Parking and Transportation Master Plan

Prepared by

July 2009
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Purpose Statement

This Parking and Transportation Master Plan (PTMP) defines a transportation strategy and implementation recommendations that will enhance mobility for Georgia Institute of Technology (Georgia Tech) employees, students and visitors. The PTMP supports the objectives of the 2004 Campus Master Plan Update, the 2006 Landscape Master Plan, and other plans for nearby areas for both short-term and intermediate time frames. The plan addresses transportation facilities and operations on the campus in a balanced way, based on the following goals:

- The plan reviews the existing parking supply and utilization, and assesses future parking needs based on planned institutional growth, potential demand reductions through transportation demand management programs, and potential loss of parking supply due to redevelopment.
- The plan evaluates potential locations for future parking facilities and assesses the appropriate scale of these facilities.
- The plan reviews and looks to improve the quality of multi-modal connections including walking, bicycling, and campus transit link between campus destinations and to relevant off-campus destinations.
- In addition, the plan looks to reduce the number of vehicles, particularly single occupant vehicles, regularly traveling to and around the campus by establishing Transportation Demand Management (TDM) goals in support of the overall transportation system and campus sustainability initiatives.
- The plan includes order-of-magnitude cost estimates for the potential future strategies for the future.

In general, the PTMP looks to improve the overall transportation experience at Georgia Tech and suggests investment priorities.

Regional Transportation Infrastructure and Access

The City of Atlanta, and its surrounding metropolitan region, is one of the most populous and fastest growing urban areas in the United States. According to 2006 U.S. Census Bureau information, the Atlanta region is the ninth largest city in the U.S. and is currently the fastest growing metropolitan area in the country. A substantial network of transportation infrastructure and services has been developed over time to meet the transportation demands of this ever-growing urban metropolis.

The city is served by three primary interstate freeways (I-20, I-75, and I-85) as well as the auxiliary interstate facility I-285. Regional transit services are provided by the Metropolitan Atlanta Rapid Transit Authority (MARTA), which operates subway and bus service throughout the metropolitan Atlanta region. A variety of other public, private, and alternative agencies operate and/or promote alternative transportation services to provide critical mobility to Atlanta residents and visitors. Some of these agencies include the Atlanta Regional Commission, Cobb County Transit, Atlanta Bicycle Campaign, and VPSI, Inc.

Hartsfield-Jackson Atlanta International Airport, located 10 miles south of downtown Atlanta, is the world’s busiest airport, as measured by both passenger and aircraft traffic, providing air travel to myriad national and international destinations. The airport is accessible via I-75, I-85, and I-285 freeways. MARTA rail station is located within the airport terminal, providing access to the entire MARTA system and direct service to Georgia Tech at North Avenue and Midtown stations.

Georgia Tech is located near the center of Atlanta, primarily along the eastern edge of the I-75/85 interstate freeway (Downtown Connector). A variety of arterial roadways provide access to the Georgia Tech campus, including Northside Drive, Hemphill Avenue, State Street, 10th Street, 5th Street, and North Avenue. The following intersections surrounding Georgia Tech serve as the primary “gateways” to the campus:
- North Avenue at Techwood Drive
- North Avenue at Cherry Street
- Tech Parkway at Means Street
- Northside Drive at 10th Street
- 10th Street at Hemphill Avenue
- 10th Street at State Street
- 10th Street at Atlantic Drive
- 10th Street at Fowler Street
- Spring Street at Fifth Street
- West Peachtree Street at Fifth Street

The Georgia Tech campus is served by several citywide transit options. Primary among these is MARTA rail service, which operates two stations within walking distance of the campus: North Avenue Station and Midtown Station (on 10th Street). Additionally, the campus is served by several MARTA bus routes, including the route 113 bus, which travels north-south through the center of campus via State Street and First Street. A number of MARTA bus routes provide service to the edge of campus, generally along either North Avenue or 10th Street, including routes 12, 27, 37, 99, 137.

While the MARTA transit system has incorporated routes and programs to serve the Georgia Tech community, a number of opportunities for greater connection to Atlanta’s regional transportation network exist. Currently, the Georgia Tech campus is not well integrated into the MARTA east-west heavy rail transit routes. The east-west MARTA Bankhead/Indian Creek rail lines are only accessible by transferring from the north-south North Springs/Doraville/Airport lines at the Five Points station. Some MARTA commuter bus routes which operate in the east-west direction, such as route 45, do not stop at convenient locations to significantly capture Georgia Tech riders. The Cobb Community Transit (CCT) agency also operates bus routes which serve the MARTA North Avenue and Midtown Stations, but do not provide any stops on or directly adjacent to the Georgia Tech campus (including routes 100, 101, 102, 480, and 481). CCT route 12 serves 10th Street along the northern edge of campus.

Other transit and shuttle services operating in the Atlanta area include:
- MARTA – Georgia Regional Transportation Authority
- C-Tran – Clayton County Transit
- CCT – Gwinnett County Transit
- CATS – Cherokee Area Transportation System
- Atlantic Street free shuttle to Arts Center MARTA Station
- Buckhead-Lawnson Connection
- The Cliff - Clifton Corridor and Emory University
- Georgia State University’s Panther Express
- Vinings Library Transit

Parking and Transportation Master Plan Timeframe and Projections

Georgia Tech’s student and faculty/staff population has consistently increased in recent years. Between 1996 and 2007, the faculty/staff population increased 35 percent and the student population increased 44 percent. The overall campus population increased 42 percent. The 2004 Master Plan Update projected continued population growth. The PTMP projections of future campus population will reflect this growth trend.

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<tr>
<td>Faculty/Staff</td>
<td>3,973</td>
<td>5,482</td>
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<td>Students</td>
<td>12,985</td>
<td>16,792</td>
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<td>Total</td>
<td>16,958</td>
<td>22,274</td>
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Sources: 2004 Campus Master Plan Update

The Parking and Transportation Master Plan projections have been organized according to two analysis horizons: a five-year horizon and a ten-year horizon. These analysis horizons correspond to design years 2014 and 2019. The 2014 design year matches the analysis horizon used in the Georgia Tech Master Plan Update. The 2019 design year provides new projections to aid in intermediate range planning on the Georgia Tech campus.

Five-year Horizon

The PTMP five-year analysis horizon projections extraplate historic growth trends in both the faculty/staff and student populations. By 2019, campus population is expected to increase to a total of 27,300 students and employees. However, this population projection is approximately 7 percent lower than the 2004 Master Plan Update projection.

Ten-year Horizon

The PTMP ten-year analysis horizon projections reflect an expectation for continued growth at rates consistent with the past 10 years. By 2019, campus population is expected to increase to a total of 31,650 students and employees. This population projection exceeds the 2004 Master Plan Update projection by approximately 7 percent.
Parking and Transportation Master Plan

Planning Process

Specifically, the following analyses were conducted to determine likely impacts to the campus:

- Quantify future parking supply and demand
- Analyze future travel patterns and travel behavior
- Analyze future transit operations
- Evaluate potential transportation demand management programs

Analysis in these areas conforms to the five and ten-year analysis horizons previously discussed.

Alternative Development and Evaluation

VHB prepared candidate transportation scenarios to address projected needs associated with the PTMP horizon years including parking measures, transit measures, pedestrian and bicycle measures, travel demand management measures, traffic measures, and order of magnitude cost estimates.

VHB evaluated the potential influence of these alternatives on the Georgia Tech transportation system and developed evaluation criteria to project the efficacy of these measures with regard to consistency with the Campus Master Plan goals for mobility and sustainability. The impacts and viability of each of the strategies were assessed in light of any projected changes in parking and transportation resources, behavior, and patterns. The recommendations of this plan are focused primarily on campus parking and transit operations.

Preferred Alternative

Based on feedback from the Georgia Tech community and the findings of the alternatives evaluation, VHB worked with the Georgia Tech to refine a preferred alternative and develop a set of recommendations. These recommendations are geared toward meeting the needs of all Georgia Tech stakeholders, achieving the campus development and landscape goals, satisfying the Institute’s sustainability mission, and proposing a strategy within its financial means. Reasoning supporting selection of the Preferred Alternative includes:

- Pro vs. Con analysis of the various measures considered in the alternatives evaluation
- Specific analysis of physical, policy, and revenue and financial impacts.
- Analysis of evaluation criteria outlined during the alternatives evaluation.
- Implementation strategy based on Campus Master Plan development milestones.

Future Conditions Review

An analysis of future conditions was conducted based on the information gathered in the Existing Conditions Assessment. In particular, proposed changes in buildings, landscape, enrollment, staffing, and the surrounding areas discussed in the 2004 Master Plan Update and 2006 Campus Landscape Master Plan informed the evaluation of future parking and transportation needs and operations on the Georgia Tech campus.
Parking and Transportation Master Plan

Georgia Institute of Technology Planning History

Georgia Tech was initially founded in 1885 and opened to students in October 1888 as the Georgia School of Technology. It was initially an all-male, vocational training-focused institution that required students to take shop classes and offered only one degree—a bachelor of science in mechanical engineering. The Administration Building—now Tech Tower, and the Shop Building located immediately to the west (destroyed by fire in 1952) were the first structures constructed on campus. Today the area around these structures—the "Hill"—comprises a national register historic district that encompasses 12 buildings including among them the Tech Tower, the J. S. Coon building, the A. French Building and the Lyman Hall building. In addition there are a number of other buildings on campus of various ages that are examples of various historic architectural styles.

The commercial shop program was abandoned in 1899. This became a notable turning point for the school as new science-based programs were introduced to replace the shop programs and the schools of civil engineering and electrical engineering were created. By 1912 the campus was bounded by Cherry Street on the west, Techwood Drive on the east, North Avenue on the south and 3rd Street on the north. The emphasis on technological innovation was initiated with the creation, by the Georgia General Assembly in 1919, of the Engineering Experiment Station—the precursor of the Georgia Tech Research Institute.

In 1931 the University System of Georgia was established and Tech's role as the focal point for technology-oriented education in the state was secured, with the relocation of civil and electrical engineering courses at the University of Georgia to the School. In 1945 the Board of Regents authorized the school to change its name to the Georgia Institute of Technology.

The emphasis on forward-looking technology continued in 1957 when the Georgia Legislature provided $2.5 million for construction of a nuclear reactor on the Tech campus—and the subsequent completion of the Frank H. Neely Nuclear Research Center in 1963. In 1994 the campus extended from Hemphill Avenue on the west border to I-75/85 on the east and from North Avenue on the south border to 14th Street on the north. At that time Hemphill Avenue—a significant street in part because it cut across the entire north-south midtown grid, extended southwesterly all the way to North Avenue. Then in the mid-80s the campus was expanded significantly to the west through an urban renewal program, to what is now Tech Parkway. This major expansion created the core campus boundaries as they presently exist.

Since the completion of the previous master plan in 1957, the campus has continued to undergo major changes. Among the major buildings constructed on campus over the past five years are: the Parker H. Pitts Biotechnology Building, the Ford Motor Company Environmental Sciences and Toxicology Building, the L.L. Whitter Biomedical Engineering Building, the Joseph B. Whitehead Medical Services Building, the J. Erskine Love Manufacturing Center, and the expansion and renovation of the Campus Recreation Center and Aquatic Center. In addition the institute has undergone significant expansion of the campus as well as the construction of new major facilities at Tech Square and the creation of the North Avenue Research Area. The creation of these new campus facilities has occurred in response to the needs for new facilities and the opportunities afforded by available, underutilized properties.

2004 Campus Master Plan Update Overview

The major goals for the 2004 Campus Master Plan Update (CMPU) are based on three elements, derived from the Georgia Tech Strategic Plan, which is a broad-based statement of the Institute's values, emphasizing creation of a "sustainable campus community." These elements include: Economy—how we manage and use resources; Ecology—"the pattern of relationships between living things and their environment"; and Educational Life—which encompasses equity and additional elements related to the social and academic life of the campus community. The major goals for the 2004 Campus Master Plan Update were placed in the sustainability framework:

Economy
- Accommodate Future Needs of the Institute for academic, research, support and service functions
- Maintain flexibility to address opportunities
- Minimize costs

Ecology
- Plan an integrated functional open space system that reduces stormwater runoff and discharge to the city system

Educational Life
- Improve campus livability by planning and designing buildings and spaces that enhance the living, working, learning environment of the Institute
- Improve campus accessibility

The two most significant issues, which arose after the completion of the 1997 plan, and are addressed in the Update are related to storm water management and campus accessibility. Storm water management is a significant issue for the city of Atlanta because much of the city relies on a combined storm and sanitary sewer system. This sewer system cannot contain all of the water flowing in during heavy and continuous rain storms. At such times, untreated sewage overflows into rivers and streams resulting in degradation of the water quality, thereby putting the city out of compliance with clean water regulations. The Update expanded on recommendations from the 1997 Master Plan by recommending a major conversion of existing open space (primarily parking and roads) into ecologically sustainable park land with increased stormwater retention capability. The 2004 Campus Master Plan Update's recommendations are expected to effectively reduce stormwater runoff and outflow to the sewer system.

The second major issue of importance to the Institute, which was not a significant factor in the 1997 Campus Master Plan, is accessibility for persons with disabilities. Although the 1997 plan addressed the framework for pedestrian movement it did not directly deal with accessibility issues. The topography of the Georgia Tech campus has required that accessibility be addressed through site and building design (generally through a combination of gently sloping sidewalks and building elevations) for numerous recent or on-going building projects on campus. In keeping with the intents of the Strategic Plan for the school, accessibility is a key part of an equitable environment and a key element of a sustainable campus community.

2006 Landscape Master Plan Overview

As a result of the recommendations in the 2004 Campus Master Plan Update, the Georgia Institute of Technology developed a Landscape Master Plan (LMP) in 2006. The intent of the LMP was to focus on recommendations contained in the 2004 CMPU and to create an ecologically-based plan document to guide future development to achieve a livable, sustainable, and beautiful campus. Specifically, the primary goals of the LMP were to achieve the following:

- Develop an integrated, ecologically-based landscape and open space system that helps Georgia Tech achieve its goal of environmental sustainability, specifically, a 50% reduction of current stormwater entering the Atlanta sewer system.
- Develop a landscape that enhances the living, working, and learning environment of the Institute.
- Develop a landscape that unifies the campus and gives it a distinct sense of place and expresses the identity of Georgia Tech.

Based on these goals, the LMP produced products which were made available to the Georgia Tech community online. These two components include a Master Plan Map, which shows the proposed conditions for the total landscape, and a Master Plan Report, which contains ecological requirements for different zones on campus, design intent for campus corridors, and guidelines for landscape development. The Master Plan Map identifies a network of design corridors for open space and transportation, which will visually unite different regions of campus and form the basis for the PTPMP's pedestrian and bicycle corridor recommendations.

Parking Implications

The recommendations of both the 2004 Campus Master Plan Update and the 2006 Landscape Master Plan will result in a major transformation of much of the interior Georgia Tech campus. The 2004 CMPU estimated that approximately 7,200 existing parking spaces would be eliminated through the development of greater open space (known as the Eco-Commons Plan) and new instructional/research facilities. The CMPU suggested a number of sites with the potential for construction of replacement parking in structured garages, however, since 2004 a number of these suggested locations have been designated for alternative land uses. The Update also recommends an expansion of development within the southwestern portion of campus, resulting in the elimination of most of Tech Parkway and conversion of Marietta Street into the primary roadway defining this portion of campus.

The Landscape Master Plan builds on the recommendations of the 2004 CMPU and recommends the transformation of numerous roadways from primarily vehicular facilities to non-automotive pathways. Specifically, the LMP advocates the conversion of Atlantic Drive to allow only pedestrians, bicycles, handicap vans, and service vehicles along a majority of its length. The plan also advocated reconstruction of portions of Cherry Street and Bobby Dodd was as pedestrian ways, essentially making their current usage as pedestrian zones permanent. These changes will result in some impacts to traffic patterns within campus, but should result in significant safety and mobility benefits for pedestrians and bicyclists. These recommended roadway conversions are expected to promote alternative modes of transportation, in keeping with the Institute's plan to reduce single occupant vehicles on campus.
Parking and Transportation Master Plan

Future Sites for Athletic and Recreational Facilities

The CMPU incorporates three sites that address needs for intercollegiate athletic facilities. New sites are identified for a women's softball field and associated support facilities, a new tennis center that incorporates outdoor courts and an indoor tennis facility on an adjacent site. All the new facilities proposed are clustered on the west side of campus near the existing Campus Recreation Center, thereby creating a consolidated athletics/recreational complex. Additionally, the CMPU identifies two sites, one the west side of campus and one site on the east side of campus, for recreational open space. The two western sites are currently occupied by parking lots and the eastern site is the site of the Peters Park parking deck (EP2D).

Since 2004, an alternative site for the women's softball field has been chosen on the east campus, just south of the Alexander Memorial Coliseum. As discussed in more detail in a subsequent section of this report, construction of the new softball field is complete.

Future Sites for Support Services and Infrastructure Facilities

The CMPU identifies potential locations for support services such as physical plant, operations and maintenance activities, printing services, infrastructure facilities, or specialized research facilities around the periphery of the campus. These uses do not require central locations on campus and the Marietta Street corridor is considered suitable for such uses, which could also be compatible with the planned active, urban, mixed-use environment for this corridor.

Future Sites for Student Residential Facilities

The CMPU identified three sites for future student housing and the March 2009 Final Student Housing Master Plan has provided additional detail on the Institute’s future housing plans. These plans focus on renovation and replacement of the oldest campus housing to expand capacity, provide more apartment-style housing for upper-classmen and graduate students, and support living-learning communities. The Housing Master Plan recommends improvements in three areas: renovation of the Tech Estates (Pitts, Freeman, and Montag halls) area, the combined replacement of Woodruff Hall and construction of over 1,000 new beds in two new buildings at Northside Drive and 10th Street; and renovation of Area 2 (Perry, Matheson, Hanson, Hopkins, and Field halls). Overall, the plan will recommend expansion of the Institute’s housing capacity by 1,119 beds, with the vast majority of this increase located in the proposed buildings in the northwest corner of campus.

Future Land Use and Building Plans

The 2004 CMPU provides a future building concept overlay for the Georgia Tech campus, which serves as a general “road map” for future development of instructional and research facilities on the campus. Overall, the CMPU calls for the following total future building development on the Georgia Tech campus:

- Approximately 4.1 million square feet of academic, research, office and support facilities (26 to 31 buildings)
- Graduate student housing for approximately 1,100 students
- Relocated plant operations (approx. 7 acres)
- Chiller plant (2 acres)
- Women’s Softball field

Additional Sites for Instructional / Research Facilities

In general, the CMPU does not designate specific departments or uses for the future buildings or sites, which provides flexibility to the Institute during the planning process. As has always been the case, the Institute will determine specific uses for each location based on the compatibility of adjacent uses. Exceptions to this include the Molecular and Materials Science and Engineering (MSE) Building, Molecular and Materials Science and Engineering (MSE) Building, and the Clough Undergraduate Learning Commons (CULC), all of which were either under design or construction by 2004. Exhibit 1 shows the proposed locations of new instructional or research buildings in dark blue.

The overall building development plans outlined in the CMPU will greatly expand upon the existing academic, residential, and athletic/recreation services and opportunities currently offered at the Institute. However, the plans present a significant transportation and parking challenges for the school. Building plans within the central core of the campus will result in elimination of multiple existing parking lots and garages, requiring replacement at least a portion of this lost parking supply. While greater enrollment may increase vehicular travel and demands for parking depending upon the amount of additional housing construction and the availability of non-automobile access to the campus.

Future Sites for Support Services and Infrastructure Facilities

The CMPU identifies potential locations for support services such as physical plant, operations and maintenance activities, printing services, infrastructure facilities, or specialized research facilities around the periphery of the campus. These uses do not require central locations on campus and the Marietta Street corridor is considered suitable for such uses, which could also be compatible with the planned active, urban, mixed-use environment for this corridor.

2004 Campus Master Plan Update/2006 Landscape Master Plan

Total Population (Georgia Institute of Technology)

<table>
<thead>
<tr>
<th>Observed Data</th>
<th>Future Projections (CMPU)</th>
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<tr>
<td>1996 2002 2003 2014 % Increase</td>
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</tr>
<tr>
<td>Faculty/Staff</td>
<td>3,973 4,609 5,482 7,585 38%</td>
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<tr>
<td>Undergraduates</td>
<td>9,469 11,457 11,257 12,000-13,000 7-15%</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>3,916 5,022 5,536 8,000-10,000 65-81%</td>
</tr>
<tr>
<td>Total</td>
<td>16,858 20,988 22,274 27,856-30,985 40-37%</td>
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Source: Georgia Tech Office of Capital Planning and Space Management

Enrollment Projections

In 1996 the enrollment at Georgia Tech was 12,985 total undergraduate and graduate students. The original 1997 Master Plan projected that Georgia Tech’s 2002 enrollment would grow to 13,789 undergraduate and graduate students and an additional 1,042 distance learning students. However, as shown in the Total Population table below, actual enrollment in the fall of 2002 significantly exceeded the original Master Plan projections and continued to grow in 2003.

For planning purposes, the 2004 CMPU assumed that the undergraduate enrollment would grow very little if at all over the chosen 10-year analysis horizon. However, the CMPU assumed that the graduate enrollment could double in that same time frame. As shown in the Total Population table, according to these projections, by 2014 Georgia Tech total enrollment on-campus would be approximately 20,000 - 22,000. Of this total, approximately 12,000 - 13,000 are assumed to be undergraduate students and approximately 8,000 - 10,000 are assumed to be graduate students.

