TDM PLAN FOR THE HOWARD UNIVERSITY CAMPUS MASTER PLAN

Final Report

January 2012
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<td>31</td>
</tr>
<tr>
<td>Figure 18</td>
<td>Neighborhood Street Weekday Occupancy - 1:00 PM</td>
<td>32</td>
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<td>Figure 19</td>
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<td>33</td>
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<td>34</td>
</tr>
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<td>Figure 21</td>
<td>Neighborhood Non-Resident Occupancy - 1:00 PM</td>
<td>35</td>
</tr>
<tr>
<td>Figure 22</td>
<td>Neighborhood Non-Resident Occupancy - 3:00 PM</td>
<td>36</td>
</tr>
</tbody>
</table>
1 EXISTING CONDITIONS SUMMARY

BACKGROUND

The Howard University Campus Master Plan

Howard University’s historic Central Campus is the focus of its 2011 Campus Master Plan (HUCMP). Located in Washington DC’s Ward 1, and within five miles of the Nation’s Capitol, the 118-acre Central Campus is the setting for most of the University’s academic and administrative buildings and activities. The Central Campus Master Plan is a strategic tool and guide for the physical development of the campus over the next ten years. The plan is designed to enhance the physical condition of the campus, to create new opportunities for excellence in the future development of new facilities, and to provide the physical framework within which the University can achieve its academic mission.

The transportation element of the HUCMP identifies potential transportation impacts of the plan and provides recommendations to minimize adverse impacts on the surrounding community. The Transportation Demand Management (TDM) Plan provides a detailed assessment of opportunities to mitigate adverse transportation impacts — primarily by enhancing multimodal Central Campus access and mobility for the extended Howard University community.

The TDM Plan is organized as follows:

1. Projected Campus Growth - An overview of projected physical and demographic expansions planned for the Central Campus in the HUCMP.

2. Alternative Mode Infrastructure Assessment - A qualitative summary of the means by which non-driving faculty/staff and students can access Central Campus destinations, plans for improvements, and comparisons to best practices.
3. A Review of Campus Travel Patterns - An assessment of how, and how frequently, faculty/staff and students are getting to and around the Central Campus, and where they are coming from.

4. An Evaluation of Current Transportation Demand Management (TDM) Efforts and Investments - An assessment of what the University is currently doing to manage current and future travel patterns.


Projected Campus Growth

The Central Campus encompasses 118 acres of land and over 5.5 million gross square feet of University building space. As of fall 2011, Central Campus populations include roughly 11,000 students and 3,300 faculty and staff members. The HUCMP represents no physical expansion of the campus footprint, and does not propose significant campus population growth. The following table presents approximate current and projected campus growth measures.

**Figure 1 Existing and Projected Campus Measures**

<table>
<thead>
<tr>
<th>Campus Measure</th>
<th>Existing</th>
<th>Planned</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>11,000</td>
<td>12,000</td>
<td>9%</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>7,400</td>
<td>8,400</td>
<td>14%</td>
</tr>
<tr>
<td>Graduate</td>
<td>3,600</td>
<td>3,600</td>
<td>0%</td>
</tr>
<tr>
<td>On-campus beds</td>
<td>3,800</td>
<td>5,000</td>
<td>32%</td>
</tr>
<tr>
<td>Faculty/Staff (non-hospital)</td>
<td>3,300</td>
<td>3,300</td>
<td>0%</td>
</tr>
<tr>
<td>Campus Area Acres</td>
<td>118</td>
<td>118</td>
<td>0%</td>
</tr>
<tr>
<td>Building Area (GSF)</td>
<td>5,709,995</td>
<td>6,952,293</td>
<td>22%</td>
</tr>
</tbody>
</table>
The Central Campus encompasses 118 acres of land and over 5.5 million gross square feet of University building space. As of Fall 2011, Central Campus populations include roughly 11,000 students and 3,300 faculty and staff members. The HUCMP represents no physical expansion of the campus footprint, and does not propose significant campus population growth — no growth in non-hospital faculty or staff, no growth in graduate student enrollment, and 14% growth in undergraduate enrollment. It does, however identify growth in total campus building area of nearly 22% including new graduate and working housing as well as commercial uses.

The HUCMP includes 17 development (new construction or major renovation) sites. Several of the proposed developments will bring non-University related populations to campus, including the Howard University Town Center, a mixed-use residential and retail development. Additionally, the buildings along Georgia Avenue will include new ground floor retail, which over the course of the HUCMP will add a net increase of 153,300 square feet of retail space to campus. The new recreation center will be open to the community, which will bring more people to campus. At the same time, plans to expand on-campus housing capacity by nearly one-third should significantly reduce driving commute rates among students. Because of this, and a commitment to developing a robust TDM program, the HUCMP anticipates future parking supply levels, and thus campus-based traffic levels, to be lower than they are today.
MULTIMODAL NETWORKS ASSESSMENT

The following assessment provides an overview of existing conditions among primary, alternative-modes serving the Central Campus. For each mode, an overview of existing conditions is followed by a summary of changes and improvements recommended in the Campus Plan, an outline of industry best practices, and a gap assessment to identify key areas of potential improvement.

Pedestrian Facilities

Conditions

The Howard University Central Campus is a compact, highly-walkable campus. The size of the campus (generally less than half of a mile across and about three-quarters of a mile from Drew Hall to Howard University Hospital), existing pedestrian amenities (wide sidewalks and crosswalks), and the location of transit stations and parking results in high levels of pedestrian traffic throughout campus.
**Figure 2  Observed Pedestrian Crossings**

Map and Analysis: Gorove/ Slade

**Planned Changes**

Campus Plan recommendations were developed to address existing issues and mitigate future impacts:
• Improve conditions along east-west and north-south routes — expanded sidewalk widths, removed obstructions, crosswalk upgrades, and traffic calming (speed tables, decorative pavers, intersection bulb-outs, mid-block crossings, etc.).
• Minimize on-street parking impacts by implementing performance parking (increase space availability to reduce "search" traffic).
• Minimize visitor parking traffic by locating dedicated spaces on the periphery.
• Calm traffic on 4th Street between Howard Place and W Street.
• Add a traffic signal at 4th Street and College Street to accommodate increased pedestrian activity anticipated between the campus quad and planned campus housing east of 4th Street.
• Work with DDOT to implement Lower Georgia Avenue recommendations that improve pedestrian conditions along the Georgia Avenue corridor — bulb-outs on Georgia Avenue at Howard Place, general sidewalk improvements, wider planted buffers, and enhanced crossing facilities.
• Install Leading Pedestrian Intervals (LPIs) at signalized crossings along Georgia Avenue and 4th Street to assist east-west pedestrian crossings.
• Add east-west pedestrian connections between Georgia Avenue and Florida Avenue along W Street and Bryant Street in the form of new streets.
• Improve intersection facilities for pedestrian along Florida Avenue at W Street, Vermont Avenue, and V Street to accommodate increased activity through this area — traffic controls, marked crosswalks, and traffic calming features where warranted.
• Improve sidewalk conditions on Florida Avenue between Sherman Avenue and V Street to accommodate increased demand along this route — widening sidewalks, installing or increasing buffers, and removing obstructions.
Figure 3  Pedestrian Network Improvements in the HUCMP

- Implement Lower Georgia Avenue pedestrian recommendations
- Provide pedestrian connection between Georgia and Florida Avenue along Howard Place, W Street and Bryant Street to provide east-west connectivity.
- Install traffic signal at W and Florida to assist crossings.
**Best Practices**

**Americans with Disabilities Act Design Guidelines**

Bring all walkways into compliance with ADA design guidelines. Compliance will not only make more of the campus accessible to all users, but create more comfortable, safe, and accommodating conditions for pedestrians in general.

**Pedestrian Zones**

The pedestrian is the defining transportation modal element of any campus. To create a protected campus core where pedestrians dominate, while still providing access for automobiles and delivery trucks, many university campuses have created a ring road for vehicles, along with a campus core where through-vehicle traffic is limited.

**Space Control and Assignment**

Design and materials should support the safety of pedestrians as they access and traverse the campus. Bollards can be used to prevent vehicles from entering the pedestrian realm. Unified pathway treatments can help to define a space as pedestrian-dominant. Signage can be used to control speed and access by other modes, and to lead pedestrians down specific pathways. Regardless of specifics, the pedestrian should be given the most direct routes possible between their origins and destinations.

**Leading Pedestrian Intervals**

Intersections characterized by heavy vehicle and pedestrian traffic often present crossing hazards that impinge upon pedestrian mobility. Incorporating Leading Pedestrian Intervals (LPI) within traffic signal sequencing at these locations can dramatically improve the safety and comfort level of crossing pedestrians. By beginning the WALK phase of the signal cycle a few seconds before the companion GREEN phase, LPI allows pedestrians to establish themselves within the crosswalk before potentially-conflicting vehicle turns can begin. This also discourages drivers from attempting to turn at the beginning of the GREEN phase, ahead of the opposing through traffic, and thus helps improve overall safety at the intersection.

**Gap Assessment**

Overall, Howard University’s existing pedestrian network is of high quality, and walking is the primary mode for moving around campus and between campus and nearby destinations. However, there are physical, technological, and qualitative gaps in the network.
Recent sidewalk installations and improvements appear to be in ADA compliance. Many older facilities, however, including crosswalks in particular, could use compliance-level upgrades. Driveway-sidewalk interfaces present an example where improvements to both new and older network segments could greatly improve both the accessibility and walkability of the central campus - see Figure 5 and Figure 6. Many improvements identified in the HUCMP will help bring a greater share of the campus pedestrian network into ADA compliance and improve general, campus walkability.
Within the heart of the Central Campus, there are significant areas (quads) in which pedestrians are essentially the only form of traffic. Formalizing these as pedestrian zones may be less important than ensuring high-quality, appealing pedestrian links between these areas and ensuring that all other traffic expects to yield to pedestrians in and around these areas.

LPI implementation at key intersections along Georgia Avenue and 4th Street — as identified in the HUCMP — could provide significant improvements for east-west, cross-campus pedestrian mobility.
Bicycle

Conditions

There are several cycling facilities surrounding the Central Campus, including on-street bike lanes, signed bike routes, and three Capital Bikeshare stations (see Figure 7). However, gaps between these bicycle facilities and the Central Campus, as well as limited or missing amenities on-campus (particularly secure, sheltered parking opportunities) limit the potential of this network to serve Central Campus access needs.
Increasing use of the on-campus Capital Bikeshare station indicates significant, latent demand for bike access to and from campus. Capital Bikeshare, which premiered in September 2010, has three campus-area stations — one on campus, at Georgia Avenue and Fairmont Street; one adjacent to the Metrorail station portal located at 10th Street and U Street; and another at 7th and T Streets NW. Access to the Capital Bikeshare system is available on a yearly, monthly, three-day, or daily membership basis for a $75, $25, $15, or $7 fee, respectively. Members can access any bike within the system, and ride for free for up to 30 minutes. After 30 minutes, an escalating fee is charged. Usage data for the on-campus station is summarized below.

**Figure 8 On-Campus Bike-Share Performance**

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Departures</th>
<th>Arrivals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>Oct</td>
<td>212</td>
<td>181</td>
</tr>
<tr>
<td>2010</td>
<td>Nov</td>
<td>243</td>
<td>185</td>
</tr>
<tr>
<td>2010</td>
<td>Dec</td>
<td>181</td>
<td>130</td>
</tr>
<tr>
<td>2011</td>
<td>Jan</td>
<td>261</td>
<td>217</td>
</tr>
<tr>
<td>2011</td>
<td>Feb</td>
<td>328</td>
<td>283</td>
</tr>
<tr>
<td>2011</td>
<td>Mar</td>
<td>326</td>
<td>261</td>
</tr>
<tr>
<td>2011</td>
<td>Apr</td>
<td>399</td>
<td>296</td>
</tr>
<tr>
<td>2011</td>
<td>May</td>
<td>479</td>
<td>416</td>
</tr>
<tr>
<td>2011</td>
<td>Jun</td>
<td>588</td>
<td>434</td>
</tr>
</tbody>
</table>

Data Source: DDOT, accessed via: http://www.capitalbikeshare.com/dashboard

As shown in Figure 8, usage has grown steadily since the stations were installed. Also apparent is the modest, but consistent gap between departure and arrival volumes, which is likely an impact of the higher relative elevation of the Central Campus compared to surrounding bike-share stations.
Aside from the Capital Bikeshare station, there are three traditional bicycle racks located on campus; one at Blackburn Center, one near the athletic stadium, and one at the Howard Plaza Towers.
Planned Changes

Figure 10 Bicycle Conditions and Concerns

Map and Analysis: Gorove/Slade
Bicycle network improvements recommended in the HUCMP include:

- Use 10th Street & Barry Place to connect bike lanes on W and V Streets with campus — an all-way stop, this is an ideal location for cyclists to cross Georgia Avenue.
- Create a bicycle facility on 8th Street between R Street and Barry Place, which would require a bicycle-actuated traffic signal to cross Florida Avenue.
- Alternatively, re-construct Georgia Avenue to include bicycle facilities by implementing the Georgia Avenue Great Streets plan — which includes a shared bus and bike lane.
- Locate an enclosed and secure bicycle parking facility on campus (possibly in a parking garage in the first phase), targeted to commuters (faculty/staff and off-campus student) and make shower facilities available to users.
- The proposed Recreation Center building will have shower facilities, and is a potential location for an underground parking facility. If a parking facility were constructed at this parcel, it would provide an excellent opportunity to create a centralized long-term, commuter-based bicycle parking facility on campus that can accommodate most commuters with direct access to shower facilities.
- Consider installing a cycle track along 6th Street to provide for north-south connection within campus if demand warrants additional facilities.
- Add DDOT-compliant bike racks outside of major campus buildings, focusing on those closest to bike routes and residence halls.
- Provide bicycle commuter benefits to faculty/staff.
- Residence halls should incorporate a significant amount of long-term storage for students who wish to bring bicycles to campus.
Figure 11  Bicycle Network Improvements in the HUCMP

Implement Lower Georgia Avenue bicycle recommendations

Upgrade and install bike facilities between the Harvard Street Multi-use Trail and the Warder Street and Park Place Bike Lanes.

Provide two-way connectivity along Barry Place to provide east-west connectivity

Provide two-way connectivity along W Street to provide east-west connectivity. Install traffic signal at W and Florida to assist crossings

Bicycle signal at 8th and Florida would assist north-south traffic and help cyclists avoid roads with higher traffic volumes

Shared bus-bike lane recommended in the Lower Georgia Avenue study will provide north-south connections

8th Street Bicycle Boulevard could be installed until Georgia Ave. Improvements are finalized

Bicycle Recommendations
- Existing Bikeshare Station
- Potential Bikeshare Station
- Recommended Short-term parking locations

Map and Analysis: Gorove/ Slade
Best Practices

Continuous, Dedicated Bikeways

Excellent bicycle facilities take many forms, from dedicated paths fully separated from the surrounding roadway system to bicycle lanes to traffic-calmed lanes where bicycles comfortably share the road with low-speed motor vehicles. Bikeways, however, are only as good as the worst links in the network. If a bike lane suddenly disappears as it approaches a challenging intersection, or if a path ends before it reaches a major destination, it is of little use in encouraging cycling as an alternative to driving. As the bikeway system becomes a more densely interconnected network, the rate of bicycling increases on a sharply upward curve.¹

Bicycle Parking

After continuous bikeways, the design and placement of bicycle parking is the next most important factor for the encouragement of bicycling. The placement of racks on the “desire line” between the approach path and the front door is important. Bicycle racks should be designed to support the frame and allow the use of a variety of locks, including using a U-lock to secure both the frame and the front wheel to the rack. At residential and office areas, protection from weather and theft is important.

Bicycle Safety Education

While extensive coursework and testing is necessary to secure a license to drive a car, anyone can ride a bicycle without special training. Basic education in the safe operation of a bicycle, however, can reduce crash and injury rates — and increase the confidence of novice cyclists to take on the challenge of urban cycling environments.

Summer Bicycle Storage

Many students with bicycles but no car lack the means to take their bicycles with them over the summer. A simple way to encourage bicycling throughout the year is to offer low-cost summer bike storage, taking advantage of underutilized spaces, such as resident hall basements.

Wayfinding

Major bikeways, like major roadways, should be signed. In addition, special destination signage is also helpful, particularly at major bikeway intersections.

Maps and Information

Maps of campus bike networks, parking facilities, retailers, and service providers can help elevate awareness of bicycling as a viable and supported campus travel mode. Maps are frequently provided on university websites, in orientation packages, and posted on information kiosks.

Gap Assessment

The presence of a rich and expanding bicycle facility network surrounding the Central Campus presents an opportunity for the University to tap into the demand for bicycle mobility that such conditions generate. Many such opportunities are identified in the HUCMP, including identifying the proposed

recreational facility as an ideal location for significant, long-term bicycle parking working in coordination with DDOT. This location would combine state of the art parking with facilities for showering and changing before class or work, the absence of which is a common barrier to bicycle commuting, particularly among professionals.

**Vehicle Parking**

![Vehicle Parking Image]

**Conditions**

**Supply and Demand**

Parking at the HU Central Campus is provided by the University through surface lots. A total of approximately 2,295 spaces are available within these lots. Among these spaces, 916 are reserved for student parking (about 0.083 spaces per enrolled student) and 1,300 are reserved for faculty/staff parking (about 0.4 spaces per faculty/staff member). There are no significant commercial providers of public parking in the area.

Occupancy surveys were conducted as part of the HUCMP to determine peak-hour demand at each parking facility. Surveys were conducted at several times during a typical weekday when classes were in session during the Spring 2011 semester. Findings are summarized in the table and maps below.
Figure 12  University Parking Facilities - Supply and Peak Occupancy by Location
The following table presents these occupancy measures along with quantities of permits sold at each facility, as provided by the Office of Parking and Shuttle Operations (OPSO).

