need to increase renewable energy use and capture and reuse as much stormwater as possible. Because there is a limited amount of area available to successfully achieve all three goals, the use of green roofs should be strategically located in places where they are visible to building occupants, maximizing both ecological and human benefits. Establishment of green roofs, renewable energy systems and recycled stormwater/greywater systems should be planned holistically to yield maximum results.

As a part of the GAR, credit is also given to reducing the amount of impervious surface in the area, increasing the overall tree canopy, and establishing urban parks. By establishing a minimum pervious surface area objective of 35 percent, the SW Ecodistrict will contribute to the improved health of the Chesapeake Bay watershed. By establishing a minimum tree canopy area objective of 40 percent and concentrating new plantings along streets and in the 14.3 acres of new or improved parks and plazas, the SW Ecodistrict can help Washington move towards its city-wide goal.

ACHIEVE A MINIMUM GREEN AREA RATIO OF 0.45

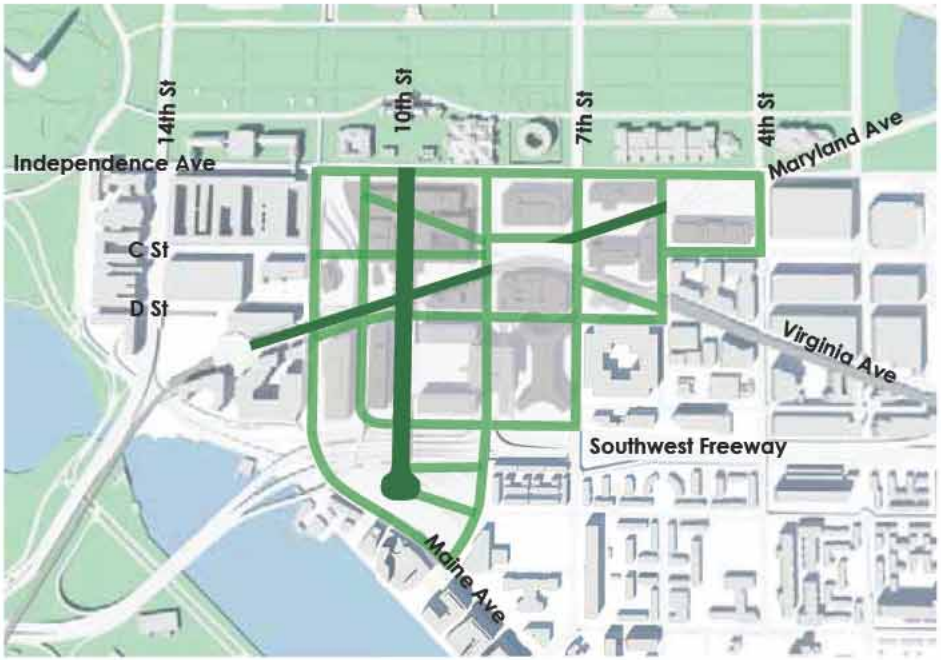
STRATEGIES

BUILDING-SCALE STRATEGIES

The following strategies are able to make the biggest impact through implementation on a building-by-building basis.

- **Green Roofs** Locate and design green roofs to maximize their ecological function and their visibility to on-site and nearby building occupants and/or from the street level.
- **Edible Rooftop Gardens** Designate selective rooftop areas for edible gardens, and use compost and mulch from the area to amend planting beds and improve soil quality.
- **Green Walls** Incorporate green walls into exterior building features to cool structures, decrease energy costs, reduce heat island effect, and enhance streets and plazas.
- **Rain Gardens** Incorporate rain gardens into landscaping to manage and treat stormwater.

(Images, clockwise from upper left) - Solar/green roof, edible rooftop garden, edible green wall, green wall, rain garden



GREEN STREET INFRASTRUCTURE

Green Corridor

Enhanced Tree Canopy

Green streets manage stormwater and improve urban ecology.

BLOCK-SCALE STRATEGIES

While many strategies at the block-scale are implemented in the public realm, adjacent landowners and government agencies with jurisdiction over the public realm can work together to achieve even greater results.

- **Stormwater Management** Capture and treat stormwater across property lines using integrated green infrastructure elements in parks, plazas, building yards, and along streets. Elements include low impact development features like rain gardens, cisterns, and grassed swales.
- **Pervious Area** Maximize ground infiltration by increasing open space and using permeable pavement and structural pavement systems that allow for water and oxygen absorption to improve vegetative root growth.
- **Native Vegetation** Integrate native vegetation into parks, plazas, streetscapes and bio-retention features such as rain gardens to improve water quality and visual aesthetics, lower energy/water consumption, and promote mid-Atlantic ecology.
- **Parks and Plazas** Design parks and plazas for people to socialize and reconnect with nature, treat stormwater, control flooding, and provide habitat opportunities.
- **Urban Soils** Establish healthier urban soils by using compost and mulch from the Ecodistrict, structural soils that resist compaction, and more permeable pavers that allow for vegetative root growth.
- **Urban Heat Island Effect** Use shade from trees and structures, as well as surface materials with a high solar reflectance index (SRI), to reduce the heat island effect.

DISTRICT SCALE STRATEGIES

In order to meet green infrastructure targets, some strategies must be implemented at a district-scale.

- **Green Corridor** Transform 10th Street into a "green spine" of vegetation to connect the National Mall and the southwest waterfront. Use street trees, water features and other green infrastructure elements such as rain gardens to connect parks and plazas.
- **Tree Canopy** Use tree-friendly construction details that increase soil permeability and root growth, in streetscapes. Concentrate new tree canopy into parks and plazas, redeveloped parcels, and along streets.
- **Awareness Campaign** Integrate exhibits and way finding elements into the green infrastructure system to connect people to nature. Provide interpretive/educational information about regional ecology, history, and culture.
- **Indicator Species** Identify a bird or insect to serve as the "indicator species" to monitor the ecological health of the SW Ecodistrict.

GREEN INFRASTRUCTURE - PROJECT RECOMMENDATIONS

	Summary Description	Phasing	Potential Partners Federal – F District – D Private Sector –P Public Util ty - PU
1. Green Roofs	Locate and design green roofs to maximize their ecolog cal function and their visibil ty to on-site and nearby building occupants and from the street level.	As buildings develop/redevelop	P, F
2. Edible Rooftop Gardens	Designate selective rooftop areas for edible gardens, and use compost and mulch from the area to amend planting beds and improve soil qual ty.	As buildings develop/redevelop	P, F
3. Green Walls	Incorporate green walls into exter or building features to cool structures, decrease energy costs, reduce heat island effect, and enhance streets and plazas.	As buildings develop/redevelop	P, F
4. Rain Gardens	Incorporate rain gardens into landscaping to prov de stormwater management.	As buildings develop/redevelop	P, F, D
5. Stormwater Management	Capture and treat stormwater across property lines using integrated green infrastructure elements in parks, plazas, building yards, and along streets. Elements include low impact development features like rain gardens, cisterns, and grassed swales.	Coordinate with design of cistern infrastructure under 10th Street	PU, F, D, P
6. Pervious Area	Maximize ground infi tration by increasing open space and using permeable pavement and structural pavement systems that allow for water and oxygen absorption to improve vegetative root growth.	As buildings develop/redevelop; coordinate in public spaces with streetscape design	PU, F, D, P
7. Native Vegetat on	Integrate native vegetation into parks, plazas, streetscapes and bio-retention features such as rain gardens to improve water qual ty and visual aesthet cs, lower energy/water consumption, and promote mid-Atlantic ecology.	As buildings develop/redevelop; coordinate in public spaces with streetscape design	P, F, D
8. Parks and Plazas	Design parks and plazas for people to socialize and reconnect w th nature, treat stormwater, control flooding, and provide habitat opportunities.	Coordinate with design of cistern infrastructure under 10th Street and green corridor design	F, D
9. Urban Soils	Establish healthier urban soils by using compost and mulch from the Ecodistrict, structural soils that resist compact on, and more permeable pavers that allow for vegetative root growth.	As buildings develop/redevelop; coordinate in public spaces with streetscape design	P, F, D
10. Urban Heat Island Effect	Use shade from trees and structures, as well as surface materials w th a high solar reflectance index (SRI), to reduce the heat island effect.	As buildings develop/redevelop; coordinate in public spaces with streetscape design	P, F, D
11. Green Corridor	Transform 10th Street into a “green spine” of vegetation to connect the Nat onal Mall and the SW Waterfront. Use street trees, water features and other green infrastructure elements such as rain gardens to connect parks and plazas.	Coordinate with design of cistern infrastructure under 10th Street, parks, and plazas	P, F, D
12. Tree Canopy	Use tree-friendly construction details that increase soil permeability and root growth. Concentrate new tree canopy into parks and plazas, redeveloped parcels, and along streets.	As buildings develop/redevelop; coordinate in public spaces with streetscape design	P, F, D
13. Awareness Campaign	Integrate exhibits and way finding elements into the green infrastructure system to connect people to nature. Provide interpretive/educational informat on about regional ecology, history, and culture.	Coordinate with Ecodistrict marketing strateg es	F, P
14. Indicator Spec es	Identify a bird or insect to serve as the “indicator species” to mon tor the ecological hea th of the SW Ecodistr ct.	Coordinate with Ecodistrict marketing strateg es	F, P

RESULTS

The development scenario strategies will lead to a resilient green infrastructure system that significantly improves ecological health; treats stormwater and prevents flooding; reduces energy use in buildings; reuses compost created in the SW Ecodistrict to improve soil quality and connect green spaces for contiguous habitat for critters. The green infrastructure system will also filter air pollutants; reduce urban heat island impacts; absorb carbon dioxide in the soil and tree canopy; and improve human health with views and access to roof gardens, parks, and recreational areas for rest and social interactions.

GREEN INFRASTRUCTURE

› Achieve a Green Area Ratio of 0.45 and 14.3 acres of improved parkland for ecological and human health.

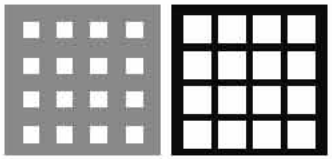
TREE CANOPY

› Increase tree canopy coverage from the existing 8.6 percent to 40 percent.

Existing Development Scenario

PERMEABLE SURFACES

› Increase permeable surface from the existing 20 percent to at least 35 percent.



Existing Development Scenario

BEST PRACTICES - GREEN INFRASTRUCTURE

Philadelphia Municipal Green Infrastructure Plan (Philadelphia, PA)

The Philadelphia Water Department captures, treats, and reuses stormwater through an integrated green infrastructure system. When compared to traditional underground stormwater conveyance systems, green infrastructure provides a cheaper and more flexible solution that delivers additional ecological and personal health benefits. Linking smaller elements such as green roofs, rain gardens, and tree boxes creates a resilient and growing system that not only treats stormwater, but increases awareness of city residents and employees about the health of the ecosystem.

Greenwich Millennium Village (London, England)

Initiated in 2006, this brownfield development in southeast London is a mixed-use community that fully integrates a contiguous system of green infrastructure into the neighborhood. The green infrastructure treats stormwater runoff, provides habitat for a variety of species, and teaches residents and visitors about their ecosystem. It contributes towards an overall 30 percent reduction in water use, 80 percent reduction in energy use, and provides opportunities to interact with nature throughout the development, both in a streetscape/public realm setting as well as in restored wetland areas.

The Environmental Framework

Recommended Development Scenario
Study Model (2030).

CONCLUSION

ENERGY, WATER, WASTE AND GREEN INFRASTRUCTURE

The outcomes of the Environmental Framework recommendations include:

ENERGY

- **Reduces the energy use of all buildings,** including lightly rehabbed buildings by 47 percent and fully rehabbed buildings and new development by 72 percent.
- **Results in a 30 percent increase in the Ecodistrict's total energy use supplied by renewable energy.** This assumes 15 percent will be produced within the area and 15 percent will be purchased from credits. This energy will not create any greenhouse gas emissions and will reduce costs over the long-term.
- **Results in a 51 percent reduction in greenhouse gas emissions for the Ecodistrict.** This significantly exceeds the federal government's goal to reduce greenhouse gas emissions 28 percent by 2030. If the central utility plant could adapt to using a renewable fuel source in the future, the area could be zero net energy with no greenhouse gas emissions.
- **Demonstrates that the central utility plant is extremely valuable in reducing the ecodistrict's greenhouse gas emissions.** The proposed development scenario assumes that the plant will provide heating and cooling to all buildings in the Ecodistrict resulting in 70 percent of the area's total energy use being supplied by natural gas instead of coal.

WATER

- **Reduces the overall potable water use by 67 percent per square foot per year.** This will be accomplished through high efficiency buildings and the capture and reuse of stormwater for non-potable water uses.
- **Allows for the capture and reuse of all the rainwater in the SW Ecodistrict throughout the year.** Not only will this provide a free water source for non-potable water uses but it will decrease the Ecodistrict's greenhouse gas emissions by eliminating the need to pump and treat water miles outside of the study area.

WASTE

- **Increases the amount of waste diverted from the landfill from 35 to 80 percent.** This will be achieved through executing programs to reduce product consumption and encourage recycling and composting.

GREEN INFRASTRUCTURE

- **Improves human health with views and access to roof gardens, parks, and recreational areas for rest and social interactions.**
- **Increases the tree canopy from 8.6 to 40 percent.** This will improve air and water quality, reduce heat island effect, and provide a more comfortable pedestrian experience.
- **Increases the permeable surface from 20 to 35 percent.** This improves water quality and allows more stormwater to be captured and reused within the Ecodistrict.

THE SW ECODISTRICT WILL BE A HIGH PERFORMANCE ENVIRONMENTAL SHOWCASE

4

The Development Scenario and Focus Areas

GUIDING SUCCESSFUL REVITALIZATION

The recommended development scenario for achieving the SW Ecodistrict vision is informed by the neighborhood and environmental frameworks presented in Chapters 2 and 3. The scenario recommends a phased strategy that includes rehabilitating some facilities and repurposing others, infilling vacant parcels and complete redevelopment. Combined, these changes repair the urban grid and balance the mix of uses and density necessary to support a revitalized, urban community in the heart of the nation's capital.

The symbiotic relationship between the neighborhood and environmental frameworks supports the development of a high-performance sustainable community. Efficient district energy, water, and waste management systems combine to support a high performance built environment. To achieve efficiencies in these systems, a diverse community of residents, workforce, and visitors, who have different resource demands throughout the day and evening is needed. To attract such a diverse community, the area must be a mixed-use, walkable and transit-oriented neighborhood.

While aspirational, the development scenario anticipates the realities of implementation. It is divided into four Focus Areas and designed for flexibility. Without displacing federal agencies, improvements can be made as federal space needs change, buildings are modernized, or opportunities arise to leverage federal, local, and private funds. Inevitably, as individual improvements are made, the design and the overall land mix may vary, but the basic philosophy of the plan will remain.

The SW Ecodistrict will become a vibrant, sustainable mixed-use community and showcase of possibilities. The area will demonstrate sustainable best practices, high performance building and landscape design, integrated safety and security measures, and prove that district-scale strategies yield the greatest environmental and economic benefits.

The Development Scenario

THE DEVELOPMENT SCENARIO

The development scenario represents the physical design scheme that best achieves the overall objectives without being prescriptive. It provides direction for rehabilitating, repurposing, or redeveloping buildings; developing underutilized sites to meet high performance building and landscape standards; and a range of infrastructure improvements. The approach started with an in-depth analysis of environmental and neighborhood elements at the building scale. These included:

- Current and proposed energy, water, and waste use;
- Historic value of the property;
- Relationship of the building to the street grid;
- Stormater management capacity; and
- Maximum development density.

Detailed modeling and analysis informed the development scenario to ensure that at build out, the Ecodistrict performs at its fullest potential.

To create the development scenario, the 2009 energy, water, and waste use of each property was collected. That information was compared with new development alternatives to determine the potential benefits. These included development capacity, the share of transit ridership, and sources and uses for energy, water, and waste. The development scenario was then adjusted through an iterative process to determine how best to maximize results. Buildings were placed into one of the four categories:

Rehabilitation - Existing buildings that will remain in the near future will require a degree of rehabilitation.

- **Light Rehabilitation** - Buildings that may be repurposed or redeveloped will be lightly rehabilitated in the near-term by improving lighting and water fixtures to reduce energy and water consumption.
- **Full Rehabilitation** - Buildings identified as permanent facilities of the Ecodistrict will be fully rehabilitated by upgrading windows, building skin envelopes, and mechanical systems.

Repurpose - Repurposing of some existing buildings involves fully rehabilitating the structure and changing the building's use. It may also involve adding height and increasing the building footprint and potentially transferring the building's ownership.

Infill - Infill development will occur on sites that are currently vacant or underutilized.

Redevelopment - Existing buildings that are inefficient or do not fully use their site may be razed and redeveloped.

The development scenario seeks to retain federal agencies within the District of Columbia in locations appropriate to their missions. The scenario looks to improve the efficiency of federal ownership of land and buildings and suggests opportunities to foster a greater mix of cultural, hotel, and residential uses. New development will supplement existing office workers to generate day, evening, and weekend activity and support neighborhood-serving convenience retail. New construction will provide the ability to rebuild the street grid to improve connections and enhance public space.

Some say the greenest building is the one already built. While this may be the case for individual facilities functioning at the highest level of efficiency, the SW Ecodistrict seeks to move beyond individual buildings and achieve sustainability at a district scale. While rehabilitating existing buildings will dramatically decrease energy and water use and improve efficiency of interior space, it is the repurposed, infill, redevelopment of sites and infrastructure improvements that will be catalytic in realizing the SW Ecodistrict vision.