Staffing Projections

In 2003 there were 5,482 faculty and staff employed at the Institute. The 2004 CMPU assumes that the ratio of faculty and staff to students will remain the same in the future as in 2002. Based on this assumption, the 2014 projections for future faculty and staff will be approximately 7,600 persons, an increase of about 2,100 persons, or a 38 percent increase.

The staff of Georgia Tech’s Office of Capital Planning and Space Management estimated that the largest increases would occur in the categories of Instructional Faculty and Librarians and Research Faculty and Professionals, who combined, account for about 1,650 of the total 2,100 assumed increase. It is important to note that the numbers in the table represent assumptions for the master plan’s purposes only and do not constitute actual projections, targets or goals defined by the Institute.

Future Sites for Student Residential Facilities

The CMPU identified three sites for future student housing and the March 2009 Final Student Housing Master Plan has provided additional detail on the Institute’s future housing plans. These plans focus on renovation and replacement of the oldest campus housing to expand capacity, provide more apartment-style housing for upper-classmen and graduate students, and support living-learning communities. The Housing Master Plan recommends improvements in three areas: renovation of the Tech Estates (Pitts, Freeman, and Montag halls) area, the combined replacement of Woodruff Hall and construction of over 1,000 new beds in two new buildings at Northside Drive and 10th Street; and renovation of Area 2 (Perry, Matheson, Hanson, Hopkins, and Field halls). Overall, the plan will recommend expansion of the Institute’s housing capacity by 1,119 beds, with the vast majority of this increase located in the proposed buildings in the northwest corner of campus.

Total Population (Georgia Institute of Technology)

<table>
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<tr>
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<td>Total</td>
<td>16,858 20,988 22,274 27,856-30,985 40-37%</td>
</tr>
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</table>

Source: Georgia Tech Office of Capital Planning and Space Management
Tech Parkway and Marietta Street Improvement Plans

CMPU Tech Parkway and Marietta Street Improvement Plans

The CMPU proposes major modifications to both the Tech Parkway and Marietta Street corridors as part of an overall plan to unlock potential campus development within existing Georgia Tech property and properties controlled by others along the southwestern portion of the campus. The CMPU plan suggests a partial reconstruction of Tech Parkway from its existing intersection with North Avenue to a new terminus at the intersection of Wallace Street and Marietta Street. The remaining portion of Tech Parkway to the northwest would be demolished and the right-of-way associated with the demolished roadway would become developable land within the campus. Numerous future instructional, research, and athletic facilities would be constructed along Marietta Street, which would replace Tech Parkway as the primary roadway defining this edge of campus. The Institute envisions Marietta Street as an attractively streetscaped and widened commercial thoroughfare, with expanded vehicular capacity (six lanes instead of the existing four lanes). Exhibit 2 shows the CMPU plan, with eliminated roads and facilities in red and proposed buildings in yellow.

The CMPU plans for Tech Parkway and Marietta Street entail major changes to the access and parking provisions for existing and potential future Institute facilities in the southwestern portion of the campus. The plan will result in a significant loss of existing parking, including the Student Center deck (W02). New parking facilities capable of replacing the lost parking supply and providing significant additional parking to meet new demands would be necessary under this plan.

City of Atlanta Marietta Street Improvement Plan

The City of Atlanta, in cooperation with local advocacy groups such as the Marietta Street Artery Association, is currently pursuing an improvement plan for the Marietta Street corridor which is contradictory to the CMPU plan. The City of Atlanta proposes a wide array of transportation improvements for the corridor to transform the roadway environment to provide slower speeds and make the roadway more conducive to alternative forms of transportation. Reconstruction of Marietta Street from a four-lane to a two-lane roadway, with possible retention of the two outer lanes for bus rapid transit lanes, is possible. Additional streetscape improvements to sidewalks, crosswalks, bicycle lanes, and bus shelters are envisioned. Resolution of these different visions for Marietta Street will be necessary if the elimination of Tech Parkway is to be achieved.

Eco-Commons Plan

The CMPU recommends a new paradigm for Georgia Tech's approach to achieving sustainability and livability throughout the entire campus. Through a broadening of the definitions of open space and landscape, the CMPU advocates a conversion of much of the existing campus from parking and vehicular transportation facilities to a mostly continuous band of greenspace and pedestrian-oriented transportation facilities. From the CMPU (page 12): "The functional open space constitutes what will look like a continuous park space extending through the north side of campus, occupying lands that are predominantly existing parking lots. The ecological overlay is applied to sites that are either occupied by existing development (buildings, open spaces, athletic and recreational fields, etc.) but that are important to the future development of the overall Eco-Commons Plan concept." The CMPU deems the Eco-Commons Plan essential to recognizing the inter-relationship between the living and non-living elements on campus and to achieving environmental sustainability, particularly in terms of reducing stormwater discharge to the city's combined sewer system. Exhibit 3 shows the Eco-Commons Plan concept.

Exhibit 2. Tech Parkway Elimination Plan

Source: 2004 Campus Master Plan Update

Exhibit 3. Eco-Commons Plan

Source: 2004 Campus Master Plan Update

Additionally, beyond a general emphasis on pedestrian corridor improvements, the pedestrian circulation system recommended in the Update incorporates an accessibility "overlay". Because of substantial grade changes on the Georgia Tech campus, accessibility is currently a major issue for students, faculty, staff and visitors with mobility impairments. The CMPU identifies several specific locations and types of improvements that are needed to make the campus significantly more accessible and meet federal accessibility guidelines.
The Landscape Master Plan (LMP) defines a grid of movement and open space corridors that should be more than simply functional streets and pathways. They should be three dimensional volumes of outdoor space that contain the community life of the campus—portals to buildings, gathering places, and venues for diverse activities. The LMP recommends steps that Georgia Tech can take to provide common design elements and uniform transportation operations on each individual corridor in order to unify different regions of campus visually and functionally. The design corridors defined in the LMP are summarized below and shown in Exhibit 4:

- Atlantic Drive
- Bobby Dodd-Third Street
- Cherry Street
- Eco-Commons Basin A
- Eco-Commons Basin B – Fourth Street
- Eighth Street
- Ferst Drive-Fifth Street
- Fowler Street
- Hemphill Avenue
- Plum Street
- State Street
- Techwood Drive
- Marietta Street (perimeter)
- North Avenue (perimeter)
- Northside Drive (perimeter)
- Tach Parkway (perimeter)
- Tenth Street (perimeter)

The LMP has selected the design corridors based on their cultural, historical, or geographic prominence as activity corridors on the Georgia Tech campus. While each exists in some part today, many are fragmented or are visually undistinguished. Some of the specific design recommendations from the LMP will significantly impact the visual and functional attributes of the existing core campus roadways.

Atlantic Drive and 4th Street

Atlantic Drive currently functions as an active north-south vehicular and pedestrian corridor, linking the central campus with Tenth Street and the Home Park neighborhood to the north. Fourth Street provides direct east-west access to buildings, including the Library, the College of Architecture, the future CULC, and parking in the heart of the campus.

The LMP makes specific recommendations for a transformation of Atlantic Drive and 4th Street within the interior core of the campus, from the existing vehicular roadways to dedicated pedestrian/non-automotive pathways. This conversion of the roadways’ primary use would be accomplished for much of Atlantic Drive (between the North parking deck and Tech Green) and along a short portion of Fourth Street, up to approximately the College of Architecture. The LMP calls for a narrower, tree-lined Atlantic Drive concourse, with focal points being a vertical monument at the highpoint around Fifth Street and Tech Green at the low point. The function of Fourth Street would be modified through paving to accommodate east-west lines of pedestrian movement and wide plazas space.

Cherry Street and Bobby Dodd Way

Cherry Street is one of the most admired streets on campus and provides connectivity between the heart of campus and North Avenue, to the south. Bobby Dodd Way connects historical Georgia Tech and the heart of the campus with the urban grid of midtown on the east side of the I-75/85 expressway. It is an especially active corridor on game days and an important connection between Tech Square and The Hill or the Student Center.

The LMP recommends permanently eliminating vehicular access to Cherry Street, between Ferst Drive and Bobby Dodd Way, and on Bobby Dodd Way, between Cherry Street and Fowler Street. The streets would be restricted to pedestrians, bicycles, handicapped vans, and service vehicles, as they are today. In general, the LMP suggests retaining the curbed streets but reducing their widths, accommodating bicycle lanes and parking, adding street tree strips, and constructing wider sidewalks, leading up to the top of the hill at the campus center. At the intersection of Cherry Street/Bobby Dodd Way, the LMP suggests that Georgia Tech create a brick-paved, simple orthogonal square with a monument that can be seen from all directions.

The proposed roadway closures represent an estimable goal to eliminate access for automobiles to the center of campus. The redesign of these roadways as non-automotive transportation facilities, coupled with the potential for new landscape and concourse design around the Tech Green and CULC areas, will change the character of this focal point on campus. However, these changes could present challenges for access to existing facilities and campus shuttle operations by limiting routing flexibility and further restricting shuttle access to the core campus area.

Future Sites for Structured Parking Decks

The CMPU uses the parking supply ratio objective defined in the 1997 Campus Master Plan to calculate future recommended parking supplies on the campus. The parking ratio objective is 52 spaces per 100 persons on campus (faculty, students and staff). This ratio was applied to an assumed future campus population of approximately 29,300 for a total recommended parking supply of about 15,000 spaces.

The CMPU accommodates this objective, and pursues several sustainability goals, by recommending relocation of approximately 7,200 existing parking spaces from surface parking lots to parking decks. This will provide needed sites for future buildings and open space and reduce the impervious coverage of the campus now occupied by parking lots.

As shown in Exhibit 5, the CMPU identifies 10 sites in orange for parking decks containing approximately 8,200 parking spaces. These spaces, in combination with the existing 4,500 spaces to remain will provide a total of about 12,700 structured parking spaces. The remainder is recommended to be accommodated at off-site locations or by retaining some existing surface lots.

Exhibit 5. Future Sites for Parking Decks

Source: 2004 Campus Master Plan Update

Notably, the CMPU does not assess the adequacy of the proposed supply and several of the proposed garage sites are no longer available or face significant challenges in terms of access to regional roadways and consistency with existing or proposed buildings/uses.
Marcus Nanotechnology Research Building

The Marcus Nanotechnology Research Building was recently completed on the site of the Electronics Research Building, and required relocation of the Neely Nuclear Research Center Building. The Marcus Nanotechnology Research Building is a 160,000 gross square foot facility, housing the new Nanotechnology Research Center (NRC). The NRC contains the largest cleanroom laboratory in the Southeast United States.

The facility includes state-of-the-art equipment, including a specialized electron-beam lithography tool. Scientists and engineers researching nanotechnology are studying the characteristics and behavior of atoms and molecules and using that knowledge to create new materials and tiny nano-scale tools and machines. The National Science Foundation has awarded funding to the Georgia Tech a new Materials Research Science and Engineering Center (MRSEC), to be housed in the Marcus Nanotechnology Building. This Laboratory will focus on the development of new materials to serve as the successors to silicon in the semiconductor industry.

Clough Undergraduate Learning Commons

The Clough Undergraduate Learning Commons (CULC) will be a seven-level building located on the slope between Tech Green and the Price Gilbert Library. Located at the center of campus, the CULC is envisioned as a multi-functional facility dedicated to students’ academic enrichment and offering innovative learning opportunities. Plans for the center aim to provide a unique environment, outside the traditional classroom, with hands-on, collaborative, and technologically enhanced teaching and learning opportunities. All of the first- and second-year core science laboratories will be located in the building. The CULC will take advantage of its location in the center of first- and second-year student activity, to offer a variety of academic support services to these students, regardless of School or College affiliation.

As stated in the 2004 Campus Master Plan Update, the Institute’s vision for the Clough Undergraduate Learning Commons (CULC) “is defined by five concepts – support for the teaching and learning mission of the Institute, collaboration / convergence, state-of-the-art technology, research / knowledge management and access. While the focus is on supporting and enhancing the undergraduate academic experience, we envision that faculty and staff will converge with students to utilize the [center] in both formal and informal activities. Its great appeal is that it is always staffed and available to customers, both in-person and remotely.”

This facility will be connected to the existing Library building and serve to consolidate many of the Library’s information, reference and technology support services as part of an overall renovation and reconfiguration of the existing Library complex. Georgia Tech sees this reconfiguration as an opportunity to provide state-of-the-art information resources, technology and expert advice in an environment that will be staffed virtually around the clock. The space will be designed to be inviting, providing services a café and display spaces for campus research projects and Georgia Tech history.

Construction of the CULC has already resulted in closure of parking lots E42, E43 and E14. Construction activities will also result in temporary closure of Fourth Street to automobile traffic, and reconfiguration of the driveways on the north side of the Library.

Women’s Softball Field

Georgia Tech has recently completed construction of a new women’s softball field on Fowler Street, between 8th Street and 9th Street, in the northeastern corner of campus. The new stadium will provide the Yellow Jackets softball team with a premier facility to host in-season tournaments, the ACC Tournament, and NCAA regional tournaments.

North Avenue Apartments

The Georgia Institute of Technology acquired the North Avenue Apartments (NAA) from Georgia State University in 2007. The North Avenue Apartments are located south of North Avenue between Centennial Olympic Park Drive and I-75/85. Originally built for the 1996 Olympics, the buildings were gifted to Georgia Tech to accommodate the expanding student population.

Georgia Tech has completed a Master Plan for the North Avenue Apartments, which include improvements to the NAA, including extensive renovation to the façade to correct construction deficiencies and transportation improvements. These transportation improvements include modifications to the vehicular drop-off, transit hub, and parking area on Centennial Olympic Park Drive, which is a gateway to the North Avenue Apartments complex.
North Avenue Streetscape

A North Avenue Corridor Study was developed to establish a conceptual plan for campus development along North Avenue, more fully integrate the corridor into the Georgia Tech campus, and identify necessary transportation improvements. The plan focuses on transforming North Avenue as a campus roadway rather than a campus edge, reinforcing Georgia Tech’s identity including campus gateways and open space, and creating a functional and safe circulation system.

Primary among the study’s recommendations is the need to implement a consistent streetscape design along North Avenue. This would be accomplished through installation of standardized streetlights, Georgia Tech signage and banners, new street trees, and a standardized sidewalk pattern. These improvements are mainly intended to provide a consistent and friendly aesthetic along this critical border of the Georgia Tech campus.

Additional physical improvements along North Avenue are also recommended in the study. These improvements include removal of fencing near the Tech Tower lawn to provide a new “gateway,” construction of a pedestrian plaza at Bobby Dodd Stadium, and reconfiguration of the parking lot at Smith Hall to provide wider sidewalks.

Finally, the study recommends measures to improve traffic operations on North Avenue and improve connectivity between the Georgia Tech campus and the North Avenue MARTA station, located to the east of campus. These improvements include new turn lanes from eastbound North Avenue onto Spring Street; implementation of two-way travel on Ponce de Leon Avenue; reductions of curb cuts at The Varsity; and possible redevelopment of the existing North Avenue Bridge over I-75/85.

West Campus Leadership Challenge Course Complex

A university-operated challenge course is planned in the location of an existing maintenance/power facility adjacent to the Couch Park in the northwest portion of the campus. The challenge course would consist of an engineered structure built of wood, steel, ropes, and cables, designed to allow safely-harnessed participants to traverse wooden and cable “bridges” or obstacles at various heights above the ground. The challenge course would provide outdoor personal development, leadership, and teambuilding opportunities for Tech students, faculty, staff, alumni, and external community organizations. The Leadership Challenge Course Complex will also feature an outdoor classroom pavilion and associated amenities to enhance the experience.

West Campus Leadership Challenge Course Complex Site
Parking and Transportation Master Plan

Connect Atlanta Plan

Overview

To prepare for the future, Atlanta has developed a Comprehensive Transportation Plan (CTP), known as the Connect Atlanta Plan, promoting mobility, continued economic growth, and desired quality of life for citizens and visitors to the city. The Plan was developed to achieve a number of goals related to the long-range vision and goals of residents and stakeholders of the City. These goals include promotion of safe and balanced alternatives to the use of single occupant automobiles, such as transit, pedestrian and bicycle facilities, and promotion of public health and safety, with a focus on pedestrian safety and reducing traffic accidents.

Based on analysis of existing transportation operations, a needs assessment and feedback from City Council Members, City Administration, the Technical and Stakeholder Advisory Committees, other stakeholders and the general public, the following recommendations were developed for the Connect Atlanta Plan:

- **Transit:** Ninety-five (95) miles of rail transit and high-frequency bus transit are recommended in the Plan. This includes existing proposals to extend MARTA’s West rail line to I-285 and construction of a Bus Rapid Transit line from the H.E. Holmes station to Fulton Industrial Boulevard. It also includes implementation of the planned BeltLine transit facility, the Peachtree Streetcar Streetcar, and high-frequency bus service, streetcar and light rail lines in several other major corridors in the city.

- **Bicycle Network:** The Plan proposes 200 miles of bicycle lanes on existing streets. A core set of bicycle lanes is proposed that will link key travel corridors to activity centers; a secondary set of bike lanes will link neighborhoods.

- **Pedestrian Facilities:** The plan will include guidelines for the location and design of sidewalks and other pedestrian amenities in new developments. There will also be guidelines for developed areas that reflect current land use and proximity to community facilities.

- **New Streets:** The plan proposes seventy-three (73) new streets to better connect the existing road network and improve the network’s efficiency.

- **Road Widening:** The plan will include twenty-two (22) proposed road widening projects to add more capacity to the system.

- **Other Projects:** There will be other projects in the plan such as intersection improvements, modifications in the one-way pairing of streets and roundabouts.

The Connect Atlanta Plan provides numerous opportunities for the Georgia Institute of Technology to expand the scope of its current transit and non-automotive connectivity. Preliminary information suggests new transit stations in proximity to Georgia Tech could be located at the North Avenue/Techr Parkways and Northside Drive/Marietta Street intersections. The proposed bicycle network includes lanes along several Georgia Tech campus perimeter roads such as 10th Street, Marietta Street, Spring Street, and Peachtree Street. The plan also discusses new transit networks, such as the BeltLine and Peachtree Streetcar initiatives, with connection opportunities.

BeltLine

The BeltLine is a comprehensive economic development effort being conducted by the City of Atlanta to continue greenspace, trails, transit, and new development along 22 miles of historic railroad segments that encircle the urban core. By attracting and organizing some of the region’s future growth around parks, transit, and trails, the BeltLine is anticipated to reduce sprawl, encourage sustainable development and transportation infrastructure, and enhance quality of life.

Primary among the BeltLine’s goals is the creation of a vastly improved urban transit, trails, and transportation network. The BeltLine will add 25 miles of light rail trail that will connect with the existing MARTA system and the proposed Peachtree Streetcar. New multi-use trails will follow the 22-mile trail loop, and 11 miles of additional trails will extend into surrounding neighborhoods to increase access to the BeltLine. The BeltLine will also improve the City’s transportation infrastructure by connecting neighborhoods via sidewalks, streetscapes, and road/transection improvements leading to a more cohesive urban street grid.

The proposed Beltline transit and trails routes surround the portion of downtown Atlanta which includes the Georgia Tech campus. To the east and west of campus, the Beltline loop is proposed to run within two miles of the Georgia Tech campus, providing opportunities for the Institute to connect its existing transit services with a large multi-modal system enclosing the city.

Peachtree Corridor Partnership and Peachtree Streetcar

The Peachtree Corridor Partnership seeks to transform 16.5 miles of Peachtree Street, from Club Drive in the north to Lee Street in the south, into a world-class boulevard. The Peachtree Corridor project will provide both streetscape improvements and a new streetcar transit system which the City of Atlanta expects will provide vehicular mobility improvements, economic growth, and improve quality of life. The city envisions the program fostering an increase in pedestrian activity and introducing non-vehicular vitality along the existing driver-oriented corridor.

The streetscape aspect of the program includes pedestrian improvements such as wider sidewalks, new parks, and more inviting public places where people can interact. The streetscape component calls for construction of a modern-day streetcar system to provide residents and visitors a method for making short trips without the use of cars.

The Peachtree Streetcar route will run along Peachtree Street, four blocks to the east of the Georgia Tech campus, and the segment closest to Georgia Tech is at approximately the midpoint of the route. Expansion of the Institute’s transit and pedestrian connections to provide more convenient access to the Peachtree Streetcar would link the Institute to a unique alternative mode of transportation and numerous destinations to the north and south of campus.

Midtown Alliance

The Midtown Alliance is a planning organization comprised of a collection of elected official and commercial property owners, which oversees the Midtown region of downtown Atlanta. The Mission of the Midtown Alliance is to improve and sustain the quality of life in the region through “a comprehensive approach to planning and development that includes initiatives to enhance public safety, improve the physical environment, and strengthen the urban amenities which give Midtown Atlanta its unique character.” The Midtown Alliance exists to promote and enable causes, such as retail, residential, and office development; public safety; streetscape enhancements; transit initiatives, and traffic improvements, within the Midtown region.

Specifically, the Midtown Alliance seeks the addition of more than 8 million square feet of new mixed-use development (residential, retail, or commercial), including 70% of this development in mixed-use centers, that are active day and night. This goal includes the addition of 30,000 new housing units in a blend of low, medium, and high-density residential and mixed-use configurations and 2 million square feet of new street-level retail space. The master plan also calls for a shift in the Midtown transportation focus, away from vehicles, to make pedestrian “priority one,” with wider and safer sidewalks and creative urban parks and places. The master plan recommends a multi-modal approach to transportation in Midtown, calling for new transit options such as trolleys, streetcars, and a network of bicycle lanes.

Home Park Master Plan

The Home Park neighborhood, located to the north of Georgia Tech, has undertaken a master-planning effort to provide cohesive direction to the improvement of land use and transportation within the neighborhood. As stated in the Greater Home Park Master Plan document, the plan provides “a vision of a community that is integrated, fully linked, and seamlessly connected to its environment.”