**Figure 13  Permit Sales and Occupancy by Location**

<table>
<thead>
<tr>
<th>Lot Name</th>
<th>Number of Spaces</th>
<th>Number of Staff Permits Sold</th>
<th>Number of Student Permits Sold</th>
<th>Total Permits Sold</th>
<th>Peak Occupancy</th>
</tr>
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<tbody>
<tr>
<td>Childers</td>
<td>76</td>
<td>90</td>
<td>0</td>
<td>90</td>
<td>99%</td>
</tr>
<tr>
<td>Florida Ave</td>
<td>23</td>
<td>23</td>
<td>0</td>
<td>23</td>
<td>83%</td>
</tr>
<tr>
<td>Founders</td>
<td>54</td>
<td>48</td>
<td>0</td>
<td>48</td>
<td>70%</td>
</tr>
<tr>
<td>HUSC</td>
<td>62</td>
<td>60</td>
<td>0</td>
<td>60</td>
<td>100%</td>
</tr>
<tr>
<td>Business</td>
<td>36</td>
<td>49</td>
<td>0</td>
<td>49</td>
<td>100%</td>
</tr>
<tr>
<td>Medical Arts Bldg</td>
<td>30</td>
<td>11</td>
<td>0</td>
<td>11</td>
<td>*</td>
</tr>
<tr>
<td>Miner</td>
<td>53</td>
<td>55</td>
<td>0</td>
<td>55</td>
<td>104%</td>
</tr>
<tr>
<td>East</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>*</td>
</tr>
<tr>
<td>Johnson</td>
<td>41</td>
<td>37</td>
<td>0</td>
<td>37</td>
<td>100%</td>
</tr>
<tr>
<td>Bryant St</td>
<td>11</td>
<td>9</td>
<td>0</td>
<td>9</td>
<td>*</td>
</tr>
<tr>
<td>Mackey</td>
<td>56</td>
<td>51</td>
<td>0</td>
<td>51</td>
<td>90%</td>
</tr>
<tr>
<td>9th &amp; V St</td>
<td>70</td>
<td>7</td>
<td>35</td>
<td>42</td>
<td>29%</td>
</tr>
<tr>
<td>Downing</td>
<td>31</td>
<td>30</td>
<td>0</td>
<td>30</td>
<td>97%</td>
</tr>
<tr>
<td>LSHSL</td>
<td>43</td>
<td>33</td>
<td>0</td>
<td>33</td>
<td>44%</td>
</tr>
<tr>
<td>Drew</td>
<td>53</td>
<td>5</td>
<td>54</td>
<td>59</td>
<td>83%</td>
</tr>
<tr>
<td>A1-Rear</td>
<td>23</td>
<td>22</td>
<td>0</td>
<td>22</td>
<td>92%</td>
</tr>
<tr>
<td>Greene</td>
<td>46</td>
<td>42</td>
<td>0</td>
<td>42</td>
<td>96%</td>
</tr>
<tr>
<td>Burr</td>
<td>12</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>75%</td>
</tr>
<tr>
<td>Georgia</td>
<td>34</td>
<td>27</td>
<td>0</td>
<td>27</td>
<td>85%</td>
</tr>
<tr>
<td>Wonder Plaza</td>
<td>50</td>
<td>51</td>
<td>0</td>
<td>51</td>
<td>75%</td>
</tr>
<tr>
<td>Just</td>
<td>22</td>
<td>22</td>
<td>0</td>
<td>22</td>
<td>70%</td>
</tr>
<tr>
<td>West</td>
<td>247</td>
<td>109</td>
<td>189</td>
<td>298</td>
<td>56%</td>
</tr>
<tr>
<td>Chemistry</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>75%</td>
</tr>
<tr>
<td>C.B.P.</td>
<td>55</td>
<td>58</td>
<td>0</td>
<td>58</td>
<td>79%</td>
</tr>
<tr>
<td>6th St</td>
<td>10</td>
<td>8</td>
<td>0</td>
<td>8</td>
<td>50%</td>
</tr>
<tr>
<td>Bunche</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>25%</td>
</tr>
<tr>
<td>Bethune</td>
<td>216</td>
<td>172</td>
<td>117</td>
<td>289</td>
<td>85%</td>
</tr>
<tr>
<td>Annex 1</td>
<td>86</td>
<td>103</td>
<td>0</td>
<td>103</td>
<td>117%</td>
</tr>
</tbody>
</table>
Off-street parking facilities are commonly considered "at-capacity" when 90% of spaces are full. About half of all HU lots appear to be at- or over-capacity, while the other half have excess capacity (and sometimes significant excess capacity), even during peak times. Thus there appears to be a significant opportunity to improve overall parking conditions by redistributing demand more evenly across the Central Campus lots.

Other noteworthy conditions evident from available demand data include an estimated absentee rate among permit holders of roughly 30%.

In addition to University facilities, several streets on and near campus provide parking opportunities — primarily metered parking and residential-permit parking which allows non-residents two hours of free parking. Many of these on-street spaces are utilized by both faculty/staff and students that do not obtain parking permits, as well as visitors that cannot find parking within the University or do not wish to pay for a daily permit.

**On-Street Parking**

With few exceptions, the management of on-street parking within and surrounding the Central Campus is not intended to accommodate typical commuter parking demand patterns. Even for students, time-limits create a barrier to using on-street spaces while attending classes. Many spaces do, however, provide four-hours of parking, significantly reducing this barrier for students attending one or two classes at a time. Such spaces, however, can be of limited benefit if they attract much more demand than they can accommodate. To assess the capacities and availability of these resources for Central Campus commuters, a series of inventory and occupancy surveys of all on-street spaces within the Central Campus were conducted during peak-demand times.
The following maps provide a summary of weekday occupancy conditions on metered, Central Campus streets, as observed during surveys conducted at 11:00 AM, 1:00 PM, and 3:00 PM — hours when weekday parking demand tends to be at its highest.
Figure 15  Campus Street Weekday Occupancy - 1:00 PM

Average Occupancy
- 0% - 50%
- 51% - 80%
- 81% - 85%
- 86% - 90%
- 91% - 95%
- 96% - 100%
- Over 100%

Data Sources: DC-GIS

NelsonNygaard Consulting Associates Inc. | 28
As shown, survey findings indicate that on-street parking is a fairly constricted resource, offering limited availability on many blocks within core areas of the Central Campus. However, for those willing to pay the $2-per-hour rate, adhere to the time limits, and walk a few blocks, most of the surveyed streets appear to provide ample parking options.

This survey effort also provided an opportunity to assess any campus-based impacts on parking availability within surrounding neighborhoods. Most of the blocks in these areas are managed through the District’s Residential Parking Permit program, which provides permits to local residents and restricts parking by non-permit-holders to one or two hours (two, in the case of Howard-area neighborhoods). To assess the impact of campus parking demand on these streets, occupancy surveys were conducted on most blocks within campus-adjacent neighborhoods. These surveys distinguished overall occupancy, as well as occupancy by non-residents (vehicles without a displayed Zone 1 Permit).

The following maps provide a summary of weekday occupancy conditions on Campus-adjacent, residential streets, as observed during surveys conducted at 11:00 AM, 1:00 PM, and 3:00 PM.
Figure 17  Neighborhood Street Weekday Occupancy - 11:00 AM

Average Occupancy
- 0% - 50%
- 51% - 80%
- 81% - 85%
- 86% - 90%
- 91% - 95%
- 96% - 100%
- Over 100%

Data Sources: DC-GIS
Figure 18  Neighborhood Street Weekday Occupancy - 1:00 PM
Figure 19  Neighborhood Street Weekday Occupancy - 3:00 PM
Figure 20  Neighborhood Non-Resident Occupancy - 11:00 AM

Average Occupancy
- 0% - 50%
- 51% - 75%
- 76% - 90%
- Over 90%

Data Sources: DC-GIS
Figure 21  Neighborhood Non-Resident Occupancy - 1:00 PM
Figure 22  Neighborhood Non-Resident Occupancy - 3:00 PM

Average Occupancy
0% - 50%
51% - 75%
76% - 90%
Over 90%

Data Source: DDOT
The District's resident parking permit regulations on these blocks allow for parking by non-residents for up to two-hours during the times of the surveys. The program objective is not to prevent any non-residential parking on these streets, but to manage non-residential demand enough to preserve parking access for residents. The assessment of campus-based parking impacts on these streets, therefore, begins with identifying blocks where access to parking is being constrained in general. As shown in Figure 17 through Figure 19, between six and eleven such blocks indicated constrained availability conditions (over 85% occupancy) at different times during the surveys.

As shown in Figure 20 through Figure 22, non-residential demand appears to be the primary cause of constrained parking availability on just a small proportion of surveyed blocks. In fact, the only blocks on which this was consistently evident during surveys were: the north side of W Street, between 2nd Street and 1st Street; the south side of Elm Street, between 5th Street and 4th Street; the east side of Vermont Avenue, between U Street and Florida Avenue; and the north side of W Street, between 10th Street and Florida Avenue. This is a fairly good indication that the existing resident permit regulations are working. For those blocks currently experiencing problematic levels of non-resident demand, reduced time limits for non-permitted vehicles could improve conditions for residents.

In either case, residential-block surveys indicate little reason for campus-parking spillover concerns to limit implementation of pricing or other demand-management actions related to Central Campus off-street facilities.

Management

On-campus parking management is provided by OPSO, with the exception of dormitory parking, which is managed by the Department of Residence Life. All vehicles parked on University property must display a valid hangtag or parking permit for the appropriate parking lot or area. Vehicles parking without a valid permit are subject to ticketing, towing, and/or immobilization. Enforcement is conducted by the Campus Police, Parking Enforcement Division. A total of four officers from the division (three for Central Campus and one for Hospital facilities) are dedicated to monitoring parking compliance full-time, from 8:30 AM to 3:30 PM.

551 reserved spaces are distributed to departments for allocation to individual faculty and staff. All other parking spaces are non-reserved. Access to all spaces is controlled via "hang tag" permits. Annual permit costs are $400 for a reserved space and $300 for a non-reserved space — about $44 and $33 per month, respectively, based on the nine-month academic year. Student parking permits are allocated on a first-come, first-serve basis. Permit registration is held following the spring semester of each year. Freshmen are not eligible for parking privileges. Annual student permits cost $240, which amounts to roughly $27 per month over the course of a nine-month academic year.

The University has sufficient supply to offer a permit to every faculty/staff member and eligible student who requests one, although not always at the lot of their preference. In all, 1,779 faculty/staff permits were sold last year — just over half of all Central Campus faculty/staff members. That same year, 1,053 student permits were sold — less than one for every ten Central Campus students.

During summer sessions, monthly parking permits are available for faculty/staff and students. The monthly rate for summer-registered students is $24. Summer month permits for faculty and staff are $30.
Visitors may park in non-reserved spaces within designated lots with a $4 daily parking permit. Daily permits are sold directly at the University's OPSO office. The number of permits available is limited, and varies based on available spaces within University lots. However, most visitors are not aware of this option, and are left, then, to try to find on-street parking.

Parking Enforcement personnel monitor lots and inform OPSO staff throughout the day regarding availability for daily parking.

**Hospital Parking**

Hospital parking is also managed by OPSO. Howard University Hospital parking facilities contain approximately 1,495 spaces for accommodating hospital staff, patients, and visitors. Two-year staff parking permits sell for $552. A limited amount of free parking is provided to Community Physicians, who perform pro-bono work at the hospital. These doctors are at the hospital only a few times a month, and are given parking permits as a courtesy for the days they are on-site. The hospital also has two visitor parking lots for patients and visitors. The lots are managed by a private operator, and offer public parking from 6:30 AM to 11:30 PM at the following rates:

- 1 hr or less: $2.00
- 1 hr to 1½ hrs: $2.75
- 1½ hrs to 2 hrs: $3.50
- 2 hrs to 3 hrs: $4.50
- 3 hrs to 4 hrs: $5.50
- Max. to 24 hrs: $6.50

**Planned Changes**

Over the course of the HUCMP, many existing surface parking will be removed and replaced by new underground parking facilities. An explicit goal of the HUCMP is to build the minimal amount of parking needed to accommodate the plan. A strong TDM Plan will be critical to achieving this goal.

The Campus Master Plan does not propose significantly increasing campus population levels, and, from a parking demand standpoint, the proposed increase in students is off-set by the increase in students living on-campus with excellent walking, cycling, and shuttle access to all Central Campus destinations. Beyond University uses, however, additional parking demand is expected from several changes anticipated or planned for in the HUCMP, including:

- The Howard University Town Center;
- Non-campus population use of the Recreation Center and ground floor retail; and
- The workforce housing parcel.

The HUCMP identifies ten locations for potential new parking facilities to replace existing surface lots. It is recommended that the University’s options for the use of these sites remain flexible, however, allowing it to respond to evolving levels of observed parking demand.
This report recommends that Garage 1 be constructed as a shared facility, with the first parking floor dedicated to public parking, to serve University visitors, non-campus population use of the Wellness/Recreation center, and patrons of the ground-floor retail. The other floors of the garage can be reserved for University employees, accessible by permit only, except for weeknights and weekends where it can be opened for public use.

Existing spaces remaining (excluding Hospital): 740 spaces
Total spaces in preferred parking garages (ex. Hospital): 1,110
Total proposed parking supply (ex. Hospital): 1,850

Locations chosen as preferred based on how well their access location avoids vehicular and pedestrian conflicts. All preferred locations may not be constructed depending on success of Campus Plan TDM program (constructing all of the preferred locations provides an ultimate parking supply slightly higher than the existing supply, excluding the Hospital). Back-up locations may be constructed in lieu of preferred locations depending on financial, phasing, and other constraints.

Howard Town Center & Workforce Housing parcels will also have parking facilities dedicated to serving their own demand. The total amount of spaces will be determined during their Further Processing applications.

**Campus Plan – Potential Parking Facilities**
- Existing Parking Lot
- Existing Parking Structure
- Future Parking Garage – Preferred Location (garage number/number of spaces)
- Future Parking Garage – Back-up Location (garage number/number of spaces)
- Parking Facility Constructed to Serve Development Site (Details to be determined in further Processing)
- New Roadways → Potential Garage Access
Specific parking recommendations made in the Transportation Report include:

- Establish a goal of reducing demand by 25-30% over the next ten years;
- Implement significant TDM measures immediately to meet this goal;
- Monitor parking demand regularly, by year or semester, to track progress of reducing demand;
- Use results to determine if and when parking facilities identified in the HUCMP should be constructed;
- Of the potential parking facilities identified in the HUCMP, lots 1, 3, 8, and 9 are recommended to be given preference due to their location at the periphery of campus, and at different points within the campus. The technical analysis performed of the HUCMP assume that these lots are constructed; and
- Locate a primary visitor parking facility somewhere on campus, perhaps under the proposed recreation center.

Best Practices

Pricing

Best practice approaches for managing campus parking demand include two primary pricing strategies:

- Pricing parking to ensure that all parking costs are covered by user fees; and
- Pricing parking based on demand, setting rates relative to levels of demand, typically with a goal of keeping demand in line with the capacity at each facility.

Since 1960, all California State University parking programs are required to be fully self-funding. To construct new parking facilities, schools typically must raise their parking rates to pay for new construction. In such a scenario, existing parking customers have a vested interest in supporting increased TDM investments that can forestall new parking construction/increased parking fees.

An alternative pricing best practice is to simply adjust parking rates when and where demand begins to constrain capacities. Not only does this represent a time-tested market approach to managing demand for a limited resource, it can provide increased revenue for TDM investments, which in turn can be used to ease demand (and thus pressure for parking rate increases).

Optimize Resources

Parking construction, particularly within dense, urban environments, is very expensive - up to $60,000 for structured parking and even more for subsurface parking. The best run campus parking systems, therefore, ensure that existing parking resources are optimized before building new capacity. On all college campuses, some parking spaces are always more desirable than others, leading to isolated parking constraints that can skew perceptions of overall availability. To more evenly distribute demand across all campus facilities, schools use a wide variety of strategies, including assigning premium-facility access based on seniority and creating waiting lists. The most effective approach, however, has proven to be price — simply charging a higher rate at the most sought-after locations, and discounting access to the least popular, until utilization is sufficiently even across the combined inventories.

Freshman Parking Restrictions

Many schools have adopted the practice of preventing some underclassmen — freshmen and sometimes sophomores — from access to on-campus parking. This not only directly reduces
campus-parking demand, but also increases exposure to alternative mobility options among those newest to campus. This sort of temporary exposure has proven an effective strategy for increasing long-term interest in alternative modes.

Shared Parking

Opening up University facilities as public parking during off-peak hours can both support local commercial businesses and reduce the amount of parking that new businesses build near campus. Specific benefits of these arrangements can include:

- Generating more pedestrian activity — thus increasing perceptions of personal safety — on weekends and evenings by promoting a "park-once" environment in which more patrons leave their car in one place while walking between local destinations;
- Reducing excess parking supplies; and
- Fostering a more lively, pedestrian-oriented, and destination-rich campus environment by reducing the cost of making local commercial investments.

Campus Shuttles

Bus shuttles connecting parking lots and primary campus destinations can reduce the need for intra-campus driving and promote a park-once environment. This reduces the need for redundant parking supplies, reducing overall supply and allowing spaces to be concentrated in fewer, less prominent campus locations.

Gap Assessment

Howard provides no free parking to any non-hospital faculty/staff or students. Pricing has also been preliminarily identified as a primary means of managing demand while the HUCMP is implemented. Bringing the cost of campus parking closer to parity with the costs of relying on transit service will be a critical step toward optimizing the value of existing and future facilities, and reducing the amount of new parking required to support the redevelopment outlined in the HUCMP.

Howard freshmen are not permitted to purchase annual parking permits, conforming to a best practice.

The University currently shares a 70-space facility with an evening-oriented events venue — the 9:30 Club. The club currently leases the facility from 6:00 PM to 8:00 AM. Other past and present sharing arrangements include the use of the current use of Banneker Lots for a weekend Flea Market and the past practice of permitting local churches to use lots under a formalized agreement. This is a strategy that will be expanded with the opening of Howard Theater, which will be allowed to use roughly 200 spaces in two Central Campus facilities during most evenings and weekends.²

Central Campus shuttles provide frequent service connecting campus destinations with campus parking and nearby Metrorail transit services. Recent investments in this service include providing a "next-bus" texting service; real-time, bus-tracking maps online and through smart

² Theater patrons will pay for the parking, and the Howard Theater will pay a monthly leasing fee.
phone applications; improvements to the Divinity and Law school routes; and an entirely new route connecting Central Campus with a major, regional student-housing development.