DEVELOPMENT SCENARIO SUMMARY

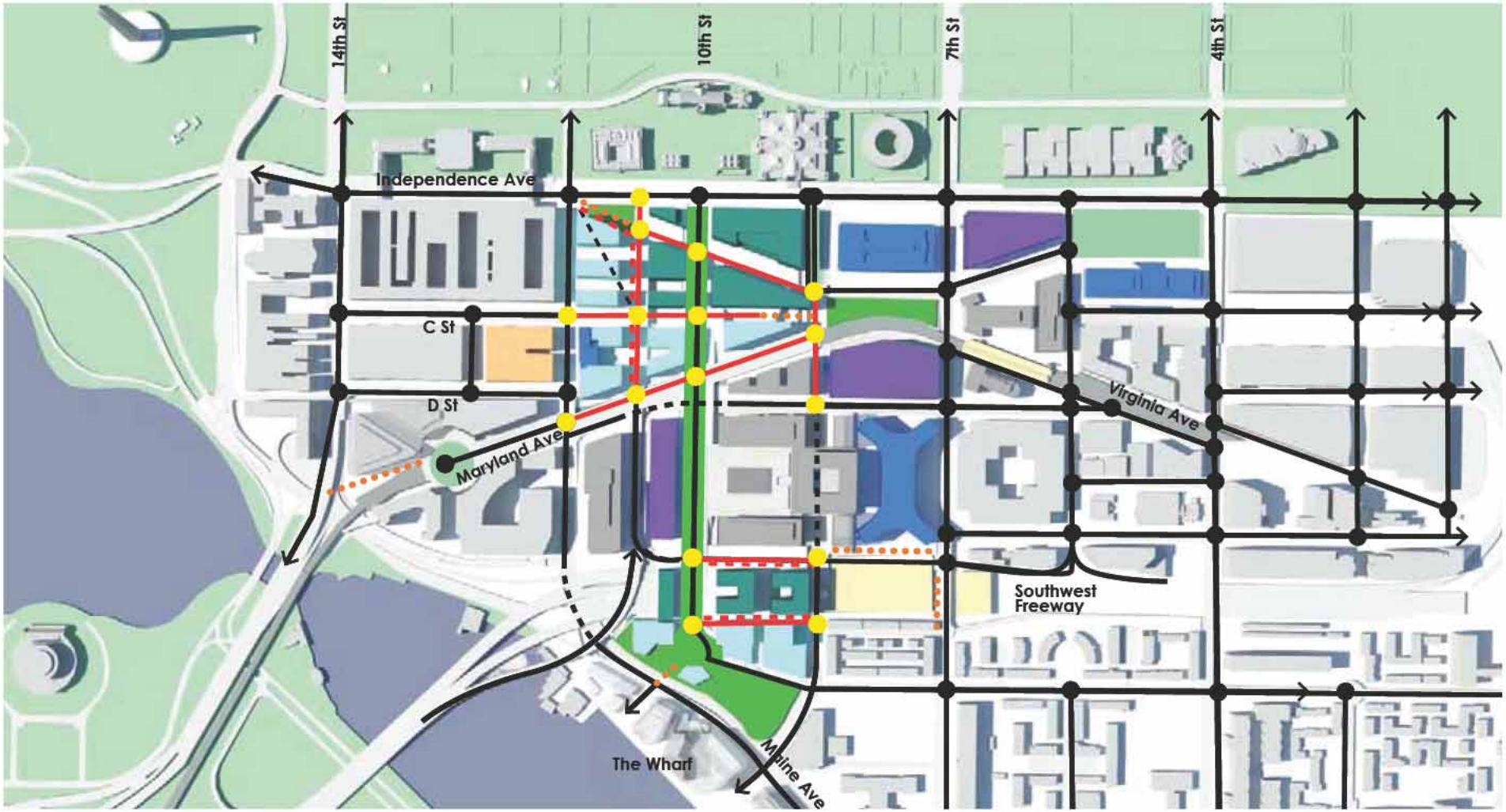
	Gross Sq. Ft.	Population[1]
Existing	10.8 Million	32,000
Rehabilitation - Full and Light [2]		+ 11,000
Repurpose	+ 600,000-1 Million	Will vary by use
Redevelopment	+3.0 Million	+ 6,000
Infill	+ 2.2 Million	+ 2,000
Potential Development Scenario [2]	14.7-15.1 Million	51,000

[1] Employees and residents

[2] Since lightly rehabbed buildings will be repurposed or redeveloped, the potential total is not cumulative.

Short term recommendations can be employed now without major investment in new infrastructure or significant redevelopment of buildings. However, there are progressive recommendations that will be catalytic and have exponential benefits to achieve the sustainability goals. These recommendations are summarized in the diagrams and project focus areas that follow.

The Development Scenario - Summary Plan



CREATING A HIGH PERFORMANCE COMMUNITY

Together, the rehabilitation, repurpose, infill, and redevelopment recommendations will transform the study area into a sustainable community. With the support of the neighborhood and environment framework recommendations, this development scenario creates a high performance neighborhood where land use and development decisions positively impact the environment, and improved infrastructure advances neighborhood amenities. Most importantly, the Ecodistrict will reintroduce both residents and visitors to an area now dominated by offices. Having a variety of users day and night is key to providing the vitality necessary to transform this area into an economically, socially, and environmentally successful community.

This relationship between the neighborhood and environmental frameworks is present throughout the SW Ecodistrict, including:

TRANSPORTATION INFRASTRUCTURE SUPPORTS LOWER CARBON EMISSIONS

Development decisions to break-up oversized superblocks and reconnect the street grid encourages walking, provides increased opportunities for retail, and decreases the overall greenhouse gas emissions produced within the Ecodistrict.

As streets and sidewalks are re-established or created, they will accommodate the necessary infrastructure to improve the generation and distribution of energy and the capture, treatment, and storage of stormwater for reuse. Streets will also be planted with trees and understory vegetation to improve urban ecology, increase pedestrian comfort, and further reduce carbon emissions.

DISTRICT WATER SYSTEM SUPPORTS GREEN INFRASTRUCTURE

By capturing, treating, and reusing all of the stormwater within the area, the Ecodistrict will reduce its dependence on potable water and lower operational costs. An overall lattice of green will support a lush setting composed of shaded streetscapes and elegant parks that will treat stormwater while providing human and environmental health benefits. These systems will provide connected habitat corridors to the Washington Channel and improve the visual character of the neighborhood. The introduction of quality public spaces and outdoor amenities will attract residents and visitors to the area, increasing the efficiency of the water system.

DISTRICT ENERGY SYSTEM SUPPORTS DIVERSITY OF LAND USE

The plan seeks to reduce energy use in existing and new buildings, generate and distribute energy efficiently, and use decarbonized fuel and supplement with renewable power. The existing central utility plant will provide heating and cooling for all federal and new or rehabilitated buildings. Microgrids will be established for federal and private development to allow for more flexible generation and distribution of renewable energy. Most buildings and infrastructure will support solar arrays and collect ground source heat.

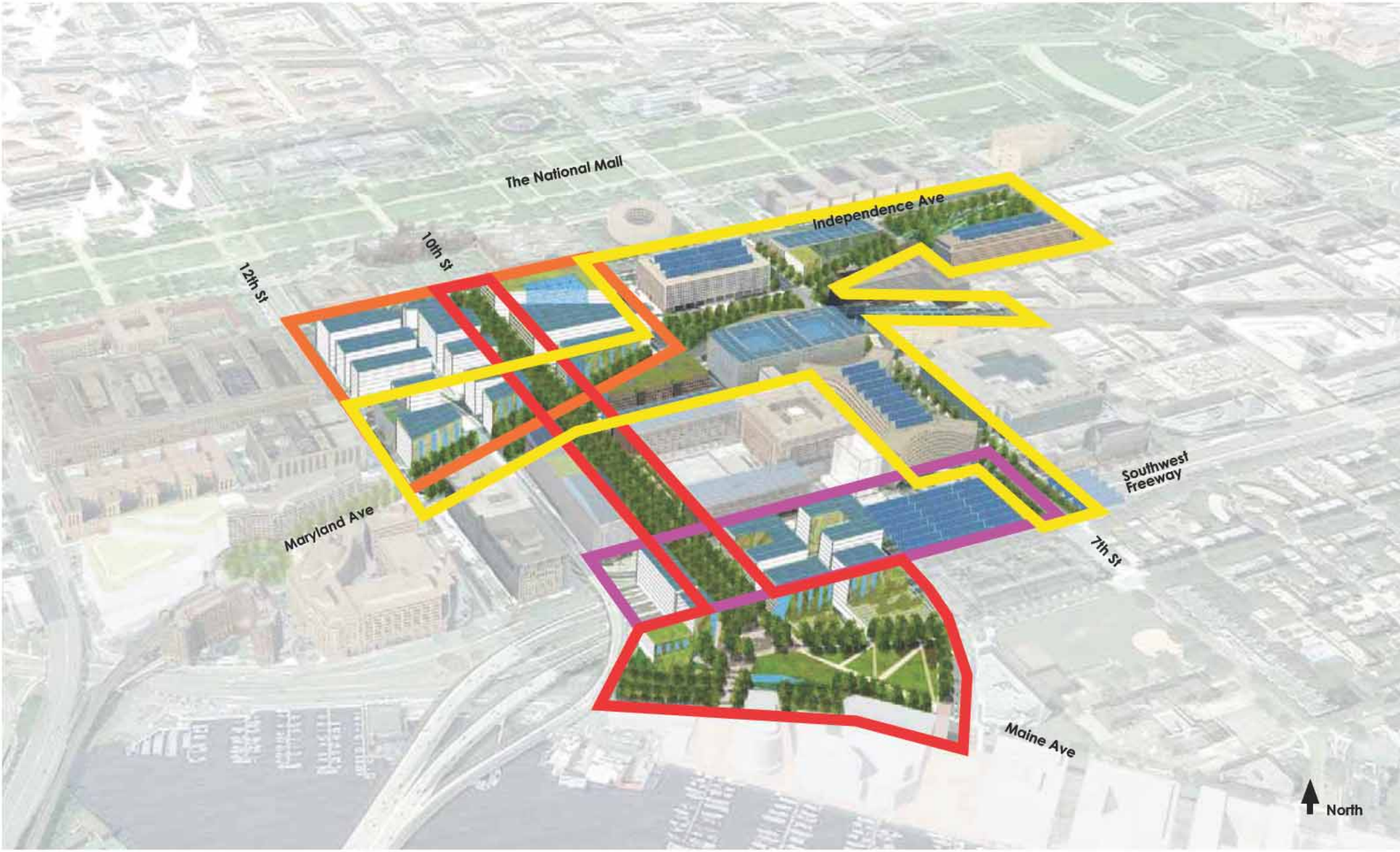
The most efficient energy systems require a diverse mix of land uses that distribute the energy demand throughout a 24-hour period. Adding residential, institutional, and evening activity to balance the overabundance of traditional office users will make this district energy system more financially viable, lower the carbon footprint of the Ecodistrict, and generally support a more vibrant community.

A mix of rehabilitation, repurposing, infill, and new development will provide the opportunity to deploy best practices in green building. The increase in density and use mix will substantially improve the operational efficiency of the existing central utility plant. Using LEED Platinum criteria as a baseline strategy will guide the placement, orientation, and construction of new buildings that employ innovative sustainable energy and water systems.

Implementing the development scenario at a district scale will support creation of an innovative new neighborhood at the heart of the nation's capital. By planning and implementing at a district scale, the resulting Ecodistrict will contribute to the region's environmental, social, and economic health.

Success can be measured quantitatively and qualitatively. Inevitably, as individual improvements are made the actual components and land mix may vary. Regardless of the final design, the land use, transportation, energy, water, and waste framework will guide the evolution of this area to be a sustainable and financial success.

Focus Areas


The National Mall
Independence Ave
10th St
12th St
Maryland Ave
Southwest Freeway
7th St
Maine Ave
North

Focus Areas

Four Focus Areas are used to organize recommendations into manageable and related efforts.

INDEPENDENCE QUARTER

A mixed-use community anchored by a national museum and a new headquarters for the U.S. Department of Energy.

MARYLAND AVENUE AND 7TH STREET CORRIDORS

An urban boulevard centered on a signature park and an expanded L'Enfant Station intermodal center.

10TH STREET CORRIDOR AND BANNEKER PARK

An inviting civic corridor connecting the National Mall and Smithsonian Museums to the southwest waterfront, anchored by an improved Banneker Park, a nationally significant cultural destination.

SOUTHWEST FREEWAY

A private mixed-use development atop the Southwest Freeway will connect Southwest neighborhoods, the waterfront, and the National Mall.

Each Focus Area includes a revitalization objective, a summary of considerations, a plan diagram, physical recommendations, and projected results. The Focus Area recommendations are organized by buildings, site, infrastructure, streets, and public space. Each recommendation includes:

- Summary descriptions of the parcel-specific proposal.
- Related or dependent projects – projects that are contingent upon another project
- Recommendations for less expensive near-term improvements could occur within five to ten years. Complex and more expensive long-term improvements could occur over the 20-year planning horizon.
- Potential partnerships to coordinate improvements, which may or may not include funding partners.

Independence Quarter

View of Independence Quarter from the northwest

(Top image) - Existing Conditions Study Model (2012)
(Lower image) - Recommended Development Scenario Study Model (2030)

REVITALIZATION OBJECTIVES

Redevelop the area between Independence Avenue and Maryland Avenue to create Independence Quarter, a new walkable neighborhood that integrates the qualities of the federal and local city within the monumental core.

Primary objectives for Independence Quarter:

- Reconnect the street grid;
- Balance the land use mix;
- Increase the efficient use of federal lands and buildings;
- Improve the setting for future cultural development;
- Establish a state-of-the-art headquarters building for the U.S. Department of Energy;
- Maximize district energy and stormwater practices; and
- Unlock the potential for 10th Street and Maryland Avenue as vibrant mixed use corridors.

TODAY

Today, approximately 20 acres south of Independence Avenue support the U.S. Department of Energy (DOE) headquarters, the Cotton Annex, the 12th Street Freeway ramp and tunnel, and several irregularly shaped, under-used parcels. The General Services Administration has jurisdiction of the land and buildings and the District of Columbia controls the streets. The Department of Energy's 1.8 million sq. ft. Forrestal Complex includes underground parking, a child care center, and a freestanding cafeteria facility for federal employees. The U.S. Department of Agriculture (USDA) Cotton Annex sits vacant.

Infrastructure barriers limit access by both car and foot. The I-395 access ramps and the CSX rail corridor limit mobility within the area. Streets have been eliminated in the creation of large superblocks lining each side of 10th Street (L'Enfant Promenade). The complex of monolithic buildings, excessive setbacks, and absence of ground floor activity makes it difficult to locate building entrances and creates an inhospitable environment.

CONSIDERATIONS

To realize Independence Quarter, several considerations must be addressed, including:

FEDERAL LAND AND FACILITIES

GSA and its tenants are working to significantly increase space efficiency of the federal real estate portfolio through physical improvements at individual facilities and through workplace management and operations. Several executive orders and Congressional directives are driving efforts to eliminate excess federal property and wasteful spending, conserve energy and water use, and reduce greenhouse gas emissions. At the same time, GSA is addressing changing agency missions and shifts in workforce technology and demographics. The concentration and configuration of federally owned property in Independence Quarter will help advance these directives.

Through the years DOE's Forrestal Complex has been incrementally improved to increase the energy and space efficiency. However, today's sustainability needs require much more. In response, GSA and DOE are evaluating the long term operational needs of the agency. GSA is also assessing the feasibility, costs, and benefits of disposing of underutilized assets.

While potential redevelopment of the DOE headquarters and the potential disposition of the surrounding parcels will address agency needs and help meet executive and legislative directives, it is important to retain ownership of an adequate amount of federal land to meet future federal office space requirements and retain cabinet agency headquarters within the area. To maximize government efficiency and ensure continuing operations of public service, it is important that federal agencies not be displaced and that real estate and facility operation decisions are not made in isolation. A comprehensive approach is critical to also maximize the use of federal land and its real estate value.

CULTURAL FACILITIES

The study area is gaining interest from potential memorial and museum sponsors because of its proximity to numerous Smithsonian Institution facilities, the National Mall, and The Wharf.

The National Women's History Museum is seeking Congressional approval to purchase federal land at or near the southwest corner of 12th Street and Independence Avenue. Congressional legislation was introduced to authorize the National Museum of the American Latino Commission to use the Arts and Industries Building and to develop an underground annex south of Independence Avenue for the museum. Additional sponsors are also exploring memorial or museum development within the Ecodistrict.

HISTORIC PRESERVATION

Early in the 20th century, the area was a walkable neighborhood of rowhouses and businesses. The streets and the blocks were altered with the introduction of the Urban Renewal Plan after World War II. Built in the 1930s, the Cotton Annex pre-dates urban renewal and has been determined eligible for the National Register of Historic Places (NRHP). While the L'Enfant Plan of Washington is also listed in the NRHP, the portion of Virginia Avenue between 9th Street and Independence Avenue does not contribute because the avenue was abandoned and views to the Washington Monument blocked. If restored, its non-contributing status could be re-evaluated.

Although 10th Street is a contributing element of the L'Enfant Plan, the view corridor between the Smithsonian Castle and the waterfront is non-contributing because the view was blocked with construction of the Forrestal Complex in 1970. The Forrestal Complex is nearing the threshold for consideration but has not yet been fully evaluated for listing in the NRHP. However, the DC State Historic Preservation Office has indicated that it considers restoration of the view corridors more important than preservation of the Forrestal Complex if it is ultimately determined eligible for the NRHP. Redeveloping the Forrestal Complex will reestablish Virginia Avenue and its link between Reservation 113 and the Washington Monument, restore views between the Smithsonian Castle and the southwest waterfront, and reclaim the street grid and the block configuration of the L'Enfant Plan.

The federal government will be required to comply with the National Historic Preservation Act in the development of proposals to sell, alter, repurpose, or redevelop resources considered eligible for or listed in the NRHP.