The plan recommends achievement of the neighborhood’s goals through identification of various development districts and specific improvements at various locations throughout the Home Park neighborhood. The plan includes encouragement for development within the Techwood Drive/14th Street area, Georgia Tech Foundation site, Naraje site, and Warehouse District. The plan also emphasizes pedestrian and transit improvements along major arterial roadways as a means to reduce vehicular traffic, improve non-vehicular transportation opportunities, improve the overall appeal of the community. Additionally, the plan seeks to support homeowners by offering methods to increase home ownership and encouraging greater interaction with Georgia Tech and the students living within the Home Park community to reduce conflicts between students and permanent residents.

Atlantic Station

Atlantic Station is the largest urban brownfield redevelopment in the nation. The 131-acre master planned community was formerly home to Atlantic Steel Company and is located in the northeast section of the Home Park neighborhood. The master plan totals 12 million square feet of residential, office, and retail space and 11 acres of public parks.

The master planned community offers a centrally located, walkable, mixed-use environment for diverse mix of commercial, residential, and office uses. The development incorporates pedestrian-friendly amenities and environmentally sensitive design, including LEED certification for many buildings, and the project’s developers consider the project to be a leader in smart growth design.

Georgia Tech currently provides a direct transit connection to the Atlantic Station development on Saturdays and Sundays via the Grocery Shuttle. Atlantic Station is employing many of the same sustainable development principles that the Institute is pursuing and may provide partnership opportunities for additional transportation connections through the Home Park neighborhood.
Parking and Transportation Master Plan

Stakeholder Meetings

Summary of Stakeholder Meeting Process

The following is a summary of the major themes and issues discussed during a series of PTMP stakeholder meetings held with various members of the Georgia Tech community and other parties in August 2008. Some of the groups involved in these meetings included representatives from the Parking and Transportation Office, Capital Planning and Space Management, Provost’s Office, Athletic Department, Student Center, Student Housing, Student Government, Campus Police, Facilities Department, MARTA, Midtown Alliance, and Home Park.

Transit Service and Connectivity to Neighboring Communities

A recurring theme of the stakeholder discussions was a desire from the Georgia Tech community to incorporate an effective and more expansive transit system to connect the school with a variety of important destinations. A number of stakeholders described inadequacies of the existing transportation opportunities on the Georgia Tech campus. Issues pertaining to both MARTA bus service and rail transit were expressed.

Bus service along the major corridors surrounding campus is considered complicated and inconsistent, and students said they are dissatisfied with MARTA bus service. MARTA acknowledged that cost increases have resulted in reduced service on some routes. Numerous stakeholders expressed a desire for better connections to residential areas and outlying communities, but the assertion to MARTA bus service could be a barrier to greater use of such routes. A number of stakeholders also cited insufficient bus shelters, a lack of pull-out lanes along roadways, and perceptions of social or safety concerns on bus routes as possible barriers to greater use of MARTA bus service.

Many stakeholders also felt that connections to the MARTA stations on 10th Street and North Avenue could be improved to be more accessible and inviting. Some student participants noted that the Stinger shuttles only go to the “edge of campus” and do not connect to the MARTA rail stations closest to campus.

Bicycle Routes and Parking/Storage

A general lack of dedicated bicycle lanes and bicycle parking/storage was cited by numerous individuals. The Georgia Tech campus does not currently have an expansive network of bicycle lanes. Lanes are currently provided on a portion of Ferst Drive/Spring Street, and the Georgia Tech campus does not provide any dedicated bicycle routes from the interior campus to outlying areas or neighboring communities. Dedicated bicycle connections, including both on-street bike lanes and off-street paths are desired to connect student residential areas with the central campus. Some of the areas identified for improved connectivity include 6th Street/McMillan Street, Home Park, Midtown, and the M Street Apartments. Some impediments to the provision of new bike lanes were identified, including on-street parking and community opposition.

Additionally, both student representatives and Georgia Tech administrators noted that the existing bicycle parking and storage options are inadequate to properly encourage bicycle usage. Some existing bike racks were described as unsafe and some existing bicycle lockers were described as being in disrepair. A greater number of bicycle racks or lockers are desired, particularly at the Student Center. Some opposition to providing new bicycle lockers was expressed, due to concerns about the amount of space required for them.

Trolley/Stinger Routing and Operations

A number of participants lamented the somewhat confusing pattern of trolley and shuttle routes (presumably the Green route in particular) and “roundabout” routing without stops in the very center of campus. Some stakeholders requested better signage at stops and increased availability of information through hand-held communication devices, such as cell phones or personal digital assistants. It is not clear to many people where the trolleys and shuttles stop and when they only stop when no passengers are boarding or alighting.

Some stakeholders also noted complaints about trolley/shuttle frequency and overcrowding, particularly during the morning and midday peak ridership periods, which generally coincide with movement of students from residential areas to classes in central or Tech Square areas. As noted in the Transit section, another frequent complaint with the shuttle system is that it does not travel beyond the perimeter of the Georgia Tech campus to serve destinations in nearby communities.

The general sentiment from university administrators is that Georgia Tech should provide one of the best transit systems of any universities in the nation. Some in the administration believe that as vehicle parking is consolidated along the fringes of campus, development of a parking shuttle service will eventually be necessary to get students and employees to and from the center of campus. A desire to incorporate cutting edge technology to improve communication between the transit services and its patrons was mentioned. Improvement of reliability and dependability are also priorities that Georgia Tech will seek as part of the goal to provide a first-tier system.

Campus Walkability and Pedestrian Connections to Neighboring Communities

While a number of stakeholders discussed problems with walkability in or around campus, some did note that pedestrian accommodations and facilities have improved recently. Students generally felt that the existing ten-minute break between class periods is sufficient to travel between classes, though some consideration is being given to extending this time.

Among the primary pedestrian concerns identified during the discussions are the major crossing points or nodes around the edges of the campus. The following locations were specifically identified as inopportune, and in some cases potentially dangerous, for pedestrian crossings:

• Northside Drive at 10th Street
• Spring Street at Fifth Street
• Techwood Drive at Bobby Dodd Way
• North Avenue at Techwood Drive
• North Avenue at I-75/85 ramp/Williams Street

Traffic volume is also considered a primary challenge to pedestrian improvements at all of these locations and vehicle speed is a major concern, particularly on North Avenue. Additionally, 10th Street was noted by multiple stakeholders as having limited crossing locations that result in finished mid-block crossings of the busy roadway. Given plans to build significant new facilities in the future, managing potential bicycle/pedestrian conflicts with construction, service and facility maintenance operations is also considered a challenge.

Stakeholders desired improved connectivity between the Georgia Tech campus and surrounding communities, particularly Home Park and Midtown. Both 10th Street and the I-75/85 corridor are seen by many as significant barriers to pedestrian connectivity between the campus and other communities. Many stakeholders consider both the North Avenue Bridge and the 10th Street Bridge to be unwelcoming to pedestrians, which may discourage travel to the nearby MARTA rail transit stations. The 3rd Avenue tunnel was also closed at the time of the meetings because of security/safety concerns for pedestrians. Improvement or replacement of this connection is desired by both Georgia Tech and Midtown Alliance representatives.

Parking Concerns

While overall parking supply for the campus is considered adequate, the major parking concern for most stakeholders on the Georgia Tech campus is the limited availability of parking at the main activity centers. This parking shortage was noted as particularly acute in:

• the eastern portion of the campus, which houses the central academic facilities, a number of residential dormitories, and athletic facilities; and
• the northeastern academic campus, near the Baker and Marcus Nanotechnology buildings.

Participants noted that the Peters parking garage, which provides the single largest supply of parking spaces for the eastern campus, is outdated and experiencing some structural deficiencies. The northwest academic campus is supported by a number of surface parking lots, which will be replaced with Eco-Commons green space in the future. Finding acceptable replacement options for the parking in both the Peters garage and the northeastern academic campus is considered a priority. Stakeholders noted a desire to see a new parking plan that provides above-grade, structured parking; limits single-occupant vehicles within the campus core; and provides good accessibility to transit. There is also a general desire for improved signage and access design for both vehicles and pedestrians at a number of parking garages, particularly the Student Center deck (W02). The Campus Recreation Center garage was provided as a good example of helpful signage.

Alternative Transportation and Sustainability

Throughout the stakeholder meeting process, participants consistently expressed interest in creating a first-tier transportation system with effective alternatives to single-occupant vehicle driving on the Georgia Tech campus. A variety of measures are envisioned to comprise such a system, including expanded bicycle accommodations, more efficient shuttle/trolley service, and long-term expansion of the existing transit system to provide new routes and connect to other transit systems throughout Atlanta.

Specifically, Georgia Tech administrators noted a desire to create additional bicycle lanes to encourage more bicycle travel and reduce use of sidewalks by bikers. The school is also considering bicycle sharing programs, with possible cooperation between various Georgia Tech departments, area residential communities, and retailers. Improvement of the trolley/shuttle system marketing and communication of routes and stop locations, potentially via popular electronic communication systems, is desired. Georgia Tech administrators also noted interest in opportunities to connect the campus transit system to other systems, such as the proposed Peachtree Streetcar line or a potential Emory CCOC/Buschute shuttle line.
Parking Location

The Georgia Institute of Technology maintains 39 separate permitted parking lots and garages on the Institute campus and off-campus locations. Additional visitor, metered, and public parking areas are also available on the campus. Exhibit 7 shows the location of all parking areas, the parking reference designation (i.e. W01, E862, etc.).

Exhibit 7. Campus Parking Locations and Designations
Source: Georgia Tech Parking and Transportation

Parking Supply

A review of Georgia Tech campus plans and information from Parking and Transportation indicates that a total of 12,954 parking spaces are provided by the Institute for use by students, staff/faculty, and visitors. It should be noted that this total does not include 270 additional Institute-owned parking spaces in the GTRI (E70) garage, which are leased to Georgia Public Broadcasting (including those spaces, Georgia Tech owns and maintains a total of 13,224 parking spaces). A summary of the parking spaces by type is provided below; reserved spaces include carpool and vanpool designated spaces. Motorcycle parking spaces have been excluded from this inventory.

To examine the parking supply, the campus map has been divided into seven regions, plus the off-campus GTRI site. These regions generally correspond to different activity types (i.e. residential vs. instructional/research activities). Exhibit 8 shows the parking supply by the various regions of campus. It should be noted that the Institute also has access to spaces located in the E82 garage, north of Tech Square, which are excluded from this inventory.

Summary of Parking Spaces, by Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of Spaces</th>
<th>Percent of Inventory</th>
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</thead>
<tbody>
<tr>
<td>Regular</td>
<td>11,818</td>
<td>91.9%</td>
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<tr>
<td>Handicap</td>
<td>241</td>
<td>1.9%</td>
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<tr>
<td>Reserved</td>
<td>191</td>
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<tr>
<td>Metered/Timed</td>
<td>177</td>
<td>1.4%</td>
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<tr>
<td>Fuel Efficient</td>
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<tr>
<td>Visitor</td>
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<td>3.1%</td>
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<tr>
<td>Total Spaces</td>
<td>12,954</td>
<td>100%</td>
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</table>

Source: Georgia Tech Office of Parking and Transportation

Exhibit 8. Campus Parking Supply
Source: Georgia Tech Parking and Transportation
Parking and Transportation has provided parking occupancy data for most of the parking lots and garages on campus. Therefore, Exhibit 9 shows the total number of occupied parking spaces, by region. It should be noted that occupancy data is not available for some parking locations, including the visitor parking lots and public metered spaces. Therefore, Exhibit 9 shows a revised parking space inventory, including only the parking spaces for which occupancy data was provided.

Exhibit 9 indicates that parking occupancy varies depending on location of each region. The region experiencing the greatest level of peak parking activity is East Campus (purple), which contains a large portion of the undergraduate housing and Bobby Dodd Stadium. The lowest levels of parking activity occur in the Tech Square (light blue) and GTRI garages, both of which are located outside of the main campus.

While a number of the regions do not show occupancy levels approaching parking capacity, some individual parking areas currently exceed their functional capacity during peak period of parking activity. The following table shows the campus parking supply by each parking garage or lot for which data was available.

<table>
<thead>
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<th>Eastern Parking Facilities</th>
<th>Western Parking Facilities</th>
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<td>Occupied Spaces</td>
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<tr>
<td>E94</td>
<td>396</td>
<td>429</td>
</tr>
<tr>
<td>E96</td>
<td>278</td>
<td>279</td>
</tr>
<tr>
<td>Total</td>
<td>4,434</td>
<td>6,078</td>
</tr>
</tbody>
</table>

Source: Georgia Tech Office of Parking and Transportation (excludes W09 and W32, for which no occupancy data was available)

Note: * Construction at CULC reduced E44 capacity from 167 to 72 spaces; occupancy data reflects pre-construction conditions

The parking occupancy data provided by the Georgia Tech Office of Parking and Transportation suggests that a number of individual parking garages and surface lots currently operate at or near capacity. In some cases, the occupancy data exceeds the parking supply value, resulting in occupancy percentages greater than 100 percent, which may indicate that some motorcycles were counted or that some vehicles are parked illegally. Of the 36 major parking facilities for which data was provided, 16 of these facilities currently experience peak parking occupancy greater than 80 percent. The individual parking garages and lots experiencing the greatest daily demand are mostly concentrated in the following regions:

- Southeastern campus: E41, E42, E43, E44, E45, E46, E47, E48, E49, E50, ER52, ER53 and lots EUR51, EUR52 are located in the historical and academic activity center, with relatively high densities of student residences; and
- Central/North campus: W21, W23, W25, W27, and W28, are located in an area with numerous instructional/research facilities, such as the Marcus Nanotechnology and Centennial Research buildings.

This data suggests that Georgia Tech’s reserve parking capacity is located toward the periphery of campus, in areas such as Tech Square, GTRI, NARA, and the southwestern portions of campus. While the data shows that the campus reaches peak occupancy of over 70 percent of capacity, approximately ten individual garages or parking lots within the campus core currently meet or exceed their functional capacity during peak times. This suggests that Georgia Tech should seek policies to encourage students and employees to park outside of these campus activity centers.
The Georgia Tech Office of Parking and Transportation sold approximately 11,195 parking permits for the 2008-2009 academic year. This figure does not include 132 additional permits sold for the affiliated E82 parking garage, north of Tech Square. Most of the permits are associated with an individual parking lot or garage and may not be used elsewhere. A limited number of permits (fewer than 100) are issued for use in all parking locations.

Exhibit 10 shows the number of permits sold for each parking location compared to the number of parking spaces provided in these locations. With the exception of the southeastern region of campus, which contains the historical and central academic buildings, the overall parking supply for each area exceeds the number of permits issued to users.

The exhibit indicates that most areas contain significantly more parking spaces than parking permits sold. However, more permits are sold for the east campus than the number of available spaces. This demand for parking permits is consistent with the high demand for parking, borne out by the previously analyzed occupancy data. Specifically, the Institute sells a greater number of permits than available spaces in the most active parking areas, which include ER51 and ER52 (Peters Deck). This indicates there is significantly greater demand than parking supply in these locations.

The Institute has also oversold parking permits in some garages which do not appear to experience peak occupancy of greater than approximately 70 percent, including the E40 (Klaus Advanced Computing buildings) and W02 (Student Center) garages. This reflects the daily fluctuations in parking demand at these locations and accounts for the fact that many students and employees do not travel to or park on campus every day.

On the other hand, the school has significantly undersold permits in some of the largest parking garages and lots located toward the outskirts of the campus, including E65, E70, E91, E92, E66, and W29. This indicates that the Institute has significant reserves of unused parking supply in these areas.

Exhibit 10. Parking Permits, by Region

Source: Georgia Tech Parking and Transportation
Note: * 272 additional permits with the designations “ANY09”, “EW”, and “RALL” have been issued to employees, students, and others but do not appear to be associated with a single specific parking location.
** Georgia Tech has issued 270 additional permits to Georgia Public Broadcasting for use in the E70 garage only; the permits and parking spaces associated with Georgia Public Broadcasting have been removed from this summary and the subsequent analysis.
Parking Pricing Strategy and Finances

Georgia Tech charged $500 for an annual parking permit in all locations in 2009/2010. Lower cost permits for carpooling, motorcycles, off-peak hours, weekly use, and daily use are also available for between $10 and $340. This pricing strategy effectively addresses equity issues often associated with zone parking pricing; however, the system does not provide price-incentives for well distributed use of all facilities. The permit sales data indicates that some of the most active parking lots in the campus core are oversold for permits, while a surplus of parking spaces exists in many other locations. This information suggests that the Institute may be undercharging for permits in central parking locations, but overcharging for permits in peripheral areas. At this time, the Institute has favored a simpler, one-size-fits-all system over a yield-maximizing/demand-balancing solution.

Financial data from the Office of Parking and Transportation was reviewed to determine the parking system’s revenue and expenditures. The following table summarizes the annual revenue and expenditures for the entire Georgia Tech parking system since 2005:

<table>
<thead>
<tr>
<th>Source: Georgia Institute of Technology Office of Parking and Transportation</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking Permits</td>
<td>$5,709,289</td>
<td>$6,290,116</td>
<td>$6,524,470</td>
<td>$6,809,179</td>
</tr>
<tr>
<td>Daily Parking</td>
<td>$1,389,683</td>
<td>$1,559,529</td>
<td>$1,689,090</td>
<td>$1,884,247</td>
</tr>
<tr>
<td>Parking Meters</td>
<td>$89,649</td>
<td>$90,569</td>
<td>$132,804</td>
<td>$135,823</td>
</tr>
<tr>
<td>Citations</td>
<td>$785,525</td>
<td>$789,048</td>
<td>$918,423</td>
<td>$1,170,692</td>
</tr>
<tr>
<td>Special Events &amp; Interest</td>
<td>$206,323</td>
<td>$331,669</td>
<td>$522,348</td>
<td>$691,897</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>$8,269,269</td>
<td>$9,020,053</td>
<td>$9,737,103</td>
<td>$10,320,838</td>
</tr>
<tr>
<td>Expenditures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personnel Salary</td>
<td>$1,053,840</td>
<td>$2,087,671</td>
<td>$2,118,749</td>
<td>$2,280,946</td>
</tr>
<tr>
<td>Direct Operating Expenses</td>
<td>$499,320</td>
<td>$493,766</td>
<td>$522,611</td>
<td>$573,219</td>
</tr>
<tr>
<td>Contracted Services</td>
<td>$61,364</td>
<td>$65,762</td>
<td>$69,207</td>
<td>$75,891</td>
</tr>
<tr>
<td>Equipment and Renovation</td>
<td>$0</td>
<td>$20,667</td>
<td>$62,103</td>
<td>$90,283</td>
</tr>
<tr>
<td>Indirect Operating Expenses</td>
<td>$898,901</td>
<td>$895,489</td>
<td>$878,003</td>
<td>$1,161,521</td>
</tr>
<tr>
<td>Debt Service</td>
<td>$3,700,986</td>
<td>$4,334,300</td>
<td>$5,161,661</td>
<td>$5,043,207</td>
</tr>
<tr>
<td>Total Expenditures</td>
<td>$5,774,011</td>
<td>$7,608,091</td>
<td>$8,643,394</td>
<td>$9,146,387</td>
</tr>
<tr>
<td>Net Income</td>
<td>$1,495,258</td>
<td>$1,401,962</td>
<td>$1,083,709</td>
<td>$1,172,471</td>
</tr>
<tr>
<td>Depreciation</td>
<td>$1,150,673</td>
<td>$1,390,616</td>
<td>$1,494,390</td>
<td>$3,371,862</td>
</tr>
<tr>
<td>Net Income After Depreciation</td>
<td>$344,585</td>
<td>$411,346</td>
<td>$589,319</td>
<td>($1,209,391)</td>
</tr>
</tbody>
</table>

Both the Student Center deck and Cumn Street deck will complete their financing schedule within the study horizon. Additionally, the Institute will make their final payment on the North Campus deck in 2010. The completion of payments on these parking facilities will reduce the Institute’s annual debt service obligations by approximately $1.8 million. The completion of these debt payments will likely coincide well with potential construction of new parking facilities to serve future demands. Based on the appropriate cost to construct each of the Georgia Tech parking structures, converted to 2008 dollars, it is possible to calculate an approximate existing cost for new facilities. These facilities provide a total parking supply of 5,555 spaces, suggesting the average cost to build a parking structure at Georgia Tech is approximately $14,300 per space. However, recent industry data suggests that the average cost of structured parking in Atlanta, GA is $17,035 per space, and this figure is used for all financial parking analysis in the PTMP.

Depreciation

The Georgia Tech Office of Parking and Transportation uses revenue to allocate funds toward future facility replacement. This funding is tied to the original cost of facility, applied over an assumed useful life of 40 years for a parking facility. In 2008, the Office of Parking and Transportation allocated $3,371,862 to this depreciation fund.

Financial Summary

The data included in the Annual Parking Finance Summary table indicates that net income (cash flow) from parking has remained relatively stable over recent years, exceeding $1,000,000 annually. This indicates that despite increasing debt, which has risen over 36 percent in three years, the Institute receives more in parking revenue than it spends to run and maintain the parking system. It is worth noting that all revenue comes directly from fees, operations, and interest, with no apparent additional subsidies from the Institute or other agencies. This revenue stability and growth is likely a result of increasing enrollment/employment, parking prices, and a large amount of surface parking that does not carry a debt-burden and is less expensive to operate and maintain.

