

The Catholic University of America
School of Architecture & Planning

ARCH 402/503: Comprehensive Building Design Studio (CBDS)

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6 credits

M, W, F - 1:00pm - 6:00 pm

Comprehensive Building Design Studio (CBDS) Project

Exploring the Integration of Building Systems, Materials, and Construction Methods into a Cohesive Whole

CLIENT	DC Department of Transportation, DDOT
PROJECT	Transit Hub Design an environmentally friendly responsible Public Transportation Center focusing on architectural innovations to preserve tomorrow's resources.
PROJECT DESCRIPTION	<p>Public Transportation Center Public transportation is undergoing rapid change due to evolving economic uncertainty and the insecurity of earth's natural resources. Society is rediscovering public transportation's usability, environmental kindness, and cost effectiveness. A majority of transit passengers are traveling within a local area or region between their homes and places of employment, shopping, or schools. A transportation center often serves as the city's gateway for visitors and reflects the cities heritage, people, and values.</p> <p>The program encourages students to merge two modes of public transportation while considering the facility's potential symbolic aesthetics and connection to the city with its surrounding community. Students are to design a Transit Hub to accommodate the needs of their city. This will be a ground-up design facility. This transportation center will need to support two means of mass transit and should be designed to be able to expand in the future. Passengers will change or transfer between the modes of transit; convenience in getting around and through is important, since many travelers need to quickly and efficiently move from transportation and back. The center will also be a hub of interaction and a significant emblem of the nature and character of the culture it serves. The center may include convenience services such as a coffee shop, newspaper or magazine stand or other small retail.</p>
PROJECT DESCRIPTION	<p>Sustainable Initiatives The United Nations World Commission on Environment and Development stated, "sustainable development attempts to meet the needs of the present without compromising the ability of future generations to meet their own needs."</p> <p>Sustainably designed buildings aim to lessen their impact on our environment through energy and resource efficiency. The building industry—encompassing the design, construction and manufacturing industries—is working to promote buildings that are healthy, environmentally responsible, and cost-effective places to live and work. The goal is to minimize natural resource use while enhancing social and economic benefits.</p> <p>Sustainable design innovations and ideas should be used throughout the Transportation Center including the building and exterior. Sustainably designed buildings and sites aim to lessen their impact on our environment through energy and resource efficiency. Sustainable design concepts must include at least three of the following solutions: durability, recyclability, reduced site disturbance, storm water management, heat island mitigation, optimized energy performance, indoor air quality, material use reductions, and recycled content use.</p>

PROJECT HISTORY

The District of Columbia is adding population and jobs rapidly, and is projected to continue growing over the next 25 years. Because of this growth, more people will be commuting to work in the city and making more trips within the city. The number of total internal trips—that is, one-way journeys using one mode of transportation in the District—is expected to increase 32 percent by 2030. In addition, many Metrobus routes and Metrorail lines are currently at or above capacity, and congestion on two Metrorail lines is expected to become “unmanageable” by 2013.

It is clear that the District faces a significant transportation challenge in the future. Adding to and improving the District’s transit network is one way of enhancing mobility for DC residents, particularly those not now served by Metrorail. With the right mix of new transit services, travel times for DC residents will improve. The District can also use the transportation investments to attract new development and strengthen communities within the city.

Based on the results of corridor evaluations, a recommended long-range plan (by year 2030) has been identified that includes the implementation of Streetcar or BRT service in the following corridors:

- H Street NE/Benning Road NE
- K Street NW
- M Street SE/SW
- Massachusetts Avenue NW
- U Street/18th Street NW/Calvert Street
- Good Hope Road SE
- Georgia Avenue NW/7th Street NW/SW
- M Street NW
- 8th Street SE/NE
- Florida Avenue NE/NW
- Anacostia Demonstration Line
- 11th Street and South Capitol Street Bridge

The H Street NE Corridor is an important travel route that connects the District to outlying areas. The establishment of the streetcar along H Street in the late 19th Century spurred both residential and commercial development, and by the mid 1900s the H Street NE corridor had become the city’s second biggest commercial hub, serving both the local neighborhood and the District at large. However, Washington DC, like many other American cities, began losing population following World War II. Residents of the neighborhoods surrounding H Street NE started to move to the District suburbs, a pattern that continued for much of the succeeding decades. Population loss and years of neglect resulted in a decayed socio-economic fabric along H Street, and the corridor became, for many, simply an arterial that connects the District with its outer suburbs.

Today, the Corridor is at an important juncture. A renewed interest in the health of H Street, on the part of local government, the community, business owners, and other critical stakeholders, has created momentum for significant public and private investments in the Corridor. Projected private investments total nearly \$1.03 billion, and an additional \$42 million of public money has also been committed. With these financial backings, H Street NE is on the verge of a major transformation.

Refer to <http://www.bakerprojects.com/hstreetne/index.asp> for more information on the H Street Corridor.

Refer to the course website for other resources on light rail in Washington, DC, the Great Streets Initiative, etc. These resources will be useful for the site, urban and conceptual analysis

PROGRAM

Light Rail Services Light Rail will approach the station on 2 tracks, which are served by one center platform elevated to approximately 48", thus allowing passengers to enter and exit trains without steps. The platforms must be a minimum of 24' wide and 600' long.