RECOMMENDATIONS

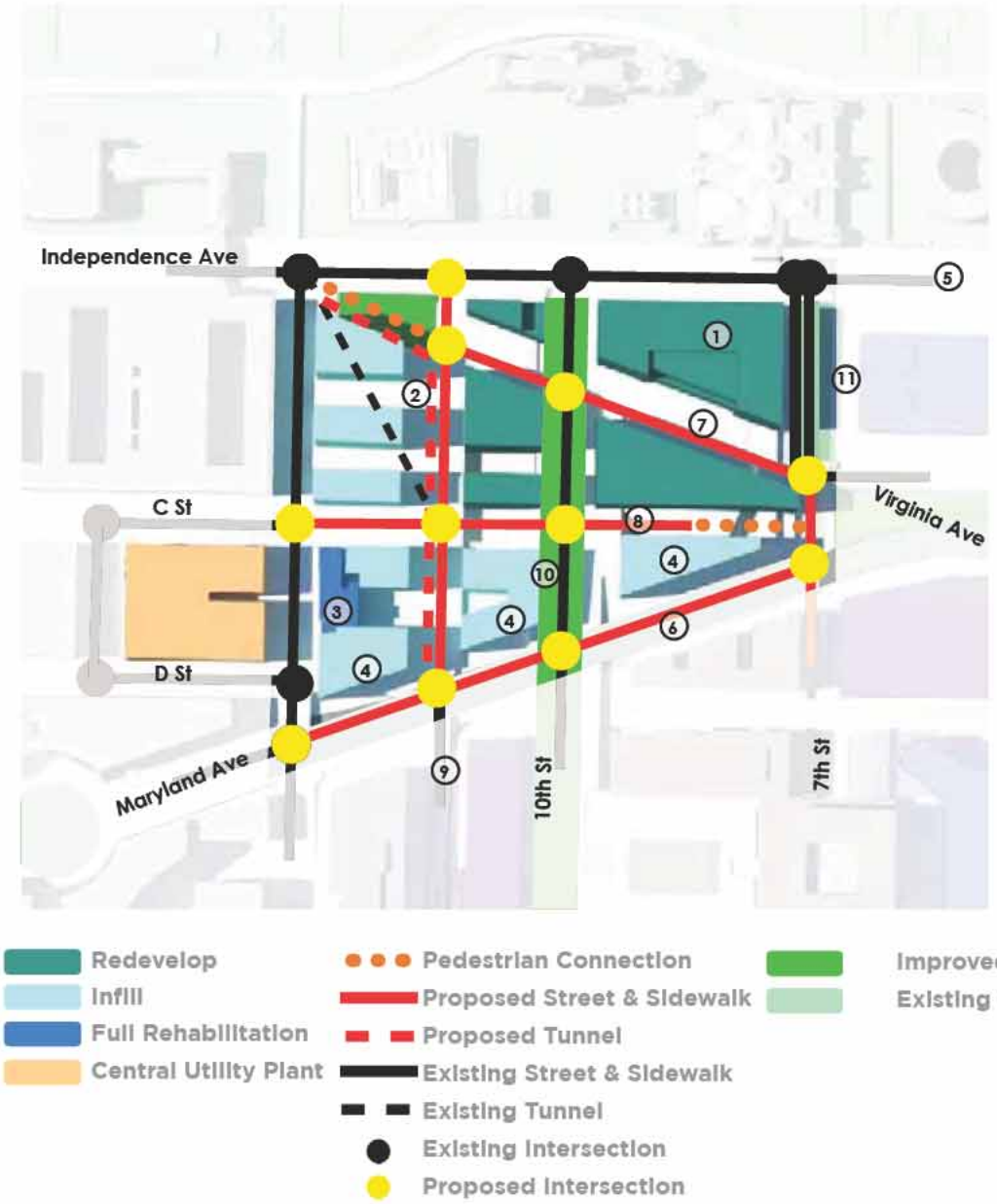
Redevelopment of the Forrestal Complex is the most significant catalyst to unlock the potential of the SW Ecodistrict. It offers the greatest opportunity to infuse the civic qualities of the monumental core with the vitality of downtown Washington, and to transform the area into a sustainable mixed-use neighborhood. Redevelopment of this area provides the opportunity to deck the 12th Street ramp, reconnect the street grid, and improve parcel configurations throughout the study area. It also presents the opportunity to employ a district stormwater system, an energy microgrid, and other best practices related to renewable energy. The matrix summarizes the recommendations for each parcel and street.

RESULTS

Independence Quarter will:

- Accommodate one or more parcels to support a new 1.8 million sq. ft. headquarters for the DOE.
- Yield more than two million sq. ft. of new development for residences, hotels, museums, and additional office.
- Provide a prominent site for the National Women's History Museum.
- Provide a new public park or plaza on Independence Avenue.
- Re-establish three streets that will provide up to 11 new intersections to improve walkability and accessibility.
- Increase efficiency of the central utility plant by improving the use mix to balance energy loads throughout the day.
- Provide the opportunity to construct a shared stormwater management system and microgrid infrastructure.
- Restore the L'Enfant Plan street network and reinstate important reciprocal views, including along Virginia Avenue to the Washington Monument from Reservation 113, and views between the National Mall and Banneker Park.

SUMMARY PLAN



INDEPENDENCE QUARTER - PROJECT RECOMMENDATIONS

Independence Quarter

		Summary Description	Phasing and Related Projects Near Term Projects (3-10 years) Long Term Projects (5-25 years) Coordination with Other Projects	Potential Partners* Federal - F District - D Private Sector - P Cultural - C
Building and Site Development				
1	Forrestal Complex	Redevelop the Forrestal Complex to increase square footage and the mix of uses to enhance sustainability. Accommodate a modern headquarters for the Department of Energy that supports its mission, provides more efficient government office space, and showcases high performing sustainable practices. Designate prominent locations for a nationally significant museum and memorial.	Near Term - Rehab for energy and water use reductions Long Term - Redevelop Site	F, D, P, C
2	12th Street Tunnel Air-Rights Development	Deck over the ramp to the 12th Street Tunnel with a mix of uses to include residential and/or hotel development. Realign the 12th Street ramp to establish an at-grade intersection at Maryland Avenue. Create a commemorative park fronting Independence Avenue between 11th and 12th Street. Consider incorporating the commemorative park into the design of the adjacent parcels (for example, the US Navy Memorial at Market Square on Pennsylvania Avenue, NW).	Coordinate with Forrestal Complex Redevelopment	F, D, P, C
3	Cotton Annex	Expand the Cotton Annex to maximize use of surrounding parcels and rehabilitate to improve space, energy, end water efficiency.	Coordinate with adjacent infill or redevelopment	F, D, P, C
4	GSA Parcels 1-3	Develop under used parcels along Maryland Avenue with a mix of uses, prioritizing residential development. Consider increasing the size of these parcels by aggregating with adjacent land when feasible.	See Maryland Ave Focus Area Potential to Coordinate with Forrestal Complex Redevelopment	F, D, P, C
Infrastructure, Streets, and Public Space				
5	Independence Avenue	Design buildings, public spaces, and streetscape to encourage pedestrian activity while respecting the civic qualities of the National Mall and its adjacent cultural institutions.	Coordinate with Forrestal Complex Redevelopment	F, D, C
6	Maryland Avenue	See Maryland Avenue Focus Area.	See Maryland Ave Focus Area Potential to Coordinate with Forrestal Complex Redevelopment	F, D, P, C
7	Virginia Avenue	Reestablish Virginia Avenue to create walkable blocks, improve access for all modes of travel, and reclaim important views and linkages between the Washington Monument and Reservation 113.	Coordinate with Forrestal Complex Redevelopment	F, D, P, C
8	C Street	Reestablish C Street between 9th and 12th Streets to improve mobility and provide access for daily functions such as building loading, parking, and service entries.	Coordinate with Forrestal Complex Redevelopment	F, D, P
9	11th Street	Reestablish 11th Street between Maryland and Independence Avenues to improve mobility and provide access for daily functions such as building loading, parking, and service entries.	Coordinate with Forrestal Complex Redevelopment	F, D, P
10	10th Street	See 10th Street Focus Area		
11	9th Street (north of Maryland Avenue)	Redesign 9th Street between Independence Avenue and Maryland Avenue with a park-like character that links Reservation 113 with the Smithsonian's Ripley Garden while retaining adequate access to the I-395 tunnel and adjacent buildings. The segment of the street between Independence Avenue and C Street should be phased in concert with the future redevelopment of the Forrestal Complex.	Coordinate with Forrestal Complex Redevelopment	F, D
	All Projects	Construct and connect infrastructure systems and buildings to generate, convey, collect, store, and distribute thermal energy and recycled water throughout the district. Design and orient building footprints to maximize natural light and air ventilation.		F, D, P, C

***Partners will coordinate improvements but may not always be funding partners.**

10th Street Corridor And Banneker

View of 10th Street, SW from the Mall

(Top image) - Existing Conditions Study Model (2012)
(Lower image) - Recommended Development Scenario Study Model (2030)

REVITALIZATION OBJECTIVES

Establish the 10th Street corridor and Banneker Park as a cultural destination serving as a contemporary extension of the National Mall. The corridor will infuse the vitality of downtown Washington between the Smithsonian museums and gardens and the southwest waterfront. The corridor's prominent location provides an opportunity to become an environmental showcase displaying the best of American culture and innovation.

Primary objectives for the 10th Street corridor and Banneker Park:

- Design 10th Street as a walkable, vibrant mixed-use cultural corridor;
- Create a setting along the corridor and at Banneker Park befitting a national cultural destination, to serve as an extension of the National Mall;
- Program the corridor for daily activity and for special exhibitions and events;
- Design the corridor to serve as the energy and water management spine of the Ecodistrict;
- Use the lower level of 10th Street to accommodate energy, water, and parking infrastructure; and
- Showcase state-of-the-art urban design and environmental practices to increase public awareness.

TODAY

10th Street, also known as L'Enfant Promenade, is an overscaled unfriendly pedestrian and vehicular corridor on axis with the National Mall and Banneker Park. An elevated park overlooks the southwest waterfront and sits on axis with the Smithsonian Castle. Although thousands of people work along the 10th Street corridor, the area remains desolate and devoid of significant street activity.

North of the rail line, the Forrestal Complex visually and psychologically isolates the study area from the National Mall and Smithsonian museums. South of the rail, 10th Street is lined with the U.S. Postal Service headquarters and the privately-owned L'Enfant Plaza office and hotel complex. These single-use superblock buildings provide little relation to the expansive 225-foot wide right-of-way. A portion of the street sits on sub-surface parking and a portion is elevated above active rail and the 10-lane Southwest Freeway, ramps, and related access roads. A labyrinth of stairs and ramps conceal

building entrances and obscure pedestrian routes. A lack of street trees or other vegetation, minimal seating, maintenance, and subpar building materials contribute to making the street unconducive for walking or social gatherings.

Banneker Park is an eight-acre elevated site that sits 45-feet above Maine Avenue. It overlooks the Washington Channel with sweeping vistas to East Potomac Park, the Potomac River, and beyond. This federal parkland is managed by the National Park Service. The park contains a plaza that sits atop a large, barren, sloping lawn containing vehicular access ramps and interpretive signage commemorating the contributions of Benjamin Banneker. Despite its location less than a half mile from the National Mall, poor pedestrian conditions and building edges cause the plaza to seem disconnected from the city and contribute to its lack of use. It is occasionally used by nearby workers at lunch and for those passing through to access the steep dirt slope path to the Maine Avenue Fish Market.

The Wharf, a new private waterfront development, will transform the southwest waterfront into a lively mixed-use neighborhood and regionally important destination. Just to the north, phased improvements to the L'Enfant Plaza are also underway. These developments will alter the mid-century Modern public spaces along 10th Street and the waterfront, and restrict views of the river from Banneker Park.

CONSIDERATIONS

To revitalize the 10th Street corridor and Banneker Park, several considerations must be addressed.

HISTORIC PRESERVATION

10th Street was once a neighborhood road that serviced the active shipping wharfs along the river. It was altered in the mid-20th century into a large plaza-like street (L'Enfant Promenade) and park (Reservation 719, now known as Banneker Park). The vistas associated with 10th Street and Banneker Park are identified as non-contributing elements in the NRHP nomination of the L'Enfant Plan of Washington. These non-conformities are a result of the altered street grid, block configurations, and artificial topographical changes that occurred as a result of the urban renewal and development of the Forrestal Complex. Although the intent of the *SW Ecodistrict Plan* is to re-establish the street grid and the block configuration of the L'Enfant Plan, further evaluation of the mid-century Modern buildings and landscape will be necessary to determine their historical significance.

L'Enfant Plaza, the private mixed-use complex fronting 10th Street, and the Overlook were designed by I.M. Pei and Dan Kiley. Both are renowned mid-century Modern designers. The buildings and landscapes of this era are nearing the threshold to be considered for inclusion on the NRHP. Although several nearby federal buildings and spaces have been determined eligible for the NRHP, neither the U.S. Postal Service nor 10th Street has been studied to determine eligibility. Initial research has been conducted to evaluate the potential eligibility of Banneker Park and the work of designer Dan Kiley; however, research is inconclusive at the time of this study's release. Additional evaluation is necessary to determine eligibility of these landscapes and buildings, and compliance with Section 106 of the National Historic Preservation Act. The federal government will be required to comply with this act in the development of proposals to sell, alter, repurpose, or redevelop resources considered eligible for, or listed in, the NRHP.

CULTURAL FACILITIES

Over the centuries the area evolved from a river plantation to a settlement of immigrants and freed African Americans, to the nation's first full-scale urban renewal project. A cultural heritage trail called River Farms to Urban Towers details the area's history. In 1971, the 10th Street Overlook was formally named Banneker Park in honor of Benjamin Banneker, the African American astronomer and mathematician who helped survey the boundaries of the new capital city. The Washington Interdependence Council (WIC), a memorial sponsor, obtained legislative authority in 1998 to place a national memorial to Benjamin Banneker in the District. WIC has advocated for locating this memorial at Banneker Park, along with a Math and Science Technology Institute and a clock tower, as well as a memorial along the length of 10th Street. In 1999, the National Capital Memorials Advisory Commission recognized Benjamin Banneker's important contributions but suggested that alternate sites in the District also be considered. The legislative authority for the memorial expired in 2005. New legislation has been introduced but not enacted at the time this plan was written.

Banneker Park is identified in the *Memorials and Museums Master Plan* as a prime candidate site for a national museum or memorial. The perception that the area is isolated from the National Mall has deterred museum sponsors from previously considering the site. However, with continued investment in the area, the site is gaining the attention of several museum and memorial sponsors.

ELEVATED 10TH STREET

The conditions below 10th Street and the topography of the park present opportunities and challenges. As an elevated street, there are opportunities to use the lower level of 10th Street to accommodate parking; and to house cisterns to store and treat stormwater for non-potable reuse. The topography of Banneker Park also presents opportunities to establish important views to the Potomac River and locate a sewer-mining facility into the hillside near the 12th Street ramp.

RECOMMENDATIONS

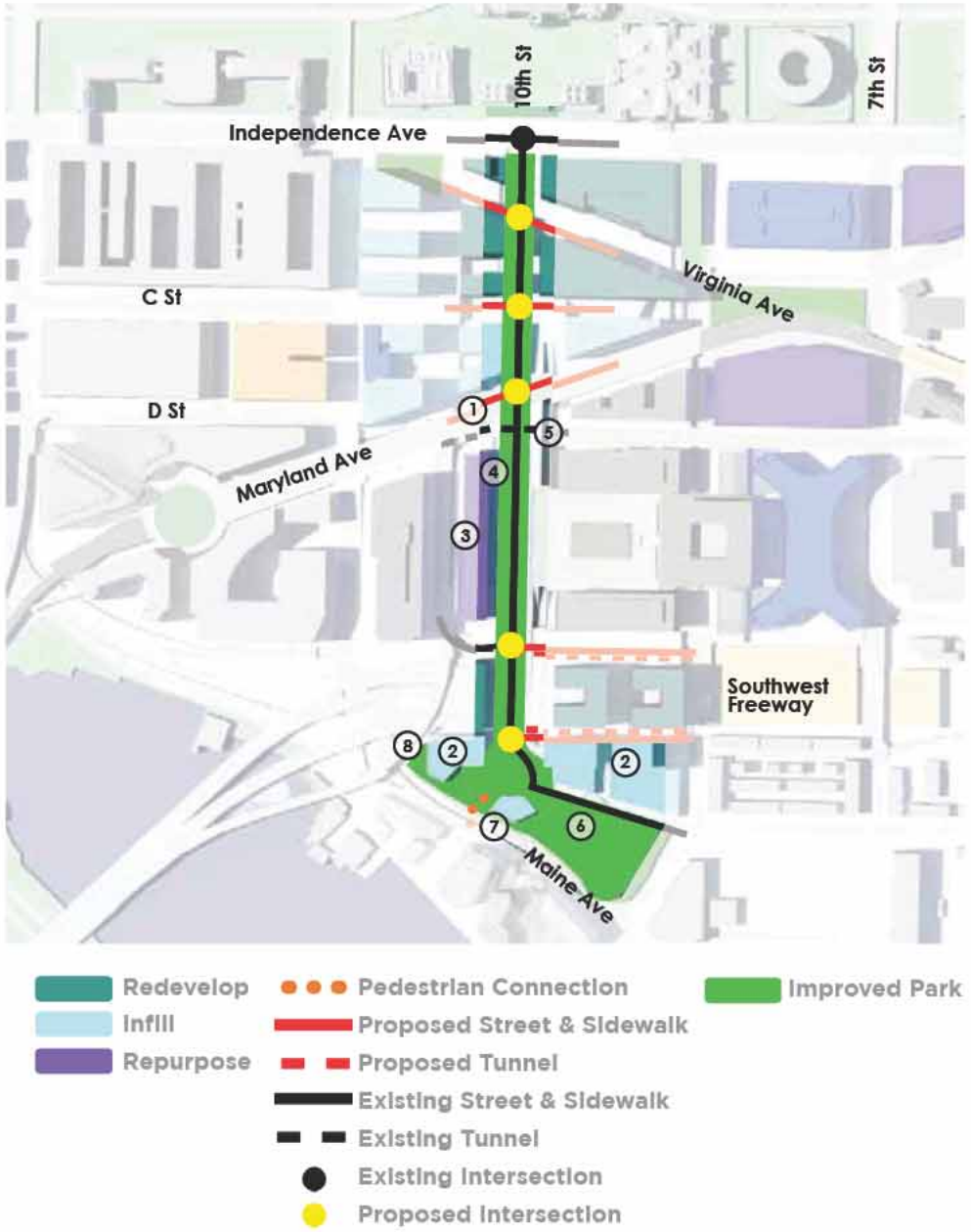
Near-term improvements to the 10th Street Streetscape and the Banneker Park landscape will signal the importance of 10th Street as a new cultural corridor. It will attract visitors with physical and programmatic improvements, and link the National Mall, Smithsonian museums and the southwest waterfront. These short-term improvements will position the street for long-term investment. In conjunction with the redevelopment of the Forrestal Complex, long-term streetscape and district water system improvements will establish the street as the sustainability spine of the SW Ecodistrict. A master cultural development plan for Banneker Park will provide the framework for build-out as sponsorship opportunities arise. The matrix summarizes the recommendations for each parcel and street.

RESULTS

10th Street Corridor and Banneker Park recommendations will:

- Improve the setting and establish locations for about one million sq. ft. of cultural facilities for up to four museums and three memorials.
- Improve more than eight acres of usable public space (1.7 acres along the 10th Street median and 6.5 acres at Banneker Park).
- Establish a distinguished walkable corridor in the monumental core.
- Reintroduce nature into the city and improve urban ecology.
- Store up to 94 million gallons of rainwater for reuse to reduce potable water use.
- Provide new infrastructure to expand service of the central utility plant and lower greenhouse gas emissions.
- Provide tour bus parking on the lower level of 10th Street.