**Transit**

**Conditions**

**Howard University Shuttle Services**

*Operations*

Howard University Shuttle Bus Service (HUBS) is provided for the University's faculty, staff, students, and visitors to and from the Central Campus, various parking lots, dormitories, the School of Divinity, the School of Law, and other University based locations. Service to and from the Shaw/Howard University and Brookland/CUA Metro stations is also provided by HUBS. In addition, HUBS provides service to University Town Center (UTC) in Hyattsville, Maryland. This privately managed residential tower houses Howard University students, among other area university students. HUBS routes are organized as North Campus, North Express, South Campus, South Express, Divinity/East Campus, Law/West Campus, and University Town Center. Hybrid routes are operated on weekends and during the summer. The shuttles are free, but all patrons must present a valid ID card (for HU faculty, staff, and students, validated Capstone ID cards; for visitors, passes are available from the Office of Parking & Shuttle Operations).

The North and South routes operate every 15-20 minutes from 7AM to 12:20AM on weekdays and until 3:00AM on Friday nights. The Divinity/East Campus route operates every 35 minutes weekdays from 8:00AM to 1:00PM and 4:00PM to 10:30PM. On Saturdays, the Divinity/East Campus route operates every 35 minutes from 10:00AM to 2:30PM. The Law/West Campus route operates every 50 minutes weekdays from 8:00AM to 6:00PM and 8:00PM to 11:30PM. The University Town Center route operates every 30 minutes weekdays from 7:00AM to 11:00AM and 7:30PM to 11:30PM. The Weekend route operates every 20 minutes from 8:50AM to 12:30AM (Sunday night) and 8:50AM to 3:00AM (Saturday night).
Figure 24  Central Campus Shuttles

http://www.howardshuttle.com/
Figure 25  Law (Green) and Divinity School (Blue) Connectors

http://www.howardshuttle.com/
Ridership

Shuttle utilization over the past year has varied from a high of almost 5,000 riders per day in September 2010 to approximately 800 riders per day in May 2011 (not including summer-only service months); see Figure 27 and Figure 28. As is common at many universities, ridership starts high at the beginning of each semester, then generally decreases each month. This pattern is attributable to new students, faculty, and staff who are interested in using the transit system but find other more convenient options as the semester progresses. This indicates an opportunity to improve the shuttle system to retain more of the riders served at the beginning of the school year.

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3 Average daily ridership is based on calendar days, however not every route operates every day.
Figure 27  Average Daily Shuttle Ridership per Month

![Graph showing average daily shuttle ridership per month with data for each month from August 2010 to June 2011.]

<table>
<thead>
<tr>
<th>Month</th>
<th>North Route</th>
<th>South Route</th>
<th>Law Route</th>
<th>Divinity Route</th>
<th>Weekend Route</th>
<th>Summer Route</th>
<th>Weekend Route</th>
<th>Divinity Route</th>
<th>Law Route</th>
<th>North Route</th>
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</thead>
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<tr>
<td>Aug-10</td>
<td>883</td>
<td>280</td>
<td>123</td>
<td>84</td>
<td>629</td>
<td>28</td>
<td>629</td>
<td>28</td>
<td>50</td>
<td>28</td>
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<td>Sep-10</td>
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<td>208</td>
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<td>490</td>
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<tr>
<td>Oct-10</td>
<td>1,580</td>
<td>2,261</td>
<td>173</td>
<td>137</td>
<td>657</td>
<td>-</td>
<td>657</td>
<td>-</td>
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<tr>
<td>Nov-10</td>
<td>1,363</td>
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<td>165</td>
<td>138</td>
<td>421</td>
<td>-</td>
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<td>-</td>
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<tr>
<td>Dec-10</td>
<td>591</td>
<td>780</td>
<td>56</td>
<td>51</td>
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<td>8</td>
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<td>47</td>
<td>309</td>
<td>-</td>
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<tr>
<td>Mar-11</td>
<td>937</td>
<td>1,433</td>
<td>99</td>
<td>44</td>
<td>198</td>
<td>-</td>
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<td>Apr-11</td>
<td>1,266</td>
<td>1,578</td>
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<td>298</td>
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<td>Jun-11</td>
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<td>-</td>
<td>44</td>
<td>-</td>
<td>-</td>
<td>44</td>
<td>-</td>
</tr>
</tbody>
</table>

**Total Passengers/Day**

|         | 2,027 | 5,027 | 4,808 | 3,887 | 1,621 | 2,931 | 3,823 | 2,711 | 3,797 |

*Bus Stops*

Bus stop infrastructure supporting the Howard University shuttle system generally consists of a post and sign. All stops include a text number to receive real time bus arrival information, while some locations also include printed schedule information.

*Marketing and Information*

Howard University implemented a GPS-based Live Shuttle Tracker System provided by Ride Systems. The system tracks the location of vehicles on a map that can be accessed on the web or...
by mobile phone; vehicles report their location through a GPS transponder, and the feed is updated regularly. Figure 29 displays what users saw on a typical summer weekday; the arrows move around the map in almost real-time (with a few seconds of delay possible). In addition to the Live Shuttle Tracker, Howard University’s website provides complete schedule information.

**Figure 29   Live Shuttle Tracker**

![Live Shuttle Tracker](image)

**Shuttle Cost**

Total HUBS costs for the 2010-11 school year were $1,328,000. Including the costs of adding the UTC shuttle in the fall of 2011, total 2011-12 HUBS costs are forecasted to roughly $1.5 million.

**WMATA and Other Providers**

Howard University is directly served by Metrobus and linked with Metrorail Stations located on the Green and Yellow Lines by HU Shuttles and Metrobus.
Figure 30  Campus-Proximate Metrorail Stations

Map: Gorove/Slade Associates

Figure 31  Metrobus Routes

Map: Gorove/Slade Associates
Planned Additions

WMATA and Other Providers

Investments in significant new transit services are planned for the Central Campus area over the course of the next ten years, including new WMATA streetcar and express Metrobus service — see maps below — and new DDOT DC Circulator bus routes (see Figure 34).

Figure 32 Planned Streetcar Routes

Map: Gorove/Slade Associates
Figure 33  Planned Express Metrobus Routes

Map: Gorove/ Slade Associates
Figure 34  Planned DC Circulator Routes

Map: DDOT
Best Practices

Frequency, Speed, Reliability, and Span

Because most commuters place a high value on their time, they will generally choose whichever mode or route is the fastest – with price becoming a significant factor only when the price differential is great. In order for transit to be attractive to those who have a choice of modes, therefore, it must do well in four key areas:

- **Frequency.** As frequency increases, ridership increases on an upward curve. To be useful for a significant number of people, transit must run at least every 15 minutes.
- **Speed.** To be attractive, transit must also be reasonably fast. Systems that provide priority treatments for buses, allowing them to bypass congestion or hold green lights, tend to be the most attractive to riders.
- **Reliability.** From a customer’s standpoint, frequency is only as good as the worst gap in service, particularly unexpected gaps.
- **Span.** A 16 hour service span per day is a typical minimum to not leave riders stranded who need to travel during the middle of the day or stay late at campus.

Passenger Information

Providing easy-to-read maps and schedules and easy-to-identify bus stops is important, particularly in attracting new riders unfamiliar with the system or transit in general.

Passenger Comfort and Safety

A comfortable, safe place to sit and shelter from the extremes of weather is also important, both at bus stops and within the vehicle.

Gap Assessment

HUBS routes operate with high frequency and full day service spans, offering the Howard University population a viable on-campus transit option. Speed and reliability may have opportunities for improvement, especially if DDOT’s proposed transit lanes on Georgia Avenue are implemented.

Shuttle information is readily available via electronic systems, providing younger populations with ready access to this information. Providing hard copies of schedule and route information may also encourage less technological savvy populations to ride the shuttles.

Providing complete bus stop infrastructure, including shelters, signage, lighting, and information, at key locations is an effective way to increase the utilization and customer satisfaction with the shuttle system. This is an opportunity to transform simple bus stops where riders are vulnerable to the elements into places where waiting is comfortable.
TRANSPORTATION DEMAND MANAGEMENT

Existing Conditions

In addition to the campus shuttle services outlined above, which are direct TDM investments designed to facilitate campus access, Howard University is committed to a series of investments and services that have proven successful in reducing vehicle travel and parking demand in campus settings, including:

- On-campus housing – Howard’s Residence Life system is currently capable of housing 45% of the total University enrollment.
- Bicycle parking – discussed previously.
- Parking restriction – Freshman students are ineligible to purchase annual parking permits.
- Parking charges – while most forms of parking are subsidized (user rates are kept below market value), none are free — discussed previously.
- Car-share parking – Car-sharing (membership-based, short-term car rentals) has been shown to significantly reduce parking demand among participating members by allowing households to reduce their level of car ownership and encouraging transit use among commuters who occasionally need to use a car during the work day. On-campus opportunities to access car-share vehicles can, therefore, be expected to reduce parking demand among campus residents as well as University faculty and staff. ZipCar, the nation’s largest car-share organization, currently has nine vehicles located within the boundaries of the HUCMP, including seven within a short walk of the Lower Quadrangle. This is three times the number originally located on campus in 2007, and Zipcar is currently discussing placing up to three more vehicles in University facilities. Howard faculty/staff and students can join Zipcar for a discounted rate of $15.4 Access to these

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4 http://www.zipcar.com/howard/
cars is promoted to new students via student orientation materials and the University’s Parking and Shuttle webpage.\(^5\)

- WMATA SmartBenefits – The Washington Metropolitan Area Transit Authority's SmartBenefits program is a Web-based program that allows employers to provide transit-commuting benefits by directly adding value to employees’ SmarTrip® cards or into other transit or vanpool operator accounts via the Internet. The University's initiated its participation in the program in 2007. Since then, enrollment among eligible Howard University staff (all full-time University and Hospital employees) has nearly doubled, from 109 participants in 2007 to 191 in 2011. The participation rate among eligible employees nonetheless remains just below 6%.

![Figure 35 Level of SmartBenefits Participation](image)

### Planned Changes

The HUCMP recommends an emphasis on TDM to mitigate any future increase in parking demand. Presented as a means to reduce the HUCMP’s exposure to the extremely high cost of structured and underground parking (the form of all Central Campus parking as envisioned in the HUCMP), an effective TDM plan can more than pay for itself by reducing the amount of new parking supply required to support Central Campus uses.

### Best Practices

College campuses present unique opportunities to manage local travel demand; with a single entity having significant, direct control over local land use patterns and transportation systems and services. Colleges and universities across the country have used this opportunity to employ TDM toward a number of objectives, including:

- Reducing costs associated with providing parking on campus;
- Reducing the physical impact of parking facilities on campus design;

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\(^5\) [http://auxiliary.howard.edu/parking--shuttle.html](http://auxiliary.howard.edu/parking--shuttle.html)
• Providing opportunities to utilize campus space to support the school's primary mission (education or research) instead of vehicle storage;
• Creating more active campuses - less driving/more walking and bicycling;
• Reducing community resistance to campus expansion plans;
• Meeting school sustainability goals;
• Increasing the school's appeal to students looking to walk and bicycle more often or wishing not to need a car while on campus; and
• Enhance the school's environmental credentials/"green" image.

Whether to avoid building a new parking garage or to enhance their "green" image, more and more schools have been making significant investments in TDM. The documentation of their relative effectiveness has produced an extensive list of TDM investment options with proven success records that can be employed to meet Howard University's particular TDM objectives. The following represents a list of some of the most commonly employed and effective campus TDM strategies, which will inform the Howard University TDM plan.

• One Department for Transit, Parking, and TDM - Making these components of campus transportation the responsibility of one department helps to emphasize the connections, and potential synergies and conflicts, between transit, parking, and TDM investments.
• Campus Bike Paths or In-Road Facilities - Making cycling safer and more comfortable can promote bicycle commuting, while supporting lower rates of car ownership among campus residents.
• Transit Subsidies - Below-market campus parking rates can put transit-commuting at a cost disadvantage. Means by which schools have addressed this disparity include direct cost-sharing as well as programs that allow commuters to purchase transit with pre-tax income.
• Rideshare Matching Service - Without third-party assistance, it is difficult for most commuters to find other commuters who live near them and work similar schedules. Online rideshare-matching programs provide an easy way to make these connections for those interested in sharing rides to reduce fuel and parking costs, or just interested in a more social commute.
• Preferential Rideshare Parking - Reserving the "best" parking spaces for the most efficient auto-commuters has proven effective in encouraging rideshare commuting, particularly where parking demand increases the chances of non-rideshare commuters having to park far from their destination.
• Reserved Rideshare Parking - If ridesharing is the only way to get a reserved parking space, the appeal of rideshare commutes will increase.
• Guaranteed/Emergency Ride Home - Concerns about occasionally having to work late or leave campus early can be a significant barrier to transit and rideshare commuting. Programs that reimburse non-driving commuters for occasional cab rides in such circumstances have proven effective in overcoming these concerns.
• Flextime - Formal policies that provide options for working non-conventional work schedules can reduce peak parking and traffic loads among campus facilities.
• Telecommuting - Formal policies that support regularly working from remote locations can reduce daily parking and traffic demand.
• TDM Promotional Campaigns - Programs that "nobody knows about" are destined to fail. Common promotional elements include a dedicated TDM/Commuter Benefits webpage and social media outreach, commuter clubs, and commute competitions.
• Sheltered Bike Parking - Personal bicycles can represent major financial investments. As such, even a small chance of rain can reduce bicycle commuting when all parking options
leave bikes exposed to the elements. Sheltered parking and bicycle lockers also commonly offer more protection from theft compared to standard bicycle racks.

- **Car-sharing** - Accommodating car-share vehicles within university facilities and/or subsidizing or paying membership dues can encourage car-share use among faculty/staff and students. Ready access to car-share vehicles can encourage non-driving commutes among those who may occasionally need to make car trips during the day. Car-share access can also encourage campus residents to not keep a car on campus.

- **Bike Repair Facilities and Provision of Air Compressors for Bicycles** - Minimal investments in support infrastructure can keep bicycles in circulation, reducing parking demand that might otherwise be created by frustrated former bike commuters.

- **Incentives/Benefits for Walk- or Bike-Commuters** - Free or subsidized parking is such a common employment benefit, that it is often not even considered a benefit. Offering a comparable level of benefit to those who do not drive, particularly when offered in the form of cash, has proven very effective in reducing driving demand. This strategy can easily pay for itself where reducing parking demand can minimize or avoid new parking construction.

- **Changing Facilities for Cyclists** - For many commuters arriving on campus covered in sweat is a bike-commuting deal breaker. An increasingly popular means for avoiding this green-commute barrier is to provide campus facilities for showering and changing into fresh clothes.

- **Charging for Parking** - Increasing the cost of parking is one of the most effective ways to reduce parking demand. Particularly when complemented by viable alternatives to driving.

- **Increase Campus Housing** - Increasing campus housing reduces aggregate miles travelled to campus destinations and brings more campus commuters within range of walking, cycling, and use of campus shuttle systems.

- **Streetscape and Pedestrian Network Enhancements** - Investments that make walking safer and more pleasurable can extend the distances that faculty/staff and students are willing to walk to campus destinations. This can reduce parking demand among on-campus residents and reduce vehicle trips between campus destinations.

- **Underclassmen Parking Restrictions** - Preventing freshmen (and sometimes sophomores) from parking on campus, not only directly reduces parking demand, but exposes new students to other travel modes. Where these modes prove pleasant, reliable, cost-effective, and convenient, many students are likely to continue to rely on them well after driving and parking on campus becomes an option.

- **Live Where You Work Programs** – These programs offer low-interest mortgage loans or refunds on closing costs to homebuyers working in and looking to buy a home within a certain proximity of the institution. This program results in an increase in residents who work close enough to home to allow for commutes by transit, walking, and biking. This program also doubles as a community reinvestment tool.

- **Commuter Counseling** - Employees complete a simple form, providing home and work locations, planned travel time, and modes each employee is willing to use. University representatives use standard trip matching software to provide commute options personalized to the employee, including comparisons of travel time and cost. Employees who are aware of their travel options are more likely to travel by alternate modes.

- **Departmental Bicycle Share** – Departmental bicycle sharing programs provide participating university departments with free commuter bicycles for campus use. The bicycles come fully-equipped with fenders, lights, bell, rack, rear basket(s), odometer, combination U-lock, and helmet. Different than Capital BikeShare, departments who sign up for their own bicycle tend to feel ownership of their specific bicycle and special pride when riding it.
Gap Assessment

A recent study documented in *TDM Review* conducted a survey of 35 university TDM programs, in part to identify which strategies were most common. Figure 36 provides a summary of its findings, providing a list of TDM strategies and the percent of surveyed schools that have implemented them — TDM strategies currently in place at Howard University are in red.

Figure 36  Survey of Common University TDM Practices

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Many of the above best practices are anticipated to be incorporated within the new TDM Plan. The details of those practices to be adopted will be identified following subsequent study tasks, including a review of best practice campus TDM case studies and an assessment of DDOT’s TDM expectations for new development.

**MARKET SURVEY**

**Travel Patterns**

**Mapping Campus Trip Originations**

The following maps depict quantities of faculty/staff and student commute originations, by zip code, within the DC region. WMATA Metrorail routes are depicted to provide a context for the densities residing within areas of rapid transit access.
Figure 38  Student Commute Originations
The following maps depict quantities of faculty/staff and student commute originations generally considered within reasonable cycling distance of the Central Campus — 5 miles.

**Figure 39** Faculty/Staff Commute Originations vs. Traditional Cycling Commute Catchment
Figure 40  Student Commute Originations vs. Traditional Cycling Commute Catchment
Mode Splits

To assess current mode split conditions among those commuting to the Central Campus, an online survey of student, faculty, and staff members was conducted. This survey was designed to develop a comprehensive understanding of the current mode choices being made and the preferences and perspectives underlying those choices.

Figure 41 provides rough population estimates for these three groups, along with the number of surveys completed by members of each.

Figure 41 Population and Online-Survey Sample

<table>
<thead>
<tr>
<th>Population Category</th>
<th>Population</th>
<th>Number Surveyed</th>
<th>Proportion of Population Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>11,000</td>
<td>343</td>
<td>3%</td>
</tr>
<tr>
<td>Faculty</td>
<td>1,000</td>
<td>109</td>
<td>11%</td>
</tr>
<tr>
<td>Staff</td>
<td>2,300</td>
<td>236</td>
<td>10%</td>
</tr>
<tr>
<td>All</td>
<td>14,300</td>
<td>688</td>
<td>5%</td>
</tr>
</tbody>
</table>

To estimate the current mode split conditions within these groups, the survey contained the following question:

*How do you most frequently travel to the Howard University Central Campus? (Please tell us the mode you use for the longest part of your trip. For example, if you walk to Metrorail and drive to Campus, please respond that you use Metrorail.*)

The table and graphs below provide a summary of responses received from each group.