Waiting & Queuing Areas (including Platforms)	15,000 sq ft
Information Center/Desk	150 sq ft
Light Rail Offices	200 sq ft
Light Rail Total	15,350 sq ft

Bus Services Coaches will service the station at a maximum of 6 at one time. Following are assumed coach information: Width 96", Length 40', Wheel base 279" (23' 3"), Turning radius 44', Seating for 44 passengers with room for 22 standees, and has a wheelchair lift.

Waiting & Queuing Areas (including Platforms)	4,000 sq ft
Information Center/Desk	150 sq ft
Bus Offices	200 sq ft
Bus Total	4,150 sq ft

Transit Hub Shared Services

Ticketing/Office Facilities:

Ticket Queuing Area	350 sq ft
Fare Collection	300 sq ft
Storage	100 sq ft
Equipment Room	100 sq ft
Ticketing Facilities Total	850 sq ft

Employee Facilities:

Employee's Lockers & Toilets	1,400 sq ft
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Concessions:

Fast-food/Snack Bar	1,000 sq ft
Newsstand	500 sq ft
Concessions Total	1,500 sq ft

Total Net Square Feet 23,250 sq ft

Total Gross Square Feet 27,900 sq ft

(Including 20% allowance for Mechanical, Structural & Circulation)

SITE Still to be determined.

OBJECTIVES

There will be a total of 16 design "firms" running concurrently, each of which will design and develop their own proposals for the TRANSIT HUB.

Each firm will operate much like an architecture design firm. Working collaboratively with consultants at all phases, student firms will develop fully coordinated proposals with the understanding that their schemes could ultimately influence the final design proposals for the School of Architecture and Planning.

PHASES

Pre-Design

As defined by the AIA, Pre-Design services are intended “to assist the client in defining what the problem is and to begin to set facility-related constraints [in order] to craft a statement regarding function, form, economy, and time.”

During this period, the team assesses the social, economic, and ecological context of the project and its surrounding region. Tasks may include strategic planning, visioning, master planning, project goals definition, typology analysis, budget definition, programming, selection of the full project team, identification of applicable regulations, including zoning guidelines and building codes, research into other governing, and a thorough analysis of the physical site, including climate and other bioregional conditions. A site survey, geotechnical report, and environmental assessment typically are commissioned during this phase.

Schematic Design

As defined by the AIA, Schematic Design (SD) “establishes the general scope, conceptual design, and scale and relationships among the components of the project. The primary objective is to arrive at a clearly defined, feasible concept and to present it in a form that achieves client understanding and acceptance. The secondary objectives are to clarify the project program, explore the most promising alternative design solutions, and provide a reasonable basis for analyzing the cost of the project.” The first portion of Schematic Design, during which the design concept is established, often may be referred to as Concept Design, which can represent up to half of this phase, depending on the project scale, scope and complexity.

Tasks include defining the design concept and translating it into a working set of dimensioned drawings to include floor plans, elevations, sections, and an outline specification. At the end of this phase, a cost estimate typically is solicited.

Design Development

As defined by the AIA, Design Development is “the period in which the design itself achieves the refinement and coordination necessary for a polished work of architecture.... [T]he primary purpose of design development is to further define and describe all important aspects of the project so that what remains is the formal documentation step of construction contract documents [CD’s].”

Tasks include more substantive coordination with consultants to integrate the building systems within the design concept, and expansion of the basic set of drawings to include a more comprehensive demonstration of all exterior and interior conditions. Another cost estimate typically is solicited at the end of this phase.

Construction Documents

The AIA defines Construction Documents as “the written and graphic documentation prepared or assembled by the architect for communicating the design and administering the project.” CD’s convey the quantity, quality and configuration of construction and establish the contractual obligations between the owner and contractor. Typically a building permit is filed in the middle of this phase in order to prepare for construction at the end of this phase. CD’s are used by contractors to prepare a bid to complete the work.

Presentation+ Evaluation Phase

During the course of the semester, more specific information regarding deliverables will be distributed.

1) Assignments

- Specific assignments will be given and graded. These assignments will be part of the deliverables for the reviews. However, the full list of deliverables will be given during the semester for each review.

2) Project Review Revision Submittals

- Each review the teams will present their work from the previous weeks' topics. Our consultants will review the work and provide comments and critiques. Each design firm is responsible for incorporating these comments into their design proposal.

- **Every Review, each design firm must submit a back up CD of all digital work.**

3) Construction Documents

- A set of Construction Documents (Architectural and S/MEP) fully coordinated with specifications and schedules is required for each specific portion of the building assigned to each team member. In addition, the team as a whole will be required to submit plans, sections, and elevations overall. The following drawing list / template is a guide. The addition of drawings are based on individual design teams proposals.

A-0.1	General Notes Series	A-3.0	Building Section Series
A-1.0	Plan Series	A-3.1	Building Sections
	A-1.1 Site Plan	A-3.2	Building Sections
	A-1.2 First Floor Plan	A-5.0	Wall Section Series
	A-1.3 Second Floor Plan	A-5.1	Wall Sections
	A-1.4 Roof Plan	A-5.2	Wall Sections
	A-1.5 Reflected Ceiling Plan	A-6.0	Detail Series
A-1.6	Reflected Ceiling Plan	A-6.1	Details
A-2.0	Building Elevation Series	A-6.2	Details
A-2.1	North / South Elevations	A-6.3	Details
A-2.2	East / West Elevations	A-6.4	Details