SUMMARY PLAN



10TH STREET AND BANNEKER PARK - PROJECT RECOMMENDATIONS

		Summary Description	Phasing - Related Projects Near Term Projects (3-10 years) Long Term Projects (5-25 years) Coordination with Other Projects	Potential Partners* Federal - F District - D Private Sector - P Cultural - C
Building and Site Development				
1	Intersection of 10th Street and Maryland Avenue	Establish the intersection of 10th Street and Maryland Avenue as a civic destination featuring street-level retail, commemorative works, public art, kiosks, and newsstands.	Near Term - Define and implement interim improvements as part of long term reconstruction strategy	F, D, P, C
2	Banneker Park	Provide locations for nationally significant museums and memorials within a setting that embodies the character of the National Mall. Cluster new museums and educational facilities within the park to buffer Banneker Park from the Southwest Freeway. Establish a signature landscape along Maine Avenue to serve as a gateway between the National Mall and Southwest Washington. Locate and design buildings and the landscape to maximize reciprocal views to create an entry threshold and welcoming feature between the Smithsonian Castle, Banneker Park, and the Potomac River. Locate, mass, and configure buildings to respect the scale of nearby residential development. Design and program buildings to promote street life at the upper and lower-levels of Banneker Park on 10th Street and Maine Avenue. Improve pedestrian and bicycle access between Banneker Park, Maine Avenue, and East Potomac Park.	Near Term - Design and implement interim connection between Banneker Park and Maine Avenue in coordination with Waterfront redevelopment. Prepare a master site development plan for Banneker Overlook to define appropriate furture building sites at Banneker Park and related long term open space improvements and parking feasibility. If sub-surface parking at Banneker Park is determined appropriate, it should not limit, discourage, or prevent the development of future museums or commemorative works.	F, D, C
3	U.S. Postal Service	Accommodate street-level retail, educational, and cultural uses along the USPS building's 10th Street frontage without impacting the lobby on the ground floor. Rehabilitate the building to improve space and energy efficiency. When Maryland Avenue is constructed, incorporate a civic use at the intersection of 10th and Maryland Avenue without impacting USPS building operations or security. If the USPS ever relocates its headquarters, consider repurposing the building	Near Term - Develop interim street-level improvements in coordination with 10th Street redesign	F, D, P, C
Infrastructure, Streets and Public Space				
4	10th Street	Anchor 10th Street with cultural and institutional uses housed in signature public buildings. Create a green corridor that extends the civic qualities of the National Mall to the waterfront with a series of flexible and distinguished civic spaces. Narrow the street to allow for maximum building building heights and build-to-lines that improve pedestrian scale, are compatible with adjacent uses, and accommodate water management and multi-modal transportation systems. A 140 foot right-of-way was used in the modeling of the development scenario concept. Enliven the corridor with buildings, pavilions, and kiosks that contain retail, cultural, institutional, or public uses. Prioritize the corridor for pedestrians, bicyclists, and transit. Design the lower- and upper-level of 10th Street and surroundings landscapes to incorporate a bio-retention system that conveys, cleans, and stores rainwater for reuse. Design the lower-level of 10th Street to accommodate tour bus parking. Locate and design potential underground parking and associated vehicular circulation to prevent buses from motoring through adjacent residential neighborhoods.	Near Term - Develop interim streetscape enhancements Long Term - Implement re-design of 10th Street in coordination with redevelopment of Forrestal Complex, Post Office site, Maryland Avenue, L'Enfant Plaza improvements, and SW Freeway Air-rights redevelopment	F, D, P, C
5	D Street	Improve vertical connectivity between D Street and elevated 10th/11th Streets with an attractive, pedestrian-friendly connection.	Coordinate with 10th Street Near and Long Term improvements	F, D
6	G Street	Improve pedestrian access at the intersection of G and 9th Streets. Restrict buses from motoring through the adjacent residential neighborhood.	Coordinate with Banneker Park improvements	F, D, P, C
7	Maine Avenue	Design and program signature buildings, structures, and landscapes along Maine Avenue to respect the view corridors to the Washington Monument, strengthen the street wall, and activate the street.	Coordinate with Banneker Park improvements	F, D, P, C
8	Sewer Mining Facility	Ensure that the design of the utility system at Banneker Park does not impact views to the Washington Monument or any future cultural facility.	Coordinate with Banneker Park improvements	F, D, P, C
	All Projects	Construct and connect infrastructure systems and buildings to generate, convey, collect, store, and distribute thermal energy and recycled water throughout the district. Design and orient building footprints to maximize natural light and air ventilation.		F, D, P, C

***Partners will coordinate improvements but may not always be funding partners.**

PRELIMINARY DESIGN CONCEPTS

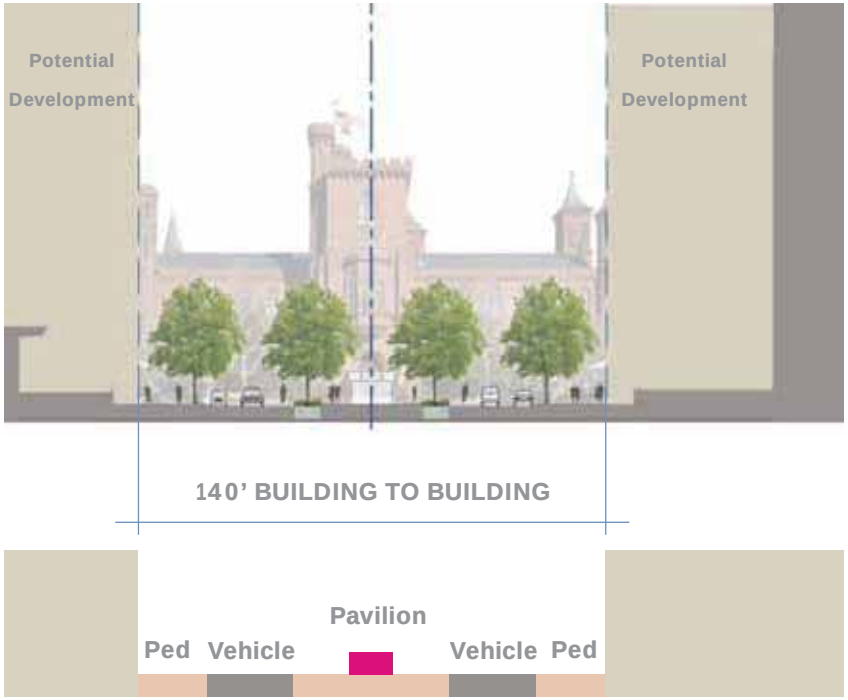
10TH STREET CORRIDOR

The SW Ecodistrict Task Force has begun to study a range of streetscape alternatives that could help achieve public space programming and design goals for 10th Street. These diagrams, illustrating a portion of the corridor, show a range of approaches and will be studied and developed in the next phase of work.

EXISTING

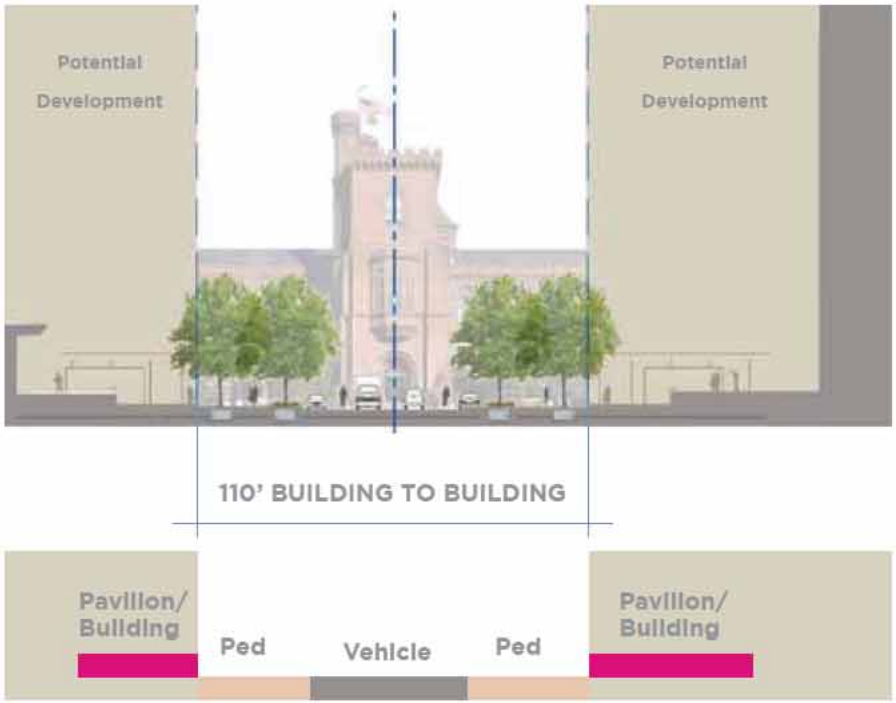
BOULEVARD

A boulevard with a large park-like median that prioritizes pedestrian activity along the primary central view corridor.



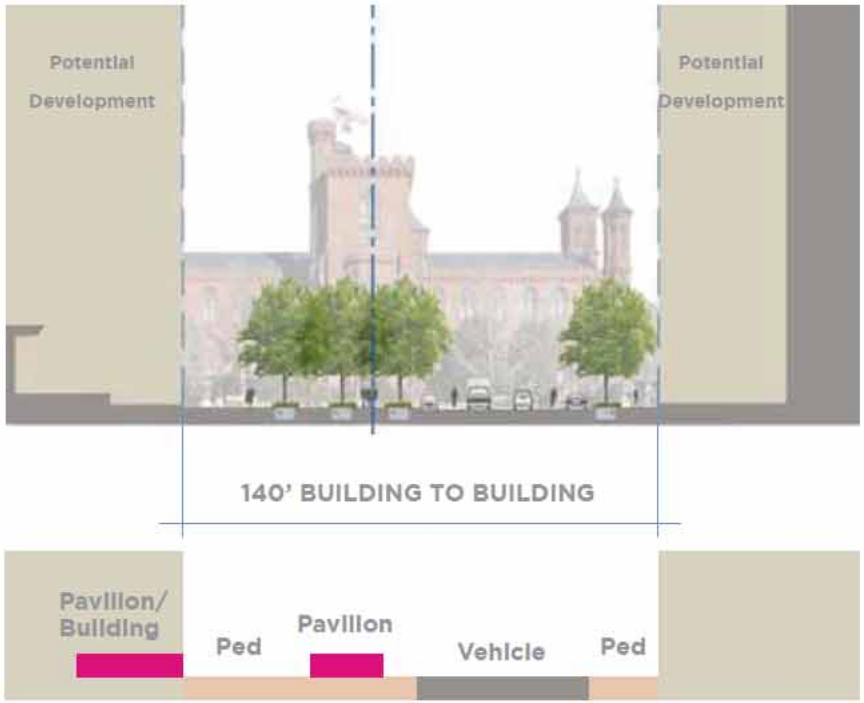
ROADWAY

A center roadway flanked by wide sidewalks, giving equal weight to motorized vehicles and pedestrians, reflects the section of a typical downtown city street.



PEDESTRIAN

An asymmetrical corridor that prioritizes the pedestrian-way along the primary view corridor and off-sets the roadway as a secondary corridor.



PRELIMINARY DESIGN CONCEPTS

BANNEKER PARK

Its location and designation as one of the top 20 future memorial sites in Washington makes Banneker Park the next preeminent national cultural destination. The 6.5 acre site can accommodate a significant memorial or a museum or a combination of museums and/or memorials situated within a signature landscape. This location will become an important civic feature and welcoming southern gateway to the National Mall. This landscape can offer intimate seating areas, water features, public art, and opportunities for commemoration on multiple levels.

The elevation of Banneker Park presents an opportunity to build a structure or feature on axis with the Smithsonian Castle. This would visually and programmatically extend the civic qualities of the National Mall and Smithsonian museums. This structure would also serve to extend this connection to the Washington Channel and East Potomac Park.

Banneker Park can be redesigned to improve vehicular and pedestrian circulation between the elevated park and Maine Avenue. An innovative landscape design incorporating stairs, ramps, and garden terraces can connect the 10th Street overlook and the waterfront at multiple locations. The important elements of the Kiley landscape can potentially be preserved, if determined eligible for the National Register of Historic Places or desirable to do so for other reasons.

The topography of Banneker Park also presents opportunities to unobtrusively incorporate a sewer-mining facility, or potentially a parking facility into the hill near the 12th Street Freeway ramp. However, a parking garage for cars or tour buses will likely prevent sponsors from considering the site for a future museum or memorial. In addition, bus routes must be designed so they do not traverse neighborhood streets.

These diagrams, illustrating a portion of the corridor, are intended to show a range of approaches and will be studied and developed in the next phase of work.

View from the Overlook at Banneker Park toward the Wharf and the Washington Channel on the Potomac River. (Hoffman-Madison Marquette)

EXISTING CONDITIONS STUDY MODEL (2012)

Banneker Park existing conditions.

POTENTIAL VIEW AXIS CONCEPTS MODELS

(Top image) - Potential development with buildings adjacent to the Southwest Freeway and expanded Overlook at south end of 10th Street.

(Lower image) - Potential development with buildings adjacent to the Southwest Freeway and vertical memorial at south end of 10th Street.

POTENTIAL MUSEUM BUILDOUT MODELS

(Top image) - Potential development with buildings adjacent to the Southwest Freeway and a building at the terminus of 10th Street.

(Lower image) - Potential development with buildings framing 10th Street, and fronting on Maine Avenue.

Maryland Avenue and 7th Street Corridors

View of Maryland Avenue from the southwest

(Top image) - Existing Conditions Study Model (2012)
(Lower image) - Recommended Development Scenario Study Model (2030)

REVITALIZATION OBJECTIVES

Establish Maryland Avenue as a prominent L'Enfant street with a series of civic spaces anchoring a new neighborhood. Expand transit capacity along the avenue and the 7th Street corridor, and improve Reservation 113 as a signature park at the center of a regional intermodal center.

Primary objectives for Maryland Avenue and the 7th Street corridors include:

- Accommodate freight rail and maximize commuter rail along the CSX corridor;
- Deck-over the existing railroad to establish Maryland Avenue and reconnect the street grid;
- Develop and program parcels along the corridor to establish a lively and balanced mix of uses;
- Protect and enhance the views to and from the U.S. Capitol;
- Design the avenue to feature a series of urban parks that extend the civic qualities of the National Mall;
- Design and program Reservation 113 to be a signature urban square and neighborhood park;
- Expand L'Enfant Station to maximize regional commuter rail capacity and design surrounding streets to accommodate enhanced transit use;
- Improve walkability and establish greater connection between all modes of transit; and
- Design L'Enfant Station to integrate it into the neighborhood and to complement Union Station and its civic purpose.

TODAY

Today, Maryland Avenue is a disconnected series of unimproved public spaces and street segments interrupted by a depressed active rail corridor, owned by CSX. The rail line is predominately used for transporting freight along the eastern seaboard. Passenger trains are limited. From the south, the rail line consists of two tracks over the Long Bridge, and three tracks that run through a short tunnel between 12th and 14th Streets which daylight within an open corridor between 9th and 12th Streets. Along this segment, there are oddly-shaped parcels of under-used land and buildings which turn their back to the corridor, establishing an industrial character.

The rail line borders Reservation 113, an unimproved park at the intersection of Maryland and Virginia Avenues and 7th Street. In this area, the tracks ascend and cross 7th Street and continue on an elevated track along Virginia Avenue, passing the Virginia Rail Express commuter rail platform between 6th and 7th Streets at L'Enfant Station. The single platform is not easily accessible or connected to adjacent transit services.

The corridor is framed by a mix of federal and private office buildings. There are no residential uses in proximity. Many of the federal buildings include internal employee-only cafeterias. A single office building at 600 Maryland Avenue, near the L'Enfant Plaza Metro Station, includes some retail concealed within the interior of the building.

Seventh Street is heavily used by commuter buses that traverse the length of the city between the southwest waterfront and Maryland. It is also one of the city's proposed streetcar corridors. The lack of trees and expansive pavement make walking across the freeway unpleasant. Beneath the rail trestle, minimal lighting, nesting birds, unsanitary conditions, and poor visual quality deter pedestrian activity.

CONSIDERATIONS

To establish the Maryland Avenue corridor, several considerations must be addressed.

CULTURAL FACILITIES

On axis with the U.S. Capitol, Maryland Avenue includes three important sites identified in the *Memorials and Museums Master Plan* for future commemorative works. Two are prime sites reserved for works of the highest national importance; one site is located at Reservation 113, and the other is the proposed President Dwight D. Eisenhower National Memorial at the intersection of Maryland and Independence Avenues. A third candidate site is located within the median near The Portals, a private development complex, between 12th and 14th Streets.

HISTORIC PRESERVATION

Reservation 113 and the streets that reflect the historic plan for the city of Washington are listed as contributing elements in the National Register of Historic Places. Although planned as prominent avenues, the portions of Maryland and Virginia Avenues that are located in the study area are considered non-contributing elements to the NRHP listing because of alternations made to the corridors when the rail line was constructed in the mid-1800s. Several of the buildings along the Maryland Avenue and 7th Street corridors were built during urban renewal in the mid-20th century and are nearing the threshold for consideration for inclusion in the NRHP. The Robert Weaver Federal Building (U.S. Department of Housing and Urban Development) was listed in the NRHP in 2008. The Wilbur Wright Buildings (Federal Aviation Administration) and the Lyndon B. Johnson Building (Department of Education) were determined eligible for listing in the NRHP in 2011. The DC State Historic Preservation Office may consider the Orville Wright Building and the GSA Regional Office Building eligible for listing.

Compliance with Section 106 of the National Historic Preservation Act will be required prior to the federal government implementing plans to alter, repurpose, or redevelop resources considered eligible for or listed in the NRHP.

HEAVY RAIL-FREIGHT AND COMMUTER RAIL

Within the study area, the CSX freight rail line shares its tracks with Amtrak and Virginia Rail Express (VRE). L'Enfant Station is VRE's top destination with about 7,375 daily riders or 40 percent of VRE total ridership. Amtrak passengers primarily board and disembark at Union Station, which is also the terminus for the Maryland Area Rail Commuter (MARC) service. VRE and MARC are either at or nearing their current daily ridership capacity. Both rail operators have identified the need to improve operations and to expand their service to meet ridership demands and projected growth. Ideally, MARC would extend service past Union Station into northern Virginia, providing a stop at L'Enfant Station. VRE has identified this as a long range option; however, it is not part of future expansion plans. The impacts, such as corridor constraints between Alexandria and Union Station, have not been studied or evaluated. While additional service will increase demands on the shared tracks, it will also have other benefits. It will provide access to jobs and cultural destinations, contribute to the regional economy, potentially reduce congestion at the Metro Center and Gallery Place Metro stations, and improve overall rider experience. Amtrak, VRE, and MARC are studying how to expand service at Union Station to accommodate increases in commuter and regional rail and high-speed rail service within the next 20 years.