However, this net revenue figure does not includes the facility depreciation costs, which the Office of Parking and Transportation matches with funding (in escrow) for renewal and replacement of facilities. A closer review of the data reveals that once depreciation funding is included, the Institute has not operated a revenue-neutral parking system since 2005. In fact, income (after depreciation) has steadily decreased over the past four years, which indicates that the Institute is not acquiring sufficient revenue to replace aging parking facilities without assuming additional debt. Additionally, Georgia Tech reported a very large increase in its depreciation figure for the 2008 fiscal year (over $3 million), from a 2007 audit suggesting previous depreciation payments were too low. According to the Georgia Tech Auxiliary Services Department, the 2008 depreciation expense is expected to decline to approximately $2 million.
Existing Conditions Assessment - Parking

Facilities Vehicle Locations

Exhibit 11 shows the storage locations and total number of facilities vehicles stored on the Georgia Tech campus. Facilities vehicles include full-sized trucks and automobiles, slow-speed open-air service carts, and other equipment. The location of these vehicles is important for determining needed reassignments associated with future changes in the campus parking supply. This exhibit identifies a total of 436 vehicles; however, Georgia Tech’s entire fleet of service vehicles includes 635 total vehicles. The remaining of vehicles not shown in this exhibit are either located off-campus or were unidentified in inventory data from Georgia Tech.

Exhibit 11. Facilities Vehicle Quantities and Locations
Source: Georgia Tech Parking and Transportation

On-campus Loading/Service Locations

Exhibit 12 shows the location of the major loading and service locations within the Georgia Tech campus. These locations include loading docks, maintenance areas, and dumpsters. Each location is identified according to its accessibility by adjacent street, via a parking lot, or by a shared walkway. Based on the information shown in Exhibit 12, many of the loading/service locations within the interior of the campus are only accessible via parking lots, which may be affected by future development plans.

Exhibit 12. Loading and Service Locations
Source: Georgia Tech Parking and Transportation
Travel Data and Patterns

Student Population and Travel Routes

The majority of the Georgia Tech's student population lives on campus; however, Georgia Tech does not provide housing for all students and a significant number live in nearby residential communities. Primary among the neighboring communities in which students live, are Home Park, Midtown, Lenox/Buckhead, and the Northwest Corridor. Exhibit 13 shows the location of these neighborhoods and summarizes the approximate student populations (of all universities) in each area.

Exhibit 13. On- and Off-campus Student Population

Source: 2000 U.S. Census Data (Note: Institute-provided data not usable for location analysis)

This data indicates that the majority of off-campus students reside either north or west of the campus. The primary routes to the Georgia Tech campus from these regions include I-75/85, Northside Drive, Hemphill Avenue, State Street, 10th Street, 5th Street, and North Avenue. These regional routes should influence the future campus transportation framework. For example, as part of the future parking and travel strategies, these regional routes should be considered prime locations for future parking facilities and bicycle lanes or sidewalk/crosswalk improvements.

Students use a variety of transportation modes to travel to and from campus, including automobiles, bus and rail transit, bicycles, and walking. However, Georgia Tech does not track student transportation data between campus and the outlying neighborhoods, so it is not possible to quantify the magnitude of students using each mode.

Employee Population and Travel Routes

Exhibit 14 shows the location of greatest employee population concentrations in the Atlanta metropolitan area. Shown in orange or red, these regions correspond to zip code population data from the U.S. Census Bureau. The area of single greatest employee population are the areas to the immediate north and west of the Georgia Tech campus, including Home Park, the Northwest Corridor, and the communities along Bankhead Highway to the west. Other areas of high employee residential concentrations include Midtown, North Atlanta, Druid Hills, Decatur, and outlying communities such as Smyrna and Marietta.

Of particular note is the geographic concentration of employees within the I-285 perimeter and further concentration along I-75 and I-85 to the north of the campus. The employee concentrations illustrated in Exhibit 14 were assigned to likely approach corridors based on GIS mapping. With this approach, it is possible to estimate travel routes for employees in each zip code. This travel routing shows which routes are the most likely paths for employees to commute to the Georgia Tech campus. The table below, which summarizes the travel routing analysis, indicates that the highest proportion of commuters originate from the north of the campus and use I-75, I-85, and GA-400 to access the local area.

Additionally, I-75 carries the highest proportion of Georgia Tech commuters when compared to the other regional expressways (I-20, I-85, GA-400). In terms of local access, North Avenue and Northside Drive carry the highest Georgia Tech-generated traffic loads. In addition to the percentages shown below, these roads also serve much of the traffic arriving from the regional highway system.

Exhibit 14. Employee Population Distribution

Source: Georgia Tech Parking and Transportation

Georgia Tech commuters when compared to the other regional expressways (I-20, I-85, GA-400).

<table>
<thead>
<tr>
<th>Route</th>
<th>To/From the East</th>
<th>To/From the West</th>
<th>To/From the North</th>
<th>To/From the South</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>25 %</td>
<td>14 %</td>
<td>39 %</td>
<td>22 %</td>
<td>100 %</td>
</tr>
<tr>
<td>North Avenue</td>
<td>10 %</td>
<td></td>
<td>4 %</td>
<td>4 %</td>
<td>10 %</td>
</tr>
<tr>
<td>Marietta Street</td>
<td>9 %</td>
<td></td>
<td>5 %</td>
<td>5 %</td>
<td>9 %</td>
</tr>
<tr>
<td>Northside Drive/ Bankhead Highway</td>
<td>8 %</td>
<td>5 %</td>
<td>17 %</td>
<td>9 %</td>
<td>26 %</td>
</tr>
<tr>
<td>I-75</td>
<td>10 %</td>
<td></td>
<td>10 %</td>
<td>9 %</td>
<td>21 %</td>
</tr>
</tbody>
</table>

Primary Travel Routes for Georgia Tech Employees

<table>
<thead>
<tr>
<th>Route</th>
<th>To/From the East</th>
<th>To/From the West</th>
<th>To/From the North</th>
<th>To/From the South</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>25 %</td>
<td>14 %</td>
<td>39 %</td>
<td>22 %</td>
<td>100 %</td>
</tr>
<tr>
<td>North Avenue</td>
<td>10 %</td>
<td></td>
<td>4 %</td>
<td>4 %</td>
<td>10 %</td>
</tr>
<tr>
<td>Marietta Street</td>
<td>9 %</td>
<td></td>
<td>5 %</td>
<td>5 %</td>
<td>9 %</td>
</tr>
<tr>
<td>Northside Drive/ Bankhead Highway</td>
<td>8 %</td>
<td>5 %</td>
<td>17 %</td>
<td>9 %</td>
<td>26 %</td>
</tr>
<tr>
<td>I-75</td>
<td>10 %</td>
<td></td>
<td>10 %</td>
<td>9 %</td>
<td>21 %</td>
</tr>
</tbody>
</table>
Bicycle and Pedestrian Facilities

The Georgia Tech campus is served by an extensive system of walkways, sidewalks and multiuse paths. However, the campus provides a limited number of on-street bicycle facilities. During the stakeholder meetings, greater bicycle accommodations were requested and a number of intersections within and around campus were identified as difficult crossing points for pedestrians. Exhibit 15 shows the existing bicycle lanes provided on Georgia Tech roadways and key locations identified during the stakeholder meetings and field investigation that should become the focus of bicycle and pedestrian improvements. The dashed line in the figure identifies an extension of the on-campus bicycle routes that could be implemented through restriping to improve overall network coverage.

Conflict and Congestion Zones

Based on input from the stakeholder meetings and a review of traffic data provided by the Institute, a number of conflict points were identified for future operational and pedestrian safety enhancements, as shown on the previous Exhibit 15. These locations have been observed to provide inadequate pedestrian crossing accommodations or may possibly lack compliance with accessibility requirements. The quality of pedestrian signal equipment and operations at these locations should be assessed, and future efforts should be made to address sidewalk and crosswalk deficiencies.

Alternative forms of transportation have not kept pace with significant increases in population in the Atlanta metropolitan area, which has led to increasing levels of congestion throughout the city. Major driving corridors in proximity to Georgia Tech have experienced similar congestion. In particular, the North Avenue corridor is a heavily traveled and congested corridor during the peak weekday commuter periods. Major capacity improvements on North Avenue, such as roadway widening, are impractical due to right-of-way constraints on both sides of the street. The North Avenue Streetscape Master Plan has suggested some smaller-scale capacity improvements, such as turning lane construction and curb cut reduction. The 10th Street corridor also experiences congestion during peak hours. The Home Park Master Plan discusses streetscape improvements on 10th Street, but no significant operational improvements have been proposed.

Without implementation of effective strategies to minimize single-occupant vehicular travel, the expected increases in enrollment and employment will likely only exacerbate congestion on the major routes providing access to the Georgia Tech campus. The PTMP assumes that the Institute will need to prioritize new alternative forms of transportation to provide a balance between growth and accessibility. Additionally, the PTMP recommends that Georgia Tech's construction of new parking facilities should continue to support a distribution of traffic loads to the major roadways providing access to the campus including Northside Drive, Luckie Street, Spring Street, and West Peachtree Street in addition to 10th Street, and North Avenue.
Campus Transit System and Ridership

Transit Routes
The Georgia Institute of Technology operates three shuttle routes (Stinger Shuttles) and one Tech Trolley route. Exhibit 16 shows a map of both the Stinger Shuttle and Tech Trolley (yellow) routes. Generally, the shuttles serve only destinations within the Georgia Tech campus, with the exception of the green route which diverges into Home Park and the Technology Enterprise Park/North Avenue Research Area. The Tech Trolley provides a connection through central campus, along Ferst Drive, and is the only route providing direct access to the MARTA system, at the 10th Street MARTA station.

Transit Ridership Data and Patterns
Exhibit 17 provides a summary of the average hourly ridership for each of the Stinger Shuttle and Tech Trolley routes. This exhibit demonstrates that the Tech Trolley and the Red Stinger routes are the most heavily traveled campus shuttle route. The Blue Stinger receives approximately two-thirds of the ridership of the Tech Trolley and Red Stinger. The Green Stinger serves much lower ridership, but is an important link to off-campus activity centers.

Exhibit 17. Stinger Shuttle and Tech Trolley Average Hourly Ridership
Source: Georgia Tech Parking and Transportation
Stingerette Escort Service

Georgia Tech operates an after-hours transportation option for Georgia Tech students, faculty, and staff, called Stingerette. The Stingerette service operates during the hours from 6:00 PM to 7:00 AM daily during the normal academic calendar. Prior to August 2008, Georgia Tech only operated the service until 2:00 AM. Depending on the time of day and rider demand, the service operates two to four separate vans simultaneously.

<table>
<thead>
<tr>
<th>Comparison of Monthly and Daily Stingerette Ridership (September 1 to October 9)</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Month+</td>
<td>Calls for Service</td>
<td>3,298</td>
</tr>
<tr>
<td>Number of Riders</td>
<td>4,743</td>
<td>11,423</td>
</tr>
<tr>
<td>Daily</td>
<td>Average Calls</td>
<td>87</td>
</tr>
<tr>
<td>Maximum Calls</td>
<td>151</td>
<td>381</td>
</tr>
</tbody>
</table>

The Stingerette service is limited to transportation between Georgia Tech operated living accommodations, academic buildings, Technology Square, and Georgia Tech facilities situated within the defined campus boundaries (10th Street, I-75/85, North Avenue, Tech Parkway, and Northside Drive). Additionally, the Stingerette shuttles will provide transportation to several off-campus locations, including CITRI, NARA, and sections of Marietta Street. The Stingerette travels to the MARTA Midtown Station after 11:00 PM. Based on ridership information provided by the Office of Parking and Transportation, the top five pickup and drop-off locations are the following:

- 14th Street and Hemphill Avenue (17%)
- Klaus Computing Center (13%)
- North Avenue Apartments (10%)
- Graduate Living Center (10%)
- Residential Lab (6%)
- College of Computing (6%)
- 14th Street and State Street (6%)
- Campus Recreation Center (7%)
- College of Computing (8%)

Campus Transit Financial Analysis

A summary of the Georgia Tech transportation revenues streams and expenditures is provided below. Much like the parking financial data, this summary shows that Georgia Tech has increased both its revenue and spending on transportation services over the past three years.

### Annual Transportation Finance Summary

<table>
<thead>
<tr>
<th>Parking Finance Categories</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>Fee Revenue</td>
<td>$1,793,131</td>
<td>$1,943,165</td>
</tr>
<tr>
<td></td>
<td>Summer Revenue</td>
<td>$237,201</td>
<td>$255,658</td>
</tr>
<tr>
<td></td>
<td>Institute Allocations/Other Revenue</td>
<td>$591,624</td>
<td>$0.00</td>
</tr>
<tr>
<td></td>
<td>Total Revenue</td>
<td>$2,621,956</td>
<td>$2,859,138</td>
</tr>
<tr>
<td>Expenditures</td>
<td>Personnel Service</td>
<td>$375,907</td>
<td>$407,250</td>
</tr>
<tr>
<td></td>
<td>Direct Operating Expenses</td>
<td>$101,754</td>
<td>$189,107</td>
</tr>
<tr>
<td></td>
<td>Contracted Services a</td>
<td>$1,919,022</td>
<td>$1,971,970</td>
</tr>
<tr>
<td></td>
<td>Equipment and Renovation</td>
<td>$6,920</td>
<td>$5,144</td>
</tr>
<tr>
<td></td>
<td>Indirect Operating Expenses</td>
<td>$59,723</td>
<td>$53,084</td>
</tr>
<tr>
<td></td>
<td>Total Expenditures</td>
<td>$2,464,326</td>
<td>$2,626,555</td>
</tr>
<tr>
<td>Net Income (Cash Flow)</td>
<td>$157,630</td>
<td>$232,583</td>
<td>$212,612</td>
</tr>
<tr>
<td>Depreciation Expense</td>
<td>$19,947</td>
<td>$19,657</td>
<td>$22,233</td>
</tr>
<tr>
<td>Net Income After Depreciation</td>
<td>$137,683</td>
<td>$212,926</td>
<td>$190,379</td>
</tr>
</tbody>
</table>

Source: Georgia Institute of Technology Office of Parking and Transportation

This financial summary indicates that the Institute’s Transportation systems is funded adequately to provide the services currently in operation, even after accounting for depreciation expenses, which are primarily associated with the Stingerette van fleet. The budget summary indicates that there may be opportunity for some expansion of service within the current funding structure. Contracted services from outside providers, such as the Stinger shuttles and Tech Trolley, are the single biggest expenses, but also easiest to track. The Stingerette Escort Service is operated by the Institute and its costs are not specified in the information provided by the Office of Parking and Transportation. Based on the 2007 contract costs and ridership data for both the Stinger and Tech Trolley services, the average cost per ride for each of the shuttle contracted routes is listed below:

- Tech Trolley: $0.69
- Red Stinger: $0.56
- Blue Stinger: $0.88
- Green Stinger: $2.29

All routes, except the green Stinger, cost less than $1.00 to operate per rider. The Green Stinger route receives significantly fewer riders than the other Stinger routes, which makes it significantly more expensive to operate, per ride. However, according to information from the Federal Transit Administration’s National Transit Database, the National average cost per ride for all public bus operators is approximately $2.70, and the MARTA bus operations cost approximately $3.33 per ride. Shuttle operating costs from one peer institution (Duke University) show a range of operating costs, depending on the route evaluated, between $0.89 and $9.48 per rider. By these measures, the per-ride costs for all of the shuttle routes operated by Georgia Tech compare favorably to other bus systems throughout the region and country.
Transportation Demand Management Programs

In addition to transit services, the Georgia Institute of Technology provides a variety of other resources through their Transportation Demand Management (TDM) program to minimize single occupant vehicle travel in and around the campus. The Instituteeither administers these TDM programs directly or partners with another organization to provide these important services. The Institute’s TDM initiatives include the following:

- Monthly discounts on the sale of transit passes, including MARTA transit passes
- Carpool incentives, such as preferential parking and parking permit discounts ($340 annual permit instead of $590)
- Pre-tax payroll deduction for employees for transit pass and carpool expenses
- Vanpooling is encouraged through provision of Vanpool Services International (VPSI) vans
- Ridershare programs, administered by Commute Connections
- SmartPark occasional parking program
- Emergency Ride Home program, administered by the Atlanta Regional Commission
- Grocery shuttle, which provides complimentary weekend transportation to a local supermarket
- Regular shuttle service to and from Emory University

Georgia Tech currently coordinates or partners with a variety of agencies to provide the TDM service and programs. These organizations include:

- Metropolitan Atlanta Rapid Transit Authority (MARTA)
- Atlanta Regional Commission
- Atlanta Bicycle Campaign
- Vanpool Services International (VPSI)
- Georgia Regional Transportation Authority Xpress
- Cobb Community Transit
- Gwinnett County Transit

It should be noted that the Institute expands on its participation in MARTA’s University Pass (U-Pass) Program by further discounting the sale of transit passes by $10. For instance, the $40 per month student U-pass is sold for $30, and the regular monthly pass of $52.50 is discounted by $10 for employees. Employees may also participate in pre-tax payroll deduction to further reduce out-of-pocket cost. Similarly, discounted passes are also available for GRTA, Cobb, and Gwinnett County systems.

A number of resources were reviewed for information on transportation mode choice (or “mode split”), to assess the current usage of various transportation modes by the Georgia Tech population. The 2000 U.S. Census Journey-to-Work (JTW) data, from surveys conducted by the U.S. Census Bureau, and the 2007 Midtown Alliance (Atlanta) Survey both provide mode split data for Georgia Tech employees.

As shown in the table below, both data sources indicate that the vast majority of employee commuters use single occupant vehicles to travel to and from the campus. However, the table also shows a significant evolution over the seven year period between the surveys, in which seven percent of “Drive Alone” and six percent of “Carpool” commuters shifted to the transit and non-automotive modes. In 2000, a total of 89 percent of employees traveled to campus by car (either alone or in a carpool). By 2007, the number of employees arriving by car had dropped to 76 percent and the number of employees who took transit, bicycled, or walked had increased to 24 percent.

**Existing Mode Split Summary for Georgia Tech Employees**

<table>
<thead>
<tr>
<th>Transportation Mode</th>
<th>2000 U.S. Census JTW Data</th>
<th>2007 Midtown Alliance Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive Alone</td>
<td>74%</td>
<td>67%</td>
</tr>
<tr>
<td>Carpool</td>
<td>15%</td>
<td>9%</td>
</tr>
<tr>
<td>Transit</td>
<td>6%</td>
<td>12%</td>
</tr>
<tr>
<td>Bicycle/Walk</td>
<td>5%</td>
<td>12%</td>
</tr>
</tbody>
</table>

*Note: Midtown Alliance Survey adjusted to 100%*

During this seven year period, the Technology Square area began operation and service to the Midtown MARTA station via the Tech Trolley was established. Additionally, this period was characterized by the revitalization of the Biltmore Hotel complex and the delivery of substantial housing capacity in Midtown Atlanta. The changes during this period are informative of the types of mode shift that might result from the next phases of PTMP development and additional or expanded strategies to increase this trend will be investigated in the future conditions assessment of this report.
To put the institute's transportation systems and TDM offerings into perspective, several institutions were contacted to identify current practices regarding TDM. This section provides an overview of institutional implementation of different categories of TDM measures across a variety of peer universities. This information was gathered through brief interviews with University officials and through information available on the respective institutions’ websites. Basic statistics for each peer institution are summarized in Exhibit 18 below and a more detailed description of each program is provided in this section.

### Exhibit 18. Peer Comparison Summary

<table>
<thead>
<tr>
<th>Institution</th>
<th>Population</th>
<th>Land Use</th>
<th>Parking Spaces</th>
<th>Notable TDM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia Tech</td>
<td>24,112</td>
<td>Urban</td>
<td>12,954</td>
<td>Extensive shuttle system; rideshare matching, parking, and discount; transit discount; car sharing</td>
</tr>
<tr>
<td>Georgia State</td>
<td>28,046</td>
<td>Urban</td>
<td>6,000</td>
<td>Extensive shuttle system; rideshare matching, parking, and discount; transit discount; car sharing</td>
</tr>
<tr>
<td>Emory</td>
<td>35,469</td>
<td>Urban/Suburban</td>
<td>15,000</td>
<td>Extensive shuttle system; rideshare matching, parking, and discount; transit discount; car sharing</td>
</tr>
<tr>
<td>NC State</td>
<td>39,012</td>
<td>Urban/Suburban</td>
<td>18,000</td>
<td>Extensive shuttle system; rideshare matching, parking, and discount; transit discount; car sharing</td>
</tr>
<tr>
<td>Washington</td>
<td>65,000</td>
<td>Urban</td>
<td>11,410</td>
<td>Extensive shuttle system; rideshare matching, parking, and discount; transit discount; car sharing</td>
</tr>
<tr>
<td>MIT</td>
<td>20,200</td>
<td>Suburban</td>
<td>n/a</td>
<td>Extensive shuttle system; rideshare matching, parking, and discount; transit discount; car sharing</td>
</tr>
<tr>
<td>Stanford</td>
<td>32,000</td>
<td>Urban</td>
<td>22,187</td>
<td>Extensive shuttle system; rideshare matching, parking, and discount; transit discount; car sharing</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>62,000</td>
<td>Urban</td>
<td>13,000</td>
<td>Extensive shuttle system; rideshare matching, parking, and discount; transit discount; car sharing</td>
</tr>
</tbody>
</table>

**North Carolina State University, Raleigh, NC**

- **Students:** 31,130
- **Faculty/Staff:** 7,882

NC State has, in recent years, experienced some growing pains and had to spread some campus facilities farther apart. The university operates shuttle buses to link the three sections of its campus and offers everyone free rides on local and regional buses. However, there is still a high demand for parking and the school maintains approximately 18,000 spaces. Annual parking fees range from some free departmental spaces to $948 for reserved employee parking.