Figure 42 Mode Split Findings

<table>
<thead>
<tr>
<th>Primary Central Campus Commute Mode</th>
<th>Faculty</th>
<th>Staff</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>HU Shuttle Bus</td>
<td>2%</td>
<td>7%</td>
<td>35%</td>
</tr>
<tr>
<td>Metrobus</td>
<td>6%</td>
<td>6%</td>
<td>7%</td>
</tr>
<tr>
<td>Metrorail</td>
<td>11%</td>
<td>12%</td>
<td>17%</td>
</tr>
<tr>
<td>Private Vehicle (alone)</td>
<td>64%</td>
<td>57%</td>
<td>9%</td>
</tr>
<tr>
<td>Private Vehicle (as passenger)</td>
<td>3%</td>
<td>8%</td>
<td>1%</td>
</tr>
<tr>
<td>Bike</td>
<td>4%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Walking</td>
<td>10%</td>
<td>9%</td>
<td>31%</td>
</tr>
</tbody>
</table>
Figure 43  Faculty Mode Splits

- Private Vehicle (alone): 64%
- Private Vehicle (as passenger): 3%
- Bike: 4%
- Walking: 10%
- HU Shuttle Bus: 2%
- Metrobus: 6%
- Metrorail: 11%

Figure 44  Staff Mode Splits

- Private Vehicle (alone): 57%
- Private Vehicle (as passenger): 8%
- Bike: 1%
- Walking: 9%
- HU Shuttle Bus: 7%
- Metrobus: 6%
- Metrorail: 12%
These findings are consistent with mode split conditions indicated by data on permit sales from 2010, which indicate that about 8% of students purchased an annual parking permit last year, while just over half of faculty and staff members did the same.\(^7\)

### 2010 Parking Permit Sales Data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>11,000</td>
<td>1,053</td>
<td>10%</td>
</tr>
<tr>
<td>Faculty &amp; Staff</td>
<td>3,300</td>
<td>1,779</td>
<td>54%</td>
</tr>
</tbody>
</table>

### Stated Parking Preferences

According to OPSO, the University has sufficient supply to offer a permit to every faculty/staff member and eligible student who requests one, although not always at the lot of their preference. In all, 1,779 faculty/staff permits were sold in 2010 — representing just over half of the Central Campus faculty/staff population. Survey findings indicate that about 1,960 faculty and staff members drive to work, so 90% of drivers received permits. That leaves roughly 180 driving commuters who chose not to obtain a University parking permit. Figure 47 provides a summary of survey responses indicating where these drivers are parking.

---

\(^7\) Permit sales data disaggregated between faculty and staff was not available at the time of this study.
From these survey responses, it can be estimated that around 160 employees are parking along local streets on most days, with the remaining 1% of non-permit drivers are parking in non-HU lots or garages. Among non-permit-holder University employees who do not drive to work, Metrorail and Walking predominate among the range of mode choices — see Error! Reference source not found. and Error! Reference source not found..

**Metrorail Station Use**

When asked which stations they use to access the Central Campus, 87% of Metrorail riders identified Shaw-Howard as the one they use most frequently. About 7% use the U Street/Cardozo/Memorial station and about 4% use Georgia Ave-Petworth. Respondents also identified Brookland-CUA and Prince George's Plaza as their primary commute stations.

---

![Shaw-Howard Station](image.png)

---

**Figure 47**  Stated Faculty/Staff Auto Parking Locations

<table>
<thead>
<tr>
<th>Where do you (driving commuters only) most frequently park?</th>
<th>Percent Response</th>
<th>Estimated Peak Daily Vehicle Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Howard University parking lot</td>
<td>91%</td>
<td>1,784</td>
</tr>
<tr>
<td>A non-Howard University parking lot or garage</td>
<td>1%</td>
<td>12</td>
</tr>
<tr>
<td>On-Street (metered)</td>
<td>7%</td>
<td>131</td>
</tr>
<tr>
<td>On-Street (non-metered, residential permit area)</td>
<td>1%</td>
<td>22</td>
</tr>
<tr>
<td>On-Street (non-metered, non-permit-area)</td>
<td>1%</td>
<td>12</td>
</tr>
</tbody>
</table>

---

**Figure 48**  Commute-Destination Stations for WMATA Commuters
Participants were also asked to identify the stations at which they begin their Central Campus commute. As expected, responses were widely varied. The map below presents a summary of locations, by the number of respondents who identified each.

**Figure 49   Originating Stations for WMATA Commuters**
Focus Group Input

A series of stakeholder focus group discussions was completed with Central Campus faculty, staff, and students to solicit input on existing Central Campus transportation and TDM conditions. All meetings were conducted on Friday, October 14th 2011, at the Cramton Auditorium. The following tables identify those who participated in these discussions.
### Figure 50  Group 1 Attending Stakeholders

<table>
<thead>
<tr>
<th>Name</th>
<th>Campus Population</th>
<th>Residency</th>
<th>Primary Mode to Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caleb Davis</td>
<td>Student</td>
<td>Slowe</td>
<td>Shuttle</td>
</tr>
<tr>
<td>D. Hammond</td>
<td>Staff</td>
<td>DC</td>
<td>Metro Bus</td>
</tr>
<tr>
<td>Deborah Johnson</td>
<td>Staff</td>
<td>DC</td>
<td>Drive</td>
</tr>
<tr>
<td>Debra Boatwright</td>
<td>Staff</td>
<td>MD</td>
<td>Drive</td>
</tr>
<tr>
<td>Eva Polston</td>
<td>Faculty</td>
<td>MD</td>
<td>Drive</td>
</tr>
<tr>
<td>Jasmine Gary</td>
<td>Student</td>
<td>UTC</td>
<td>Shuttle</td>
</tr>
<tr>
<td>Jasmine Merritt</td>
<td>Student</td>
<td>Towers</td>
<td>Shuttle</td>
</tr>
<tr>
<td>Jasmine Robinson</td>
<td>Student</td>
<td>Slowe</td>
<td>Shuttle</td>
</tr>
<tr>
<td>Lucy McCullough</td>
<td>Staff</td>
<td>DC</td>
<td>Metro Bus</td>
</tr>
<tr>
<td>Miyisha Tribble</td>
<td>Student</td>
<td>UTC</td>
<td>Shuttle</td>
</tr>
</tbody>
</table>

### Figure 51  Group 2 Attending Stakeholders

<table>
<thead>
<tr>
<th>Name</th>
<th>Campus Population</th>
<th>Residency</th>
<th>Primary Mode to Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alice Saydee</td>
<td>Student</td>
<td>Slowe</td>
<td>Shuttle</td>
</tr>
<tr>
<td>Cassandra Thompson</td>
<td>Staff</td>
<td>DC</td>
<td>Metro</td>
</tr>
<tr>
<td>Micah Johnson</td>
<td>Staff</td>
<td>DC</td>
<td>Metro</td>
</tr>
<tr>
<td>Nicole Adair</td>
<td>Student</td>
<td>MD</td>
<td>Bus</td>
</tr>
<tr>
<td>Raven Andrews</td>
<td>Student</td>
<td>MD</td>
<td>Shuttle</td>
</tr>
<tr>
<td>Chioma Njoku</td>
<td>Student</td>
<td>MD</td>
<td>Shuttle</td>
</tr>
<tr>
<td>Christina Johnson</td>
<td>Student</td>
<td>MD</td>
<td>Metro</td>
</tr>
<tr>
<td>Aqui Meeks</td>
<td>Staff</td>
<td>MD</td>
<td>Drive/shuttle</td>
</tr>
<tr>
<td>Sakinah Munir</td>
<td>Staff</td>
<td>MD</td>
<td>Drive</td>
</tr>
<tr>
<td>Tasha Delane</td>
<td>Staff</td>
<td>MD</td>
<td>Subway</td>
</tr>
</tbody>
</table>

### Figure 52  Group 3 Attending Stakeholders

<table>
<thead>
<tr>
<th>Name</th>
<th>Campus Population</th>
<th>Residency</th>
<th>Primary Mode to Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alicia Person</td>
<td>Student</td>
<td>Quad</td>
<td>Shuttle</td>
</tr>
<tr>
<td>Ehren Vance</td>
<td>Student</td>
<td>MD</td>
<td>UTC/Metro</td>
</tr>
<tr>
<td>Stephanie Miller</td>
<td>Student</td>
<td>DC</td>
<td>Shuttle</td>
</tr>
<tr>
<td>Janet Jackson</td>
<td>Staff</td>
<td>MD</td>
<td>Drive</td>
</tr>
<tr>
<td>Brian Owen</td>
<td>Staff</td>
<td>MD</td>
<td>Drive</td>
</tr>
<tr>
<td>Shaniece Palmer</td>
<td>Student</td>
<td>DC</td>
<td>Shuttle</td>
</tr>
</tbody>
</table>
Figure 53  Group 4 Attending Stakeholders

<table>
<thead>
<tr>
<th>Name</th>
<th>Campus Population</th>
<th>Residency</th>
<th>Primary Mode to Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danielle Ruth</td>
<td>Faculty</td>
<td>DC</td>
<td>Drive</td>
</tr>
<tr>
<td>Earl King</td>
<td>Student</td>
<td>Cook</td>
<td>Shuttle</td>
</tr>
<tr>
<td>Beverly Clark</td>
<td>Staff</td>
<td>DC</td>
<td>Shuttle</td>
</tr>
<tr>
<td>Iryonna Scruggs</td>
<td>Student</td>
<td>Slowe</td>
<td>Shuttle</td>
</tr>
<tr>
<td>Jumill Williams</td>
<td>Student</td>
<td>Slowe</td>
<td>Shuttle</td>
</tr>
<tr>
<td>Obi Emeagwali</td>
<td>Student</td>
<td>Cook</td>
<td>Shuttle</td>
</tr>
<tr>
<td>Bertha McBride</td>
<td>Staff</td>
<td>MD</td>
<td>Drive</td>
</tr>
</tbody>
</table>

Following is a summary of key input received during these discussions.

**Campus Travel Patterns**

The following images represent map markings indicating where attendees typically travel to on campus (blue markings indicate initial destinations, yellow marking indicate subsequent destinations), problem spots for pedestrian travel (red), and places to which they would like to see improved or better shuttle service (green).

*Key for all images: Blue Dots = Where they begin their day; Yellow Dots = Subsequent destinations; Red Dots = Hazardous pedestrian crossings/ passages; Green Dots = Destinations to which they would like improved service.*
Figure 54  Group 1 Travel Patterns

Figure 55  Group 2 Travel Patterns
Figure 56  Group 3 Travel Patterns

Figure 57  Group 4 Travel Patterns
Reasons for Attending

When asked their primary motivation for attending the focus group, attendees noted the following:

- As a student representative, one sophomore is concerned about the experiences he has been hearing about the shuttles (late arrivals, crowded vehicles, rude drivers).
- One student residing in the University Town Center (UTC) in Hyattsville, Maryland, noted her frustrations with the shuttle services (crowded buses, limited hours of service, lack of weekend service).
- Another student UTC resident came to seek improvements to the shuttle service.
- One staff member came out of concern for the lack of parking options beyond the University Lots — "If you do not have a permit, there's nowhere else to park."
- One staff member came because she is frustrated with the poor quality of shuttle service connection at the Howard Metrorail station.
- Another staff member said that she (and most other maintenance staff) arrive for work well before shuttle services begin and she is concerned for the safety of those walking from remote lots at this time of day.

Commute Options

Responses to questions and discussions regarding the commute options available for Central Campus locations included the following:

- Many attendees, especially staff and faculty, noted that they drive because they have to travel to multiple places during, before, or after the workday.
- One graduate student at the College of Medicine recently moved to Maryland, close to UTC. Would like to use shuttles but, because of their schedules and crowding conditions, drives.
- One staff member who works at the University Hospital purchases an annual parking permit, even though she only drives during bad weather.
- Several faculty attendees noted that they would prefer a non-driving commute, but that transit options are too complicated and time-consuming (many noted that they would have to take three trains, then a shuttle bus to get to Howard) for regular commuting.
- Nonetheless, many attendees noted taking transit, riding multiple trains and/or buses, and a few others noted that they will take transit when it is raining or snowing or when the traffic report is bad.
- Many students spend a lot of time on campus during weekends, either volunteering on social committees (homecoming) or studying. Those living at UTC lack shuttle access at these times.
- Many students stated that any travel costs are a burden. Many do not own cars and view Metrorail as too expensive (particularly for those living at UTC).
- No attending undergraduate students drive to campus.
- Most attendees noted that they walk between campus destinations and use shuttles if it's raining.
- For intra-campus trips, faculty/staff member are more inclined to drive if they have a car on campus and they know they can park where they are going.
- Most staff were unaware that they are eligible to ride campus shuttles free of charge.
- There appears to be room to improve the awareness/understanding of the benefits of the SmartBenefits and commuter-connections-based (carpooling and guaranteed-ride-home) programs.
• Most students were unaware that anybody can park in University lots during off-hours (after 5:30 on weekdays and anytime on weekends).
• Asked to identify locations that do not have, but should have, bicycle racks, a number of attendees noted Blackburn Hall, which does have bike racks.
• Some students expressed interest in using Capital BikeShare if it were free.
• Available ZipCar options do not seem of significant interest to students: Too expensive.
• One student, who grew up using transit, takes two buses from Silver Spring because she can't stand to drive in DC traffic.
• One faculty attendee noted that she had tried carpooling and that it worked well, until she moved. Some expressed "liability" concerns regarding carpooling.
• Many students noted interest in expanded escort service options at night.
• There is strong interest in lunchtime shuttles to Chinatown and/or Union Station, plus commute hour shuttles to Union Station.
• There was consistent interest in:
  – Paying more for better transportation options;
  – Using less convenient parking lots to save money; and
  – Carpooling as it meant more convenient or less expensive parking options.

The Howard University Shuttle Service
Many attendees attested to problems with the level of service provided by the University's shuttle service. The most common complaints are listed below.

• Infrequent service, particularly during midday and on weekends.
• A few stated that the University's Campus Escort Service — free, request-based rides to students concerned about safety of available transportation options when shuttles are not running — is unreliable.
• Some students noted that the "next-bus" information, as provided via phone texting was unreliable. Others had better experiences.
• By contrast, most felt that the new, online (phone app) bus locator maps were much more reliable.
• UTC buses, in particular, are over-crowded. Buses with 45-person official capacity are carrying up to 60 students. And even then, more students are often left to wait for the next bus. This creates an unpleasant situation among students vying to be one of the 60 who make it on, and within the bus during the long ride to campus.
• Many students noted that bus routes are unreliable, with drivers changing which route they are taking, or deviating from their designated routes, without notice.
• Many students noted rudeness among certain shuttle drivers, particularly when asked for information.
• One student suggested that buses be marked by their end destination, rather than the name of the route they are on — stating that, often, buses running the same route will have different end destinations, a fact that students only learn upon asking.
• A few students suggested that buses have route/destination signs on the back as well as the front, so students know what bus is at a stop ahead of them, or what bus has just left their stop.
• Wait times at off-campus locations, such as Meridian shopping center, were noted as particularly inconsistent, with some buses not showing up at all.
• The earliest UTC buses do not get students to campus in time for 8:00 classes, while some classes start much early.
• The library is open much later than shuttles run, leaving students to decide between research and a ride home.
• Some faculty and staff travel during the day, increasing the appeal of having a car on campus during work hours.
• "There should be better communication between OPSO and Res Life (student housing services)."

Safety and Security
Concerns regarding safety and personal security appear to impact certain mobility options among Central Campus stakeholders, particularly students. The most notable comments received are presented below.

• Many students noted that they are concerned for their personal security while walking between campus locations, particularly, but not exclusively, at night and during large school events such as homecoming. Due to these concerns, students who live within a reasonable walk of classes are essentially dependent upon shuttle buses to get to class.
• Some students noted that the escort service works well, with some noting regular use. Others felt it did not work — that they have to wait too long, or that the escort never shows up.
• Many faculty and staff also noted concern for student safety/security as one of their primary concerns, mostly related to students walking late at night or early in the morning.
• Early morning security concerns also included staff who begin well before shuttle service starts, and park in remote parking lots.
• Animosity toward Howard students from "DC residents" limits student comfort on/use of Metrobus and even Metrorail options.
• There was a consistent sense that area traffic was dangerous, particularly with drivers failing to yield to either traffic control devices or pedestrians in crosswalks.

Public Access to University Shuttles
Attendees were surveyed on their reaction to a potential strategy to allow fare-based, public access to University shuttle services, in exchange for fare-funded improvements. The response was universally, and emphatically negative. Some were slightly open to it if public riders had to show ID, or pre-register, to ride.

Impact of Vehicle Traffic Conditions
Attendees were asked to identify locations where traffic conditions and/or pedestrian infrastructure conditions threaten safety while walking. The most commonly noted locations were along Georgia, Sherman, and Florida Avenues.

Option of Creating a Transportation Services Fee in Return for Improved Services
Attendees were asked if they would be willing to pay an annual services fee in return for transportation services/benefits improvements that would be directly funded from the resulting revenue. Responses were mostly positive, with some reservations. Responses included:

• Would need to see which improvements would be funded;
Would need to see noticeable improvements on Day 1; and
Would like to see improvements prioritized.

One faculty member suggested that a "Howard Access Card", provided to those who paid the fee, could be used to control access to campus shuttles — eliminating the current reliance upon driver diligence in checking IDs to keep public riders off.

New Service Suggestions
The most popular suggestions for added shuttle destinations were to the Columbia Heights Target store and the general Columbia Heights area.

Students expressed interest in airport shuttles before and after breaks. They noted that the Metro does not accommodate luggage well, while the cost ($15) of commercial airport shuttles was too high. Students indicated willingness to pay, though it would have to be cheaper than existing options. When it was noted that current shuttle vehicles lack luggage accommodation, it was suggested that these shuttles could use different vehicles.
2 CONDITIONS ASSESSMENT

SWOT ANALYSIS

To assess the implications of the above summarized findings, these findings were organized into Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis. This analysis delineates the existing conditions, in terms of both advantages and disadvantages, and identifies opportunities for improving the University’s existing transportation systems.