CSX's National Gateway project proposes to improve the flow of freight between the Mid-Atlantic and the Midwest States. To increase the movement of freight through the corridor, CSX proposes to expand and upgrade tracks, equipment, and facilities. CSX proposes to reconstruct the Virginia Avenue tunnel and lower the tracks through the Maryland Avenue corridor to accommodate vertical clearance for double-stack rail cars. Although these projects will improve the movement of freight through the corridor, the two-track Long Bridge across the Potomac River will constrain the movement of freight and passengers. Therefore, the city is undertaking a Long Bridge expansion feasibility study to evaluate how to increase capacity through the corridor.

Improvement of the rail corridor provides the ability to increase the number of tracks and increase the vertical clearances. Increasing the vertical clearances will provide the opportunity to accommodate double-stacked trains and to deck the corridor and construct a new Maryland Avenue. Adding a fourth track will increase rail capacity, accommodate electrification of at least one track, and help separate freight trains and commuter trains to the extent possible through the District of Columbia. Adding this fourth track may require modifications to GSA's Regional Office Building, its southern side yard, and the Seventh Street bridge trestle.

Some of the constraints and competing needs to improve freight and commuter rail service within the area include:

- Bottlenecks caused by the corridor's constrained infrastructure: the limited two-track capacity across the Long Bridge and the limited three-track rail corridor; Long Bridge operating policies; and the single VRE platform at L'Enfant Station that requires two-way trains to share one track and a single-loaded platform to board and disembark passengers.
- Train propulsion methods (electric vs. diesel) and freight and passenger loads which require different infrastructure systems and design.
- Pedestrian transfer operations between systems (vertical and horizontal access) and access to trains and platforms (the number, length, and elevation of high and low platforms).

The L'Enfant Station entrances are located near or within the Maryland Avenue and 7th Street corridors. With four Metro rail lines —Green, Yellow, Orange, and Blue—converging at L'Enfant Plaza, it is one of the busiest stations in the system with 23,000 daily riders exiting during the weekday and 5,000 riders exiting on weekends. The Green Line is one of its heaviest used routes. The nearby Smithsonian Station—Orange and Blue Lines— logs an average of 16,000 riders exiting on a weekday. WMATA's 2040 Regional Transit System study considers a range of new lines, stations, and inner-line connections to add capacity to meet growing ridership demands on both track and station infrastructure. These improvements will help to relieve congestion on the Green Line and at L'Enfant Station and provide the opportunity to improve Metro access for residents and visitors south of the Southwest Freeway.

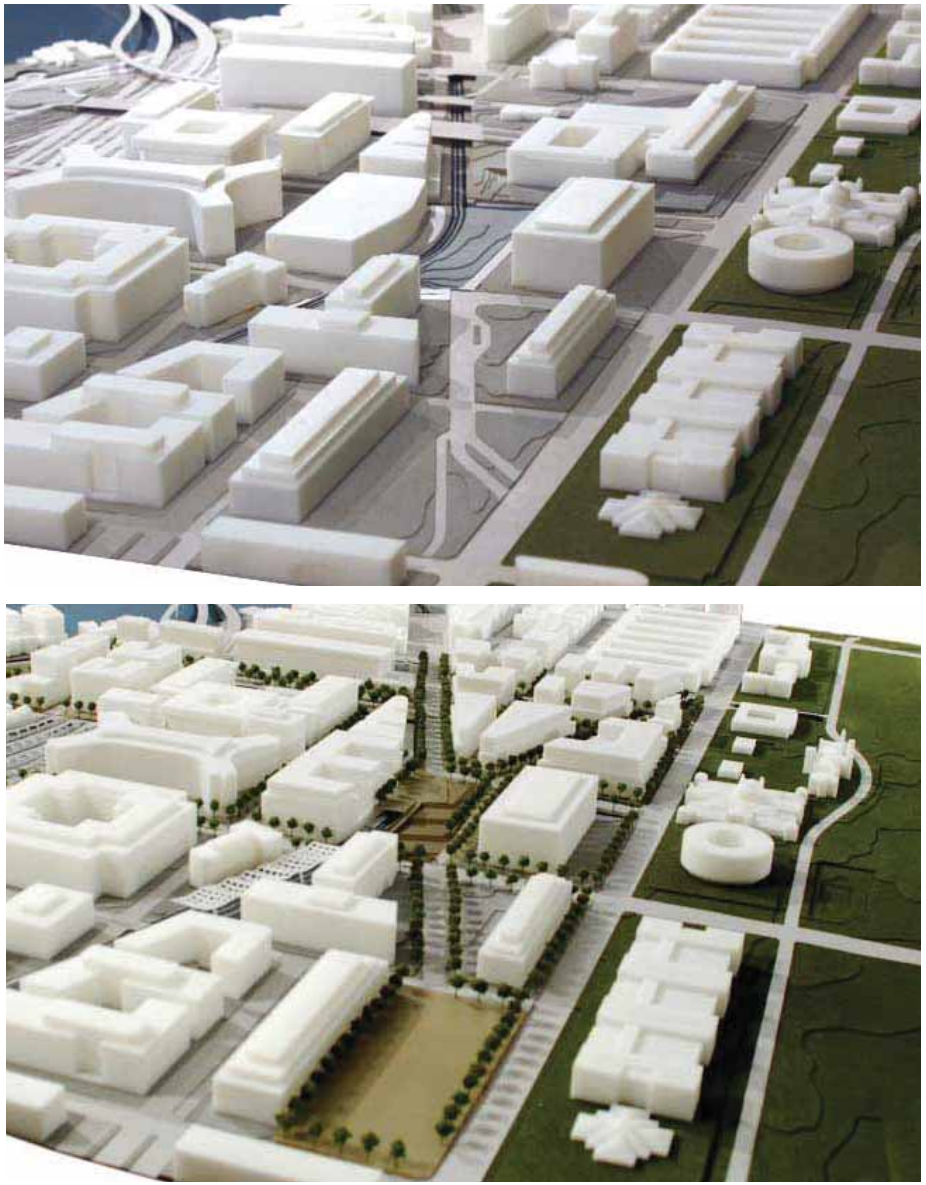
The number of transit services that converge in the study area and the proximity of L'Enfant Station to Union Station create an unparalleled opportunity to make L'Enfant Station a regionally important transit hub. There are two Metro entrances within a block and 7th Street is a surface transit corridor for local and commuter bus, as well as a planned dedicated streetcar line. In addition, the expansion of Amtrak service at Union Station will limit the ability for VRE and MARC to expand operations at Union Station. Therefore, improving L'Enfant Station to accommodate expanded VRE and MARC service will help to maximize regional commuter rail
transit capacity.

DECKING THE RAIL LINE TO ESTABLISH MARYLAND AVENUE

Establishing Maryland Avenue is a goal of the McMillan Plan and the Legacy Plan. It has been subject of serious study since the mid-1980s, kicked off by local architect Arthur Cotton Moore and later by NCPC and the District of Columbia Office of Planning.

These studies show that decking the rail line presents opportunities and challenges. It provides the opportunity to create a prestigious address for newly accessible parcels along the corridor, reconnect the street grid, as well as the ability to potentially construct subsurface parking. However, it will require innovative design to address life safety and ventilation considerations and to change the vertical profile of area streets and public spaces.

Some of the considerations include mitigating elevation changes at Reservation 113, at the GSA Regional Office Building, at the Orville Wright Building, and along 9th Street between Independence Avenue and D Street. In addition, the privately-owned building at the southeast corner of Maryland Avenue and 10th Street was constructed encroaching into the historic Maryland Avenue right-of-way. The alignment of Maryland Avenue will need to be adjusted in this area and provisions made to ensure that the building retains appropriate light and ventilation.



View of Maryland Avenue from the northeast

(Top image) - Existing Conditions Study Model (2012)
(Lower image) - Recommended Development Scenario Study Model (2030)

RECOMMENDATIONS

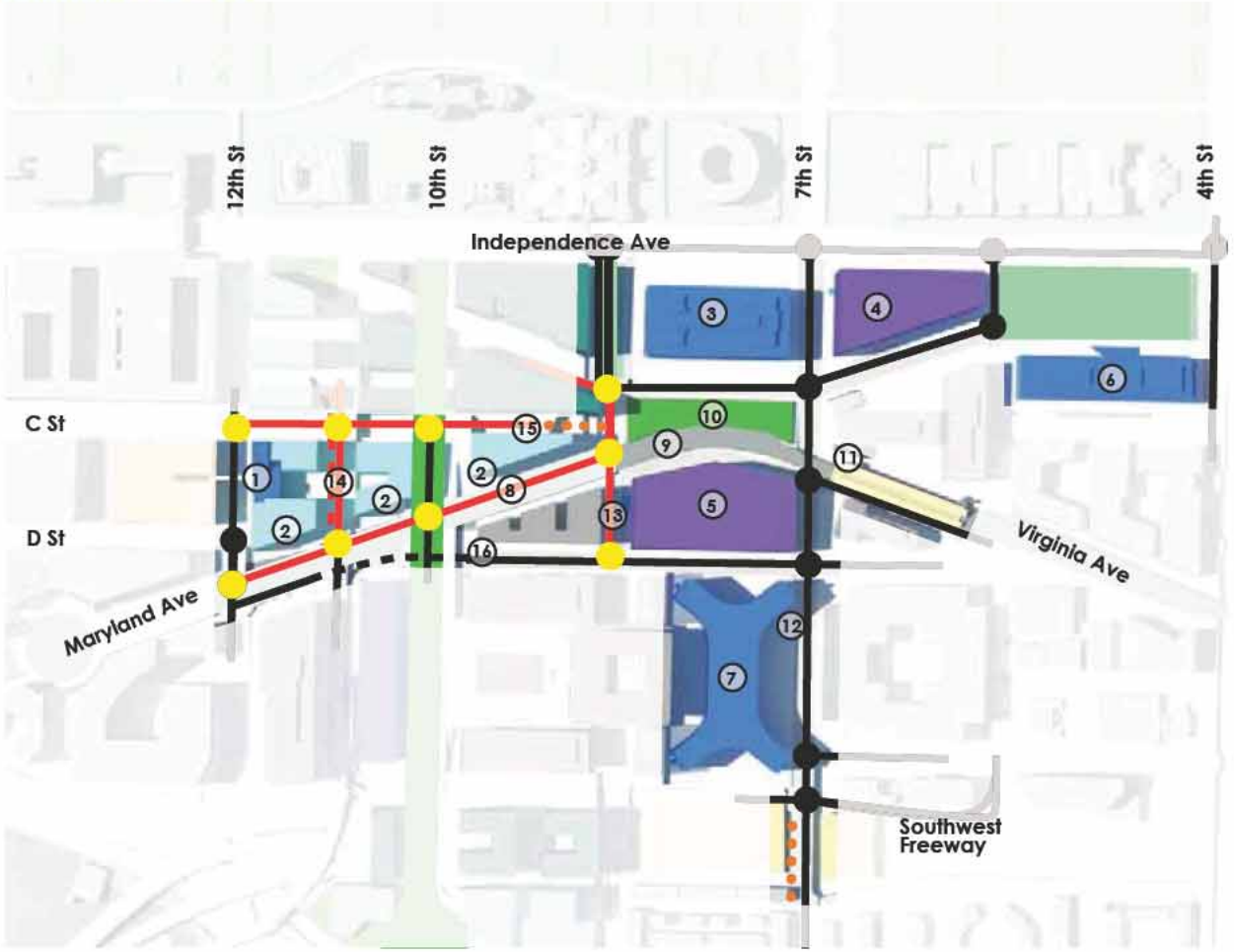
Leveraging improvements to the CSX rail corridor is a significant catalyst to reconstruct Maryland Avenue and create a new intermodal hub. This will support economic development by improving transit capacity, increasing real estate value, and improving access to a primary regional employment center. It provides the opportunity to establish a new neighborhood and workplace that is centered on the avenue and redevelops Reservation 113 as a signature urban park. A summary of the *Maryland Avenue, SW Small Area Plan* and the following matrix summarizes the recommendations for each parcel and street.

RESULTS

The Maryland Avenue and the 7th Street, SW corridor recommendations will:

- Establish Maryland Avenue as a new destination and a signature address for new residential, hotel, and office development.
- Create a new urban park at Reservation 113.
- Create a connected series of civic spaces along Maryland Avenue.
- Improve transit capacity within the region.
- Reestablish three intersections to improve walkability and mobility.
- Strengthen 7th Street as a local commuter route and increase access to transit to complement the expansion of L'Enfant Station.

SUMMARY PLAN



MARYLAND AVENUE AND 7TH STREET CORRIDORS - PROJECT RECOMMENDATIONS

		Summary Description	Phasing - Related Projects Near Term Projects (3-10 years) Long Term Projects (5-25 years) Coordination with Other Projects	Potential Partners * Federal - F District - D Private Sector - P Cultural - C
Building and Site Development				
1	Cotton Annex*	See Independence Quarter.	Coordinate with adjacent infill or redevelopment	F, D, P, C
2	GSA Parcels 1-3	See Independence Quarter.	Potential to coordinate with Forrestal Complex Redevelopment	F, D, P
3	FAA (Orville Wright Building)*	Rehabilitate the Orville Wright building to conserve energy and water use. Increase space efficiency to accommodate additional employees.	Coordinate with strategy for Wilbur Wright Building, and construction of Maryland Avenue, 9th Street, and C Street	F, D
4	FAA (Wilbur Wright Building) & GSA Parcel 4*	Repurpose the Wilbur Wright building and develop the infill parcel along Maryland Avenue for cultural or mixed-use development.	Coordinate with strategy for Orville Wright Building	F, P, C
5	GSA (Regional Office Building)*	Redevelop or build additional floors to maximize square footage and modify the floor plan to improve light and ventilation, and consider modifications to accommodate rail realignment. Consider changing the use to cultural or mixed-use development. Establish the building's main entrance to front on Reservation 113.	Coordinate with CSX re-alignment and Reservation 113 improvements	F, P, C
6	**Dept. of Education Building**	Rehabilitate Dept. of Education building to conserve energy and water use. Increase space efficiency to accommodate additional workers.	Near Term Project	F
7	HUD Building	Rehabilitate HUD to conserve energy and water use. Increase space efficiency to accommodate additional workers. Reconnect to the Central Utility Plant when feasible.	Near Term Project	F
Infrastructure, Streets, and Public Space				
8	Maryland Avenue	Deck the CSX rail between 9th and 12th Street to establish an important park-like boulevard with the civic decorum of L'Enfant's radial avenues. Minimize the physical and visual impacts caused by the varying grade changes and conditions along the Avenue. Design the avenue with a strong street wall that respects the historic 160-foot monumental viewshed to the U.S. Capitol. Maximize street network connections, and design a dignified and cohesive walkable streetscape that connects a series of signature civic spaces. Limit vehicular driveways to buildings. Maximize stormwater capture, filtering, and storage.	Near Term - Improve streetscape along existing road segments Long Term - coordinate with existing improvements	F, D, P, C
9	Rail Line Corridor	Realign the CSX rail line to accommodate a four track system to maximize the corridor's freight and passenger services carrying capacity for CSX, Amtrak, VRE, and potentially MARC. Consider opportunities for long-term electrification of the passenger rail lines for MARC and Amtrak service. Deck and design the rail line to minimize grade changes and inconsistent design conditions along the avenue. Incorporate piezoelectric energy harvesting technology into the rail corridor to showcase sustainable practices.	Near Term - Depress and realign rail Long Term - Deck and develop Maryland Avenue	F, D, P
10	Reservation 113***	Design a prominent urban square that supports L'Enfant Station and provides flexible space for commemorative works, community events, and passive recreation.	Coordinate with CSX Rail improvements	F, D, C
11	**Transit Enhancements**	Create an intermodal hub to support freight and commuter rail services for VRE and MARC. Lengthen and expand the number of platforms to increase transit capacity. Construct a photovoltaic canopy to provide shelter and contribute to district energy needs.	Near Term - Develop Implementation Strategy for long term improvements	F, D
		Construct three new Metro entrances at or near: (1) 7th Street just north of the freeway; (2) at the intersections of D and 7th Streets; and (3) at the intersection of Virginia Avenue and 6th Street.		
		Provide vertical and horizontal connections between the VRE platform, Metro station, and 6th and 7th Streets to enhance access for all modes of transit. Prioritize transit connections and pedestrian access along the 6th and 7th Street corridors.		
12	**7th Street**	Redevelop 7th Street into a retail corridor and intermodal commuter hub. Maximize the ability to accommodate bus, streetcar, bicycles, and vehicles to increase mobility for all modes of transport within and beyond the SW Ecodistrict. Improve the pedestrian connection at the rail underpass.	Near Term - Define interim improvements as part of long term enhancements	D
13	**9th Street (South of Maryland)**	Deck the I-395 tunnel ramps and build a street or a linear park and pedestrian connection between Maryland Avenue and D Streets, SW.	Coordinate with Maryland Ave	F, D
14	11th Street	Construct 11th Street between Maryland and Independence Avenues to improve mobility and provide access to buildings for daily functions (loading, parking, entries).	Coordinate with Forrestal Complex Redevelopment	F, D, P
15	**C Street**	Design C Street between 7th and 9th Streets to serve as an extension of the park at Reservation 113 while maintaining a cohesive link to Maryland Avenue. Design a pedestrian-friendly plaza at the Orville Wright Building to mitigate C Street grade changes.	Coordinate with Forrestal Complex Redevelopment, Maryland Avenue & Orville Wright rehab	F, D, P, C
16	D Street	Retain D Street as part of the street network and improve pedestrian connections between the lower level D Street and the elevated 10th Street.	Coordinate with 10th Street improvements	F, D
	All Projects	Construct and connect infrastructure systems and buildings to generate, convey, collect, store, and distribute thermal energy and recycled water throughout the district. Design and orient building footprints to maximize natural light and air ventilation.		F, D, P, C

***Partners will coordinate improvements but may not always be funding partners.**

****The potential effects of any alterations will be fully considered in the NHPA Section 106 process.**

MARYLAND AVENUE, SW SMALL AREA PLAN

The DC Office of Planning prepared the *Maryland Avenue, SW Small Area Plan* in coordination with the Southwest Ecodistrict Task Force and NCPC. The recommendations of this Focus Area incorporate and build upon the Maryland Avenue Plan recommendations.

The *Maryland Avenue, SW Small Area Plan* identifies the aspirations, complexities, and guidelines to be considered when revitalizing the avenue. The plan:

- Assesses the financial and physical feasibility of decking above the CSX rail line.
- Provides a guiding framework for the residential mixed-use development along the northern boundary of the avenue, as well as other opportunity sites along the avenue.
- Provides recommendations on how to improve the public realm and pedestrian experience, such as maintaining the 160 foot wide vista to the U.S. Capitol.
- Identifies the benefits associated with expanding transit opportunities around L'Enfant Station, in relation to Union Station and Long Bridge planning efforts.