Besides offering fare-free transit, NC State employs a TDM coordinator to assist with ridesharing and organization of the Wolf Trails program to encourage the use of alternative modes of transportation, including cycling and walking. Program participants who commit to using non-single occupancy vehicles get the privilege of up to 12 free daily campus parking passes. Carpool members receive 24 passes for only $2 per day and pedestrian and cyclist commuters can receive a few additional days to park on campus when their typical commute is not convenient for them.

**University of Washington, Seattle, WA**

- **Students:** 40,000
- **Faculty/Staff:** 25,000

The University of Washington has long been a recognized leader in creating programs and incentives to reduce single-occupancy vehicle (SOV) commutes to its campus. The university, with a large campus population and extensive medical center, maintains a supply of 11,410 parking spaces. Parking permits range from $245 for shared carpool arrangements to $1,140 for SOV commuter parking.

For an annual fee of $280 for staff and $200 for students, the campus community receives unlimited free rides on Seattle’s extensive local bus system. The campus is connected to many parts of the city with on- and off-road bicycle lanes and with wide and continuous sidewalks. A high percentage of commuters take advantage of many benefits offered by the university to walk or bike to campus. Other transportation incentives available to commuters at the University of Washington include waived membership fees to Zipcar’s car share service, a partial subsidy of vanpool fees, and occasional parking privileges. The university has a small staff dedicated to helping people find rideshare partners and the best transit routes for them.

**Massachusetts Institute of Technology, Cambridge, MA**

- **Students:** 10,000
- **Faculty/Staff:** 10,200

Parking at MIT is constrained and ranges from $560 annually for limited student spots to $935 for certain staff. A 20% permit discount is given to commuters who drive a fuel-efficient and low emissions EPA-certified SmartWay car to campus. The City of Cambridge restricts MIT to providing parking to no more than 36% of its commuter population. Parking fees increase typically 11% each year.

MIT’s urban, walkable proximity to a subway line and several bus routes gives it convenient access to commuting alternatives. All MIT affiliates receive a 50% discount on monthly bus and rail passes. Many of the roadways that lead to and through the campus have on-road bicycle lanes. Sidewalks are found on both sides of all local streets. While there is an on-staff transportation coordinator, many individuals find rideshare partners through a state-funded organization called MassRIDES. Other commuting benefits that MIT offers include vanpool subsidies and pre-tax payment, discounted parking permits for ridesharing, occasional parking permits, and a guaranteed ride home program. The MIT campus operates their own shuttle system to link to other area universities and a grocery store.
Stanford University is located in suburban Palo Alto, north of San Jose and south of San Francisco. In the center of a large urbanized area, Stanford benefits from easy access to local and regional bus and rail service. The university’s shuttle system connects campus locations with external transit providers to put the Stanford community within reach of most locations in the Bay Area. While Stanford maintains a large supply of 22,187 parking spaces to serve its sprawling campus, medical center, and research facilities, it has some of the most aggressive TDM programs in the country. Parking is priced at between $282 and $726 annually.

Stanford created a Commute Club program to provide incentives aimed at increasing use of alternative modes to travel to campus, reducing congestion, and improving the environment. Members of the program commit to not driving alone to campus and give up the right to a single-occupancy vehicle permit. In exchange, members receive a wide array of benefits, including: up to $216 a year in cash, free travel on many bus and rail lines, pre-tax payment for infrastructure, ride matching services, the ability to purchase up to eight daily parking permits a month, rewards for recruiting new members, a guaranteed ride home program, 12 free hourly car rental vouchers, membership appreciation events, and prize drawings. The university also encourages certain employees to take advantage of flexible work arrangements or telecommuting. Stanford and the surrounding community maintain on- and off-road bicycle lanes and wide and continuous sidewalks leading to and through the campus.

Georgia State University, Atlanta, GA
Students: 27,000
Faculty/Staff: 1,048 (staff estimate not available)

Georgia State’s campus in downtown Atlanta benefits from good access to local bus services and MARTA. The school maintains a supply of 6,000 parking spaces and does not have many restrictions on who may park on campus. Some parking is leased from Turner Field and connected to the campus by the Panther Shuttle. Parking fees range from free remote student parking to $960 annually for most faculty lots. Georgia State provides its affiliates with a few other park and ride opportunities that are linked by the school’s Panther Shuttle system. Zipcar offices are located throughout downtown Atlanta and help serve short-term car needs of its members.

The Downtown Atlanta Transportation Management Association (TMA) provides TDM services available to Georgia State, including a commuter rewards program offering up to $3 a day for non-single occupancy vehicle commuters. The TMA also offers a guaranteed ride home program and assists with ride matching through RideSmart. Monthly discounts are available on MARTA monthly transit passes in the amount of approximately $10 a month for faculty and staff and $20 for students.

Emory University, Atlanta, GA
Students: 12,755
Faculty/Staff: 22,714

Emory University, located in a suburban area of Atlanta, contains a large supply of 15,000 parking spaces to serve its campus and extensive medical center. Parking at Emory costs $600 a year for most students, faculty, and staff. Permits cost up to $1,500 for certain reserved parking spaces. Emory is considered a leader in its efforts to make its campus more sustainable and has significant programs to attract people to alternative commutes. Faculty and staff are offered a 100% subsidy towards the purchase of monthly MARTA transit passes. The MARTA U-Pass Program (not operated by Emory University) allows students to purchase monthly passes at a discounted rate of $40 (instead of $52.50). The campus is served by an extensive shuttle system that connects major attractions with the campus. Currently, there is a plan to expand the availability of park and ride by connecting local shopping mall parking lots to the central part of the campus.

Among the TDM programs offered to the Emory community by the University or through partnership with the Atlanta Regional Commission are car and vanpool ride matching, preferential parking and reduced permit rates for two- and three-person ride-sharing, the Cliff Permit program to offer 34 occasional parking passes to people who typically use another commute mode, a discounted Zipcar car share membership, a guaranteed ride home program, and prize drawings for items like gas cards. Registered vanpools receive monthly subsidies and reserved parking. The Cash for Commuters program, offered through the Clean Air Campaign, rewards commuters who use alternative modes with up to $900 annually. A TDM coordinator serves as an alternative transportation point-of-contact for the Emory community and is engaged with program development and monitoring.
Future Building Program

Using the Georgia Tech 2004 CMPU as a starting point, the PTMP developed a set of building program assumptions for the future 2014 and 2019 analysis horizons. These assumptions were confirmed by the Office of Capital Planning and Space Management and combined with the future enrollment projections to inform the future parking evaluation.

For the purposes of the future conditions parking evaluation, the future building program assumptions are divided into two primary categories: resident student beds and academic/research space. The CMPU discusses future residential space growth in the northwest corner of campus and the Georgia Tech Housing Master Plan provides more detail on these plans, discussing replacement and expansion of Woodruff Hall to provide a total of 1,119 new beds around 2014. Future growth assumptions for the academic/research space is based on the list of future building space included in the CMPU and scheduling information provided by the Georgia Tech Capital Planning and Space Management Department.

The table below summarizes the building program assumptions and schedule. Additionally, Exhibit 19 shows the location and assumed schedule for completion of the building space applied to the PTMP parking analysis.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>West Campus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>1,119 beds</td>
<td>0 beds</td>
<td>0 beds</td>
</tr>
<tr>
<td>Academic/Research</td>
<td>0 sf</td>
<td>0 sf</td>
<td>155,000 sf</td>
</tr>
<tr>
<td>North Campus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic/Research</td>
<td>369,350 sf</td>
<td>663,200 sf</td>
<td>0 sf</td>
</tr>
<tr>
<td>Central Campus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic/Research</td>
<td>756,100 sf</td>
<td>1,512,000 sf</td>
<td>1,125,000 sf</td>
</tr>
<tr>
<td>East Campus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic/Research</td>
<td>225,000 sf</td>
<td>0 sf</td>
<td>0 sf</td>
</tr>
<tr>
<td>NARA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic/Research</td>
<td>0 sf</td>
<td>325,000 sf</td>
<td>0 sf</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>1,119 beds</td>
<td>0 beds</td>
<td>0 beds</td>
</tr>
<tr>
<td>Academic/Research</td>
<td>1,423,250 sf</td>
<td>2,490,200 sf</td>
<td>1,280,000 sf</td>
</tr>
</tbody>
</table>

Source: Georgia Institute of Technology 2004 CMPU and Office of Capital Planning and Space Management

As shown in the summary table, the CMPU calls for further campus development of approximately 1,280,000 sf after 2019. The development schedule for this planning building space is beyond the Parking and Transportation Master Plan study horizon, and therefore, this development is not included in this PTMP evaluation.
Future Parking Supply

As discussed in the CMPU, a significant portion of the existing surface parking, particularly within the central campus, will be eliminated to complete both the Eco-Commons Plan and planned future building development on the Institute campus within the next ten years. Additionally, some structured parking facilities which are approaching the end of their useful life may also be decommissioned. The table below summarizes the expected parking supply losses at the five and ten-year horizons for the PTMP parking analysis. Exhibit 20 identifies the location and schedule for the anticipated loss of each parking lot or garage.

### Anticipated Georgia Tech Parking Supply Losses

<table>
<thead>
<tr>
<th>Location (lot/garage ID, if eliminated by 2019)</th>
<th>Total by 2014</th>
<th>Total by 2019</th>
<th>Additional Loss by 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Campus (part of W29)</td>
<td>-319</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>North Campus (W24, W25, and W26)</td>
<td>-593</td>
<td>-210</td>
<td>-803</td>
</tr>
<tr>
<td>Central Campus (W21, E41, E45, E46, E47, and E49)</td>
<td>-529</td>
<td>-820</td>
<td>-1,114</td>
</tr>
<tr>
<td>East Campus (ERS2 Peter's Deck)</td>
<td>0</td>
<td>-625</td>
<td>-625</td>
</tr>
<tr>
<td>Southwest Campus</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>-1,441</strong></td>
<td><strong>-1,126</strong></td>
<td><strong>-2,567</strong></td>
</tr>
</tbody>
</table>

Exhibit 20. Parking Loss Locations and Schedule

As shown in the table and exhibit, a total of over 2,500 spaces are expected to be replaced by open space or development by 2019. While it is outside the PTMP study horizon, the planned development program in the CMPU will result in an additional loss of 1,950 parking spaces after 2019, including the entire Student Center deck and all existing parking the southwest campus. While this development falls outside of the PTMP study horizon, this information suggests that the Institute will likely need to consider parking expansion in the central and southwestern regions after 2019.

Impact to Facilities Vehicles

### Service Vehicle Parking/Storage

The proposed development plans, and associated parking elimination, will result in impacts to the existing facilities vehicle storage and access. As a result of the Institute’s development plans, a total of 193 Facilities vehicles will potentially be displaced to other locations. The number of facilities vehicles affected is relatively small compared to the scale of overall parking supply losses, representing about eight percent of the total parking supply losses by 2019. Exhibit 21 identifies the Facilities vehicle locations which will be affected by the Institute’s development plans. Alternative parking or storage for these vehicles will need to be accomplished through a combination of designated parking in existing areas, new structures, and areas designated for facilities vehicles within new development on the Georgia Tech campus.

### Service and Loading Vehicle Access

Development plans within the central campus will eliminate parking lot W21, which is currently the only access route for full-sized facilities vehicles to some buildings, such as the Boggs Building, Forst Center, and MDRC. Future access to other buildings, such as the Howey Physics and Mason Civil Engineering buildings, by full-sized vehicles will only be possible via the access-restricted Atlantic Drive, which does not provide direct access to some of the service/loading areas for these buildings.

Many of the existing service or loading locations within the central campus are already accessible only via shared pathways. The future development plan limitations highlight the importance of providing sufficient off-street pathways serving any future central campus development, which can accommodate smaller facilities vehicles, such as motorized utility carts. Depending on the type of service and loading activities required at existing and future central campus buildings, construction of a service roadway within the central campus, as part of the redevelopment of this area, may be necessary. A roadway along the north-south axis, extending south from Forst Drive at State Street would provide access to most of the existing affected buildings and could serve future development as well.
Future Conditions Assessment – Parking Analysis

Parking Analysis Scenarios

To provide a sensitivity analysis of various potential future conditions, a variety of parking analysis scenarios were developed to test the adequacy of the future parking supply. These scenarios are designed to account for changes in the campus population, parking supply, parking permit rates, and transportation mode split. Each scenario is described in more detail and the commuter mode split results for each scenario are included in the table below.

Future Parking Scenario 1
Scenario 1 provides a hypothetical "status quo" alternative, assuming no changes to the Georgia Tech parking system or transportation mode share over the study horizons. This scenario assumes that all of the existing parking supply is retained and that all campus users continue to travel to campus by existing transportation modes at current levels.

Future Parking Scenario 2
Scenario 2 examines the future parking conditions under the assumption that the Eco-Commons Plan and future development would be completed, but that Georgia Tech would implement no measures to change commuters' mode choice. Therefore, this scenario includes all expected parking supply losses in 2014 and 2019, but assumes no change to the existing transportation mode split data.

Future Parking Scenario 2A
Scenario 2A uses the same baseline parking loss assumptions as Scenario 2. However, Scenario 2A examines the necessary transportation mode shifts from single occupant vehicles to both transit and pedestrian/bicycle modes necessary to maintain a 90 percent maximum occupancy level for the entire campus, in both 2014 and 2019. Scenario 2A assumes no change in the percentage of carpool/vanpool drivers and that the mode shift from single occupancy vehicles will be equally split between the transit and pedestrian/bicycle modes.

Future Parking Scenario 2B
Scenario 2B uses the same baseline parking loss assumptions as Scenarios 2 and 2A. However, Scenario 2B examines the necessary transportation mode shifts from single occupant vehicles to both transit and pedestrian/bicycle modes necessary to maintain a 90 percent maximum occupancy level for each region of campus. Like Scenario 2A, Scenario 2B assumes no change in the percentage of carpool/vanpool drivers and that the mode shift from single occupancy vehicles will be equally split between the transit and pedestrian/bicycle modes.

Future Parking Scenario 3
Scenario 3 is designed to examine future parking operations after both expected future parking losses and realistic commuter mode shift assumptions. Historical trends in census and survey data for the Institute show the migration of seven percent of commuters from single-occupant vehicles to alternative modes between 2000 and 2007. Based on this data, and similar trends other institutions, reasonable reduction targets of 5 and 10 percent in single-occupant vehicles by 2014 and 2019, respectively, are applied to the Scenario 3 parking analysis. Like other scenarios, Scenario 3 assumes no change in the percentage of carpool/vanpool drivers and that the mode shift from single occupancy vehicles will be equally split between the transit and pedestrian/bicycle modes.

Summary Mode Split Changes, by Scenario

<table>
<thead>
<tr>
<th>Transportation Mode</th>
<th>Scenario 1 &amp; 2 (both years)</th>
<th>Scenario 2A (both years)</th>
<th>Scenario 2B (both years)</th>
<th>Scenario 3 (both years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive Alone</td>
<td>67%</td>
<td>67%</td>
<td>56%</td>
<td>39%</td>
</tr>
<tr>
<td>Carpool</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>Transit</td>
<td>12%</td>
<td>12%</td>
<td>16%</td>
<td>26%</td>
</tr>
<tr>
<td>Bicycle/Walk</td>
<td>12%</td>
<td>12%</td>
<td>17%</td>
<td>26%</td>
</tr>
</tbody>
</table>

For the purposes of this analysis, a target of 50 percent was selected for the maximum allowable peak parking occupancy in all future parking conditions. This level of parking occupancy would represent a significant increase in parking occupancy for the Institute, which currently experiences approximately 74 percent peak occupancy, and maximize the revenue potential for this important Institute resource. Additionally, because occupancy levels near 100 percent may result in scarcity in some lots and force some drivers to park in less desirable parking spaces (i.e. top floor of garages, furthest from stairwells/exits, etc.), pursuit of high occupancy goals can encourage campus users to consider alternative transportation modes.
Parking Analysis Results

The PTMP provides the projected parking supply, parking occupancy, and percentage parking occupancy for existing conditions and each future parking scenario, by region and for the overall campus. In this analysis, parking occupancy represents the peak daily demand for parking spaces on the campus, which may exceed supply in some scenarios, resulting in projected occupancy levels higher than 100 percent. Such parking occupancy (i.e. demand) results demonstrate limitations of the future Georgia Tech parking system to accommodate future users at peak levels in those scenarios. As discussed previously, a target parking ratio of 90 percent occupancy is considered to be optimal maximum level.

Baseline Conditions (Existing)

The following table shows the existing parking supply, occupancy, and percentage occupancy on the Georgia Tech campus, based on parking inventory and peak occupancy information provided by the Office of Parking and Transportation. It should be noted that the parking supply and occupancy data do not include the outlying NARA and GTRI parking areas, for which data was limited and which are unlikely to play a significant role in accommodating future parking demands outside of their own needs.

### Existing Parking Summary

<table>
<thead>
<tr>
<th>Region</th>
<th>Parking Supply</th>
<th>Parking Occupancy</th>
<th>Percentage Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Campus</td>
<td>2,000</td>
<td>1,496</td>
<td>75%</td>
</tr>
<tr>
<td>North Campus</td>
<td>3,003</td>
<td>2,174</td>
<td>72%</td>
</tr>
<tr>
<td>Central Campus</td>
<td>2,504</td>
<td>1,885</td>
<td>74%</td>
</tr>
<tr>
<td>East Campus</td>
<td>2,055</td>
<td>1,896</td>
<td>92%</td>
</tr>
<tr>
<td>Tech Square</td>
<td>1,461</td>
<td>878</td>
<td>59%</td>
</tr>
<tr>
<td>Southwest Campus</td>
<td>836</td>
<td>536</td>
<td>64%</td>
</tr>
<tr>
<td>Total</td>
<td>11,889</td>
<td>8,835</td>
<td>74%</td>
</tr>
</tbody>
</table>

The information provided in this table represents the baseline condition from which the future parking scenarios were developed. The information indicates that the Institute is currently approximately three-quarters occupied under peak conditions, with a maximum occupancy of 92 percent in the residential and academic east campus.

Future Scenarios

The following tables provide summaries of the parking analysis results for each parking scenario. As discussed in the detailed descriptions of each scenario, the future parking supply and occupancy projections provided in these tables were calculated based on the future development plans of the Institute, future enrollment and employment projections, and modifications to the projected future commuter mode split. The future parking occupancy results reflect projected demand for parking spaces within each region of the Georgia Tech campus. Therefore, these results may exceed the parking supply ( reflected in percentage occupancy results greater than 100 percent). These demand projections are intended to provide guidance on the relative desire from the campus community for parking in each given region and to drive the Institute’s decision making process regarding the recommended location and size of future parking facilities.

### Scenario 1 Future Parking Summary

<table>
<thead>
<tr>
<th>Region</th>
<th>Parking Supply</th>
<th>Parking Occupancy</th>
<th>Percentage Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Campus</td>
<td>2,000</td>
<td>1,905</td>
<td>95%</td>
</tr>
<tr>
<td>North Campus</td>
<td>3,003</td>
<td>2,802</td>
<td>93%</td>
</tr>
<tr>
<td>Central Campus</td>
<td>2,504</td>
<td>3,255</td>
<td>130%</td>
</tr>
<tr>
<td>East Campus</td>
<td>2,055</td>
<td>1,886</td>
<td>92%</td>
</tr>
<tr>
<td>Tech Square</td>
<td>1,461</td>
<td>1,046</td>
<td>70%</td>
</tr>
<tr>
<td>Southwest Campus</td>
<td>836</td>
<td>536</td>
<td>64%</td>
</tr>
<tr>
<td>Total</td>
<td>10,220</td>
<td>11,624</td>
<td>98%</td>
</tr>
</tbody>
</table>

The Scenario 1 results show that the current parking supply is generally adequate for overall future demand in 2014, and will exceed functional capacity in 2019. However, it is unlikely that the Institute will retain all of its existing parking supply, given future development plans for the campus, and simply maintaining the existing commuter mode split will not meet Georgia Tech’s sustainability goals.

### Scenario 2 Future Parking Summary

<table>
<thead>
<tr>
<th>Region</th>
<th>Parking Supply</th>
<th>Parking Occupancy</th>
<th>Percentage Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Campus</td>
<td>1,681</td>
<td>1,905</td>
<td>113%</td>
</tr>
<tr>
<td>North Campus</td>
<td>2,410</td>
<td>2,802</td>
<td>127%</td>
</tr>
<tr>
<td>Central Campus</td>
<td>1,975</td>
<td>3,255</td>
<td>193%</td>
</tr>
<tr>
<td>East Campus</td>
<td>2,065</td>
<td>1,886</td>
<td>133%</td>
</tr>
<tr>
<td>Tech Square</td>
<td>1,461</td>
<td>1,046</td>
<td>70%</td>
</tr>
<tr>
<td>Southwest Campus</td>
<td>836</td>
<td>536</td>
<td>64%</td>
</tr>
<tr>
<td>Total</td>
<td>10,448</td>
<td>11,624</td>
<td>98%</td>
</tr>
</tbody>
</table>

The Scenario 2 results indicate that the Institute will experience significant parking supply shortages without replacement parking or measures to induce commuter mode shifts. Commuter demand for campus parking will exceed the 90 percent threshold by 2014 and continued population growth, combined with additional supply losses, will exacerbate the disparity between parking demand and supply by 2019.
The Scenario 2A results indicate that, without construction of new parking on the Institute campus, at a total of 9% and 24% of Georgia Tech’s existing single-occupant vehicle commuters will need to shift to transit, bicycle, or walking modes by 2014 and 2019, respectively, to maintain 95 percent overall parking occupancy.