![Figure 58 SWOT Analysis](image)

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-Established shuttle system that is fully integrated into the Central Campus transportation culture</td>
<td>Shuttles are under-utilized by faculty and staff, particularly those with on-campus parking</td>
<td>Unmet demand for shuttle services, particularly among students</td>
<td>Costs of maintaining, improving level of shuttle service.</td>
</tr>
<tr>
<td>Walkable campus size</td>
<td>High-volume, high-speed roadways (Georgia Avenue) and personal security issues (crime) limit walking for many travelling short distances</td>
<td>More walkers = safer walkers, safer walking -&gt; more walkers. TDM Plan partners at DDOT can help address impact of roadways.</td>
<td>Crime is a long-standing issue in many District neighborhoods, limited resources for University to address effectively</td>
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<tr>
<td>Walking access to multiple Metrorail stations</td>
<td>Grade issues reduce appeal of walking to/from most stations.</td>
<td>Planned Circulator service would enhance access to District-wide transit systems. Continued investments in Shuttle services can improve sense of connection to Metrorail.</td>
<td>Shuttle costs are high. Shuttle buses stuck in same traffic as cars - makes on-time-performance a challenge</td>
</tr>
<tr>
<td>Dense-neighborhood setting presents walking-distance housing opportunities.</td>
<td>High housing costs. Area is perceived as unsafe, particularly by students unaccustomed to urban living.</td>
<td>The housing components of the HUCMP - more student housing, and introducing Workforce/Graduate Student housing</td>
<td>Cost of providing housing, ensuring safe living environment.</td>
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<td>Strengths</td>
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<td>Plan recommends limiting parking replacement as the Central Campus is redeveloped. While primarily a cost-savings strategy, based on the vision for all subsurface facilities, limiting parking supply is also one of the most effective TDM strategies.</td>
<td>Cost of parking is currently well below market, with few benefits offered to incentivize alternative modes. Transitioning to a reduced supply will require quickly ramping up TDM investments.</td>
<td>The parking components of the HUCMP - subsurface parking replacing current lots at a less-than-one-for-one ratio.</td>
<td>Transitioning from subsidized parking to using parking to subsidize alternative modes will be challenging from a political and cultural perspective.</td>
</tr>
<tr>
<td>Dense-neighborhood setting presents potential Live Where You Work opportunities</td>
<td>High housing costs. Area is perceived as unsafe, particularly by students unaccustomed to urban living.</td>
<td>Successful precedents for expanding faculty, staff, and student housing options. Increased faculty, staff, and student populations can help increase safety.</td>
<td>Cost of providing housing, ensuring safe living environment.</td>
</tr>
<tr>
<td>ZipCar Presence</td>
<td>Low interest or use by faculty/ staff or students</td>
<td>Raising awareness of this benefit, particularly regarding special arrangement for students 20-25 (an age group typically restricted from commercial car rental services)</td>
<td>Once a faculty/ staff member or student purchases an annual parking permit, the benefit of ZipCar access is greatly diminished.</td>
</tr>
<tr>
<td>Low driving-mode commute share among students</td>
<td>Even Central Campus resident students are highly dependent upon shuttle services and escort programs due to security concerns</td>
<td>Expanding campus housing, improving UTC shuttles, improving campus security</td>
<td>Costs of maintaining, improving level of shuttle service. Crime is a long-standing issue in many District neighborhoods, limited resources for University to address effectively</td>
</tr>
<tr>
<td>Access to UTC housing — significant housing capacity within Metrorail catchment</td>
<td>Lack of WMATA pass programs, makes Metrorail commuting cost-prohibitive to most students.</td>
<td>Keep working with WMATA on transit discount options. Improve shuttle services.</td>
<td>Costs of maintaining, improving level of shuttle service.</td>
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<td>Campus Escort Services - extends transit service into evening and early morning hours.</td>
<td>Would be difficult to offer services at a capacity to meet demand. Faculty and staff are not eligible. Crime is a long-standing issue in many District neighborhoods, limited resources for University to address effectively.</td>
<td>Expand services. Improve lot lighting. Expand presence of campus security at key times.</td>
<td>Lack of capacity exposes commuters who must get to Central Campus before the shuttles begin operating, and students travelling at night.</td>
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<td>Strengths</td>
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<td>OPSO staff, coordinating with Security staff, currently monitor lot utilization levels to assess capacity to offer limited amount of daily permits.</td>
<td>Annual permit is only reliable means of parking access</td>
<td>Add periodic, monthly, and daily options.</td>
<td>Adding more options will complicate parking management oversight.</td>
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<td>Demand for shuttle services exists much earlier and later than current hours of operation</td>
<td>Expanding service could improve sense of security among off-hours travelers, and could improve appeal of more remote parking lots.</td>
<td>Costs of maintaining, improving level of shuttle service.</td>
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<td>Most newer pedestrian network components are fully ADA compliant.</td>
<td>Overall pedestrian infrastructure networks lack consistent ADA accommodations - ramps, tactile warning strips, sidewalk widths and conditions, etc.</td>
<td>The HUCMP presents and ideal opportunity to ensure all new sidewalk installations are fully ADA compliant — and prioritize the comfort and safety of pedestrians rather than reinforce the dominance of auto traffic.</td>
<td>Cost. Implementation timeline.</td>
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<td>Traffic-calming needs on high-volume, high-speed roadways are aligned with DDOT sustainable transportation objectives.</td>
<td>Limited University control over street regulations and design.</td>
<td>The HUCMP and TDM Plan present a new opportunity to work with DDOT staff to coordinate University TDM investments with DDOT traffic calming investments to promote walking as primary local mode.</td>
<td>High-volume, high-speed roadways disrupt the Central Campus's walking environment.</td>
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<td>Capital BikeShare presence</td>
<td>3rd party control, limited current cycling activity</td>
<td>Increasing ridership indicates that expanding access to this service is a promising TDM strategy</td>
<td>Cost - most students that are interested balk at the membership/ deposit costs.</td>
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<td>Expanding bicycle infrastructure around the Central Campus</td>
<td>3rd party control, limited current cycling activity</td>
<td>Minimal local bike investments can tap into inertia created by regional investments.</td>
<td>Gap between external and internal bike infrastructure consists of problematic roads, such as Georgia and Florida Avenues.</td>
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<tr>
<td>HUCMP emphasizes the importance of TDM measures, such as increasing the</td>
<td>Current parking pricing puts alternative modes at a disadvantage</td>
<td>The HUCMP presents and ideal opportunity to coordinate parking price increases with investments physical campus improvements.</td>
<td>Transitioning from subsidized parking to using parking to subsidize alternative modes will be challenging from a political and cultural perspective.</td>
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<td>Howard University Campus Master Plan</td>
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<td>Excess capacity in many parking lots</td>
<td>Perception that there is a lack of supply.</td>
<td>Can start offering more monthly/daily passes. Provides clear justification for tiered pricing.</td>
<td>More parking options will make parking management more complicated</td>
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<td>Effective RPP in surrounding neighborhoods</td>
<td>Modifications to RPP regulations can be difficult to implement.</td>
<td>DDOT can help support demand-management strategies in the TDM plan by improving RPP regulations to mitigate spillover.</td>
<td>Some streets are nonetheless being negatively affected by campus-based parking</td>
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<td>Freshman Parking Restrictions</td>
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<td>A Campus TDM best practice that could be expanded to all new, and second-year students.</td>
<td>Expanding emphasis on auto-mobility in most areas of the country may make such restrictions seem anathema to arriving students.</td>
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<td>Campus parking facilities are shared at night and on weekends</td>
<td>Very few know about this opportunity, particularly students.</td>
<td>Coupling this with expanded carshare (ZipCar) benefits could relieve pressure to expand weekend and evening shuttle service — allowing HU to focus investments on peak-hour TDM.</td>
<td>Expanded awareness of these opportunities may incentivize car ownership in locations such as UTC.</td>
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<td>Next Bus technology investments</td>
<td>Some appear to be operating below expectations</td>
<td>This is a rapidly evolving technology whose costs consistently trend downward.</td>
<td>Focusing on expanding access to what is working best (real-time, web-based, bus-locator maps) should not come at the expense of maintaining optimal conventional information infrastructure (maps and time-tables at bus stops)</td>
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<td>Transit is well-integrated into the larger District transportation culture.</td>
<td>Current economic conditions may be slowing implementation of new services.</td>
<td>Expanding area transit options include planned BRT, streetcar, and Circulator bus service</td>
<td>A variety of providers and services may create rider confusion, may make bulk-discount fare purchases more difficult to negotiate.</td>
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<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Opportunities</th>
<th>Threats</th>
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<tbody>
<tr>
<td>Campus Housing - Residence Life system current capable of housing 45% of all students.</td>
<td>Expansion is limited by housing costs, neighborhood security concerns.</td>
<td>More faculty, staff, and students living on campus could have positive impact of neighborhood security.</td>
<td>Recent efforts to expand via remote locations has underscored challenges created by this approach (i.e. limited accessibility to Central Campus, cost of providing adequate shuttle service)</td>
</tr>
<tr>
<td>Parking Charges - The University provides no free parking.</td>
<td>Charges remain below-market</td>
<td>A history of charging for parking reduces the transition to market-based rates.</td>
<td>Many faculty, staff, and students who come from non-urban environments</td>
</tr>
<tr>
<td>Moderate level of current TDM investment beyond the shuttle program</td>
<td>Moderate level of current TDM investment beyond the shuttle program</td>
<td>Should set up new, expanded investments for success.</td>
<td>May create staffing, management challenges for the University</td>
</tr>
<tr>
<td>High level of rapid and regional rail services with commuter catchment</td>
<td>Hub-and-spoke configuration means most commutes require at least one transfer (at least two for all who begin on regional rail).</td>
<td>Providing better connections to hubs like Union Station may make rail commutes more feasible/appealing</td>
<td>Connecting to any major hub will be complicated and expensive.</td>
</tr>
<tr>
<td>Many commutes begin within five miles of campus</td>
<td>Poor connections between regional bike infrastructure and the Central Campus, as well as limited bike parking on campus, limit capacity for bike commutes to reduce travel and parking demand</td>
<td>Minimal local bike investments can tap into inertia created by regional investments. District weather expands the bike-commute season compared to many campus locations across the country.</td>
<td>Central Campus has a near-complete lack of bike-commute culture.</td>
</tr>
<tr>
<td>Modest driving mode share among faculty and staff</td>
<td>A significant amount of driving is, nonetheless, likely generated by below-market parking rates, focus on annual parking permits, and minimum benefits offered to incentivize alternative mode commutes.</td>
<td>TDM benefits that directly benefit non-drivers should have a significant support base.</td>
<td>As central District housing costs go up, more and more commuters will be arriving from homes located further away from the Central Campus - creating challenges to keep alternatives competitive with driving.</td>
</tr>
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BEST PRACTICE CASE STUDIES

The University of Washington (Seattle)

Background

The main campus of the University of Washington (UW) is located within the City of Seattle, in the densely populated University District neighborhood. Student enrollment at the main campus is over 40,000, with about 6,000 of those students living on campus. The campus population also includes over 6,500 faculty members and 16,500 staff members. Over 50,000 people travel to the campus on a typical class day. Managing the transportation choices offered to the campus community is critical to meeting the academic and quality of life goals of the University. Equally important to the University, managing the implications of these choices is critical to being a good neighbor to the surrounding city.

TDM Program

UW's Transportation Management Plan (TMP) "identifies strategies that enhance access to campus by all transportation modes", with a focus on "limiting the number of vehicle trips made to the University" and, in doing so, "being a good neighbor to the surrounding city." The school's Commuter Services Department began the U-PASS benefit to put many of these strategies into action. Initiated in 1991 primarily as an unlimited-use transit benefit, the U-PASS remains the cornerstone of the University's TDM efforts. Original objectives included reducing traffic impacts in the surrounding neighborhoods and complying with the Washington State Commute Trip Reduction Act. The program's current goal is to reduce the percentage of commuters driving alone to 20% or less. The program is on target to meet their goal; in 2010 this rate was at 21%.

Since the program began, the transit benefits of the original U-PASS program have been enhanced with complementary and supplementary benefits, described below.

Transit Benefits

The U-PASS program is a voluntary, membership program that utilizes a participation sticker, placed on the back of a student, faculty, or staff ID cards (called Husky Cards), to provide unlimited, free access to regional transit services including King County Metro, Community Transit, and Sound Transit. Students are automatically sent a U-PASS sticker at the beginning of each quarter, along with a business reply envelope that they can use to return the sticker if they choose not to participate. Unless a sticker is returned, the student is enrolled in the benefit, and charged a U-PASS fee along with his or her tuition. Faculty and staff must sign up for the program, either online or at the University's Commuter Services office. Current quarterly U-PASS fees are $76 for students and $132 for faculty and staff.

U-PASS holders simply show the driver/operator on a participating system their valid U-PASS sticker. For faculty and staff, the U-PASS fee amounts to about one-third of the cost of independently purchasing the least expensive peak-period retail pass product. This discount is even greater for students. The discount is deepest for those travelling longer distances. For example, those using Sound Transit's

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8 Celeste Gilman, Transportation Systems Manager, Commuter Services, University of Washington. TDM Review, pg. 22.
9 Transit pass programs within the Seattle region are moving toward a universal transit pass, using "tap-and-go" technology, called ORCA. In step with this advancement, UW has partnered with ORCA to incorporate this technology into its Husky Cards to provide U-PASS participation benefits digitally. See: orcadirect.com/ERG-Seattle/p1_001.do
commuter rail service, the U-PASS covers the cost of trips than can otherwise cost as much as $9.25 roundtrip.

**Ridesharing**

The University promotes Rideshare Online, the regional ride-matching system that matches drivers and riders within their tri-county region. The University also contracts with Zimride to provide ride-matching to football games as well as an additional ride-matching service for campus commuters.

**Carpooling**

Commuter Services supports two types of carpools: permit carpools and impromptu carpools. Only faculty and staff are eligible to purchase carpool permits, although students can participate in a faculty/staff permit carpool. The minimum for carpool benefit eligibility is three participants for higher-demand lots, and two participants for lower-demand lots. Carpoolers must commit to carpooling at least three days per week in order to be eligible for a permit. Up to three faculty/staff participants in a permit carpool are eligible for a free U-PASS.

Impromptu carpools can be composed of any combination of students, faculty, and staff. Impromptu carpoolers can carpoo as frequently or as infrequently as they like. Upon arriving on campus, an impromptu carpool stops at a gatehouse to get a daily permit for $3, rather than the standard daily rate of $15. To be eligible for this rate:

- at least two valid faculty/staff U-PASS holders; or
- at least one faculty/staff and two (2) students all U-PASS holders; or
- at least one faculty/staff or one (1) student U-PASS holder with a disability; or
- at least three valid student U-PASS holders, must be present in the same vehicle.

**Vanpools**

UW commuters have access to various vanpool services managed by a half-dozen or so area transit providers. Most vans are equipped with bicycle racks to support on-campus mobility for participants. Vanpools may park without charge in any University permit parking lot. U-PASS holders receive reimbursements for their participation costs. Reimbursements range from up to $70.00 per month for full-time participants (3+ days per week) to up to $35.00 per month for part-time participants (2 days per week). In addition, the primary driver receives a free U-PASS.

**Bicycling**

The University provides parking spaces for more than 5,500 bikes. Bicycle parking can be found near every UW building and facility, including uncovered and covered racks, bicycle rooms in buildings, secure enclosures, and bicycle lockers. Commuter Services uses Google Maps to provide maps identifying racks, rooms, and lockers/enclosures across the campus.
Commuter Services also partners with the Hall Health Center to offer a selection of discounted bicycle lights and helmets to U-PASS holders. U-PASS holders can also receive discounts on bicycle parts and accessories at four area bike shops. Commuter Services also sponsors the annual *Ride in the Rain* bicycle challenge, a campaign to encourage faculty, staff, and students to continue bicycle commuting through the month of January. At an awards luncheon, prizes are given to teams of cyclists reporting the most trips, most miles, and most new bicycle commuters. A special “Soaked to the Gills” trophy is awarded to the team reporting the most trips made in the rain. Participation in the last challenge topped 1,000.

Commuter Services also sponsors a number of promotions in May in support of national Bike to Work Month.

**Walking**

To promote walking, Commuter Services holds an annual *Walk In* campaign. The challenge rewards hundreds of participants for making walks of 10 minutes or more by walking to work, walking to meetings, taking a walk at lunch, and walking to errands. The event includes noontime activities for walkers and seminars on the benefits of walking.

**Other Benefits**

- **Emergency Ride Home** - 90% fare reimbursements to faculty and staff U-PASS participants who use a taxi to respond to an emergency or unexpected change of schedule when they did not
have access to a personal vehicle. The program averages about seven reimbursements per month, about one for every 2,000 eligible participants.

- **Nite Ride Shuttles** - An evening van service that picks up riders at five locations on campus and drops them off at destinations in nearby neighborhoods. The service is provided during fall, winter, and spring quarters from 8:00 PM to 12:15 AM, Sunday through Thursday.

- **Flexible Work Arrangements** - Opportunities for faculty/staff and students to work remotely are promoted by the school's Work/Life Office in the Human Resources department.

- **Car-sharing** - U-PASS holders pay a discounted, $25 annual membership fee and receive discounted weekday driving rates from Zipcar, which currently has over a dozen cars on campus, including a dedicated on-campus fleet accessible to 18-20-year-olds, who are normally ineligible for membership. Zipcar will also set up accounts with individual academic departments.

- **Merchant Discounts** - Dozens of campus-area businesses provide discounts to U-PASS holders in exchange for free publicity in U-PASS marketing materials, including the U-PASS website and seasonal promotions. Cost savings from these discounts alone can recoup the cost of U-PASS fees. Promoting local shopping and dining also helps maintain vibrant, diverse concentrations of goods and services within walking distance of campus, reducing the value of having a car on campus.

### Parking Pricing

Like Howard University, UW charges faculty/staff and students for on-campus parking. UW parking rates for the 2011/12 school year include:

- Single Occupancy Vehicle Permit - $423 per quarter ($1,269 per nine-month school year);
- Carpool Permit - $423 per quarter;
- Motorcycle Permit - $141 per quarter;
- Individual Commuter Ticket\(^{10}\) - $5 per day;
- Short Term SOV Permit (Daily Permit) - $7.05 per day; and
- Pay Per Use Permit - $5 per day if used four times or less in one pay period (two weeks), $7.05 per day if used more often.