The Maryland Avenue Plan concluded that the four infill development parcels adjacent to the avenue will not yield the development potential to pay for constructing the avenue or the number of residential units needed to create an adequate concentration for a residential community. The *SW Ecodistrict Plan* recommendations include areas for additional residential development that can help meet the District of Columbia's housing goals for this area as well as other opportunities to leverage federal and private funds to contribute to the construction of the avenue.

(Top image) Illustration of a park-like Maryland Avenue.

(Image above) Maryland Avenue Plan (w/key at right).

(Image at left) Section of the rail corridor lid supporting a new Maryland Avenue.

Images courtesy of DCOP, plans and illustrations by AECOM

Maryland Avenue SW Master Plan

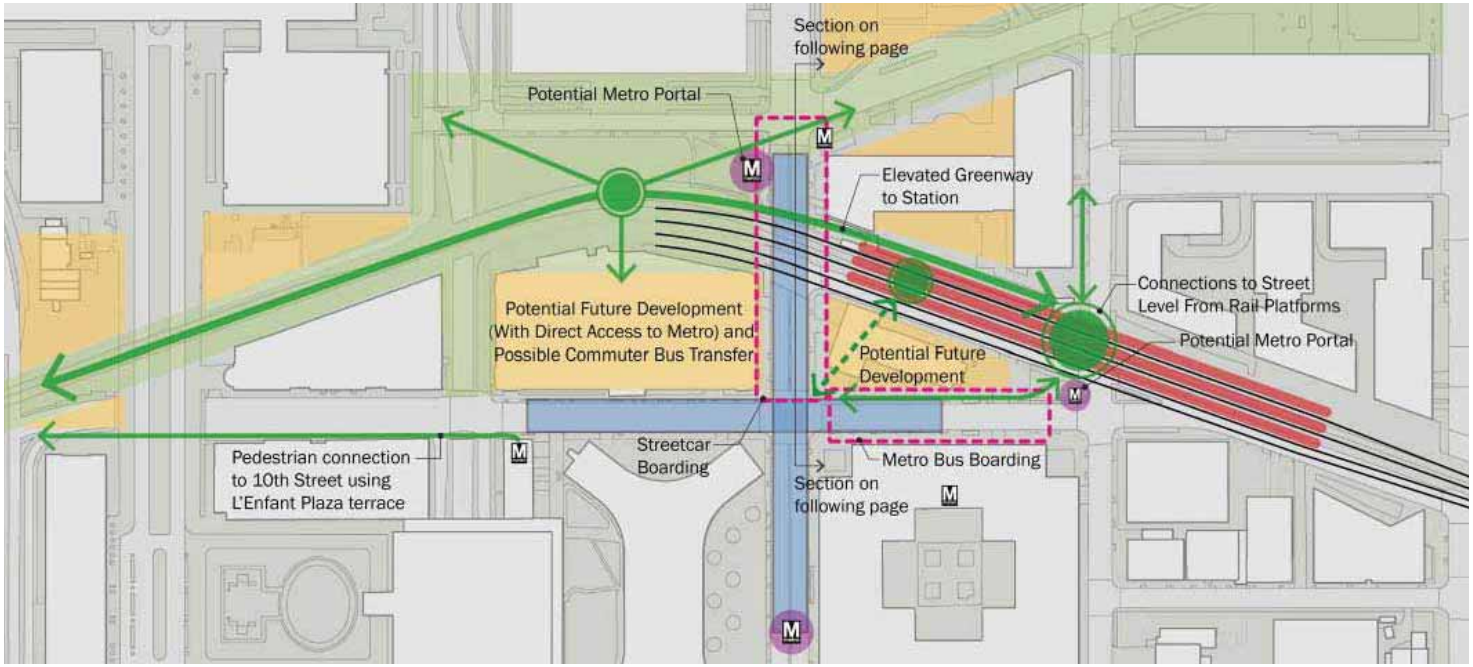
Illustration of proposed Maryland Avenue and potential adjacent infill/redevelopment

- Existing Buildings
- Potential redevelopment of the Forrestal Building - under study by NCPC
- Potential development along Maryland Avenue
- Existing Metrorail entrance

Potential Transit Connections

Diagram illustrating a potential scenario for intermodal transit connections. For study by WMATA and transit providers

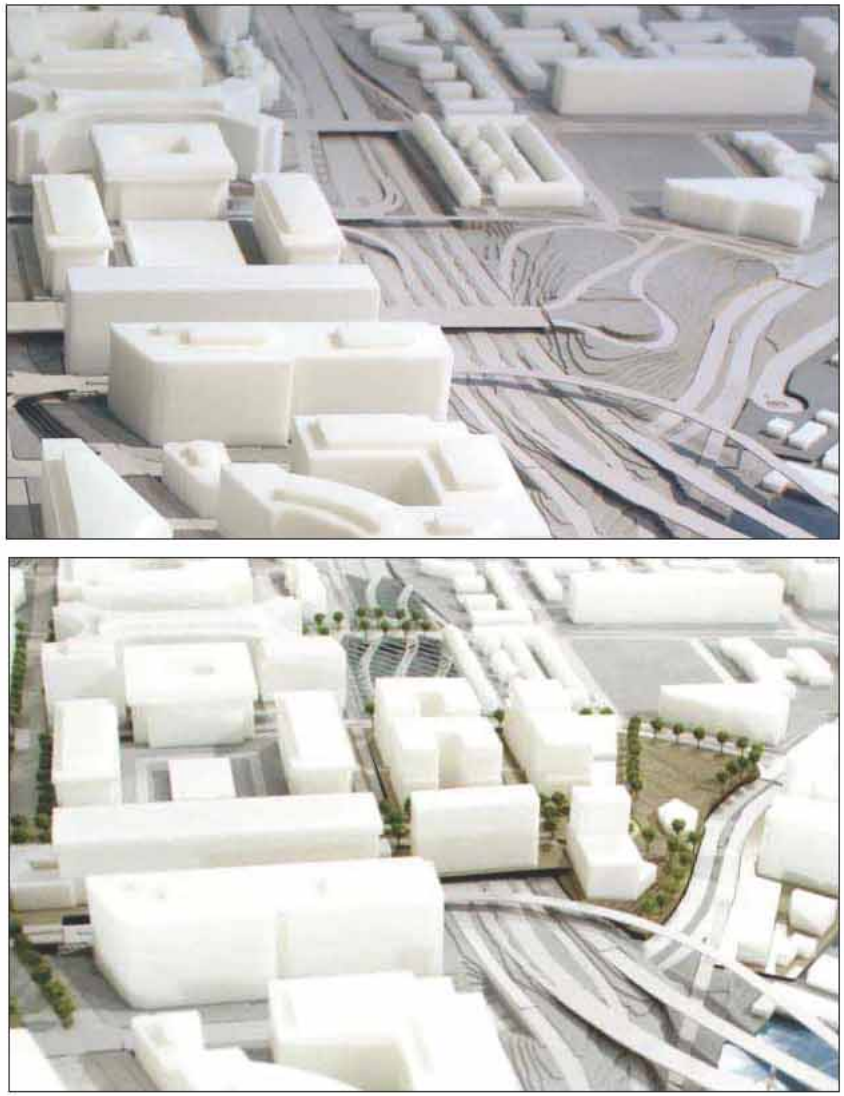
- Existing Metro Portal
- Potential Metro Portal
- Pedestrian Node
- Potential New Development
- Underground Metro Rail Station
- Street level Metro Bus and Streetcar boarding areas
- Potential passenger platforms
- Railroad Tracks
- Primary pedestrian circulation
- Additional pedestrian connection associated with redevelopment



(Top image) Illustration of potential Intermodal connections.

(Image at right) Diagram of potential intermodal connections (key above).

Southwest Freeway



View of Southwest Freeway from the west

(Top image) - Existing Conditions Study Model (2012).
(Lower image) - Recommended Development Scenario Study Model (2030).

REVITALIZATION OBJECTIVES

Decking and developing the Southwest Freeway air-rights will contribute to the neighborhood's land use mix, add to the area's renewable energy supply, and improve connections between the National Mall and waterfront. Primary objectives at the Southwest Freeway are:

- Achieve a balance of office, residential, and institutional uses;
- Improve north-south and east-west pedestrian connections between the Ecodistrict and the adjoining neighborhoods;
- Increase opportunities for public-private development; and
- Buffer adjacent residential and office uses from the freeway.

TODAY

Today, the 10-lane Southwest Freeway and its ramps and frontage roads slice through the area. The north-south street grid between 4th and 12th streets has been elevated to span the freeway and ramps were added to access the surrounding streets, except for 10th Street. The freeway and the affiliated ramps are unattractive and create a physical and psychological barrier, making it difficult and unpleasant to travel the between the southwest waterfront and the National Mall.

CONSIDERATIONS

To develop atop the Southwest Freeway, several considerations must be addressed.

DECKING AND AIR-RIGHTS DEVELOPMENT

The freeway is a non-contributing element of the L'Enfant Plan of Washington. Decking the freeway and construction of new buildings and streets will restore the street grid and the block configuration established by the L'Enfant Plan, helping to improve north-south connectivity. A similar project is underway over the Center Leg Freeway, a segment of I-395 in Northwest Washington. In 2010, the District approved a two million sq. ft., $1.3 billion dollar office, residential, and retail project which will restore the original street grid to improve east-west connections.

Due to the elevation and grade changes, vertical distances between the freeway and overpasses vary greatly through the study area. Between 6th and 9th Streets, the vertical clearance will not accommodate a flush deck for new development. This deck must be elevated to maintain the vertical clearances along the freeway. Therefore, an option to install a solar canopy-like structure was explored.

Preliminary assessments indicate that the vertical clearance and the horizontal geometry between 9th and 12th Streets will accommodate a deck and the support system necessary for physical development utilizing air-rights above the freeway. Decking this area will require reconfiguring the freeway entry/exit ramps into urban interchanges. It will also provide an opportunity to construct new east-west streets to link 9th and 10th Streets and provide access to the new development.

Example Projects

(Top) - Park atop Freeway in Seattle, WA

(Middle) - Railway tunnel with solar panels adjacent to freeway in Antwerp, Belgium

(Bottom) - proposed Capitol Crossing project over I-395 in Washington, DC (Property Group Partners)

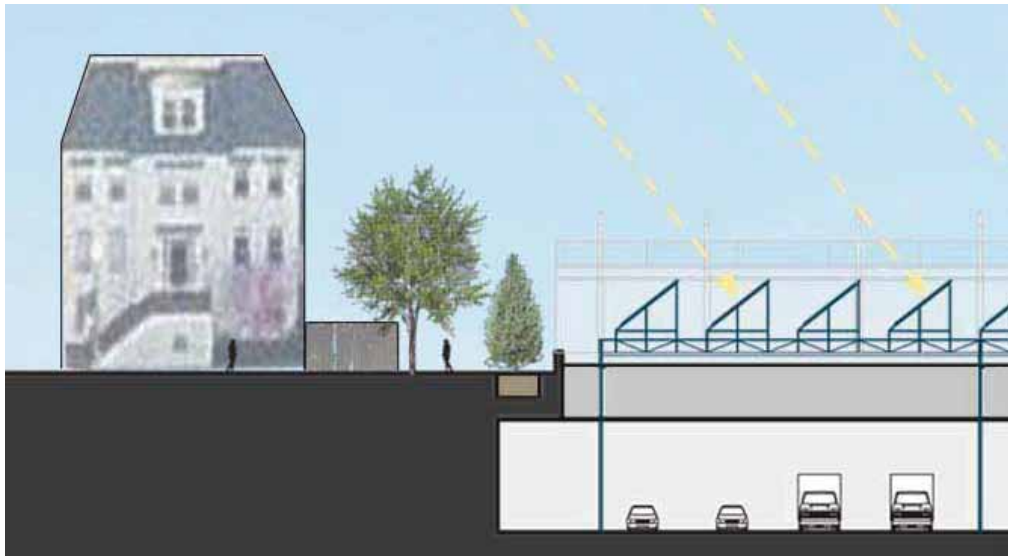
SOLAR CANOPY - PRELIMINARY CONCEPTUAL SECTIONS

9th

7th

(Top) - Section through Southwest Freeway from south to north.

(Bottom) - Section through Southwest Freeway and solar canopy between 9th and 7th Streets.



SOLAR CANOPY

The rear yards of the row houses at Capital Square are bordered to the north by the Southwest Freeway. Installation of trees and a glare-resistant solar canopy could buffer vehicular noise, and provide a source of renewable energy for the SW Ecodistrict.

Installation of a solar canopy will also support construction of new east-west pedestrian connections between 7th and 9th Streets, and expand and landscape the north-south sidewalks across 7th Street and a portion of the 9th Street bridges.

(Top) - Enlarged section at south edge of canopy.

(Bottom) - Enlarged section through 7th Street showing enhanced pedestrian connections.

RECOMMENDATIONS

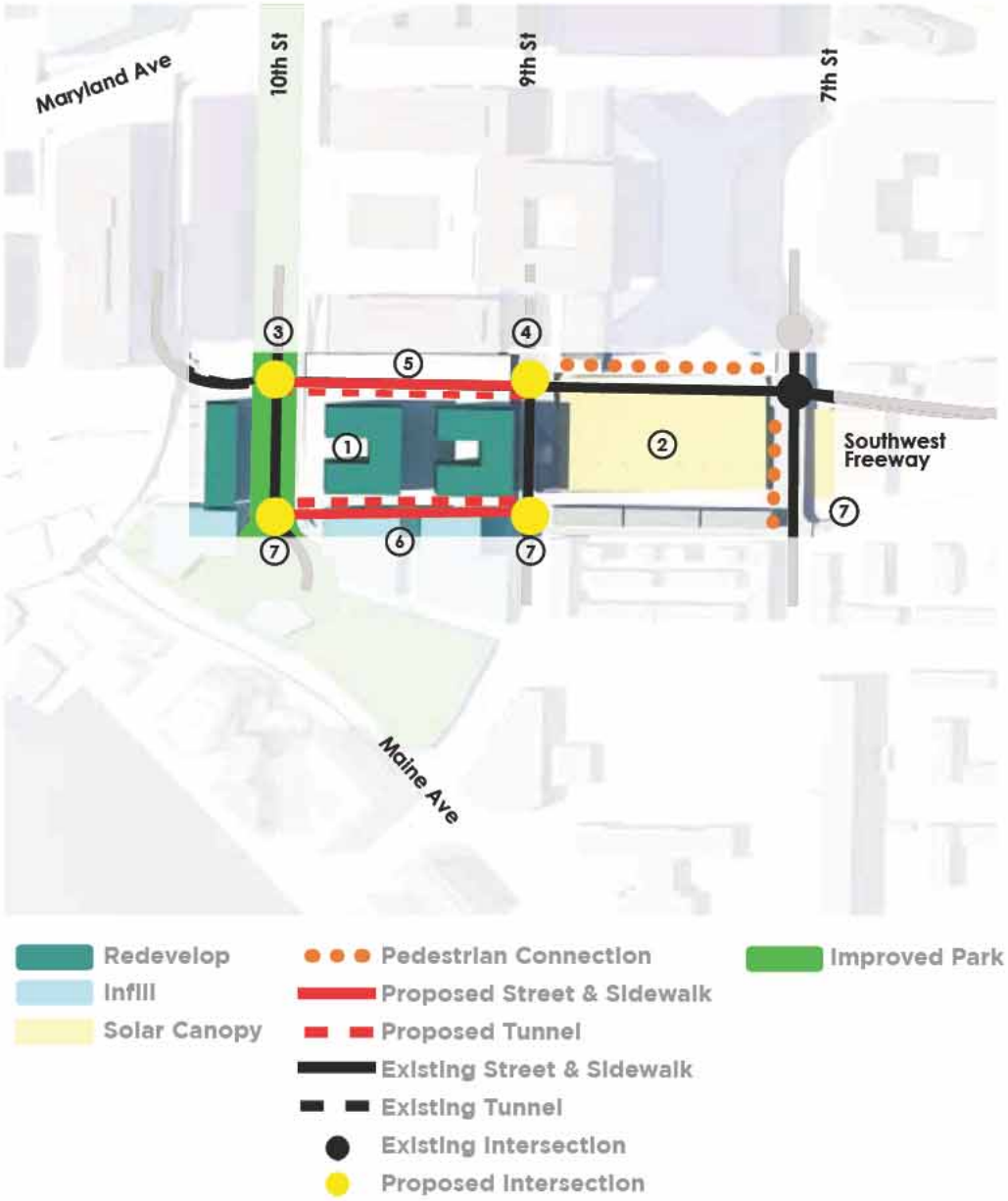
The Southwest Freeway air-rights will be attractively positioned for new private development and will contribute to improving the mix of uses. This will also help establish Banneker Park as a cultural destination and connect the SW Ecodistrict to adjoining neighborhoods. New landscaping and a solar canopy can buffer the Southwest Freeway and improve pedestrian connections. The matrix summarizes the recommendations for each parcel and street.

RESULTS

The Southwest Freeway recommendations will:

- Yield more than 950,000 sq. ft. of new space to accommodate places to live, work, and visit.
- Improve walkability along 10th Street between the National Mall, Smithsonian museums, and Banneker Park.
- Improve north-south and east-west pedestrian connections for residents, workers, and visitor traveling between Maine Avenue, L'Enfant Plaza, Metro stations, and the National Mall.
- Increase the capacity to use solar power as a renewable energy source.
- Increase the efficiency of the central utility plant by improving the use mix to balance energy loads.