Scenario 2A Future Parking Summary

<table>
<thead>
<tr>
<th>Parking Supply</th>
<th>Parking Occupancy</th>
<th>Percentage Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Campus</td>
<td>1,681</td>
<td>1,681</td>
</tr>
<tr>
<td>North Campus</td>
<td>2,410</td>
<td>2,200</td>
</tr>
<tr>
<td>Central Campus</td>
<td>1,975</td>
<td>1,684</td>
</tr>
<tr>
<td>East Campus</td>
<td>2,055</td>
<td>1,430</td>
</tr>
<tr>
<td>Tech Square</td>
<td>1,491</td>
<td>1,491</td>
</tr>
<tr>
<td>Southwest Campus</td>
<td>836</td>
<td>836</td>
</tr>
<tr>
<td>Total</td>
<td>10,448</td>
<td>9,322</td>
</tr>
</tbody>
</table>

The Scenario 2B results, combined with the commuter mode split results for Scenario 2B on page 25, demonstrate that significant mode shifts (18 and 49 percent by 2014 and 2019, respectively) from single-occupant vehicles to alternative transportation modes would be required to maintain parking occupancy under 95 percent in all campus regions, as anticipated parking supply losses occur. By 2019, the necessary commuter mode shifts represent a tremendous challenge and are probably unrealistic without significant investment in new transit services, price increases on parking permits, widespread restrictions on parking availability/location for both students and employees, and land use development and policy changes for the Institute and city.

Scenario 2B Future Parking Summary

<table>
<thead>
<tr>
<th>Parking Supply</th>
<th>Parking Occupancy</th>
<th>Percentage Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Campus</td>
<td>1,681</td>
<td>1,681</td>
</tr>
<tr>
<td>North Campus</td>
<td>2,410</td>
<td>2,200</td>
</tr>
<tr>
<td>Central Campus</td>
<td>1,975</td>
<td>1,684</td>
</tr>
<tr>
<td>East Campus</td>
<td>2,055</td>
<td>1,430</td>
</tr>
<tr>
<td>Tech Square</td>
<td>1,491</td>
<td>1,491</td>
</tr>
<tr>
<td>Southwest Campus</td>
<td>836</td>
<td>836</td>
</tr>
<tr>
<td>Total</td>
<td>10,448</td>
<td>9,322</td>
</tr>
</tbody>
</table>

The Scenario 3 results indicate that locations for new parking should be committed to accommodating the highest regional demands in the north, central, and east campuses. These results inform the PTMP evaluation of future parking locations and quantities.

Financial Analysis of Commuter Mode Choice Affects on Institute Parking Revenue and Costs

Comparison of the Scenario 2 vs. Scenario 3 parking occupancy results indicates that achievement of the Scenario 3 commuter mode split goals will reduce overall parking demand on the Institute campus by a total of approximately 500 to 1,200 vehicles between 2014 and 2019. This reduction in parking demand represents a significant shift of commuters from single-occupant vehicles into transit or other modes and translates into cost savings for the Institute by eliminating the need to construct additional structured parking for these 500-1,200 vehicles. The elevated Scenario 2 parking demand would generate greater revenue for the Institute than the Scenario 3 demand, primarily in the form of parking permit fees. Based on the current parking permit fee pricing ($900), the Scenario 3 parking demand reductions will reduce future annual parking system revenue by $266,000 to $768,000 between 2014 and 2019 (this analysis ignores potential citation or special event revenue).

However, based on the previous construction costs for existing Georgia Tech parking structures, it is also possible to calculate the approximate cost savings to the Institute associated with the Scenario 3 results. As previously discussed in the Existing Conditions Assessment of parking finances, the PTMP assumes an average cost for structured parking at Georgia Tech of $17,535 per space, based on recent industry data for Atlanta, GA. The table below provides a summary of the cost savings associated with construction of two potential parking structures, totaling 1,200 parking spaces, which are unnecessary under Scenario 3. This analysis calculates all costs at 2008 levels.

Summary of Cost Savings on Structured Parking Eliminated in Scenario 3

<table>
<thead>
<tr>
<th>Structured Parking Size</th>
<th>2008 Construction Cost</th>
<th>Annual Debt Service</th>
<th>Annual Depreciation Funding</th>
<th>Annual O&amp;M Cost</th>
<th>Total Annual Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>500-space garage</td>
<td>$8,767,900</td>
<td>$653,600</td>
<td>$219,200</td>
<td>$158,000</td>
<td>$1,031,300</td>
</tr>
<tr>
<td>700-space garage</td>
<td>$12,274,100</td>
<td>$945,600</td>
<td>$304,650</td>
<td>$221,400</td>
<td>$1,443,000</td>
</tr>
<tr>
<td>Total</td>
<td>$21,042,000</td>
<td>$1,568,650</td>
<td>$526,050</td>
<td>$380,400</td>
<td>$2,475,100</td>
</tr>
</tbody>
</table>

These results indicate that Georgia Tech would forgo sizable revenue and save significant costs through implementation transit improvements, and other travel demand management strategies, to increase the use of alternative commuter modes. By 2019, this analysis suggests that the Institute would lose approximately $708,000 annually in revenue, at current permit fees, but save approximately $2.5 million per year in debt service, depreciation, and operations costs, which results in a net annual savings to the Institute of approximately $1.8 million.
Parking Policy Recommendations

Historically, academic institutions have approached the decision to construct new parking facilities based primarily on satisfying faculty and student parking needs. However, as construction costs have escalated in recent years, and interest in providing sustainable campus infrastructure has increased, the need to develop parking policy and management goals has become integral to campus parking planners. These guidelines recognize that parking policies now form only one of many components affecting future sustainability of the transportation and parking network at Georgia Tech. With this principle in mind, the guidelines seek to reduce the Institute community’s reliance on single-occupant vehicles while encouraging alternative transportation and maximizing parking revenue.

A set of policy guidelines was developed to inform future parking decisions on the Georgia Tech campus and maintain the Institute’s financial and sustainability goals. These goals must be considered within the context of an overall campus plan which will inform parking decisions with many other considerations. The following is a summary of the recommended guiding principles for locating and managing new parking at the Institute:

Manage parking demand to enhance campus sustainability
- Set ambitious goals to reduce the percentage of GT population traveling to campus by automobile, over time.
- Reduce demand through development of innovative TDM programs and parking pricing adjustments.
- Promote pedestrian, bicycle, transit, and shuttle transportation to, from, and within the Georgia Tech campus.

Use cost to inform decisions on new facilities
- Avoid new structured parking unless pricing policies support construction, operation, and maintenance of each new facility.
- Avoid locations requiring provision of new campus transit systems or incurring significant transportation costs.
- Carefully consider required parking capacity to meet future demands, avoid unnecessary costs, and discourage additional demand.

Locate new parking facilities appropriately
- Prioritize proximity to regional roadway systems, campus gateway intercept points, and on-campus activity centers.
- Choose locations to support geographic balance of new demand.
- Maximize opportunities to share parking resources among various users including employees, residents, visitors, and event attendees.

Support campus sustainability initiatives
- Avoid locations conflicting with pedestrian and bicycle corridors.
- Incorporate provisions for bicycle, motor scooter, and motorcycle parking.
- Prioritize attractive carpark parking locations and reinforce with parking to reduce single occupant vehicles.

Design facilities consistent with Institute goals
- Respect and preserve historic, aesthetic, and ecological resources.
- If possible, design new parking structures within or hidden by buildings.
- Pursue garage designs consistent with GT architectural themes.
- Design safe and convenient encroachment points which minimize traffic impacts on surrounding roadways.

Incorporate technology to improve operations
- Use permit and gateway systems which track facility use.
- Consider monitoring and information technology to advise drivers regarding facility use and alternative options.
- Use modern and innovative signage design to manage traffic flow and wayfinding.

While these guidelines should not be considered the sole approach for successful campus parking planning, adherence to these policy goals will provide Georgia Tech with an efficient and sustainable path toward providing the appropriate amount and types of parking on the campus. These goals have been developed specifically to support existing operations on the Georgia Tech campus and plans described in the 2004 CMPU and discussed by Institute officials.

Parking Management Recommendations

In addition to the parking policy recommendations, a variety of recommendations for management of the existing and future parking supply have been developed to improve the use of these spaces, increase parking revenue, and support the implementation of policies for future parking growth. Currently, Georgia Tech charges a single rate for a regular parking permit, regardless of the users or parking location. Additionally, the Institute provides a 42 percent discount for carpark permits and a free permit for vanparks. The following list describes a variety of parking management recommendations for consideration:

- Consider transitioning the campus parking infrastructure to rely more on a daily parking system, which allows for fine-tuned pricing adjustments and electronic enforcement.
- Ensure vanpool carpark and vanpool parking spaces are identified with highly visible signage/markings to encourage new users.

Reduction of resident student parking is not included in this list because of the potential for loss of parking permit revenue associated with such restrictions. However, designating resident students to the under-utilized peripheral parking facilities, such as the Tech Square garage (E31), Graduate Living Center garage (ER66), Coliseum lot (E65), and northwest residential lots (WR29 and W31) would free up parking space within the interior of campus for daily use by employees and commuters.

Georgia Tech currently supports campus-community use of fuel efficient vehicles through Leader in Energy and Environmental Design (LEED) certification practices such as fuel-efficient parking spaces designations. Currently, approximately 45 Fuel-Efficient parking spaces are provided in two parking garages on campus: E40 and E81 (associated the LEED silver-certified Klaus Advanced Computing and College of Management buildings, respectively). The Institute is encouraged to continue participating in the LEED certification program, including support for fuel efficient vehicles through use of these spaces, to reduce greenhouse gas emissions and increase the institute’s profile as an energy and conservation leader. However, the proliferation of new parking designations for fuel-efficient, hybrid, or electric automobiles are not entirely compatible with the parking policy guidelines included in the PTMP, because these practices encourage the continued use of automobiles, however fuel-efficient they may be. The parking policy recommendations are designed to facilitate migration of the campus-community into non-autotive car modes and to reduce future needs and costs for construction of new parking on the Georgia Tech campus. For these reasons, the PTMP recommends that Georgia Tech maintain a high-profile identification and marketing program for these and other LEED practices, but that these practices should not directly inform the Institute’s parking planning policies. Enforcement of these spaces is best accomplished through use of permits based on the vehicle type, which can be checked on the vehicle’s registration and through visual verification by campus parking enforcement personnel. Pricing discounts are not recommended for these spaces.

Future Conditions Assessment – Parking Analysis

Parking and Transportation Master Plan
Future Parking Supply Deficiencies

Based on the parking analysis, EPA Commuter Model analysis, and discussions with Institute Transportation/Parking and Capital Planning and Space Management officials, the Scenario 3 results are considered to be the most representative of the Institute's future plans and goals within the PTMP study horizon. Therefore, Scenario 3 is recommended as the benchmark scenario for parking planning at Georgia Tech and is used for all subsequent discussion of parking alternatives and costs for 2014 and 2019 in this document. The table below summarizes the 2014 and 2019 Scenario 3 results and projections for future parking needs by each region of campus.

Scenario 3 Future Parking Summary

<table>
<thead>
<tr>
<th>Parking Supply</th>
<th>Projected Parking Occupancy</th>
<th>Required Supply Change to Maintain 90% Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vehicles</td>
<td>Percent Full</td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Campus</td>
<td>1,681</td>
<td>1,774</td>
</tr>
<tr>
<td>North Campus</td>
<td>2,410</td>
<td>2,353</td>
</tr>
<tr>
<td>Central Campus</td>
<td>1,975</td>
<td>2,227</td>
</tr>
<tr>
<td>East Campus</td>
<td>2,055</td>
<td>1,896</td>
</tr>
<tr>
<td>Tech Square</td>
<td>1,491</td>
<td>991</td>
</tr>
<tr>
<td>Southwest Campus</td>
<td>836</td>
<td>536</td>
</tr>
<tr>
<td>Total</td>
<td>10,448</td>
<td>9,776</td>
</tr>
<tr>
<td>2019</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Campus</td>
<td>1,681</td>
<td>1,737</td>
</tr>
<tr>
<td>North Campus</td>
<td>2,200</td>
<td>2,540</td>
</tr>
<tr>
<td>Central Campus</td>
<td>1,694</td>
<td>2,671</td>
</tr>
<tr>
<td>East Campus</td>
<td>1,430</td>
<td>1,896</td>
</tr>
<tr>
<td>Tech Square</td>
<td>1,491</td>
<td>976</td>
</tr>
<tr>
<td>Southwest Campus</td>
<td>836</td>
<td>536</td>
</tr>
<tr>
<td>Total</td>
<td>9,322</td>
<td>10,462</td>
</tr>
</tbody>
</table>

These results indicate that the overall Georgia Institute of Technology parking demand will exceed the campus parking supply by close to 400 vehicles in 2014, and that the deficit will grow to approximately 2,000 parking spaces by 2019. However, the overall results assume that historically underutilized parking areas such as Tech Square and the southwest campus, which are projected to continue providing excess parking supply even in 2019, could be managed through pricing incentives to achieve 90% occupancy levels. Without measures to shift parked vehicles into these underutilized areas, a total of approximately 950 and 2,550 new parking spaces in the west, central, north, and east campuses will be required by 2014 and 2019, respectively.

The following table provides a summary of the existing parking system and the projected inventory in 2014 and 2019, by type. This table assumes all expected parking supply losses, as described in the Future Conditions Parking Analysis, and assumes that Georgia Tech will construct 400 and 2,000 additional parking spaces on the campus by 2014 and 2019, respectively, based on the projected parking supply deficits identified in the discussion of parking supply deficiencies.

Summary of Parking Spaces, by Type

<table>
<thead>
<tr>
<th>Type</th>
<th>2014 Number of Spaces</th>
<th>2014 Percent of Inventory</th>
<th>2019 Number of Spaces</th>
<th>2019 Percent of Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td>9,665</td>
<td>89%</td>
<td>9,963</td>
<td>88%</td>
</tr>
<tr>
<td>Handicap</td>
<td>271</td>
<td>2.5%</td>
<td>283</td>
<td>2.5%</td>
</tr>
<tr>
<td>Reserved</td>
<td>217</td>
<td>2%</td>
<td>340</td>
<td>3%</td>
</tr>
<tr>
<td>Metered/Timed</td>
<td>163</td>
<td>1.5%</td>
<td>170</td>
<td>1.5%</td>
</tr>
<tr>
<td>Fuel Efficient</td>
<td>156</td>
<td>1%</td>
<td>113</td>
<td>1%</td>
</tr>
<tr>
<td>Visitor</td>
<td>404</td>
<td>4%</td>
<td>453</td>
<td>4%</td>
</tr>
</tbody>
</table>

Source: Georgia Tech Office of Parking and Transportation

Comparison to 2004 Campus Master Plan Projections

The parking recommendations in the Parking and Transportation Master Plan differ somewhat from the projections and recommendations of the 2004 Campus Master Plan. The 2004 CMPU projections were based on two of primary assumptions for future parking demand:

- Over 5,000,000 sf of new building development, and the Eco-Commons Plan, were projected for delivery by 2014; and
- Future parking demand at the Institute would correspond to a static parking supply ratio, which was based on past parking supply trends and would generally maintain similar trends for the parking system into the future.

Based on this methodology, the 2004 CMPU recommended construction of a total of 7,200 new structured parking spaces and utilization of an additional 2,500 off-campus parking spaces would be necessary to meet future needs within the 10-year CMPU study horizon. These projections result in a total projected campus parking supply of approximately 15,000 spaces.

Through the evaluation of parking occupancy and commuter mode split data, the PTMP methodology is designed to maximize parking occupancy at the Institute and reduce the use of single occupant vehicles by commuters, which should reinforce the parking system's financial and sustainability goals, respectively. The PTMP methodology projects that the Institute will require construction of approximately 2,500 parking spaces, providing a maximum parking supply of approximately 13,000 on-campus parking spaces, by 2019. No dedicated need for remote off-campus parking is currently anticipated.
Parking and Transportation Master Plan

Future Conditions Assessment – Potential Parking Locations

The existing Peters Deck (E192) is nearing the end of its useful life and may be decommissioned within the next ten years. The Peters Deck provides 625 parking spaces in one of the critical activity centers on the Georgia Tech campus and replacement of these parking spaces will be critical to meeting parking demand in this region of campus.

A number of potential locations have been identified for construction of a parking structure to replace the Peters Deck spaces and perhaps increase the future parking capacity for students and employees in the east and central campuses. Exhibit 22 shows the locations considered as part of this evaluation.

Tier 1 Parking Structure Sites

Three sites along 3rd Street, to the east of I-75/85 (shown in green on Exhibit 22,) offer the potential for future parking expansion by Georgia Tech. These sites would allow for a parking structure footprint accommodating approximately 280 to 380 parking spaces per level, with the largest footprints belonging to either site south of 3rd Street. Constructing new parking to the east of I-75/85 provides numerous advantages.

Tier 2 Parking Structure Sites

Other Parking Structure Sites Evaluated

For the purposes of further consideration, the potential sites identified in Exhibit 22 have been divided into two tiers. Included in Tier 1 are parking structures along I-75/85 at Bobby Dodd/Way or to the east of I-75/85. The Tier 2 site consists of a replacement structure on the existing Peters Deck site. Other sites considered in this review included a new North Avenue garage and property currently owned by the Coca-Cola Corporation.

Peter's Deck Replacement

The existing Peters Deck (E192) is nearing the end of its useful life and may be decommissioned within the next ten years. The Peters Deck provides 625 parking spaces in one of the critical activity centers on the Georgia Tech campus and replacement of these parking spaces will be critical to meeting parking demand in this region of campus.

All three of the potential sites allow for further expansion of the Institute and Tech Square campus into new areas, incorporation of the existing pedestrian tunnel into a campus-owned and secured structure, and potential access from campus transit system. Development of these sites would help to establish a continuous, secured access between the MARTA North Avenue station and the east campus, either utilizing the existing tunnel or in the form of an elevated crossing over I-75/85. This connection could also potentially incorporate access to future development within the parcels along I-75/85 as well.

Bobby Dodd Way Garage

The site east of I-75/85 (shown in red on Exhibit 22) would allow for a parking structure footprint accommodating approximately 280 parking spaces per level using one-half of the existing footprint. The Peter's Deck site offers the benefit of replacing parking within the existing parking location, which is well situated to meet demands in the central and east campuses. Construction of a smaller footprint than the existing Peter's Deck would allow the Institute to increase open space or use the space for other compatible uses.

The disadvantages of constructing new parking on the existing Peter's Deck site include the limited structural footprint, which would limit the potential parking supply for the garage or result in higher construction costs for below-grade levels. Access to the Peter's Deck site is limited along the interstate, which contributes to greater traffic and vehicle/pedestrian conflicts within the inner campus.

Tier 2 Parking Structure Sites

Peter's Deck Site

The Peter's Deck site shown in Exhibit 22 would allow for a parking structure footprint accommodating approximately 140 parking spaces per level using one-half of the existing footprint. The Peter's Deck site offers the benefit of replacing parking within the existing parking location, which is well situated to meet demands in the central and east campuses. Construction of a smaller footprint than the existing Peter's Deck would allow the Institute to increase open space or use the space for other compatible uses.

The disadvantages of constructing new parking on the existing Peter's Deck site include the limited structural footprint, which would limit the potential parking supply for the garage or result in higher construction costs for below-grade levels. Access to the Peter's Deck site is limited along the interstate, which contributes to greater traffic and vehicle/pedestrian conflicts within the inner campus.

North Avenue Garage

The North Avenue Garage site (shown in orange on Exhibit 22) would provide a parking structure footprint accommodating approximately 240 parking spaces per level. While this site is located close to the busiest areas on campus and would limit new traffic on campus by providing direct access to North Avenue, it holds many disadvantages, including the limited structural footprint which severely restricts expected capacity gains beyond the existing 252 spaces in this location. Heavy peak hour traffic on North Avenue is likely to disrupt access to and from this garage during peak loading and unloading times on a daily basis. Based on these factors, this site represents the least desirable alternative for future parking expansion for this region of Georgia Tech.

Coca-Cola Parcel

The Coca-Cola parcel site (shown in gold on Exhibit 22) would allow for a parking structure footprint accommodating approximately 650 parking spaces per level. This location is situated in proximity to the core central and east campus activity centers and would serve demand in those areas. The parcel is accessible via North Avenue, Tech Parkway, and Luckie Street and could be served by campus transit routes. This parcel was contemplated for Institute acquisition in the CMPU, but abuts property slated for future Institute development. The Coca-Cola parcel is also large enough to consider construction of a large above-grade garage with additional commercial, instructional, or residential development.
North and Central Campus Parking

To meet the projected parking demands of the north and central campuses, future parking locations along Ferst Drive and 10th Street have been considered. Exhibit 23 shows the locations considered as part of this evaluation.

The West Campus Garage could provide direct access to 10th Street, which would limit new traffic on the Georgia Tech campus. This garage is not located on any existing or proposed transit routes, but it would primarily serve the expanded residential parking demand associated with the planned residential expansion in the northwest region of the campus. Further, some of the potential transit route modifications explored later in this report could bring Stinger service closer to this site.

Ferst Drive Garages

Included in the potential parking site options are two sites on Ferst Drive (shown in gold on Exhibit 23) in the location of the existing W21 or W24 parking lots. The site north of Ferst Drive, which is the existing location of the W24 lot, is the preferred Tier 1 location. This site is located across from the new Marcus Nanotechnology Building, and provides convenient access to either 10th Street or Ferst Drive, via State Street. This site directly meets the needs of providing parking in proximity to activity centers in the north and central campuses and is located along all of the existing Stinger and Trolley lines. This parking structure footprint for this site could accommodate approximately 230 parking spaces per level, assuming Dalney Street is eliminated in this area and the structure uses some of the vacated roadway right-of-way.