### Flexible Parking Options

One of the strategies of the University’s TMP is to increase the percentage of commuters who pay to park each time they drive to campus, rather than provide a bulk discount for unlimited parking using a permit. A variety of programs encourage commuters to turn in their SOV parking permits for at least part-term or trial use of commuter alternatives, including the following.

- **Hold That Lot** - Faculty/staff SOV permit holders who give up their permit may request Commuter Services to hold their permit for 6 months while trying out an alternative commute method.

- **Pay-Per-Use Parking** - The Pay-Per-Use-Parking program is designed to provide regular parking options for those who use other modes at least some of the time. Drivers are charged for parking, through payroll deduction, each time they park. Participants receive data on their parking use each pay period. On average, participants park 7.6 days per month.

- **Individual Commuter Tickets** - Individual Commuter Tickets (ICTs) allow faculty and staff to park on campus at a discounted rate if they drive on average two days per week or less. ICTs are available at a discount to U-PASS participants.

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\(^{10}\) Only available to those who drive to campus twice per week or less, see description below.
- **Remote Parking** - A version of pay-per-use parking is available at a discount at a large parking lot at the edge of campus, expanding the options for alternative mode commuters who occasionally need to drive to campus.

**Performance**

Source: [http://f2.washington.edu/oess/profile/SustainabilityMetrics](http://f2.washington.edu/oess/profile/SustainabilityMetrics)
Since 1991, the U-PASS program has been "creating a culture of transit use and low-impact commuting within the UW community". In 2009, there were fewer daily vehicle trips to campus than in any of the previous 27 years — despite a 28% increase in the campus population. The University of Washington was recently awarded the international Association for Commuter Transportation’s (ACT) prestigious Leadership Award for the U-PASS program. Detailed measures attesting to the program's impact include the following from the program’s 2010 performance review (U-Pass Profile) report:

- 39% of campus trips conducted on public transit, nearly twice the drive-alone rate (21%);
- 83% of students and 59% of faculty were program participants;
- 92% of U-PASS members used their cards to ride transit;
- Driving commutes (driving alone + carpool + vanpool) accounted for just over 25% of all campus trips;
- 9,600 daily transit trips that would not have been made without the program;
- 7,840 fewer metric tons of CO2 emissions from UW commuters by; and
- CO2 emission rates among campus commuters were 30% lower than the regional average.

Princeton University

Background

Located in the state of New Jersey, about mid-way between New York City and Philadelphia, the Princeton campus combines the isolation of a mid-state small town with the connectedness of its location along the Northeast transit corridor — the busiest and best-served regional rail network in the country — and proximity to two large, transit-rich cities. The University has a student population of just over 5,000 undergraduates and about 2,500 post-graduate students, a faculty population of about 1,200, and about 1,100 administrative staff members.

TDM Program

Princeton University's Transportation and Parking Services (TPS) offers a spectrum of incentive programs designed to help the school meet its 2008 Sustainability Plan goal of decreasing the number of cars commuting to campus each day by 10% (or 500 cars, roughly) by 2020. "Employees are excited that there are incentives to take alternative modes of transportation," said Andrea DeRose, TDM Manager.

Benefit-incentives provided to faculty/staff members and graduate students living off campus include:

- A Rideshare Carpool Service - a free, secure online ride-matching service that provides applicants with a list of other University community members who live and work near them and want to carpool;
- A $25 gas card every three months when registered carpool participants carpool at least 50% of the time each month;

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12 Ibid.
13 Princeton has an unusually high rate of graduate students living on campus; around 85%.
Dedicated carpool parking spaces in six campus parking lots;

Vanpool vans provided when five or more employees who live in the same general area and share similar work schedules are identified — one member is designated as the van driver, with others sharing the fuel costs;

A Mass Transit benefit - a 50% reimbursement on transit-commuting costs for faculty, staff, and students, as well as the option for faculty and staff to pay for the remainder of their transit cost with pre-tax dollars; and

Guaranteed Ride Home services that provide reimbursements for taxi fares when unexpected circumstances make carpooling or riding transit home impossible — when, for instance, a carpooler has to work late on a non-driving day, or if one’s carpool driver had to leave early, or if a transit-rider has to pick up a sick child from school.

Benefit-incentives offered to all faculty/staff and students include:

- A 25% discount on monthly New Jersey Transit passes for full-time students;
- An additional 50% discount is offered to graduate students who commute to campus via mass transit;
- A Summer bicycle pickup and storage services for students;
- A one-year membership-fee waiver for the WeCar car-sharing service with five campus-located cars for faculty/staff;
- The free TigerTransit campus shuttle, which provides free rides to those with University IDs; and
- Eligibility for the student-run U-Bikes rental and bike-share program.

Parking

Parking at all campus parking facilities requires a valid permit. Driving commuters must obtain a permit from TPS. All parking permit holders are assigned a “parking zone” that sometimes includes multiple parking lots. Permits are provided free of charge to faculty/staff members and graduate students living off campus. Undergraduate students are not eligible for parking permits until their Junior year. The annual parking permit fee for eligible undergraduates is $200. For graduate students living on campus, annual permits are available for $190.

The University uses a parking management and permitting software/database system to track eligibility for parking permits. Participants in the Mass Transit, Vanpool, Carpool, and/or Guaranteed Ride Home programs must surrender or forego their parking permit. Permit-holders must surrender their hang tags before their registration for TDM benefit programs can go into effect. Similarly, once a registration for these major TDM benefits is activated, the system changes the customer profile to remove their eligibility for a parking permit.

Marketing

TPS also markets these programs extensively, providing updated information on available benefits and their connection to meeting University sustainability targets. Marketing efforts include:

- "Going Places - A car-free guide to Princeton University" - A downloadable, 4-page brochure providing information on getting around campus and accessing regional destinations without a car, including campus shuttles, local bus service, carpooling and car-sharing options, and bicycle rental and repair services;

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14 http://www.t2systems.com/
15 http://www.princeton.edu/transportation/goingplaces.pdf
- A real-time, online bus-locator map\(^{16}\) and smart phone app for the TigerTransit shuttle;
- An online bike map\(^{17}\); and
- Princeton In Motion\(^{18}\) - A quarterly TDM newsletter providing up-to-date program and benefit information (including Vanpool vacancies), as well as updates on progress toward Princeton’s sustainability targets.

**Performance**

Last year, 186 faculty/staff members participated in the Mass Transit benefit — an 18% increase over the previous year. The program also attracted 140 Carpool and 36 Vanpool participants. The U-Bikes program has a waitlist of 350 students, faculty, and staff in its first season of campus-wide service. Five hybrid vehicles are provided on campus by WeCar and over 300 students, faculty, and staff are now registered for the program. Program administrators estimate that they receive between eight and ten Guaranteed-Ride-Home claims per year, about one for every 30-40 eligible participants.

When participants register with the TPS for TDM benefits, they must complete an application which helps the TPS estimate the impact of the program on parking demand at Princeton. For example, of those applying for the Mass Transit benefit, about one-third indicate that they used transit to commute to campus already. For those participants, the program simply reduces the cost of the mode they have been using. For two-thirds of applicants, however, exchanging a parking permit for the Mass Transit benefit indicates a change of mode for their commute.

Last year, all programs were thus estimated to have reduced daily parking demand by 320 cars. This year, TPS is expecting that number to be around 400. Program participation and impacts are projected to allow the TPS to achieve the Sustainability Plan goal of reducing parking demand by 500 cars well ahead of the 2016 target.

By far, the Mass Transit benefit has attracted the most participants. The benefit has proven attractive to a wide range of campus constituents. Application information indicates that many lower-wage workers were already taking transit anyway, and so enjoy significant cost savings without having to change how they get to work. At the same time, many visiting faculty members tend not to bring their cars with them for the year or two they plan to be at Princeton. These faculty members tend to stay in transit-rich neighborhoods of larger cities and access the campus by train. For this reason, the Mass Transit benefit has become a common component of recruitment packages, and helped the University compete with other institutions located within larger cities such as New York and Philadelphia.

Other achievements of the program include the following:

- The school received a New Jersey Smart Workplaces Award from the New Jersey Department of Transportation in 2009.
- Participation records and participant application information are shared with the University Office of Sustainability to assist their efforts in measuring and tracking the University’s carbon emissions and other environmental impacts.
- TPS recently completed a comprehensive series of surveys regarding biking and walking on campus. The office felt its programs had neglected these modes by focusing on faculty/staff commuters. It is now in the process of developing a campus bike master plan, to include plans for new bike parking facilities, bike lanes, lighting, and an incentive program. The plan is due for release next spring.

\(^{16}\) http://princeton.transloc.com/
\(^{17}\) http://www.princeton.edu/transportation/bikemap.html
Despite these successes, aggregate parking demand on campus has grown, with new parking demand generated by faculty/staff and student population growth erasing the gains of the TPS programs. As a result of this growth, there remains pressure to construct new parking facilities. Suitable on-campus sites for new facilities, however, have not emerged. Alternatives being considered include building parking off-campus and providing shuttle buses to campus, and increasing the annual TDM budget.

With annualized costs of new parking construction estimated at over $2,000 per space\(^{19}\) (for a very basic, "off the shelf" parking structure) annual, deferred-construction savings created by TDM investments (reducing daily parking demand by 320 spaces) top $600,000. That buys a lot of transit passes, and makes increasing the TDM budget a wise investment, at least in the short-term. Rates of mode-shift achievements from TDM investments, however, tend to diminish over time as more and more of the remaining parking consumers are those most resistant to driving alternatives. At some point the University is thus likely to be faced with the choice of building a new parking garage (and thus giving up its parking-related Sustainability Plan goals) or charging for parking.

**University of Chicago**

**Background**

The University of Chicago is a private research university located on the south side of Chicago, in the urban, lakefront neighborhood of Hyde Park (local population: 43,000). Founded in 1890, the campus covers 215 acres of land seven miles south of the Loop. The current campus population consists of about 2,200 faculty members, a little less than 15,000 staff (including medical center staff), about 5,000 undergraduate students, and roughly 10,500 graduate students. According to the University, over 60% of its faculty resides within the Hyde Park neighborhood.

**The TDM Program**

In 2006, the University of Chicago’s Transportation and Parking Services Office (TPSO) began to offer alternative transportation programs as part of its commitment to reducing "the impact of single occupancy vehicle (SOV) travel upon the institution, its surrounding neighborhoods, and the region at large." The current program consists of parking pricing, transit benefits, ridesharing benefits, bicycling support, student transit passes, campus-based transit services, a guaranteed-ride-home program, and limited, daily parking passes for registered non-drivers who occasionally need to drive to campus.

**Transit**

The University provides free campus shuttle buses, as well as a real-time bus locator webpage and mobile phone app that also tracks campus-serving Chicago Transit Authority (CTA) buses. Faculty, staff, and students are eligible to ride three campus-serving CTA bus routes free of charge with valid University ID. Faculty and staff are also eligible for pre-tax transit benefits through the University’s Qualified Transportation Program, overseen by the school’s HR Services office.

The University also offers a Qualified Transportation Program, through which full-time faculty and staff can purchase transit fare media via pre-tax wages.

\(^{19}\) [www.vtpi.org/parking.xls](http://www.vtpi.org/parking.xls)
Carpooling/Vanpooling

The University provides discounted parking to rideshare participants, and directs interested commuters to a third-party20, web-based ride-matching service that can make forming a carpool or vanpool easy and secure. Two-person carpools receive a 50% discount on parking permits, while vanpools and carpools with three or more people are eligible for free parking on campus. To be eligible, participants must live outside the free bus area - see Transit above.

Carpools with five or more participants can upgrade to a Vanpool. Chicago’s suburban transit service (Pace Bus) supplies the vehicle and covers all costs including fuel, maintenance, insurance, tolls, and roadside assistance. Each rider pays a monthly, distance-based fare. Drivers pay no fare, and get up to 300 miles of personal use each month.

Occasional Parking

Faculty staff and students who usually take transit, walk, or cycle, are eligible for 24 daily parking passes per year, free of charge, to be used at their discretion.

Car-sharing

The University is served by three different car-sharing providers: I-GO, ZipCar, and Connect by Hertz. It also provides promotional and informational material on the benefits of these services.

Cycling

The University provides a campus bicycling brochure, containing information on University policies, safety guidelines and a map marking bicycle parking locations. Bicycle commuters who register with the University's Transportation & Parking division are eligible for a 50% gym-membership discount at the University's Field House facility, providing affordable access to showering and locker facilities near classes.

To expand the appeal cycling around campus the University initiated a campus-based bike-share program – Recycles – in the fall of 2009. The program is managed by the University's Office of Sustainability, which has partnered with a local non-profit bike repair/ youth education organization, Blackstone Bicycle Works, to provide refurbished bicycles to the program.

The program is open to any University student, staff, or faculty member with a valid University ID. A short online registration process must be completed prior to checking out a bike. This includes "signing" a waiver, agreeing to the usage policy, and reviewing rules of the road for cycling in Chicago. Bikes are available free-of-charge at four locations across the campus. Bikes are available for single-day use only, and all bikes must be returned to their original location by the designated closing time of that facility.

The program goes on hiatus during the winter to avoid safety and maintenance issues related to Chicago's harsh winters, but remains open the other eight to nine months of the year, depending on weather and surface conditions. During the hiatus, Blackstone Bicycle Works takes possession of the bikes to perform annual maintenance and repairs before putting the bikes back into circulation at the beginning of the school's spring quarter.

20 Pace Bus, Chicago's suburban transit authority. www.pacebus.com
Parking Pricing

Parking permits are offered on a monthly basis only. Fees range from $80 to $175 depending on the location. By reducing the amount of parking that can be purchased at one time, the TPSO provides opportunities for campus commuters to limit bulk parking purchases to specific months. This allows those interested in fair weather bicycle or transit commutes, for instance, to secure parking during Chicago's bitterly cold winter months, without having to pay for a permit that also covers September and May.

Performance

Through these efforts, the University has reduced parking permit sales by 10%, conserved funds by delaying plans for a new parking garage, and converted surface parking facilities into university buildings.
DEVELOPMENT APPROVALS REQUIREMENTS

In 2009, DDOT completed a study of ways to better incorporate TDM into the development review process.\footnote{"Incorporation of Transportation Demand Management (TDM) into the Development Review Process".} One of the outcomes of that study was a matrix of required and optional TDM actions for new development. Which actions would be required versus optional would vary based on the number of net new peak-hour vehicle trips projected for the development.

Listed below are the general TDM commitments which would be required of development projected to generate between 50 and 200 net, new, peak-hour auto trips (the HUCMP includes a projection of 149 net, new, peak-hour auto trips at full build-out).\footnote{The DDOT Report was written for the private development review process. In the context of assessing the HUCMP, references to Developer should be read as referring to the University.} Those actions already undertaken by the University are presented in italics.

- During construction, maintain or coordinate relocation of any existing bus stops at the developer’s expense.
- Comply with Zoning requirements to provide bicycle parking/storage facilities.
- Require all parking costs be unbundled from the cost of lease or purchase. Parking costs must be set at no less than the charges of the lowest fee garage, located within ¼ mile.
- Post all TDM commitments on-line, publicize availability, and allow the public to see what commitments have been promised.
- Identify a project’s TDM Leader (for planning, construction, and operations). Provide DDOT/Zoning Enforcement with annual TDM Leader contact updates.
- Install a Transportation Information Center Display (kiosk) containing printed materials related to local transportation alternatives and maintain a stock of materials at all times.
- Provide website links to CommuterConnections.com and goDCgo.co on developer and property management websites.

The last two actions in the list are identified as required, but eligible for substitution by commitments to one or more optional TDM actions. The optional actions identified in the matrix that are applicable to the HUCMP are listed below — those actions already undertaken by the University are presented in italics.

- At no cost, dedicate spaces in the garage for car sharing services to use with right of first refusal. Locate spaces that are convenient to the garage entrance, available to the members of the car sharing service, twenty-four hours a day, seven days a week, without restrictions.
- Provide reserved spaces for carpools and vanpools that are conveniently located with respect to the elevators serving the buildings. Oversee a program to provide carpools and vanpools with a parking subsidy.
- Provide secured bicycle parking/storage facilities (lockers, bicycle valet parking, etc.).
- Contribute funding to available, non-exclusive Shuttle Service to Metro or DC Circulator (based on total number of trips generated). Only applies to developments not considered Transit Oriented Developments by DDOT.
- Provide location for Bike-share Program Station/Kiosk.
- Provide Ongoing Funding for on-site Bike-share Program.
- Provide each new resident with 1-year subscription to DC Bike-sharing program.
• Provide residents with $75 mail-in refund on bicycle purchases.
• Provide SmarTrip cards plus $100.00 Metro fare media per person, for free, one time, per employee, to each of the tenants’ employees and each on-site employee of the property management company and/or building operator.
• Provide SmarTrip cards plus $100.00 Metro fare media per person, for free, one time, per resident.
• Provide a one-time membership fee subsidy in a car sharing program for each residential unit.
• Locate and furnish an on-site Transit Store free of charge.
• 30 year commitment to operate an on-site Transit Store.
• Operate a Shuttle service to metro (or other appropriate destinations) specific to the site/development.
• Install and maintain new bus stop infrastructure.
3 RECOMMENDED TDM PLAN

Following is a summary of the final, recommended TDM Plan. This plan responds directly to the SWOT analysis and a Best Practices summary presented above, and has been accepted as sufficient to meet the HUCMP’s TDM-commitment requirements for development approval.

Following is a summary of TDM and Parking Management actions recommended for Howard University, including a brief description of each action (detailed descriptions can be found in Section 3: Strategy Development) and an overview of key implementation considerations, including, at a minimum:

- **Timing** - When the University should plan to deploy each action, based on the three phases identified for the HUCMP (I: 1-3 years, II: 3-5 years, and III: 5-7 years);
- **Funding and Staffing** - Assessments of direct cost and staffing requirements for each strategy, as well as strategies for meeting them; and
- **Measuring Performance** - Behavior, such as mode splits or parking demand, to monitor to measure the impact of each strategy.

The strategies have been sorted into primary TDM categories, as follows:

- Parking;
- Transportation Fee/Benefits;
- Transit;
- Pedestrian and Bicycle;
- Communication; and
- Support Programs.

Within each group, strategies are sorted into **Committed Actions** — TDM commitments identified in the zoning approvals for the HUCMP — and **Discretionary Actions** — measures that the University intends to implement in pursuit of its own transportation, development, and sustainability objectives. Finally, this information is summarized within an implementation matrix in Figure 63.