SUMMARY PLAN



SOUTHWEST FREEWAY - PROJECT RECOMMENDATIONS

		Summary Description	Phasing - Related Projects Near Term Projects (3-10 years) Long Term Projects (5-25 years) Coordination with Other Projects	Potential Partners* Federal - F District - D Private Sector - P Cultural - C
Building and Site Development				
1	**Air-Rights Development**	Deck over the Southwest Freeway with new mixed-use private development between 9th Street and the 12th Street ramp.	Long Term - redevelop site	F, D, P
Infrastructure, Streets and Public Space				
2	**Solar Canopy**	Construct a non-glare solar panel canopy over the Southwest Freeway between 7th and 9th Streets. The canopy shall be designed with edges buffered from adjacent streets and neighborhood with green plantings to prevent negative visual impacts and vandalism.	Near Term - Develop demonstration project	F, D, P
3	10th Street	Enhance streetscape and prohibit vehicular driveways to buildings on 10th Street frontage.	Near Term - Develop interim streetscape enhancements Long Term - Incorporate streetscape improvements with air-rights development	F, D, P
4	9th Street	Redesign the 9th Street and I-395 interchange to accommodate new development and improve vehicular and pedestrian access over the highway to L'Enfant Plaza.	Coordinate with air-rights development	F, D, P
5	**E Street/ Frontage Road**	Construct a new E Street above the frontage road to create an at-grade vehicular and/or pedestrian connection between 7th and 10th Streets to improve access between SW neighborhoods and the study area.	Coordinate with air-rights development	F, D, P
6	F Street	Construct a new F Street to connect 9th and 10th Streets and provide access to air-rights development.	Coordinate with air-rights development	F, D, P
7	7th, 9th and 10th Street **Freeway Bridges**	Improve the 7th, 9th, and 10th Street freeway spans to accommodate planting area that will buffer the freeway and enhance the pedestrian experience.	Coordinate with solar canopy and air-rights development	F, D, P
	Freeway Ramps	Design freeway access ramps as urban intersections to connect to the street grid, allow air-rights development, and reduce the freeway's footprint.	Coordinate with air-rights development	F, D, P
	All Projects	Construct and connect infrastructure systems and buildings to generate, convey, collect, store, and distribute thermal energy and recycled water throughout the district. Design and orient building footprints to maximize natural light and air ventilation.		F, D, P, C

***Partners will coordinate improvements but may not always be funding partners.**

THE SW ECODISTRICT WILL BE LED BY ECONOMICALLY SUCCESSFUL PARTNERSHIPS

5

Successful Partnerships

IMPLEMENTATION

The *SW Ecodistrict Plan* identifies the urban infrastructure and development recommendations necessary to achieve the unified, sustainable vision for the study area. Implementing the recommendations will require additional planning and real estate analyses, project execution, policy development, and new governing initiatives, carried out by various entities over the plan's 20-year time horizon. There is no one entity, project, or financing tool that can do it alone — all are important to achieve the vision.

This chapter provides a framework to coordinate, prioritize, and program future actions and projects, recognizing that individual near-term efforts, such as new zoning provisions, streetscape improvements, or amended stormwater policies, must support and lay the foundation for more complex infrastructure and development projects, recognizing that federally appropriated funding is unlikely. The chapter also summarizes the financing tools and policies available and necessary to make projects happen.

This chapter is organized into four sections:

ECONOMIC FINDINGS

› The costs and benefits of implementing the development scenario, including why district-scale planning makes economic sense.

IMPLEMENTATION

› The partnership agreements, new governance entities, and pre-development studies necessary to move the recommendations forward.

POLICIES, DIRECTIVES, AND REGULATIONS

› A summary of the existing policies and directives available to help implement the recommendations.

FINANCING TOOLS

› The financing tools and partnership opportunities available to the federal government, the District of Columbia, the private sector, and other stakeholders.

Economic Findings

DISTRICT-SCALE PLANNING MAKES ECONOMIC SENSE

Implementing the *SW Ecodistrict Plan* will provide measurable and intangible economic, social, and environmental benefits for the federal government, the District of Columbia, and other public and private stakeholders. The plan recognizes that transforming the study area into the SW Ecodistrict requires strategic public and private investments. A high-level economic analysis was prepared to help the SW Ecodistrict Task Force understand these public and private investments, which include those needed for:

- Maintaining existing facilities.
- Increasing the development density in the study area.
- Adding new and rehabilitating old infrastructure and public space to support the increased density.
- Achieving the sustainability goals identified in Executive Order 13514.

A range of benefits will be realized as a result of these investments. These benefits and the beneficiary stakeholders include:

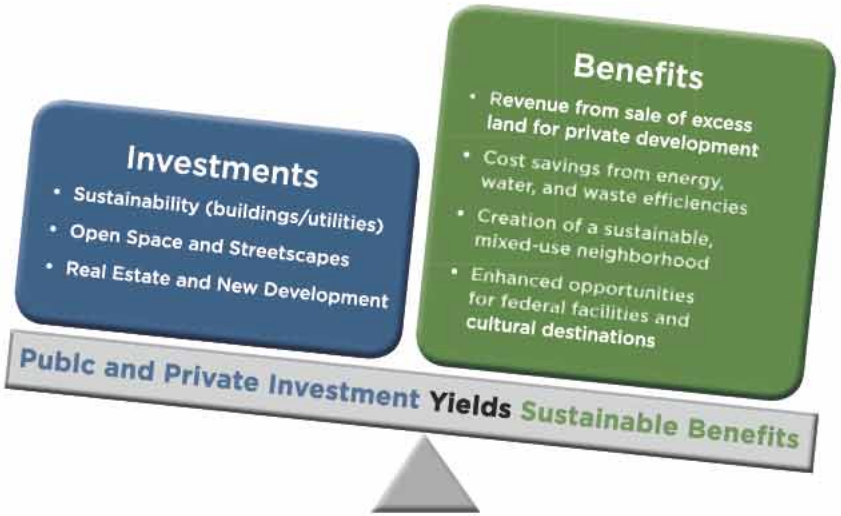
- Federal Government: Land sale revenues, reduced operating expenses, and lease rent savings from efficient space utilization.
- District Government: Land sale revenues, reduced operating expenses, and incremental new tax revenue.
- Private Property Owners: Reduced operating expenses, increased rent revenue, increased net operating income and value of new development creation. Although modest due to Washington's strong office market, sustainability investments by the private sector will yield a rent premium from lower tenant operating expenses on enhanced brand, and improved workplace conditions.

The *SW Ecodistrict Plan* provides additional benefits that are more difficult to quantify. Some benefits are unique to the nation's capital, while others enhance the reputation of the city, the federal government, and private properties. These qualitative benefits include:

- Establishing locations for future nationally significant cultural facilities and new public spaces while preserving the historic landscape of the National Mall.
- Physically, visually, and psychologically connecting the National Mall to the Potomac River and southwest waterfront, and positioning Banneker Park and the 10th Street corridor as a nationally significant cultural destination.
- Creating a national showcase for sustainability, inspiring good development practices at federal facilities and communities nationwide.
- Establishing a high quality employment center that attracts the next generation of federal and private sector workers, offers live-work opportunities, and showcases high-productivity worksites.
- Providing environmental benefits through cleaner rivers, a reduced carbon footprint, lower per capita energy and water use, and enhanced urban ecology.
- Providing a template for reuse of federal properties that offers private sector land and development opportunities while ensuring federal operations and missions are fully maintained.

The findings of this high level economic analysis are encouraging. The economic analysis estimates a return on investment assuming a 20-year life cycle for the improvements. The initial analysis concludes that the quantitative and qualitative benefits that can be achieved by implementing the *SW Ecodistrict Plan* are significant and will likely exceed the costs of investments necessary to transform the study area.

This plan acknowledges that further study is required to fully understand the value of investing in the SW Ecodistrict. Because each of the plan's proposed projects would impact or benefit a range of stakeholders differently, additional work is necessary to phase and prioritize projects and identify funding gaps. Future studies will also identify opportunities and challenges to monetize future benefits to pay for initial investments through a variety of potential mechanisms, including tax increment financing, payments in lieu of taxes, special assessments, negotiated exactions, and real estate exchange tools.



HIGH PRIORITY PROJECTS

Some projects in the development scenario can be achieved in the near-term at relatively low cost, while others will take longer because they are more complex, costly, or dependent on other projects. Four of these projects stand out as significant catalysts.

Two near-term projects will quickly demonstrate tangible change within the study area:

1. Interim streetscape improvements to 10th Street will improve the pedestrian experience and provide a walkable connection between the National Mall and the waterfront. These improvements will signal to employees, visitors, and future residents that the study area is on the cusp of change.

2. A new business model for the central utility plant that incorporates existing and future federal and private development can rapidly put the study area on the path toward significant greenhouse gas reduction.

Two longer-term revitalization projects will be catalytic in the study area's transformation:

3. Redeveloping the Forrestal Complex offers increased federal and private sector development opportunities, reconnects the National Mall and the Smithsonian Institution with the southwest waterfront, introduces a mix of uses, and creates highly sustainable buildings, including a new U.S. Department of Energy headquarters as described in the Independence Quarter Focus Area.

4. Decking Maryland Avenue will restore a preeminent boulevard, visually and physically reconnect the study area to the U.S. Capitol, and create opportunities for future private development. This project is summarized in the Maryland Avenue and 7th Street Corridor Focus Area and further detailed in the District's *Maryland Avenue, SW Small Area Plan*.

Implementation

The *SW Ecodistrict Plan* serves as a flexible tool for federal, District, and private entities to inform future facility and infrastructure planning and development decisions. Some of the recommendations for the focus areas, discussed in Chapter 4, could advance today with the existing financing tools and authorities available to the public and private sectors (described in greater detail at the end of this chapter). For example, federal and private building owners can make energy efficient improvements to their buildings, and the General Services Administration (GSA) has the authority to redevelop buildings and land for which it is responsible. In some cases, it may be appropriate to take advantage of these tools and authorities.

It is more likely, however, that implementing the *SW Ecodistrict Plan* recommendations will require new approaches because existing resources such as Congressional appropriations may not be readily available in the future. Given the magnitude of public ownership in the area, a combination of partnerships among the federal government, the District, other public entities, and the private sector offer significant opportunities to potentially leverage resources and coordinate future improvements to achieve a desired outcome.

The critical next steps to help inform potential implementation decisions include a series of partnership agreements and pre-development studies that are organized around four topics:

- Financing
- Organization and Governance
- Real Estate Development
- Infrastructure Development

PARTNERSHIP AGREEMENTS AND PRE-DEVELOPMENT STUDIES

There are several studies and partnership agreements, both underway and proposed, which are necessary to move the SW Ecodistrict recommendations to the next stage of implementation. These studies and partnerships, described in greater detail below, will program and design development and inform the National Environmental Policy Act (NEPA) and Section 106 processes. NEPA, 1969, 42 U.S.C. 4321, et seq., requires federal agencies to carefully consider environmental impacts in their decisions. All federal agencies must direct, to the fullest extent possible, their policies, plans, and programs to protect and enhance environmental quality. Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties.

FINANCING

Cost Benefit Analysis for Independence Quarter and 10th Street

A critical next step is gaining a better understanding of the costs and benefits to each stakeholder within the Ecodistrict and using this information to develop a phasing and financing approach. As part of the next steps, the National Capital Planning Commission (NCPC) will look at the conceptual phasing/sequencing and financing mechanisms for the redevelopment of federal lands adjacent to Maryland Avenue and bounded by 12th Street, 6th Street, and Independence Avenue. The analysis will calculate the costs, revenues, savings, and intrinsic benefits for each stakeholder and identify how financing gaps might be filled via value-capture mechanisms such as tax increment financing, special assessments, or real estate exchange tools (as defined in the Financial Tools Section).

Financing Strategy

An overall financing strategy for the *SW Ecodistrict Plan* recommendations will be necessary prior to the design and development of streets, parcels, public space or water and energy infrastructure. This development will require public private partnerships and the use of multiple financing tools (discussed at the end of this chapter). The Cost Benefit Analysis for Independence Quarter (described above) will help inform the overall financing strategy.

ORGANIZATION AND GOVERNANCE

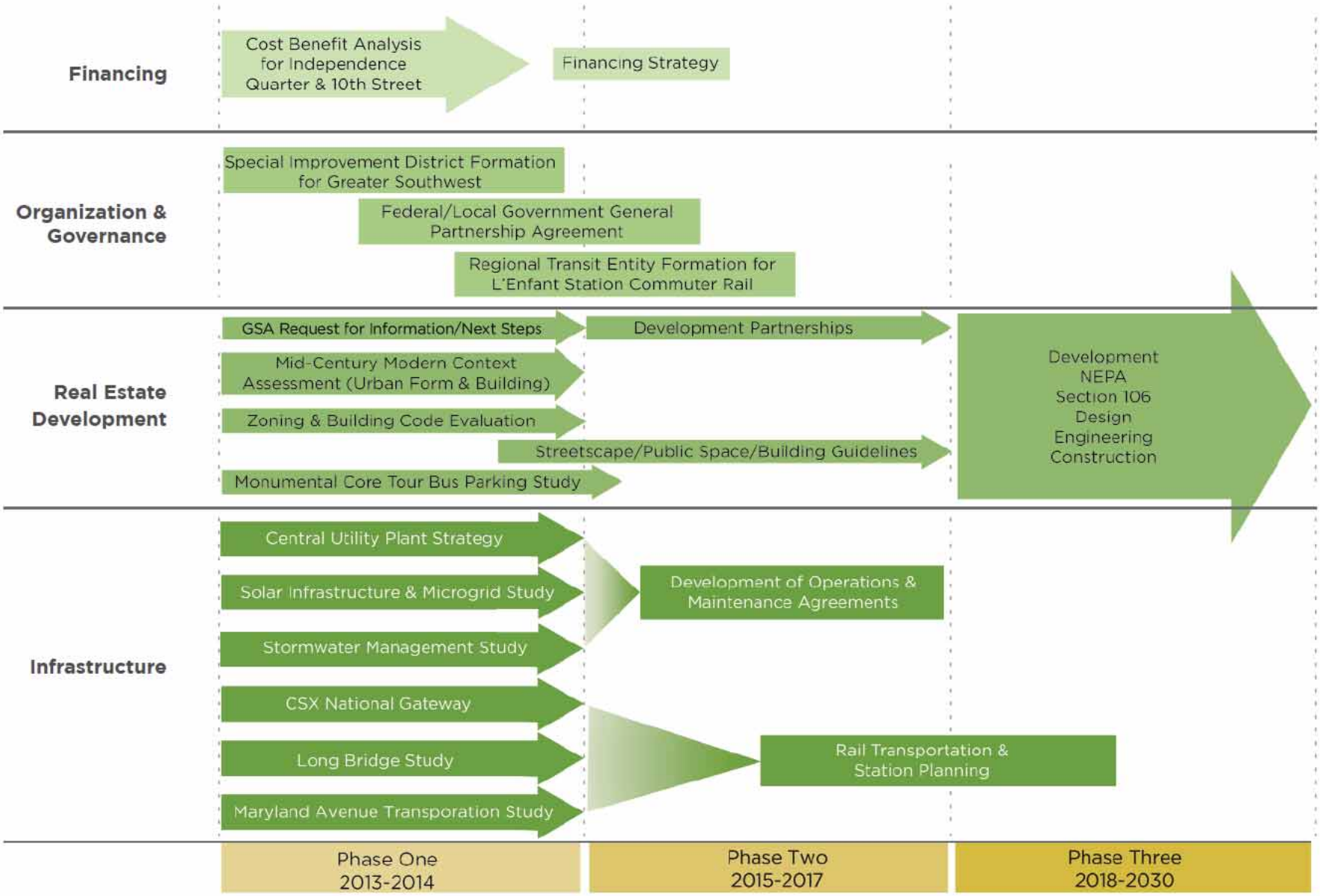
Federal/Local Government General Partnership Agreement

Implementing the *SW Ecodistrict Plan* will require that the federal government and the District of Columbia are committed to its vision and take actions to advance its recommendations. Many federal and District of Columbia agencies helped to develop the plan's recommendations, and each will continue to play a critical and distinct role in their successful implementation. It will be valuable for all entities to enter into a general agreement that serves as a good faith commitment toward future coordination of individual responsibilities. For example: the District might commit to developing new zoning regulations if needed, while the federal government might commit to participating in district-wide improvements, as appropriate.

Special Improvement District Formation

A governance entity managed by a board of public and private representatives could be valuable in providing the coordination, advocacy, financing, and management necessary to achieve the SW Ecodistrict goals. The entity could be similar in structure to a business improvement district but would also have a large role in developing the sustainable

PRE-DEVELOPMENT STUDIES AND AGREEMENTS



infrastructure of the SW Ecodistrict. Or, an entity could be established through special legislation with the appropriate authorities to carry out actions necessary to implement the recommendations. Some of the key functions of this governing entity could include:

- Develop a district-wide plan that addresses streetscape, public space, stormwater management, and infrastructure improvements.
- Implement district-wide programs to manage stormwater and reduce energy, wastewater, and potable water use.
- Champion and coordinate district-wide renewable energy improvements, including solar installations above the Southwest Freeway and on buildings.
- Coordinate with the District of Columbia on prioritizing any tax increment financing funds (TIF) and/or local improvement district (LID) property tax assessment funds generated within the Ecodistrict for environmental, street, public space, and transportation related projects.
- Finance, construct, and maintain district-wide green infrastructure improvements. This could be done using a combination of LID/TIF funds or through a private partnership.
- Administer a green power purchasing program and a stormwater credit program.
- Define a neighborhood identity through marketing and branding strategies, and develop a plan that reflects the Ecodistrict's sustainability goals.

While this entity may not ultimately manage all of the projects, such as the district-scale water and energy systems, it could provide the leadership and coordination to initiate the projects and develop and carry out necessary public-private partnerships.

Regional Transit Coordination Entity Formation

The National Capital Region is well-served by a variety of regional transit systems, including the city's two busiest transportation hubs, Union Station and L'Enfant Station. The Union Station Redevelopment Corporation, Amtrak, the Virginia Railway Express (VRE), the Maryland Area Rail Commuter (MARC) and Washington Metropolitan Area Transit Authority (WMATA) are assessing how to accommodate increased ridership, improve the commuting experience, and improve transit operations. Addressing the growing transit demand will require looking beyond the study area boundary and coordinating solutions to the complex operational and ridership requirements of all providers. Currently there is no single entity to manage this effort.
Further study is needed to determine if it is feasible to expand the existing Union Station Redevelopment Corporation's authorities to include transportation planning for L'Enfant Plaza Station, or alternatively, if a new entity is needed altogether. Either of these options may require new or amended legislation.

REAL ESTATE DEVELOPMENT

Development Partnerships

As part of the next steps, partnerships between the federal government, District government and/or private property owners will be needed to redevelop one or a combination of parcels. These partnerships would develop preliminary development programs, conceptual master plan(s), and initial financing strategies that would ultimately inform NEPA and Section 106 processes.

Mid-Century Modern Context Assessment

Prior to design work, it will be helpful to conduct the research necessary to understand and evaluate the historic significance of buildings and sites constructed during the urban renewal era. Recent research on Banneker Overlook revealed the need to gain a broader understanding of how planning and designs for individual sites were related to or influenced by the larger planning context of urban renewal. This assessment could provide guidelines for evaluating individual sites as well as the collection of properties in Southwest Washington, in accordance with National Register of Historic Places criteria.

Zoning and Building Code Evaluation

The Comprehensive Plan for the National Capital: District Elements and the zoning regulations do not apply to federal land. However, if the federal government were to dispose of land, these policies and regulations would apply. It is important that the regulations necessary to implement the *SW Ecodistrict Plan* be in place prior to any federal disposal or long-term lease. The District, in coordination with the federal government, will need to evaluate and potentially update the Comprehensive Plan's District Elements and zoning regulations for this area.