Tier 2 Parking Structure Sites

The site south of Ferst Drive, which is the existing location of the W21 lot, shared many beneficial attributes with the Tier 1 site to the north of Ferst Drive. This site is adjacent to the Hewey Physics Building, is accessible via Ferst Drive, and is served by all of the Stinger and Trolley routes. This site would allow for a parking structure footprint accommodating approximately 425 parking spaces per level. However, this is a prime development site for the Institute, and construction of a garage on this location would either preclude other development or require more expensive (potentially below-grade) construction. The combination of a building with the structured parking could also limit the available structural footprint for the garage.

10th Street Garages

Three sites along 10th Street, which are contemplated for potential future development in the 2004 CMPU update, could incorporate parking structures in west campus, proposed on the existing W01 parking lot site, and north of Ferst Drive in the location of the existing W24 parking lot. Other locations include parcels to the south of Ferst Drive in the location of the existing W21 parking lot or along 10th Street, at either State Street or Atlantic Drive, which are adjacent to the existing North Campus (W23) parking structure.

Tier 1 Parking Structure Sites

West Campus Garage

The West Campus Garage site (shown in purple in Exhibit 23) would allow for a parking structure footprint accommodating approximately 260 parking spaces per level. This garage would replace 207 existing parking spaces in the W01 lot and reduce the impact of losing approximately 320 parking spaces in the W29 zone, when the planned residential buildings are constructed.

Ferst Drive Garages

The site south of Ferst Drive, which is the existing location of the W21 lot, shared many beneficial attributes with the Tier 1 site to the north of Ferst Drive. This site is adjacent to the Hewey Physics Building, is accessible via Ferst Drive, and is served by all of the Stinger and Trolley routes. This site would allow for a parking structure footprint accommodating approximately 425 parking spaces per level. However, this is a prime development site for the Institute, and construction of a garage on this location would either preclude other development or require more expensive (potentially below-grade) construction. The combination of a building with the structured parking could also limit the available structural footprint for the garage.

Tier 2 Parking Structure Sites

10th Street Garages

Three sites along 10th Street, which are contemplated for potential future development in the 2004 CMPU update, could incorporate parking structures on the dedicated land to parking expansion. All three locations along 10th Street are accessible from either State Street or Atlantic Drive. Any of these locations would be well positioned at a 10th Street gateway to the Institute campus, allowing vehicles to be intercepted before they enter the campus, and reserving the interior of the campus for other types of development. Because of the intersection spacing along this portion of 10th Street, none of these parcels is contemplated to provide direct access to 10th Street. These sites would require modification to the existing shuttle systems to serve these locations directly. Ultimately, these structures are not favored over the Ferst Drive garage due to their peripheral location and impacts to the transit system access.

The westernmost 10th Street site (shown in red in Exhibit 23) is accessible via State Street and Dalney Street and, assuming use of the entire parcel, would allow for a parking structure footprint accommodating approximately 210 parking spaces per level. While this location is well positioned to offset Eco-Commons and development-related surface parking losses in proximity to this site, construction of a parking lot on this property would provide the smallest structural footprint of any of the three 10th Street sites.

The middle 10th Street site (shown in green in Exhibit 23) is adjacent to the existing North Deck (W25) and is accessible via State Street, Atlantic Drive, and Peachtree Place. Assuming use of the entire parcel, this site would allow for a parking structure footprint accommodating approximately 360 parking spaces per level. The 2004 CMPU update recommended incorporation of a parking structure into a future Institute building at this location, which would likely limit the structural footprint, and thus the parking supply, of this garage.

The easternmost 10th Street site (shown in blue in Exhibit 23) is accessible via Atlantic Drive and, assuming use of the entire parcel, would allow for a parking structure footprint accommodating approximately 370 parking spaces per level, which is the largest potential structure on the north campus. However, the President's House is located just to the east of this site and which may present a challenge to design a structure that complements the President's House.
This section describes a financial analysis of Georgia Tech's parking system to determine what permit pricing levels are required for the Institute to support its existing and future debt service, operations, and depreciation funding. This analysis is based on the Scenario 3 future conditions parking permit projections and includes cost assumptions associated with the potential construction of three new parking structures by 2019. This analysis relies on a range of input assumptions, including the following:

- Future non-permit revenue will increase from the 2008 level at a compounding rate of three percent annually.
- Future facility debt service is based on a projected future cost to construct parking structures of $17,535 per space and an annual financing rate of 5.5 percent over a 25-year term; the future cost projections do not include costs to acquire off-campus property for new structures.
- Future depreciation expenses are based on the approximate facility construction cost and a 40-year useful life.
- Future Operations & Maintenance (O&M) costs are based on the existing 2008 level of $517 per parking space, with annual inflation at 2.8%.
- Proposed Structure 1 is assumed to provide 500 spaces (net gain of 300) and be complete by 2013.
- Proposed Structure 2 is assumed to provide 1,500 spaces and be complete by 2013.
- Proposed Structure 3 is assumed to provide 700 spaces and be complete by 2017.
- No land costs are assumed.

The following table summarizes the annual revenue and expenditure projections for the entire Georgia Tech parking system. This analysis includes existing conditions financial data from the Office of Parking and Transportation and projections for both future analysis horizon years.

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2014</th>
<th>2019</th>
<th>EPA Commuter Model Pricing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permits Issued (Scenario 3 projections)</td>
<td>11,327</td>
<td>12,514</td>
<td>13,378</td>
<td>12,514</td>
</tr>
<tr>
<td>Assumed Parking Permit Price</td>
<td>$590</td>
<td>$590</td>
<td>$590</td>
<td>$785</td>
</tr>
<tr>
<td>Revenue</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parking Permits</td>
<td>$6,666,179</td>
<td>$7,383,260</td>
<td>$7,883,020</td>
<td>$9,823,460</td>
</tr>
<tr>
<td>All Other Non-permit Revenue</td>
<td>$3,421,659</td>
<td>$4,085,640</td>
<td>$4,736,376</td>
<td>$4,085,640</td>
</tr>
<tr>
<td>Subtotal</td>
<td>$10,320,838</td>
<td>$11,468,900</td>
<td>$12,629,396</td>
<td>$13,909,130</td>
</tr>
<tr>
<td>Expenditures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing Parking Structure Debt Service</td>
<td>$5,043,207</td>
<td>$4,774,206</td>
<td>$4,250,492</td>
<td>$4,774,206</td>
</tr>
<tr>
<td>Existing Depreciation (funded)</td>
<td>$3,171,862</td>
<td>$3,789,975</td>
<td>$3,789,975</td>
<td>$3,789,975</td>
</tr>
<tr>
<td>Existing Parking System O&amp;M</td>
<td>$4,106,418</td>
<td>$4,197,275</td>
<td>$4,327,602</td>
<td>$4,327,602</td>
</tr>
<tr>
<td>Proposed Structure 1 Debt, Depreciation, and O&amp;M</td>
<td>$0</td>
<td>$1,059,862</td>
<td>$1,059,862</td>
<td>$1,059,862</td>
</tr>
<tr>
<td>Proposed Structure 2 Debt, Depreciation, and O&amp;M</td>
<td>$0</td>
<td>$3,171,862</td>
<td>$3,262,677</td>
<td>$3,262,677</td>
</tr>
<tr>
<td>Proposed Structure 3 Debt, Depreciation, and O&amp;M</td>
<td>$0</td>
<td>$0</td>
<td>$1,622,583</td>
<td>$1,622,583</td>
</tr>
<tr>
<td>Subtotal</td>
<td>$12,521,487</td>
<td>$14,962,904</td>
<td>$16,220,888</td>
<td>$16,220,888</td>
</tr>
<tr>
<td>Net Income</td>
<td>$(2,220,649)</td>
<td>$(3,494,004)</td>
<td>$(3,591,492)</td>
<td>$(1,053,774)</td>
</tr>
<tr>
<td>Individual Permit Price Increase to Offset Costs</td>
<td>+$194</td>
<td>+$279</td>
<td>+$268</td>
<td>n/a</td>
</tr>
<tr>
<td>Resulting Parking Permit Price</td>
<td>$784</td>
<td>$869</td>
<td>$858</td>
<td>n/a</td>
</tr>
</tbody>
</table>

The analysis results indicate that by 2014, the Institute will need to charge $699 per parking permit, a $279 increase from the 2008 price, to match its costs. By 2019, the analysis indicates that the Institute will need to charge $869 per parking permit, a $268 increase from the 2008 price. While price increases could reduce some demand for on-campus parking, price increases at the levels suggested in this financial analysis are not expected to significantly affect overall demand levels.

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Enhanced Travel Demand Management (TDM) Measures

Georgia Tech operates a TDM program that fits the needs of many commuters to the Institute. Additional TDM measures could be implemented to further support the goals of reducing single occupant vehicles and developing more sustainable transportation patterns throughout the campus and community. The following is a list of additional measures, representing a range from mostly passive to very aggressive, which Georgia Tech should consider for incorporation into the Institute TDM program:

- **No Parking Expansion** - The Institute would maintain its current parking supply and not build additional spaces to accommodate increased parking demand.
- **Parking Price Increase** - An aggressive pricing approach would help the Institute decrease the number of single occupancy vehicles that travel to campus.
- **Parking Permit Buyback** - A permit buyback program rewards current parking permit holders for surrendering their parking permit and choosing an alternative commute mode (i.e. rideshare, transit, bicycling, or walking). The program can also be structured to reward anyone currently using alternative transportation modes.
- **Resident Student Parking Reduction** - Resident students comprise a significant component of the automobile commuter population and parking demand. Georgia Tech could regulate its resident student permit sales to reduce the use of cars on campus.

- **Vanpool/Carpool Parking Location** - Reserved parking spaces in premium lots would be provided adjacent to handicapped ones for the convenience of rideshare commuters. This benefit is a common strategy to make ridesharing more appealing.
- **Bicycling Improvements (pathways, intersections, showers, racks)** - The Institute would address concerns about traffic and bicycle conflicts at certain intersections near campus, as discussed in the Pedestrian and Bicycle Facilities section. At a minimum, bicycle amenities, like secured storage and access to shower facilities would also aid and encourage bicycle commuters.
- **Pedestrian Improvements (sidewalks, signal priority, street trees, etc.)** - Improvements to the pedestrian environment, such as those discussed in the Pedestrian Safety Enhancements section, are essential to getting more commuters to consider walking a viable alternative to driving to campus.
- **TDM Coordinator** - A full-time TDM coordinator can be very helpful to coordinate changes with local and regional authorities, assist commuters with their options, program marketing, and assessment.
- **Commuter Membership Program** - An alternative commuter program would be created, so the Institute can track participation, commuting behavior, and market program updates. The program could provide rewards, prize drawings, and referral bonuses to help increase participation. A financial reward, of approximately $150 annually could be provided for people who commute to campus by bicycle or walking. This reward could either be a direct cash reward, or could be provided through an outside service provider through a sponsored reward program. For an example of this type of program, visit www.nurode.com.
- **Member Spot-Rewards** - Providing spot rewards as overall transportation milestones are achieved would help maintain interest in alternative commuting and possibly lure new participants while encouraging the Georgia Tech community to work together on achieving mode split or parking goals.
- **Transportation Events** - Campus-wide events, like employee and new student orientations provide great forums to communicate commuting options before people have already developed a travel pattern. The TDM manager would emphasize the cost savings and ecological benefits of alternative commutes, while providing guidance to individuals wondering what the most appropriate option is for them.
- **Transit Advocacy/Coordination** - The Institute would continue to offer the MARTA U-pass and seek additional opportunities to coordinate with MARTA or other transit providers and connect Georgia Tech systems to others.
- **Transit Financial Incentives** - The Institute currently offers a discount on the cost of a MARTA U-pass, pre-tax payroll deduction for transit expenses, and free campus shuttles, but further discounts can encourage increased ridership on transit systems.
- **Park & Ride Implementation** - The Institute could consider operating shuttles to remote park & ride lots.
EPA Commuter Model

The United States Environmental Protection Agency’s (EPA) Commuter Model (version 2.0) was used to test the effectiveness of the various parking scenarios and TDM enhancements. The Commuter Model is a spreadsheet-based computer model that estimates the travel impacts of TDM programs and provides some indication of the likely effectiveness of individual TDM measures. The program considers the impact of many different types of programs on travel behavior, with a significant bias toward changes in pricing and financial incentives and, such as:

- Transit fare incentives;
- Transit service improvements;
- Ridesharing programs including financial incentives and preferential parking;
- Parking pricing;
- Pedestrian and bicycle improvements; and
- Flexible work arrangements.

The model allows the analyst to consider the impact on mode share from a variety of combinations of programs using a LOQIT mode-choice methodology, commonly employed in more complex regional travel demand models. This model was used to estimate the impacts of the TDM scenarios on mode choice and parking demand. Several assumptions were employed in this analysis including:

- Population forecasts for faculty, staff, and students developed for the PTMP;
- Parking supply and utilization information provided by Parking and Transportation;
- Housing projections, based on data from the Georgia Tech Department of Housing;
- City characteristics for a large urban city; and
- Numerous model-default travel assumptions: work trip length, peak period duration, percent of trips during the peak period, etc.

With the above assumptions and information held constant, inputs reflecting the mode choice results from the parking analysis were used to estimate which types of TDM measures would be necessary to meet the goals of each scenario. The mode choice changes are based on the scenario’s projected reduction in single occupant vehicles (SOVs). The mode split goals of each parking scenario are summarized below:

- Scenario 1 – no mode split change
- Scenario 2 – no mode split change
- Scenario 2A – 9% reduction in SOV by 2014; 28% reduction in SOV by 2019
- Scenario 2B – 18% reduction in SOV by 2014; 49% reduction in SOV by 2019
- Scenario 3 – 5% reduction in SOV by 2014; 10% reduction in SOV by 2019

The model uses the existing mode split data (also used in the parking analysis), current parking pricing information, and attributes of Georgia Tech’s existing TDM program to develop a baseline understanding of the campus parking and transportation operations. Changes in future model scenarios are calculated relative to the baseline input data. The model requires that the annual parking permit prices be converted into daily parking price (approximately $2.50 per day at the 2008 permit price). Because Scenario 1 and Scenario 2 assumed no changes in the mode split (suggesting no changes to the TDM program would be implemented), the EPA Commuter Model was not conducted for these scenarios. The following summaries discuss the potential TDM measures which the EPA Commuter Model results suggest are necessary for Georgia Tech to attain the targeted mode split goals.

Scenario 2A Commuter Model Outcomes

- Approximate parking price: $4.50 daily parking for SOVs (83% increase)
- $0.50 daily parking for rideshare and preferential parking (62% discount)
- Daily discount of $0.90 on transit pass costs (50% off current transit benefit) with pre-tax payroll deduction and on-site sales
- Improved infrastructure for bicycle and pedestrian travel

Scenario 2B Commuter Model Outcomes

- Approximate parking price: $5.00 daily parking for SOVs (103% increase)
- Free daily parking for rideshare and preferential parking (100% discount)
- Daily discount of $1.20 on transit pass costs (65% off of current transit cost) with pre-tax payroll deduction and on-site sales
- Ridesharing by Transportation Coordinator
- Improved infrastructure for bicycle and pedestrian travel, including access to secure bicycle storage and shower facilities

Scenario 3 Commuter Model Outcomes

- Approximate parking price: $5.50 daily parking for SOVs (134% increase)
- Reduced daily parking fees for rideshare and preferential parking (50% discount)
- Daily discount of $1.45 on transit pass costs (78% off of current transit cost) with pre-tax payroll deduction and on-site sales
- Improved infrastructure for bicycle and pedestrian travel, including access to secure bicycle storage

It should be noted that the 2019 Scenario 2B results reflect a hypothetical circumstance, which is untenable through the measures identified by the EPA Commuter Model alone. Significant changes in local land use and very restrictive policies would be necessary to achieve a reduction of almost 50 percent in commuters using single occupant vehicles. Such measures would include major rezoning efforts and developer incentives to ensure construction of dense residential and mixed-use development near the campus, which would encourage more students and employees to live and work in one area.

While the EPA Commuter Model is considered a useful tool for estimating future commuter mode shifts, the model is limited to a specific range of options and is heavily reliant upon parking pricing changes. This leads the model to overstate the necessary pricing adjustments, and for this reason, the Institute should consider incremental increases in permit pricing, accompanied by other TDM strategies, to achieve the Institute’s commuter mode choice goals.
Transportation Policy Recommendations

Transportation Demand Management

The PTMP previously provides a range of potential TDM measures for consideration by Georgia Tech officials. The Institute should not regard all of the measures described in this report a comprehensive requirement to achieving successful changes in commuter mode choice behavior. The Institute may choose to implement only a few or many specific TDM measures at any given time, at the decision will be based on economic, logistical, and campus-cultural factors. However, below is a list of guidelines developed to provide the Institute with a set of principles for success, regardless of which specific TDM measures the Institute may choose implement on the Georgia Tech campus:

Provide transportation options that are competitive and convenient compared to drive-alone commuting.
- Focus transit services on areas with dense campus populations and off-campus transit nodes
- Improve the convenience of bicycle commuting through improved infrastructure and secure storage

Direct incentives are the most effective way to encourage the use of alternative transportation and reduce driving.
- Price parking at market rates and adjust it periodically to maximize revenue or achieve Institute goals.
- Support the use of transit by providing fare-free or reduced-fare passes for the campus community.
- Promote ridesharing by marketing ride-matching services, increasing permit discounts, and improving preferential parking.

Coordinate campus land use and parking management.
- Prioritize future development and strategies to take advantage of existing under-utilized parking.
- Review campus parking holistically rather than attempting to increase parking supply for each new building.
- Locate new parking structures to serve zones of need and support future expansion, generally toward campus periphery and along transit routes.

Apply consistent transportation demand management strategies throughout campus.
- Evaluate current transportation options and infrastructure on a regular basis.
- Conduct periodic surveys to determine which transportation programs are working and generate ideas for new ones.
- Integrate TDM evaluation and consideration with campus environmental and sustainability reviews and policies.

Institutionalize transportation options throughout campus by providing infrastructure and policies to support it.
- Construct physical infrastructure like bicycle lanes, bicycle storage, and access to showers.
- Maintain wide and continuous sidewalks and clearly lined crosswalks.
- Permit flexible work schedules, compressed workweeks, and telecommuting.

Support and promote Georgia Tech as a major activity center in local, regional, and state plans.
- Coordinate with local governments and planning agencies to ensure local and regional transportation systems provide expanded and innovative access to campus.

Communicate the benefits of alternative transportation to the campus community.
- Use the latest information technology, such as a dynamic website, to provide information to the Georgia Tech community on all transportation modes.
- Solicit feedback from students and employees about TDM success, communication tools, and potential improvements.
As growth in the student and employee population at Georgia Tech continues, it will be important for the Institute to pursue new transit connections to reduce the use of single occupant vehicles by commuters, minimize parking construction costs, reduce congestion, and meet sustainability goals. Consideration of an expanded central on-campus hub for transit activity could support the existing and proposed transit services, provide non-automotive transportation amenities, and act as a highly-visible example of the Institute’s commitment to alternative transportation modes.

Construction of a centrally-located and highly-visible transit center could effectively capture the more users from campus activity centers and provide a crossroads for new and existing shuttle routes. The existing campus transit stop on Ferst Drive, across from the Campus Recreation Center, is designed exclusively for shuttle boarding/alighting functions, but a new campus transit center could provide an expanded range of features, including the following:

- Potential terminus of Tech Trolleys, Blue Stinger, Red Stinger, Green Stinger, and proposed Connector transit routes
- Stingerette Hub
- Covered bus shelters and benches
- Transl/alternative transportation information center, kiosk, or signage
- Campus map
- Bicycle lockers or storage station

While provision of bicycle amenities may seem superfluous, construction of bicycle racks, lockers, or supervised storage at transit nodes (accompanied by provision of bicycle racks on the front of shuttles/buses) can further encourage mode shifts from automobiles to transit and bicycles.

One possible option is to convert the existing Tech Trolley turnaround on Ferst Drive, opposite the Campus Recreation Center, to provide the features and service discussed in this section. However, a more central location within the campus would be preferable and could provide more space for multiple transit shuttles from a variety of different routes. The current E41 parking lot on Ferst Drive, located between the Student Center, Waber building, and the future Cough Undergraduate Learning Commons (CULC) represents a promising possible location. Exhibit 24 shows one potential layout for a transit center at the E41 lot location, including a dedicated shuttle loop. Additionally, the concept includes a colonnade or covered walkway treatment, as illustrated below, which would both provide a covered shelter for riders awaiting transit shuttles and connect principal campus buildings, such as the Student Center, Library, Skiles Building, and CULC.
Evaluation of Future Impacts on Existing Georgia Tech Shuttle System

The Georgia Tech Stinger and Tech Trolley systems currently serve the campus well, operating for long periods on headways of less than 15 minutes and providing shuttle stops at many advantageous locations. However, information from campus stakeholders suggests these shuttle systems currently experience some capacity constraints between class periods or during periods of heavy commuter travel in the morning and evening. An evaluation of the existing Stinger and Tech Trolley operations and capacity has been conducted to identify future service deficiencies and determine the ability of the existing Georgia Tech transit system to accommodate future campus growth. The following evaluation is based on campus transit ridership and service data provided by the Office of Parking and Transportation.

Future growth within the existing campus transit system will be driven by two separate phenomena, as previously discussed in the parking analysis section of the PTMP:

- overall campus population growth; and
- expanded transit services and incentives to achieve a 10 percent reduction in single-occupant vehicle trips at the Institute.

This evaluation considers both sources of growth and evaluates the existing transit system’s capacity to handle projected future ridership volumes.