**PARKING**

**Committed Actions**

**Increase Parking Rates**

The University will double its annual parking rates for all users (faculty, staff, and students) for its most in-demand lots (those with peak occupancy measures of 80% or higher, as noted in the 2011 HUCMP Transportation Plan; see Figure 60) for the academic year 2012/13.
Figure 60 University Parking Facilities - Supply and Peak Occupancy by Location
Howard University will use the incremental revenue gains from this increase to fund additional TDM actions and alternative-mode benefits to help current drive-commuters adjust to reduced parking options and increased parking costs — while also benefiting the majority of commuters who rely primarily on non-driving modes.

**Timing**

This TDM action will be implemented during Phase I of the HUCMP.

**Funding and Staffing**

This TDM action is a revenue-positive action and will not require any additional staffing. Existing staff should expect an increase in time required for communication of the new rates and on-going customer service to address negative user response to increased rates.

**Measuring Performance**

Parking rates should become the primary strategy for achieving multiple performance measures, including:

- Mode Share - Reduce faculty and staff drive-commute rates below 50%; and
- Parking demand - Reduce aggregate off-street parking demand (weekly peak occupancy across all Central Campus facilities) by 1,000 cars by completion of the HUCMP with no significant impact on on-street parking in residential areas (see on-street survey results in the Existing Conditions section).

These will be tracked via annual TDM surveys and Neighborhood Street Occupancy surveys, as described below.

**Unbundled Tenant Parking**

The University already charges its non-University tenants for access to University parking facilities. However, to qualify as "unbundled" according to DDOT’s impending TDM standards, tenant parking rates will need to increase significantly until they at least equal the lowest monthly rate offered by a commercial parking facility within one quarter-mile of the campus. Based on a recent survey of nearby parking rates, the lowest monthly rate is $145, compared to the current tenant charge of less than $60 per month.

**Timing**

The University will increase its tenant parking rates each year, charging existing and future tenants the same amount each year. By the end of Phase II of the HUCMP, these rates will at least equal the lowest monthly rate offered by a commercial parking facility within one quarter-mile of the campus. The survey of nearby parking rates will be conducted each year to confirm the target rate for the end of Phase II.

**Funding and Staffing**

This TDM action is a revenue-positive action and will not require any additional staffing. Existing staff should expect an increase in time required for communication of the increasing rates and on-going customer service to address negative user response to increased rates.
Measuring Performance

By the end of HUCMP Phase I, the University will begin tracking commute mode shares among its tenants and tenant-employees, as part of its annual TDM Performance Surveys (based on the online surveys completed for this study). If drive-alone rates among these Central Campus commuters remain above 50%, the University will consider further increases in tenant parking rates.

Discretionary Actions

Reserved Rideshare Parking

The University will explore strategies for reserving preferentially-located parking spaces for registered rideshare vehicles. This will require developing distinct parking permits for carpool and vanpool parking, including defining qualification criteria, and designating spaces at specific parking facilities. Common criteria and implementation strategies include:

- Requiring three committed carpool participants for higher demand lots, and two committed carpool participants for lower demand lots (University of Washington);
- Offering discounted daily permits for "impromptu" carpools — non-registered, high-occupancy vehicles (University of Washington);
- Providing carpools with pre-paid gas cards (Princeton - $25 every three months);
- Providing discounted rates for carpools and/or free parking for vanpools (University of Chicago - free vanpool parking); and
- Excluding registered rideshare participants from acquiring additional conventional parking permits, while providing them with 20-30 daily parking permits for when participants cannot carpool (Princeton and University of Chicago).

Timing

The University will seek to implement a rideshare parking benefit during Phase II of the HUCMP.

Funding and Staffing

This action will require no new funding. Revenue lost from providing discounted parking rates and increasing the parking customer to permit ratio will be more than offset by increased standard parking permit rates.

This action will require additional staff time to establish the new rate or permit type, plus time for communication of the program. Minor capital costs will be required for physically designating spaces for car/vanpool use only.

Measuring Performance

The estimated current ratio of carpools to drive-alone commuters is roughly 1 in 10 among faculty and staff (5.9% carpool, 59.4% drive alone). A successful carpool benefit program, complemented by increased standard parking rates and other TDM measures, should produce a ratio that is closer to 1 in 5.

Reduced Supply

Implementation of the development program set in place by the HUCMP has already begun, with a reduction of the existing parking supply expected before the Fall 2012 semester begins. At that
time, Central Campus commuters will have approximately 275 fewer parking spaces available to them. This, in itself, will be expected to significantly influence commute mode choices. To this end, the University is committed to allowing the reduction in supply to help support a shift in commute-benefit priorities — away from subsidized driving commutes and toward increasing subsidies of more sustainable modes.

**Timing**

This TDM action will be implemented during Phase I of the HUCMP.

**Funding and Staffing**

This action will require no new funding. Existing staff should expect an increase in time required for on-going customer service to address negative user response to the reduced parking supply and discussing other commute options.

**Measuring Performance**

Combined with increased parking rates, this action should generate significant progress toward meeting the following performance targets:

- Mode Share - Reduce faculty and staff drive-commute rates below 50%; and
- Parking demand - Reduce aggregate off-street parking demand (weekly peak occupancy across all Central Campus facilities) by 1,000 cars by completion of the HUCMP with no significant impact on on-street parking in residential areas (see on-street survey results in the Existing Conditions section).

These will be tracked via annual TDM surveys and Neighborhood Street Occupancy surveys, as described below.

**Phase Out Annual Permits**

As the HUCMP is implemented, and most parking is provided within structured, access-controlled facilities, the University will explore gradually phasing out annual parking permits in favor of monthly permits and daily parking (including pay-per-use permits, as described below under University of Washington practices). The monthly permit, as offered at the University of Chicago, is a much more flexible level of bulk parking purchase, providing an opportunity to opt out of a driving based on the temperature and climate. It also provides an opportunity for campus commuters to temporarily reduce their commuting costs without having to forgo parking access for the entire year. Anyone uninterested in this flexibility can continue to purchase permits every month at no penalty.

**Timing**

The replacement of surface parking lots with structured parking should frame the timing for implementing a shift away from annual permits. This will ease some of the logistical challenges, primarily by introducing new permit media at facilities with controlled access. An optimal timeframe for this might be:

- HUCMP Phase I: Use capacities created by increased annual parking rates to begin to offer more daily parking permits.
- HUCMP Phase II: Phase out annual permits at new parking facilities, replacing with monthly and pay-per-use permit options.
- HUCMP Phase III: Eliminate all annual permits.

**Funding and Staffing**

The capital cost of implementing this action should be incorporated into the already-planned infrastructure elements of the new structured, access-controlled facilities. Additional staff time will be required to manage monthly, daily, and pay-per-use permit sales, though existing on-line payment systems are available to simplify these efforts. In addition to current staff, an additional 0.5 of a Full Time Equivalent staff member is anticipated to be needed to manage this program, though this estimate should be revisited at the end of Phase I.

**Measuring Performance**

Annual TDM surveys will provide an ideal opportunity to solicit pre-implementation input on which permit options are most appealing, and post-implementation customer satisfaction feedback from early adopters. If this strategy performs as intended, there should be discernible demand peaks for monthly parking in winter months, and for pay-per-use parking on inclement days.

**TRANSIT**

**Committed Actions**

**Maintain and Improve HU Shuttles**

The University will continue to invest in improving its shuttle services. Input received from the HU Focus Groups identified earlier weekday shuttle service around the Central Campus and midday shuttle service to the University Town Center as desired improvements.

**Timing**

This is an ongoing action that the University has been engaged in, most recently in its expansion of shuttle services to the University Town Center in Hyattsville, Maryland. This action will continue through all HUCMP phases and vary based on input received during future surveys.

**Funding and Staffing**

This strategy will require additional funding for shuttle operations and potentially additional vehicles. Specific costs will be determined based on the specific improvements implemented. New funding opportunities to support these improvements include: increased parking rates and the proposed Transportation Services Fee.

**Measuring Performance**

Customer utilization and satisfaction with shuttle services should be tracked as part of the University's annual TDM surveys.

**Increase Marketing of WMATA's SmartBenefits Program**

The University will increase marketing of these benefits in employee "welcome" packages, and as part of its revamped Parking and Shuttles webpage — see Communications strategies below.
Timing
This TDM action will be implemented during Phase I of the HUCMP.

Funding and Staffing
This action will require no new funding or staffing investments. Minimal capital costs will be incurred for printing of additional “welcome package” material. Design of the new material should be coordinated with HU’s academic design programs.

Measuring Performance
The University should seek to achieve participation rates in this program equal to at least 90% of the estimated faculty and staff mode split for Metrobus and Metrorail. For example, the target for 2011/12 participation would be 90% of an estimated 18% mode split, or 16% of all faculty and staff participating (the actual existing rate is estimated at 5.8%).

Maintain Existing Bus Routes/Stops
Maintaining these resources during any and all University construction events is a current practice that is viewed as, not only an important practice for supporting campus access to transit, but also a "good neighbor" policy to avoid disruptions for transit service for the Howard and surrounding communities.

Timing
This is already an action that is taken by the University whenever it is required.

Funding and Staffing
This strategy will require no new funding or staffing commitments. However, the earlier that anticipated impacts can be identified by existing University planning staff, the easier the Action will be to implement. Therefore, it is recommended that a point-person be identified who will be tasked with anticipating route/stop impacts as the HUCMP is implemented. The cost of implementation will vary on a case by case basis, depending on which bus routes or stops will be affected, to what degree, and for how long.

Measuring Performance
This action will be measured by the percentage of bus stops or routes disturbed and relocated. Based on Howard University’s history and intention, a 100% relocation rate is anticipated.

Discretionary Actions

Transportation Services Fee + Pass
The University will explore options for developing a multi-modal Transportation Services Fee (TSF) + pass program that would work similar to the U-PASS program described in the University of Washington case study. The essentials of such a program are:

- The establishment of a TSF that generates revenue exclusively to fund improved campus transportation;
- The use of fee revenue to enhance transportation options, including bulk purchasing access to carshare, bikeshare, and transit services; and
The provision of a single pass to access multiple transportation benefits that accompany TSF participation.

**Timing**

- **HUCMP Phase I:**
  - Initiate a modest TSF focused on improving existing benefits; primarily the HU Shuttle service in response to feedback received from student focus groups.
  - Begin bulk-membership rate negotiations with carshare and bikeshare providers.
  - Begin coordinating with the Consortium of Universities of the Washington Metropolitan Area to collectively negotiate bulk transit pass purchase options with WMATA.
  - Begin discussions with DDOT regarding potential future DC Circulator bus service to Central Campus, including bulk-purchase unlimited pass options.
- **HUCMP Phase II:** Increase the TSF, or create tiers of TSF options, as benefits are expanded to include carshare and bikeshare memberships and transit discounts/passes.
- **HUCMP Phase III and beyond:** Continue to seek opportunities to enhance the TSF and its associated benefits.

**Funding and Staffing**

This action will be self-funding and should require no new staffing investments.

Additional staff time will be required to first investigate and then manage the TSF. In addition to current staff, an additional 0.5 of a Full Time Equivalent staff member is anticipated to be needed to manage this program. Additional senior staff time will also be needed to support the effort and coordinate with the Consortium of Universities and operating agencies.

**Measuring Performance**

Annual TDM surveys will provide an ideal opportunity to solicit input from program participants on the benefits and services they use most often, and with which they are most and least satisfied. As benefits extend to services such as carshare, bikeshare, and transit, subsequent TDM surveys should also reflect an increased reliance upon non-driving modes among Central Campus commuters.

**PEDESTRIAN/BICYCLE**

**Committed Actions**

**Fund Capital BikeShare Station**

The University will provide space for and fund the installation of at least one Capital BikeShare station on the Central Campus.

**Timing**

This action will be implemented within Phase I of the HUCMP.
Funding and Staffing

It is estimated that total funding costs for this action will approximate $50,000. This action should not require any new staffing investments.

Measuring Performance

Utilization rates at each Capital BikeShare station can be tracked via the Capital BikeShare website: www.capitalbikeshare.com/dashboard. Steadily increasing use rates, as have been documented at the existing Central Campus station, will be a good indicator that the new installation is contributing to the expansion of bike mobility on the campus.

Expand Bicycle Parking

Howard University will significantly expand the quantity and quality of bike parking facilities on the Central Campus, as part of the overall implementation of land use development identified in the HUCMP.

Timing

The university will pursue development of new bike parking facilities, in coordination with the phases proposed in the HUCMP. The new-capacity targets for each phase are as follows:

- Phase I - 84 long-term and 123 short-term spaces to be developed within three years;
- Phase II - an additional 87 long-term and 301 short-term spaces to be developed within three to five years; and
- Phase III - an additional 91 long-term and 113 short-term spaces to be developed within five to seven years.

For the purposes of achieving these targets, the University will count every installed Capital BikeShare space as three short-term spaces.

If surveys indicate that new facilities fail to regularly reach 50% occupancy, bike parking for similar new uses will be built to 50% of the standard ratio.

Funding and Staffing

Direct costs for providing new bike parking facilities will vary, particularly for indoor bike parking. The following guidelines, however, provide rough estimates of the costs for various facility types:

- Bike racks, including purchase and installation: $75 - 150 per bike;
- Bike lockers, including purchase and installation: $500 to $2,000 per bike;
- Indoor bike storage: The cost of indoor bike storage facilities varies depending on how much building space is available for the desired level of capacity. Generally, horizontal parking will require 2 feet by 6 feet of floor space per bicycle, while vertical parking will require 4 feet by 2 feet of floor space and a vertical clearance of 6 feet per bicycle. In addition, there should be a five-foot wide aisle of to allow room for maneuvering bikes into and out from their parking spaces. With a securable point of entry, the room can be outfitted with racks without need to anchor racks to the ground. This significantly reduces installation costs. The following are examples of unit costs for a variety of indoor racks:

23 http://www.bicyclinginfo.org/engineering/parking.cfm
A single-bike floor stand: $20
- A basic, three-bike stand: $45
- A 6-bike floor rack: $160
- A 2-bike, stacked rack: $60-140
- A 4-bike, stacked rack: $100
- A single-bike, vertical hook: $20
- A 2-bike, vertical rack: $240
- A 3-bike, vertical rack: $270

These actions require no new dedicated staffing. Building interior spaces for bike parking facilities should be identified early in the design/build phases of new HUCMP building construction. Initial outdoor facility locations have been identified in the HUCMP Transportation Report.

Measuring Performance

Annual TDM surveys should indicate a measurable increase in the bike-commute mode share among Central Campus commuters following completion of any of these types of facilities.

Peak hour utilization surveys will be conducted to identify bicycle utilization and help quantify any supply constraints/surpluses.

Discretionary Actions

Streetscape and Pedestrian Enhancements

The HUCMP identifies a series of specific, physical improvements to the Central Campus pedestrian network designed to improve the appeal, safety, and effectiveness of pedestrian circulation.

Timing

As per final HUCMP.

Funding and Staffing

As per final HUCMP.

Measuring Performance

When asked in the study's online survey, how they most frequently traveled between Central Campus locations, 14.3% of faculty and staff respondents indicated that they used a private vehicle. While the choice to walk is influenced by many factors, HUCMP improvements to campus walking conditions should be expected to accompany a drop in this rate to below 10%.

Bike Paths and In-Road Facilities

The HUCMP identifies roadway segments in which the addition of bike facilities would help connect the Central Campus to the regional, in-road bike network. Further, it recommends considering construction of a Cycle Track (physically separated bike lane) along 6th Street on campus.
The TDM Coordinator will take the lead in approaching DDOT with these suggestions and in maintaining an ongoing dialogue with DDOT Bicycle Program staff to identify additional opportunities to connect the Central Campus with the District's expanding bike infrastructure networks.

**Timing**
This TDM action will be initiated during Phase I of the HUCMP.

**Funding and Staffing**
This action will require no new funding or staffing investments.

**Measuring Performance**
A measurable increase in the bike-commute mode share among Central Campus commuters should be expected following completion of any of these types of facilities.

**Promote Area Bicycle Services**
The University will distribute information on nearby bicycle vendors and servicers via, at a minimum, new-student informational materials, campus bicycle maps, and web links on its transportation services webpage

**Timing**
This TDM action will be implemented during Phase I of the HUCMP.

**Funding and Staffing**
This action will require no new funding or significant staffing investments.

**Measuring Performance**
There are no performance measures proposed for this action.

**Departmental Bikeshare**
The University will explore options for setting up a pilot program in which an academic or staff department "adopts" and manages shared access to a bicycle. Stored at strategic, secure locations, bicycles (with helmet and lock) would be reserved and signed-out for by eligible faculty/staff, similar to traditional employee vehicle fleets. This would reduce the need to provide car parking at each Central Campus building, and provide faculty/staff with more flexibility when they need to travel between Central Campus locations.

**Timing**
During Phase II of the HUCMP, the University will seek expressions of interest from departments, and provide up to five bicycles to qualified applicants.

**Funding and Staffing**
Good, used bicycles can cost as little as $200 and new bikes can be purchased for less than $500. A basic bike helmet costs around $30 and a quality bike lock can be acquired for less than $20. In total, this would bring the cost of implementing a 5-department pilot program to no more than $3,000 (including new bikes), and as little as $1,250 (if purchasing used bikes).
A limited amount of staff time will be required to communicate the program, review applications, and purchase and provide the equipment.

**Measuring Performance**

If the pilot program is successful, the program should continue until interest (measured by number of applying departments) is depleted.

**Showers and Changing Facilities**

The Recreation Center building proposed in the HUCMP will incorporate significant, sheltered bicycle parking facilities to take advantage of this site's shower and locker amenities. Similarly, the University will seek to include changing and showering facilities where feasible and where concentrations of faculty and staff are expected.

**Timing**

The Recreation Center building is proposed for development in Phase I of the HUCMP.

**Funding and Staffing**

This action will require no new funding or significant staffing investments beyond final HUCMP commitments.

**Measuring Performance**

Annual TDM surveys should show steady awareness and use of these facilities in each of the first five years after they are completed.