Streetscape/Public Space/Building Guidelines

This initiative will prepare streetscape and public space guidelines for all streets and public spaces in the SW Ecodistrict. The purpose is to identify street sections, programming guidelines, and materials to ensure projects are coordinated and result in a cohesive and beautiful public realm that reflects the SW Ecodistrict recommendations.

Monumental Core Tour Bus Parking Study

The National Park Service (NPS) is studying the issue of tour buses circulating and idling around and near the National Mall, which generates traffic and environmental problems. While tour bus service is important to the local tourist economy, the absence of a comprehensive tour bus parking policy and management plan makes it difficult to mitigate their negative impacts: congestion, air and noise pollution, and visual clutter around the National Mall and vicinity. The results of this study will inform a follow-up study that will consider specific locations, including the SW Ecodistrict.

INFRASTRUCTURE DEVELOPMENT

Central Utility Plant Strategy

Modeling studies conducted to develop the *SW Ecodistrict Plan* recommendations concluded that expanding the number and use of public and private buildings served by the central utility plant would dramatically reduce the area's greenhouse gas emissions. It could also help finance operations and maintenance. The GSA does not, however, have the authority to expand the central utility plant's operations to private buildings. This plan recommends that the GSA seek authority to examine the environmental and financial implications of expanding the service of the central utility plant to private buildings in the area in addition to the impacts of federal buildings disconnecting from the plant. A new policy expanding the GSA's authority with regard to the plant should be considered.

Solar Infrastructure and Microgrid Study

This study will assess how to phase and finance the installation and operation of a district-wide solar array and microgrid infrastructure.

Stormwater Management Study

This study will evaluate how to phase and finance the installation and operation of the stormwater infrastructure system with a focus on the 10th Street corridor. It will assess the district-wide collection, conveyance, and treatment of stormwater, and the distribution of non-potable water to new and existing buildings. It will calculate the costs, revenues, savings, and other intrinsic benefits, accounting for the one-time and ongoing costs and benefits of system improvements. The study will also consider the regulatory and policy hurdles to a district-wide collection system and make recommendations.

Development of Operational/Management Agreements

Upon completion of the central utility plant strategy, solar infrastructure, and stormwater management study, agreements will need to be developed between public and private property owners, utilities, and possible third party companies regarding the financing and construction of district-wide infrastructure systems. New or amended legislation may be needed to execute potential agreements.

CSX National Gateway Plan

CSX's *National Gateway Plan* proposes to improve the flow of freight between the Mid-Atlantic and the Midwest States. To increase the movement of freight through the corridor, CSX is proposing to upgrade tracks, equipment, and facilities to accommodate double-stack rail cars. This requires reconstructing the Virginia Avenue tunnel and lowering the tracks through the Maryland Avenue corridor to accommodate vertical clearance. Implementation of this plan presents an opportunity to lower and expand the tracks to reconstruct Maryland Avenue and increase freight and commuter rail capacity.

Long Bridge Study

The District Department of Transportation (DDOT) and CSX began the Long Bridge Study in September of 2012 to address the significant bottleneck that exists over the Potomac River. The study will assess the feasibility of improving the span and corridor for multiple modes of transportation (freight and passenger rail, Metrorail, and bicycle/pedestrian access) which will influence operations at L'Enfant Station.

Rail Transportation and Station Planning

Constrained infrastructure, growing ridership, competing operational needs, and multiple jurisdictions that cross city and state boards call for strong partnerships and coordinated planning among all freight and commuter service providers, including the operators at Union Station and L'Enfant Station. Planning initiatives to address some of these issues were recently completed or are now underway, such as the July 2012 Amtrak Master Plan for Washington Union Terminal (Union Station), the CSX National Gateway project, and the City's Long Bridge Study. However, a comprehensive Commuter Rail Expansion Study and an Economic Analysis are needed to assess the feasibility, cost, and benefits of the physical and operational improvements to the rail lines, the stations, and the connections to multiple transit modes at both Union Station and L'Enfant Station.

Transportation Feasibility Study for Maryland Avenue

To coordinate infrastructure improvements as recommended by the District of Columbia Office of Planning *Maryland Avenue, SW Small Area Plan*, DDOT is undertaking a Transportation Feasibility Study for Maryland Avenue and the adjacent street network. It will provide guidance for implementing street improvements to the area. It will be beneficial to phase the study to align with the National Gateway Plan's project schedule.

Policies, Directives, and Regulations

The federal government and the District have a range of existing legislative tools and regulations that can be used to effectively implement the *SW Ecodistrict Plan*'s recommendations. Development on private land in the District is guided by policies in *The Comprehensive Plan for the National Capital: District Elements* and regulations in the zoning code. The federal government is guided by the Comprehensive Plan's Federal Elements, a number of executive orders, existing laws, and policies that encourage the federal government to advance livable and sustainable communities. These policies encourage federal land and facilities to contribute to the civic life of local communities.

FEDERAL GOVERNMENT

Policies and regulations that guide the GSA to promote the use of federal space to strengthen cities, encourage a mix of uses within federal buildings, and encourage programming and landscaping of public spaces include:

Federal Space Management, Executive Order 12072

Promotes the use of federal space to strengthen cities and make them attractive places in which to live and work; to improve their social, economic, environmental, and cultural conditions; and to improve the administration and management of federal agencies.

The Public Buildings Cooperative Use Act of 1976

Encourages the location of publicly accessible commercial, educational, and recreation facilities within federal buildings.

The Good Neighbor Program

Sets forth the goal of making the federal government's properties safer, cleaner, and livelier while helping to rebuild cities, block by block. The program promotes providing space for shops and restaurants that invite people into federal buildings, and developing plazas and public spaces around federal properties. It encourages property managers to program, design, and maintain public space; streamline and integrate security; improve image and aesthetics; and enhance access and circulation.

The First Impressions Program

Advances the GSA's Design Excellence goal of creating federal buildings that "express the vision, leadership, and commitment of the government in serving the public and expressing the values of the nation." Specifically, the First Impressions Program enlivens public spaces such as lobbies and plazas through better programming and enhanced signage and landscaping.

The Public Buildings Act

Permits the GSA to exchange or acquire property. This exchange authority requires the GSA to determine that any property exchange is in the "best interest of the government." This authority was used by the GSA in 2000 to exchange a federal building in Charleston, South Carolina, for a site owned by the City of Charleston. The exchange allowed the GSA to obtain a more suitable site for a new federal courthouse while providing the city with a desirable site for its own purposes.

Title V of the Stewart B. McKinney-Vento Homeless Assistance Act, as amended (42 U.S.C. § 11411)

Requires the GSA to submit to the Department of Housing and Urban Development (HUD) all properties reported to GSA for disposal for a HUD determination of suitability for homeless use. Properties determined suitable are posted by HUD for 60 days to provide notice of availability to interested parties. Interested parties may apply to the Department of Health and Human Services (HHS) to obtain the property by permit, lease or deed for homeless use. HHS reviews and approves applications for homeless use of surplus real property, and recommends assignment of these properties from federal disposal agencies to approved applicants.

Policies and regulations applicable to all federal agencies for sustainability improvements with regard to greenhouse gas reductions, energy, waste, and water efficiencies, and public transportation include:

The Energy Independence and Security Act of 2007

Requires all federal buildings to reduce their overall energy consumption 30 percent by 2015. New buildings and buildings undergoing major renovations must reduce fossil fuel-generated energy consumption 55 percent by 2010 and 100 percent by 2030. The act also establishes the Office of Federal High Performance Green Buildings within the GSA to oversee the implementation of these requirements.

Strengthening Federal Environmental, Energy, and Transportation Management, Executive Order 13423

Calls for, among other items, all federal agencies to reduce their energy consumption 30 percent by 2015 and requires that at least half of an agency's energy use come from renewable sources.

Federal Leadership in Environmental, Economic, and Energy Performance, Executive Order 13514

Introduces new greenhouse gas (GHG) emissions management requirements, expands water reduction requirements for federal agencies, and addresses waste diversion, local planning, sustainable buildings, environmental management, and electronics stewardship for federal agencies and properties.

Policies and regulations that promote the protection and use of historic buildings for federal occupancy and permits (with consultation) the long-term leases and adaptive reuse for places listed on the National Register of Historic Places include:

Federal Facilities on Historic Properties, Executive Order 13006

Promotes the use of historic buildings and properties for federal occupancy to support Executive Order 12072, "Federal Space Management" and the National Historic Preservation Act.

Section 106, National Historic Preservation Act of 1966

As amended by 36 CFR, Part 800, Protection of Historic Properties, requires federal agencies to take into account the effects of their undertakings on historic properties, and affords the Advisory Council on Historic Preservation a reasonable opportunity to comment.

Section 110, National Historic Preservation Act of 1966

Promotes the preservation and protection of historic properties owned or controlled by federal agencies. The act also provides for the transfer of surplus federal historic properties to ensure their protection and enhancement and for these agencies to undertake planning to minimize harm to National Historic Landmarks that may be directly and adversely affected by actions. This legislation was used to rehabilitate and restore the National War College at Fort McNair in Washington, DC.

Section 111, National Historic Preservation Act of 1966

Permits long-term leases and adaptive reuse for all or portions of assets listed on the National Register of Historic Places, after consultation with the Advisory Council on Historic Preservation. This legislation was used to adapt the historic Tariff Building located on 7th Street, NW for reuse as a hotel and restaurant.

"Preserve America," Executive Order 13287 and the White House's Preserve America Initiative

Builds on the National Historic Preservation Act and NEPA to protect and utilize historic properties to advance economic vitality and foster awareness of U.S. history and American values, particularly through public-private partnerships. They also endorse public agency collaboration to promote the use of historic properties for heritage tourism and related economic development. They support local community preservation activities and heritage tourism programs, including the annual Preserve America grants that may be used for heritage tourism planning and implementation.

THE DISTRICT

District of Columbia legislation, policies and regulations that promote sustainability on District-owned and privately-owned sites include:

Parking

The District of Columbia regulates parking on private property based on development use and size. The parking requirements are currently being reviewed as part of a larger zoning update. *The Comprehensive Plan for the National Capital: Federal Elements*, which guides NCPC's review of federal projects, recommends minimal parking for federal buildings in this area due to its central employment area location and proximity to multiple modes of transportation.

The Green Building Act of 2006

Establishes high-performance building standards that require the planning, design, construction, operation and maintenance of building projects and establishes a green building incentives program. All District public buildings meet the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification standards for environmental performance. The District of Columbia expedites all LEED Gold-level projects through the permitting process and by 2012, all new private development projects will be required to meet LEED certification.

Clean and Affordable Energy Act of 2008

Requires public buildings to benchmark their energy use and publicly post their rating on an online database. Annual benchmarking of private buildings is being phased in, and after 2013, all buildings of 50,000 sq. ft. or more will be required to participate. Ratings are based on expected energy performance of a project's modeled energy use.

Distributed Generation Amendment Act of 2011

Increases the Solar Renewable Portfolio Standard (RPS) requirements for the District (which is the percent of renewable energy required in utility services). Additionally, it no longer allows renewable energy distributors located outside of the DC grid to gain SREC's (Solar Renewable Energy Credits); this encourages local production and consumption of renewable energy.

The Mayor's 2012 Sustainability Vision to become the greenest and most livable city in the nation is resulting in the development of new legislation, policies and regulations to promote sustainability on District-owned and privately-owned sites. These include:

Energy Efficiency Financing Act of 2010

Authorizes the District of Columbia to issue, sell, and deliver DC revenue bonds to finance low-interest loans to District property owners for the purpose of making energy efficiency and renewable energy improvements to their property. The property owners who elect to participate in the program would repay the loans through an assessment on their property taxes.

Community Renewables Energy Act of 2012

Allows utility customers to subscribe to energy created by Community Energy Generation Facilities. This enables community renewable energy use; credits the benefits from a community energy generating facility directly to a customer's monthly utility bill; allows for-profit, non-profit or third-party entities to build, own, and operate community energy generating facilities; and creates opportunities for participation by low-income utility customers.

Renewable Energy Incentive Program Amendment Act of 2012

Allows the District Department of the Environment (DDOE) to continue to offer rebates to District businesses and residences that install energy improvements to their facilities.

2012 District of Columbia Construction Code

The District bypassed the 2009 International Code Council (ICC) Codes in favor of the more progressive and environmentally conscious 2012 ICC Codes. This will enforce sustainable building practices for all new and renovated residential and commercial buildings.

District of Columbia Stormwater Regulations related to the Municipal Separate Storm Sewer System (MS4) Permit

Newly developed and redeveloped properties will have to retain 1.2 inches of rainfall on-site through the use of green infrastructure controls like green roofs, rain gardens, and trees planted along streets. This will dramatically decrease the amount of runoff into the Anacostia River which suffers from stormwater runoff filled with pollutants.

The Green Area Ratio and Other Sustainability Measures in the District of Columbia Zoning Code Update

The Green Area Ratio (GAR) is an environmental sustainability zoning measure that is intended to set standards for landscape and site design that is measured by a scoring method developed by the District Department of Consumer and Regulatory Affairs. The GAR model allows a user to implement landscaping and energy-efficient techniques which translates into an overall GAR score for the property site. The GAR will apply to all new buildings requiring a Certificate of Occupancy, to major building renovations that more than double the assessed value of a property, and for residential properties with more than two units.

Financing Tools

The federal government, the District, and private interests can use a variety of funding tools to implement components of the *SW Ecodistrict Plan* recommendations. In some cases, it may be appropriate to use an agency's existing funding resources. However, it is more likely that implementing the *SW Ecodistrict Plan* recommendations will require new funding approaches. Given the largely public ownership interests in the area, a combination of any number of partnerships among the federal government, the District, another public entity like WMATA, and the private sector offer significant opportunities to leverage resources. This is possible because the plan's recommendations achieve broad benefits that extend to the federal government, to the District, its workers and residents, and to existing property owners in the area. Potential financing mechanisms include:

FEDERAL GOVERNMENT

- Land dispositions: The GSA is allowed to use money from the disposition of federal land to reinvest in the Public Building Fund.
- Capital budgets: Agencies could prioritize projects in annual budgets.
- Congressional appropriations: Although current and foreseeable budget conditions make this unlikely, Congress could appropriate money for individual projects when appropriate.
- Federal grants: The federal government offers grants to state, regional and local jurisdictions and to public and private entities. These grants include the Better Buildings Initiative (Department of Energy), the Sustainable Communities Initiative (Department of Transportation/ Environmental Protection Agency/Housing and Urban Development), and TIGER Grants (Department of Transportation).
- Federal Payment to a Business Improvement District (BID): The federal government can make payments to BIDs (as it does with the Downtown DC BID) to receive services provided by the BID.
- Federal bonds: Build America Bonds program expired in 2011 but other programs could exist in the future.

THE DISTRICT

- Capital budgets: District agencies could prioritize projects in annual budgets.
- Tax Increment Financing (TIF): TIF creates funding for public projects by borrowing against projected future increases in property tax revenues. The District of Columbia uses the TIF tool for projects that create a public benefit such as the Great Streets Program or affordable housing.
- Payments in Lieu of Taxes (PILOT): PILOT funds allow the District of Columbia to collect funding that replaces lost property tax revenues on federally-owned property or other non-taxable entities. PILOTs can also be made with private entities as part of public/private partnerships for development.
- Freeway Air Rights Title 23 Funds: If the Federal Highway Administration (FHWA) approved the sale of the air rights over the SW Freeway, the District of Columbia would then be allowed to use the money from the sale to reinvest in Title 23 eligible projects (i.e. road infrastructure).
- Local Improvement (or Special Assessment) Districts: see "Partnership" section below.

PRIVATE

- Private development: New construction could be financed by private investors.
- Energy saving performance contracts: A company pays the upfront investment for energy-efficiency renovations and retrofits in a building in exchange for payments from energy savings over time.
- Special purpose entity for water/energy systems: A privately-owned entity could build, own, and operate a district-scale water or district-energy system with revenue coming from energy/water sales and local credits.

PARTNERSHIPS

- Public-private partnerships for site redevelopment: The federal government could partner with a local government or the private sector to develop a new federal building in exchange for federal land or facilities.
- Enhanced-Use Leases: A company is allowed to develop government land with renewable energy or other projects in exchange for payment or in-kind services such as reduced-rate energy.
- Local Improvement District Tax Assessment: A special assessment is levied against property within a particular area to fund infrastructure/ public realm projects. While federal government land cannot be assessed, an alternate form of payment could be considered.
- Special purpose entity/partnerships for energy and water systems: This model would be a shared district system between the local and/or federal government and a private entity.

Recommended Development Scenario Study Model (2030).

Plan Applicability

The *SW Ecodistrict Plan* is not a prescriptive master plan; rather, it identifies opportunities to coordinate complex development, public space, infrastructure, and transportation improvements. It will guide future programming, planning, design, and development decisions for federally owned property under the jurisdiction of individual federal agencies, such as the GSA or the NPS. Although not applicable to District-owned or privately-owned land; participation by the District of Columbia and private property owners is vital to achieving the goals of the plan.

Individual projects that benefit one agency could be led by a single entity; however, other projects may exceed the scope of a single federal or local agency's mission and operational budget. Some initiatives will only be considered when the useful life of a facility or infrastructure system is close to its end, although initiating detailed feasibility studies may be warranted sooner. The near- and long-term project recommendations will require additional detailed planning, evaluation, and design to comply with NEPA, the National Historic Preservation Act, and other requirements.

Projects can be pursued as funding becomes available. The plan identifies the potential partnerships necessary to carry out the projects, as well as the possible legislative tools and governance approaches that may help move the projects toward implementation.

NCPC will advise federal agencies, and encourage District and private property owners, to use the plan as a guide when programming, planning, and designing future development proposals in the SW Ecodistrict. In addition, NCPC will also use the plan to:

1. Evaluate and comment on:

    a) development proposals that go beyond the routine maintenance of public buildings; and

    b) proposals for improvements to parks, public spaces, and public transportation systems.

2. Guide input on federal, local, and private planning studies and reports.

3. Inform future updates of NCPC's Strategic Plan that describes the Commission's mission, values, and vision, and conveys the agency's goals over a specified time period.

4. Develop or amend future NCPC planning studies and reports, including the *Comprehensive Plan for the National Capital: Federal Elements* and the *Federal Capital Improvements Program*.

Acknowledgements

The *SW Ecodistrict Plan* is a partnership initiative led by the National Capital Planning Commission in cooperation with 17 federal and local agencies that comprised the SW Ecodistrict Task Force. The Task Force served as the steering committee for the plan, and a Working Group provided technical expertise.

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SW Ecodistrict


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