**Bike Repair and Maintenance Education Program**

Howard University is well positioned to develop a successful program along the lines of the Blackstone Bicycle Works program at the University of Chicago. Like UC, Howard is surrounded by low-income communities that can benefit from programs that train youth in viable job skills. Like Chicago’s, DC’s bicycling market is rapidly growing which will increase demand for the repair and maintenance skills that such a program can help develop among those growing up near the Central Campus.

**Timing**

During Phase II of the HUCMP, the University will reach out to Blackstone Bicycle Works to identify implementation opportunities and barriers for a Central Campus program in more detail.

**Funding and Staffing**

Such a program may be eligible for local and federal job-development grants. Discussions with the administrators of the University of Chicago program should include information on its funding requirements and strategies.

**Measuring Performance**

No performance measures are proposed for this action.
**Bike Parking Map**

As Central Campus bike parking opportunities are expanded, the University will develop an online map to promote and direct cyclists to these facilities. Examples from other campuses will be explored to determine the best implementation options for Howard.

**Timing**

This TDM action will be implemented during Phase I of the HUCMP.

**Funding and Staffing**

This action will require no new staffing investments. Howard University’s academic design departments provide an opportunity for in-house development of this map. A minimal cost for reproducing hard copies of this map will be required.

**Measuring Performance**

Utilization should go up measurably, especially at previously under-utilized locations, following successful deployment of this map.

**Summer Bike Storage**

The development of long-term, indoor bike parking as part of the HUCMP will create an opportunity to use these spaces to store student bicycles during the summer, which, in turn can encourage student bike purchases.

**Timing**

This action will be implemented as suitable indoor bike parking, or other long-term storage, locations are identified.

**Funding and Staffing**

This action will require no new funding investments. Limited staff time will be required to communicate and coordinate the program, with the majority of time spent at the beginning and end of the academic year.

**Measuring Performance**

This strategy should be continued and expanded according to utilization levels.

**COMMUNICATION**

**Committed Actions**

**Post and Publicize TDM Commitments**

Howard University will post a downloadable copy of the final TDM Plan on its Parking and Shuttle home page. The commuter benefits it identifies, and the timeline for implementation, will also be provided to all faculty, staff, and students via the website and other University media.

**Timing**

This action will be implemented within Phase I of the HUCMP.
Funding and Staffing
This action will require no new funding or staffing investments.

Measuring Performance
Annual TDM surveys should reflect steadily increasing awareness of basic commuter benefits such as ride-matching services, Guaranteed Ride Home, WMATA SmartBenefits, and special deals on ZipCar memberships.

Identify a HU TDM Leader
Howard University will identify a TDM Coordinator, who will oversee the implementation of the TDM Plan, including its specific TDM action commitments, and serve as the University's TDM contact for DDOT/Zoning enforcement. Contact information for this position will be updated at least annually and subsequent to any changes.

Timing
This action will be implemented within Phase I of the HUCMP.

Funding and Staffing
This action will require no new funding or staffing investments.

Measuring Performance
There are no performance measures proposed for this action.

Install Information Kiosks
The University will install at least one Information Kiosk during each of the first five years of HUCMP implementation. These will be installed at strategic locations across the campus, such as the entrances to bookstores, dining halls, dormitory buildings, and administrative buildings. Information will be regularly restocked and updated.

Timing
This action will be implemented during Phase I of the HUCMP.

Funding and Staffing
This action will require no new staffing investments, beyond the time to regularly restock the kiosks.

Costs for information kiosks range from around $100 to over $1,000. Figure 61 presents examples of kiosks priced at between $250 (left) and $990 (right).
**Measuring Performance**

Annual TDM surveys should reflect steadily increasing awareness of basic commuter benefits such as ride-matching services, Guaranteed Ride Home, WMATA SmartBenefits, and special deals on ZipCar memberships.

**Links to Commuter Support Websites**

Links to commuter support websites will be prominently displayed on appropriate University webpages. In addition to those services currently linked on its webpages, the University will add the links to the following:

- CommuterConnections.com;
- DDOT’s Washington, DC Bicycle Map;
- Washington Walks;
- Nearby bicycle vendors and service providers;
- goDCgo.com; and
- Washington Metropolitan Area Transit Authority.

**Timing**

This action will be implemented within Phase I of the HUCMP.

**Funding and Staffing**

This action will require no new funding or staffing investments.
Measuring Performance
Annual TDM surveys should reflect steadily increasing awareness of commuter benefits advertised on these websites, such as CommuterConnections’ ride-matching and Guaranteed Ride Home services and WMATA’s SmartBenefits program.

Annual TDM and Parking Surveys
The University will continue to conduct annual TDM and Parking surveys, similar to the surveys completed for this study. At a minimum, the TDM survey will identify:

- Central Campus commute mode split estimates for students, faculty, staff, and non-University tenants (retailers);
- Estimated levels of awareness of, and participation in, various commuter benefits;
- Feedback on recent changes;
- Input on potential future changes; and
- Customer satisfaction with HU Shuttle services.

The introduction to each survey is also a prime opportunity to highlight recent TDM and commuter benefit investments.

The parking survey will identify on-street parking utilization of the blocks within and around the Central Campus.

Timing
This TDM action will be implemented during Phase I of the HUCMP.

Funding and Staffing
This action will require no new funding. To reduce staff costs, it is recommended that the University seek the participation of students in drafting survey materials, collecting and organizing survey data, and developing survey-response analysis and findings, with oversight provided by the University’s planning department faculty and TDM Coordinator.

Measuring Performance
There are no performance measures proposed for this action.

Annual Reporting
The University will prepare an annual TDM and Parking report to be submitted to DDOT. These reports will focus, first and foremost, on documenting progress toward the TDM Plan performance targets that the University has agreed to for HUCMP:

By the end of Phase II of the HUCMP:
- Estimated faculty and staff drive-alone rates should each be below 50% (currently 64.2% and 57.2%, respectively); or
- The cumulative, student, faculty, and staff drive-alone rate should be no more than 18% (currently, 36.3%).

By the end of Phase III of the HUCMP:
- The faculty and staff drive-alone rates to should each be no more than 40%; or
- The cumulative, student, faculty, and staff drive-alone rate should be no more 15%.
Timing
This TDM action will be implemented during Phase I of the HUCMP.

Funding and Staffing
This action will require no new funding. A limited amount of additional staff time will be required to prepare the report and communicate with DDOT.

Measuring Performance
There are no performance measures proposed for this action.

Discretionary Actions

Dedicated TDM Webpage
The University will create a dedicated webpage to identify and promote its transportation benefits and resources. For the purposes of this plan, this will be referred to as the future Transportation Services webpage when describing related TDM actions. This page will be the home for all information on:

- Parking;
- Transit;
- Carpool and Vanpool;
- TDM and Commuter Benefits;
- TDM Survey results and reporting;
- Transportation and parking maps;
- Links to supportive programs;
- Links to alternative mode services and vendors; and
- Marketing materials.
Timing
This TDM action will be implemented during Phase I of the HUCMP.

Funding and Staffing
This action will require no new funding. A limited amount of staff time will be required to develop the new webpage, though this may be an opportunity for HU students to participate.

Measuring Performance
Successful development and promotion of this site should be expected to result in a measurable increase in awareness of programs such as WMTATA’s SmartBenefits and CommuterConnections’ rideshare and Guaranteed Ride Home services, as monitored via annual TDM surveys. A more direct measure would be to track the number of "hits" that each linked page receives from the TDM homepage.

Marketing Materials
The University will explore developing new TDM-marketing materials, such as a Car-Free guide — a downloadable brochure with information on getting to and around the Central Campus, and accessing city and regional destinations, without a car. Such materials will be distributed in New Hire (faculty and staff) and Welcome packages, at information kiosks, and via the Transportation Services website.
Timing
This TDM action will be implemented during Phase II of the HUCMP, if not sooner.

Funding and Staffing
This action will require no new funding beyond the capital cost of printing the material. A limited amount of staff time will be required to develop this material. Students should be involved in developing the design and content of these materials, with best-practice guidance provided by the TDM Coordinator.

Measuring Performance
Monitoring annual measures of awareness of various TDM and Commuter Benefits programs will be the most effective way to track the impacts of these types of efforts.

SUPPORT PROGRAMS

Committed Actions

Telecommute and Flextime Benefits
The University is in the process of developing formal "Alternative Work Schedules" guidelines, which will define opportunities for telecommuting as well as maintaining non-traditional weekly work schedules. University staff charged with implementing the TDM Plan will ensure that the TDM benefits of various policy options — reducing peak-hour travel and parking demand — are considered when developing and implementing these guidelines.

Timing
This TDM action will be implemented during Phase I of the HUCMP.

Funding and Staffing
This action will require no new funding or staffing investments.

Measuring Performance
The action can be measured by both increased participation rates and changes to travel documented in the annual TDM survey.

Discretionary Actions

Expand On-Campus Housing
The HUCMP proposes an expansion of on-campus housing by 1,200 beds, via a combination of new undergraduate dormitories as well as graduate-student/workforce housing facilities.

Timing
Most of the undergraduate housing is planned for Phase I (within 3 years), while the graduate-student/workforce housing is planned for development in Phase III (5-7 years out).
Funding and Staffing
As per final HUCMP.

Measuring Performance
Expanded on-campus housing should significantly increase walking and/or HU Shuttle commute mode shares among Central Campus commuters.

Live Where You Work Programs
The University will explore the potential to utilize existing “Live Where You Work” programs to boost the proportion of faculty/staff and students living near campus. These programs provide low-interest mortgage loans or a cash payment to be applied at closing to those purchasing a home within a designated distance of where they work.

In partnership with selected DC employers, DC’s Office of Planning will match employer contributions (up to $6,000 per participating employee for down payment and closing cost assistance) to attract and retain DC residents, with the primary purpose of encouraging employees to live close to their place of employment and/or transit.

Timing
This TDM action will be implemented during Phase I of the HUCMP. If the programs fail to create new housing opportunities, the University will explore options for creating its own program by the completion of Phase III of the HUCMP.

Funding and Staffing
Taking advantage of existing programs will require $6,000 per participating employee and additional staff time to help employees coordinate their applications.

An in-house program will require an additional 0.5 Full Time Equivalent staff member. An in-house program developed by Yale University in 1994 recently passed the 1,000-participant mark (currently standing at 1,013 participants). At a $30,000 maximum benefit per participant, the total cost of this success could be as high as $30,000,000. This figure could also serve as a conservative cost estimate for a single, subsurface parking space; meaning that, if each participant represented one drive-alone commuter who now walks to campus, such a program (currently the most generous in the country among university-based programs) could actually be self-funding.

Measuring Performance
Expanded on-campus housing should significantly increase walking and/or HU Shuttle commute mode shares among Central Campus commuters.

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### Figure 63: TDM Plan Implementation Summary Matrix (by HUCMP Phase)

<table>
<thead>
<tr>
<th>Action</th>
<th>Committed or Discretionary</th>
<th>Funding Requirements</th>
<th>New Staffing Requirements*</th>
<th>Behavior to Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHASE I</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased Parking Rates</td>
<td>Committed</td>
<td>Revenue-Positive</td>
<td>Limited (communications &amp; customer service)</td>
<td>Parking Demand, Drive-Alone Mode Share</td>
</tr>
<tr>
<td>Unbundled Tenant Parking</td>
<td>Committed</td>
<td>Revenue-Positive</td>
<td>Limited (communications &amp; customer service)</td>
<td>Tenant Drive-Alone Mode Share</td>
</tr>
<tr>
<td>Improve HU Shuttles</td>
<td>Committed</td>
<td>High, but varies based on changes to shuttle service</td>
<td>Varies based on changes to shuttle service</td>
<td>Utilization Rates, Customer Satisfaction</td>
</tr>
<tr>
<td>Maintain Bus Routes/ Stops</td>
<td>Committed</td>
<td>Limited based on construction needs</td>
<td>None</td>
<td>100% Compliance</td>
</tr>
<tr>
<td>Increase SmartBenefits Marketing</td>
<td>Committed</td>
<td>Minimal</td>
<td>None</td>
<td>Participation Rate</td>
</tr>
<tr>
<td>Fund Capital BikeShare Station</td>
<td>Committed</td>
<td>± $50,000</td>
<td>None</td>
<td>Utilization</td>
</tr>
<tr>
<td>Post TDM Plan</td>
<td>Committed</td>
<td>None</td>
<td>None</td>
<td>Commuter Benefits Awareness</td>
</tr>
<tr>
<td>Identify TDM Leader</td>
<td>Committed</td>
<td>None</td>
<td>None</td>
<td>None proposed</td>
</tr>
<tr>
<td>Install Information Kiosks</td>
<td>Committed</td>
<td>$100 - $1,000 each</td>
<td>Limited (restocking materials)</td>
<td>Commuter Benefits Awareness</td>
</tr>
<tr>
<td>Links to Commuter Support Websites</td>
<td>Committed</td>
<td>None</td>
<td>None</td>
<td>Commuter Benefits Awareness</td>
</tr>
<tr>
<td>Annual TDM and Parking Surveys</td>
<td>Committed</td>
<td>None</td>
<td>Limited (student time and staff oversight)</td>
<td>None Proposed</td>
</tr>
<tr>
<td>Annual Reporting</td>
<td>Committed</td>
<td>None</td>
<td>Limited (reporting and DDOT communications)</td>
<td>None Proposed</td>
</tr>
<tr>
<td>Telecommute and Flextime</td>
<td>Committed</td>
<td>None</td>
<td>None</td>
<td>Participation Rates</td>
</tr>
<tr>
<td>Reduced Parking Supply</td>
<td>Discretionary</td>
<td>Revenue-positive (deferred construction costs)</td>
<td>Limited (communications &amp; customer service)</td>
<td>Faculty and Staff Drive-Alone Mode Share</td>
</tr>
<tr>
<td>Bike Paths and In-Road Facilities (coordination with DDOT)</td>
<td>Discretionary</td>
<td>None</td>
<td>None</td>
<td>None Proposed</td>
</tr>
<tr>
<td>Action</td>
<td>Committed or Discretionary</td>
<td>Funding Requirements</td>
<td>New Staffing Requirements*</td>
<td>Behavior to Measure</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>----------------------------</td>
<td>----------------------</td>
<td>----------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>Promote Area Bicycle Services</td>
<td>Discretionary</td>
<td>None</td>
<td>None</td>
<td>None Proposed</td>
</tr>
<tr>
<td>Bike Parking Map</td>
<td>Discretionary</td>
<td>Minimal (printing)</td>
<td>Limited</td>
<td>Utilization</td>
</tr>
<tr>
<td>Dedicated TDM Webpage</td>
<td>Discretionary</td>
<td>None</td>
<td>Limited (webpage development)</td>
<td>Commuter Benefits Awareness</td>
</tr>
<tr>
<td>Live Where You Work Programs (Phase III if in-house)</td>
<td>Discretionary</td>
<td>$6,000 per participating employee if using existing programs. High to execute in-house program (potentially $30,000 per participating employee).</td>
<td>0.5 FTE</td>
<td>Walk and HU Shuttle Mode Shares</td>
</tr>
</tbody>
</table>

**INCREMENTAL BEGINNING IN PHASE I**

<table>
<thead>
<tr>
<th>Action</th>
<th>Committed or Discretionary</th>
<th>Funding Requirements</th>
<th>New Staffing Requirements*</th>
<th>Behavior to Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expand Bicycle Parking</td>
<td>Committed</td>
<td>Moderate to High depending upon bicycle racks selected</td>
<td>None</td>
<td>Utilization, Bike-Commute Mode Share</td>
</tr>
<tr>
<td>Phase Out Annual Permits</td>
<td>Discretionary</td>
<td>None</td>
<td>0.5 FTE</td>
<td>Seasonal and Weather-Related Parking-Demand Variability</td>
</tr>
<tr>
<td>Transportation Services Fee + Pass</td>
<td>Discretionary</td>
<td>Self-funding</td>
<td>0.5 FTE plus senior staff support &amp; coordination</td>
<td>HU Shuttles Customer Satisfaction, Drive-Alone Mode Share</td>
</tr>
<tr>
<td>Expand On-Campus Housing</td>
<td>Discretionary</td>
<td>Per HUCMP</td>
<td>None</td>
<td>Walk and HU Shuttle Mode Shares</td>
</tr>
</tbody>
</table>

**PHASE II**

<table>
<thead>
<tr>
<th>Action</th>
<th>Committed or Discretionary</th>
<th>Funding Requirements</th>
<th>New Staffing Requirements*</th>
<th>Behavior to Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing Material</td>
<td>Committed</td>
<td>Limited (printing)</td>
<td>Limited (material development)</td>
<td>Program Awareness</td>
</tr>
<tr>
<td>Reserved Rideshare Parking</td>
<td>Discretionary</td>
<td>Minimal (space designation)</td>
<td>Limited (program development &amp; communications)</td>
<td>Rideshare to Drive-Alone Mode Splits</td>
</tr>
<tr>
<td>Bike Repair and Maintenance Education Program</td>
<td>Discretionary</td>
<td>To be accessed via outreach to peer program</td>
<td>To be accessed via outreach to peer program</td>
<td>None Proposed</td>
</tr>
<tr>
<td>Departmental Bikeshare</td>
<td>Discretionary</td>
<td>$1,250 - $3,000</td>
<td>Limited</td>
<td>Applications to Participate</td>
</tr>
</tbody>
</table>
### TDM Plan for the Howard University Campus Master Plan

**Howard University**

**Nelson\Nygaard Consulting Associates Inc. | 117**

<table>
<thead>
<tr>
<th>Action</th>
<th>Committed or Discretionary</th>
<th>Funding Requirements</th>
<th>New Staffing Requirements*</th>
<th>Behavior to Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COORDINATED WITH HUCMP</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Showers and Changing Facilities</td>
<td>Discretionary</td>
<td>Per HUCMP</td>
<td>None</td>
<td>Awareness of Facilities</td>
</tr>
<tr>
<td>Streetscape and Pedestrian Enhancements</td>
<td>Discretionary</td>
<td>Per HUCMP</td>
<td>Per HUCMP</td>
<td>Private Vehicle Use for Intra-campus Trips</td>
</tr>
<tr>
<td>Summer Bike Storage</td>
<td>Discretionary</td>
<td>None</td>
<td>Limited (communications)</td>
<td>Utilization</td>
</tr>
</tbody>
</table>

*Note: The cumulative staffing requirements total 1.5 FTE. However, many individual actions require limited staff support that when combined should be considered 0.5 FTE. In total, 2.0 FTE’s are recommended to implement the TDM Plan.*