Existing Transit Ridership

Records provided by the Office of Parking and Transportation indicate that Georgia Tech transit system serves an average of over 15,000 riders per day. These average ridership records provide a baseline understanding for overall use of the system and individual shuttle routes. Additionally, the Office of Parking and Transportation recorded passenger boardings on all of its transit shuttle services, typically a day for campus operations. These passenger counts indicated that over 17,000 users boarded shuttles that day, of which, 15,567 boarded at locations within the Georgia Tech campus and 1,200 boarded the Tech Trolley at the MARTA Midtown station. Based on a review of the shuttle stop locations, as shown in Exhibit 16 (on page 18), the proportion of each route’s ridership associated with the various campus regions was determined. A summary of the existing transit ridership by each region of campus on a typical day is provided in the table on the next page. This data provides the basis for evaluation of impacts related to development on campus and future increases in public transit use by the Georgia Tech community.

Campus Population Growth

As discussed in the PTMP future parking evaluation, Georgia Tech anticipated population growth from 24,112 students and faculty/staff in 2008 to 31,650 students and faculty/staff by 2019. These population projections provide a consistent basis for growth expectations in both the parking and transit evaluations. The population growth projections represent a 31.3 percent increase in transit users over the next decade, which equates to 4,873 additional Stinger or Tech Trolley riders.

Future Changes in Mode Choice

As discussed in the parking evaluation, Georgia Tech will pursue TDM programs and improvements to achieve a 10 percent reduction in overall use of single-occupant vehicles by commuters to the campus. The future projections included in the parking analysis suggest that half of this reduction will be associated with increased use of public transit, such as MARTA or GRTA, by commuter students and faculty/staff. Based on the population projections developed for the parking analysis, this shift results in a total of 1,583 additional public transit riders by 2019.

It should be noted that not all of these new transit riders will also use the campus shuttle system. This analysis assumes that 50 percent of the new 1,583 transit riders will also use the Tech Trolley to travel between the MARTA-Midtown station and the Georgia Tech campus, which results in 792 new Tech Trolley riders in addition to the increases associated with overall campus population growth.

Distribution of Growth

As discussed in the Development Program and Schedule section, and shown on Exhibit 19, the PTMP developed a set of building program assumptions for the future 2014 and 2019 analysis horizons, based on information contained in the Georgia Tech 2004 CMPU. For the purposes of the future conditions parking evaluation, the future building program assumptions are divided into two primary categories: resident student beds and academic/research space. The CMPU discusses future residential space growth in the northwest corner of campus and the Georgia Tech Housing Master Plan provides more detail on these plans, discussing replacement and expansion of Woodruff Hall to provide a total of 1,119 new beds around 2014. Future growth assumptions for the academic/research space is based on the list of future building space included in the CMPU and scheduling information provided by the Georgia Tech Capital Planning and Space Management Department.

These future development programs provide the basis for distribution of the future population projections among the various regions of campus. The table below summarizes the approximate regional population of both students and faculty/staff assignments at Georgia Tech in 2008 and 2019. For the purposes of this analysis, resident students were assigned to housing locations and commuter students were assigned to academic/research locations.

Approximate Regional Student and Staff Population

<table>
<thead>
<tr>
<th>Region</th>
<th>2008 Population</th>
<th>2019 Population</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Campus</td>
<td>4,238</td>
<td>5,367</td>
<td>+1,119</td>
</tr>
<tr>
<td>North Campus</td>
<td>3,486</td>
<td>5,182</td>
<td>+1,696</td>
</tr>
<tr>
<td>Central Campus</td>
<td>7,407</td>
<td>11,190</td>
<td>+3,783</td>
</tr>
<tr>
<td>East Campus</td>
<td>5,774</td>
<td>5,774</td>
<td>0</td>
</tr>
<tr>
<td>Tech Square</td>
<td>2,123</td>
<td>2,577</td>
<td>+454</td>
</tr>
<tr>
<td>Southwest Campus</td>
<td>332</td>
<td>332</td>
<td>0</td>
</tr>
<tr>
<td>Other (NARA)</td>
<td>752</td>
<td>1,238</td>
<td>+486</td>
</tr>
</tbody>
</table>

Future growth in the campus population is assumed to produce proportionate increases in demand for transit services in proximity to the population growth centers. Both the shuttle stop locations and regional population data were used to project future growth along each of the campus shuttle routes. The anticipated proportional growth in each campus region was calculated and is summarized for each shuttle route in the table below.

Future Ridership Growth by Region and Route

<table>
<thead>
<tr>
<th>Route</th>
<th>2008 Ridership</th>
<th>2019 Ridership</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Campus</td>
<td>55.7%</td>
<td>44.3%</td>
<td>0%</td>
</tr>
<tr>
<td>North Campus</td>
<td>10.0%</td>
<td>10.0%</td>
<td>0%</td>
</tr>
<tr>
<td>Central Campus</td>
<td>34.6%</td>
<td>27.6%</td>
<td>0%</td>
</tr>
<tr>
<td>Tech Square</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Other (NARA)</td>
<td>0%</td>
<td>100%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Future Conditions Assessment – Campus Transit System

Evaluation of the future campus shuttle ridership projections, based on the typical day boarding data, indicates that all of the campus shuttle routes will require additional service to meet future ridership demands by 2019. The following section summarizes the individual service improvements required on each route.

Red Stinger

The transit capacity analysis indicates that deficiencies on the Red Stinger are expected primarily during afternoon and evening operations. One additional Red Stinger shuttle should be provided on between 2:30 PM and 9:30 PM to reduce headways and add overall capacity to this route.

Blue Stinger

The results of the transit capacity analysis indicate that future capacity deficiencies are likely to occur sporadically throughout the day on the Blue Stinger route. The scope of these deficiencies indicates that additional service on this route for extended periods is not necessary. By arriving five minutes earlier or waiting an additional five minutes, most passengers will have little difficulty boarding a Blue Stinger through most of the day. However, the Institute may wish to add one additional Blue Stinger shuttle from 5:00 PM to 7:00 PM to address the future period most likely to experience capacity challenges.

Green Stinger

Future development on both the North campus, along 10th Street, and at the NARA complex is likely to contribute to general limitations on capacity along the Green Stinger route. One additional shuttle, operating between 8:30 AM and 5:30 PM is recommended to address the potential capacity issues on this route.

Tech Trolley

The Tech Trolley route is currently the most heavily utilized shuttle route on the Georgia Tech campus, and future use of this route is expected to increase significantly. One potential option to increase capacity on the trolleys is to replace the existing shuttles with larger vehicles, like those used on the Stinger routes. However, the popularity and identify of the Tech Trolley route is largely tied to the trolley vehicles with Georgia Tech has used for many years. Assuming the Institute continues to use the trolley vehicles, addition of two or three shuttles from 7:00 AM and 7:00 PM is recommended.

Other (NARA, MARTA station)

The PTPM recommends that Georgia Tech should continue to monitor transit ridership regularly, via passenger ridership counts on all shuttles, on an annual basis at a minimum. Ridership counts should include data on the number of riders both boarding and disembarking at each stop, and the number of riders denied service when shuttles are full. Continued monitoring of ridership will allow the Institute to determine trends in the Stinger and Tech Trolley ridership over time and assess capacity constraints within each service route. The projected service improvements discussed above should be implemented as the Institute expands and ridership data shows individual routes approaching or exceeding capacity. Efforts should be made to ensure that riders are typically able to board the first shuttle arriving at their stop.

This summary demonstrates that, by 2019, the campus shuttle system is expected to accommodate 5,665 additional riders, which includes 4,873 new riders associated with Institute population growth and 792 new riders associated with improved future utilization of public transit.

Finally, to determine capacity deficiencies on each shuttle route, the regional ridership increases were applied to the individual passenger boarding records for a typical day. The raw existing passenger boarding data for each individual shuttle run was summed to provide a conservative estimate of demand on each shuttle. Maximum capacity boarding assumptions were applied to shuttles which had been recorded as full. After aggregation of the existing data was complete, additional ridership generated by new development was apportioned to each run, based on the temporal distribution of total boardings at all stops. For the Tech Trolley, the additional riders due to future increases in public transit use were apportioned based on the temporal distribution of boardings for each run at the MARTA Midtown Station.

Ridership results were grouped into 15 minute intervals and capacity deficits were determined for each 15-minute interval. Records indicate that the Stinger route vehicle capacity is 56 passengers per shuttle (37 seated passengers and 19 standees) and that the Tech Trolley has a capacity of 36 passengers per shuttle (24 seated passengers and 12 standees). Any routes projected to experience capacity deficiencies for more than one 15-minute period were identified for improved service recommendations.
Potential Transit Route Modification and Expansion

Georgia Tech currently provides daily shuttle service within the campus, to the Home Park residential neighborhood, and to the Midtown MARTA station via the Tech Trolley. However, the existing system is reaching maximum capacity on some lines, while others are significantly under-utilized.

New routes operated by Georgia Tech could serve additional MARTA rail stations or other transit systems, increase the number of on and off-campus destinations, and improve the level of service provided to the Institute’s constituents. The following section describes a number of potential modifications or new proposals which target ways to both streamline and expand Georgia Tech’s scope of transit services.

Red and Blue Stinger Route Evaluation

The Red and Blue Stinger shuttles currently provide circulator service throughout the main Georgia Tech campus. Ridership on the Red and Blue Stingers is among the highest of any routes operated at the Institute and the routes are successful in providing access for students, staff, and faculty to all regions of the campus. These routes are very effective in their current configurations and no modifications to these routes are recommended.

Future residential expansion, through renovation of Woodruff Hall and the construction of two new residential buildings, is planned for the northwest corner of the Georgia Tech campus. The Red and Blue Stinger routes currently serve the west region of campus, via 6th Street, McMillan Street, and 8th Street. The distance between the Red and Blue route bus stop on McMillan Street and the planned residential buildings in the northwest corner of campus is similar to the longest distances to existing residential buildings in this region. Therefore, extension or modification of the Red and Blue routes is not necessary to provide reasonable and effective service to the west region in the future.

However, as discussed in a subsequent section of the PTMP, potential access restrictions to 6th Street and McMillan Street may require modifications the existing Red and Blue Stinger routes to maintain access to the west campus. In the event that the access restrictions are completed, the PTMP recommends shifting the Red and Blue routes to run a one-way loop between Hemphill Avenue and 8th Street, via 9th Street, Curran Street, and Turner Place. These modifications would maintain service to the existing bus stop on McMillan Street and also allow the Red and Blue routes to directly serve the planned residential expansion near Woodruff Hall.

Future Conditions Assessment – Campus Transit System

Modifications to Existing Green Stinger Route

The Green Stinger route is currently the least utilized of the four Stinger and Trolley routes, by a significant margin. Ridership data for the Georgia Tech shuttle system provided by the Office of Parking and Transportation indicates that the Green Stinger serves only approximately five percent of the total Stinger and Trolley ridership. Consequently, the cost to operate the Green Stinger is far greater, per ride, than any of the other routes. For these reasons, Georgia Tech should consider modifications to the Green route to serve more riders or reduce costs. These priorities could be accomplished by separating the Green Stinger into multiple routes with different vehicles. Exhibit 25 shows an alternative option for the Green Stinger route and pros and cons of this option are discussed below.

These route modifications would reduce costs by minimizing the Green route service area and serving a portion of the route with a van instead of a transit shuttle. The Green Route is also recommended to only operate during the daytime when undergraduate, GTRI, and NARA activity are greatest.

Improvements

• Provides access from off-campus research destinations to multiple campus hubs.
• Reduces costs by significantly reducing the service area, hours of service, and vehicle operating costs.

Disadvantages

• Mostly ignores residential areas, such as Home Park, and other activity centers to the north of campus.

Another route alternative which would serve the MARTA Arts Center station and Atlantic Station was briefly considered in this evaluation. However, minimal ridership demands to those remote destinations and potential costs associated with the longer route eliminated further development of this alternative.
Future Conditions Assessment – Campus Transit System

Modifications to Existing Tech Trolley Service

The Tech Trolley is currently one of the most popular and heavily used transit services on the Georgia Tech campus. The PTMP considered modifications to the Tech Trolley which could expand options for users traveling between central campus and numerous off-campus destinations. The following options cover a range of potential modifications to the existing Tech Trolley service which would increase its range and ridership.

Improvements relative to the existing Tech Trolley and disadvantages of each option are described below.

Tech Trolley Option A
Option A extends the existing Tech Trolley route along Ferst Drive to the Student Center and adds two shuttles to the route to reduce headways to four minutes during normal daily service. This option is depicted, with Option B, on Exhibit 27.

Improvements to Existing Trolley System
- Provides direct access to the Student Center area
- Additional service accommodates projected ridership growth

Disadvantages
- Provides no new service to key off-campus transit destinations

Tech Trolley Option B
Option B is similar to Option A, but divides the Trolley system into two separate routes serving both the Midtown and North Avenue MARTA stations, as shown on Exhibit 27. The Gold route is the same in Options A and B.

Improvements to Existing Trolley System
- Serves two MARTA stations and potential site for parking expansion to the east of I-75/85
- Provides direct access to the Student Center and stadium areas
- Additional service accommodates anticipated ridership growth

Disadvantages
- Provides direct access to the Student Center area
- Additional service accommodates anticipated ridership growth

Tech Trolley Option C
Option C would divide the Trolley service into two separate routes, serving both the Midtown and North Avenue MARTA stations, as shown on Exhibit 28.

Improvements to Existing Trolley System
- Serves two MARTA stations, North Avenue Apartments, and Tech Square
- Provides direct access to the Student Center area
- Additional service accommodates anticipated ridership growth

Disadvantages
- Provides no transit access directly to central/historic campus
- Bronze route uses a significant portion of congested North Avenue
- Additional traffic on Cherry Street

Additional consideration was given to another Trolley alternative (Silver route) routed through the central campus via the restricted sections of Cherry Street and Bobby Dodd Way. Under this alternative, these restricted sections of Cherry Street and Bobby Dodd Way would still prohibit access to passenger vehicles and trucks, but would allow transit vehicles, bicycles, and pedestrians. However, this alternative was not pursued further because of a desire to eliminate regular vehicular access on these roadway sections.
Potential New Downtown Connector Shuttles

Exhibit 29 provides a visual summary of three potential new transit routes considered for addition to the Georgia Tech transit system, providing access between the central Georgia Tech campus and priority downtown destinations. The following is a description of the potential new shuttle routes:

- **Vine City Connector** – Central Campus to Vine City MARTA Station, via North Avenue and Northside Drive
- **CNN Connector** – Central Campus to CNN Center MARTA Station, via Luckie Street
- **Civic Center Loop** – Central Campus to Civic Center MARTA Station loop route, via Luckie Street, Centennial Olympic Park Boulevard, Alexander Street, West Peachtree Street, and North Avenue (with an optional on-campus spur serving Techwood Drive, 4th Street, Fowler Street, and Bobby Dodd Way).

Of particular importance to the Institute is the creation of new service directly to the east-west MARTA rail line, on which both the Vine City and CNN Center stations are located. Georgia Tech currently only provides a direct connection to the north-south MARTA rail line at the Midtown Station, and riders destined to points along the east-west line must transfer trains at the Five Points station. Evaluation of the existing Georgia Tech shuttles and MARTA rail travel times suggests that new shuttle service to either the Vine City or CNN Center stations, operated on headways similar to the Tech Trolley, could reduce average commute times for east-west MARTA users by up to 15 minutes. The MARTA Civic Center Station is not located on the east-west rail line, but the station provides a central connection for a number of the Georgia Regional Transportation Authority’s Xpress commuter bus routes to suburban Atlanta destinations.

The student and employee residential populations along these proposed routes are relatively low. Therefore, these routes would primarily serve as connector routes to the MARTA system or other transit systems, such as existing bus lines operated by the Georgia Regional Transportation Authority and proposed transit routes for the Connect Atlanta Plan and Peachtree Streetcar. Georgia Tech would likely maximize its benefit and minimize its costs by implementing only one of these routes. Given its central routing and service to an east-west line MARTA station, the Coke-CNN Center Connector route is considered to have the highest benefit vs. cost.

Georgia Tech should consider starting one or more of the connector routes as a pilot program, with funding from local, state, or federal sources, such as the CMAQ program (described in more detail on the next page). The Institute should also consider partnership with other area employers along these routes, such as Coca-Cola Corporation, Turner Broadcasting Company, and CNN. Because these routes serve downtown destinations, and offer links between multiple transit systems, Georgia Tech should also consider partnership with the Atlanta Regional Commission and other transit services, such as GRTA, to implement new Connector routes and improve funding resources.
The results of the cost analysis indicate that any service expansion along with the exception of the Green Stinger modifications, which can be implemented at lower costs than the existing Green Stinger, all of the transit route proposals will increase costs to the Institute. Costs are projected to increase by about $130,000-$190,000 per route for transit service expansion; $475,000 for Tech Trolley expansion; and $400,000-$885,000 per route for transit route modifications. Funding sources for new transit routes or modifications to existing routes could include any parking system surplus revenue and possible FHWA funding through the Congestion Mitigation and Air Quality (CMAQ) Improvement Program, which is discussed further in the next section.

Typically, a screening evaluation of the ridership for each route would provide some indication of the cost benefits per rider. However, while demographic data provided by the Institute was reviewed for a preliminary assessment of transit route viability, this data is insufficient to develop reliable future ridership projections. Georgia Tech should consider developing ridership estimates for each proposed transit route, based on more detailed demographic data, MARTA ridership data, and survey information from existing campus transit riders.

Congestion Mitigation and Air Quality Improvement Program (CMAQ)

The Congestion Mitigation and Air Quality Improvement Program (CMAQ) is a federally-funded air quality improvement program, which supports surface transportation and related projects that contribute to air quality improvements and reduce congestion. The main goal of the CMAQ Programs is to fund transportation projects that reduce emissions of ozone, carbon monoxide, and particulate matter in EPA nonattainment and maintenance areas.

Transit and Public Transportation Programs

According to publicly available CMAQ program information, CMAQ funds may be used to support the use of public transportation. There are three broad categories of transit projects or programs that are eligible for funding: service or system expansion by providing new transit facilities or additional transit vehicles); provision of new transit service; and financial incentives to use existing transit services. CMAQ has also placed emphasis on improving intermodal connections in major urban areas and such projects are generally eligible for CMAQ funding.

The start-up of new transit service (e.g., new express bus routes or new shuttle service linking major activity centers) is supported under the CMAQ program in an effort to tap new markets for transit. While CMAQ cannot be a permanent source of funding for transit service, the goal is to encourage experimentation to determine whether new types of services are viable.

Financial incentive strategies attempt to encourage transit use, and include innovative fare policies as part of an overall effort to reduce "exceedances" of the air quality standards. Under specific conditions, CMAQ may be used to offset the cost of offering reduced or free transit fares. This can be done when the subsidized fare is an element of an overall, area-wide strategy for reducing emissions during peak periods of ozone pollution.

CMSAQ projects are selected by the State or the local Metropolitan Planning Organization. The FTA determines the eligibility of transit projects, and the FHWA determines the eligibility of all other projects. Because CMAQ funds are intended to improve air quality, funds must be spent in nonattainment or maintenance areas, which are regions which currently, or previously, do not meet the EPA's national ambient air quality standards.

CMAP projects are selected by the State or the local Metropolitan Planning Organization. The FTA determines the eligibility of transit projects, and the FHWA determines the eligibility of all other projects. Because CMAQ funds are intended to improve air quality, funds must be spent in nonattainment or maintenance areas, which are regions which currently, or previously, do not meet the EPA's national ambient air quality standards.

To be eligible for CMAQ funds, a project must be included in the local MPO's current transportation plan and TIP. In nonattainment and maintenance areas, the project also must meet the conformity provisions contained in the Clean Air Act and federal transportation conformity regulations. In addition, all CMAQ-funded projects must meet the National Environmental Policy Act (NEPA) requirements and meet basic eligibility requirements for funding under the United States Code.

Beyond transit service improvements, a variety of other projects are also potentially eligible for CMAQ funding, including Bicycle and Pedestrian Facilities and Programs, Travel Demand Management, and Carpooling and Vanpooling. More information is available at the FHWA's website for the CMAQ program (http://www.fhwa.dot.gov/environment/cmapgs).
Future Conditions Assessment – Priority Corridors

The Georgia Tech campus is surrounded by a number of primary roadways and internal vehicular access is provided by a network of on-campus roadways. Additionally, the Institute currently provides a variety of paths throughout the campus for the combined use of pedestrians, bicyclists, and other non-automotive modes. The Institute has also constructed dedicated bicycle lanes on portions of 5th Street, Ferst Drive, and State Street to separate bicycles from vehicle and pedestrian traffic within those corridors. Exhibit 30 shows the various transportation corridors on and surrounding the campus.

**Perimeter Corridors**

The perimeter corridors are identified in red on Exhibit 30. These corridors carry the heaviest traffic volume and represent the primary access routes onto the Georgia Tech campus.

**North Avenue**

North Avenue is a four-lane, undivided urban arterial roadway, which crosses I-75/85 via a five-lane overpass. North Avenue provides concrete pedestrian sidewalks on both sides of the street and standard crosswalks at most intersections. North Avenue represents the southern border of the Georgia Tech campus and is a heavily congested roadway during peak commuter traffic periods.

**10th Street**

Tenth Street is a four-lane, undivided urban arterial roadway, which crosses I-75/85 via a seven-lane overpass. Tenth Street provides concrete pedestrian sidewalks on both sides of the street and standard crosswalks at most intersections. Tenth Street represents the northern border of the Georgia Tech campus.

**Northside Drive**

Northside Drive is a seven-lane, undivided urban arterial roadway. Northside Drive provides concrete pedestrian sidewalks on both sides of the street and standard crosswalks at most intersections. Northside Drive represents the western border of the Georgia Tech campus.

**Marietta Street**

Marietta Street is a four-lane, undivided urban collector roadway. Marietta Street provides concrete pedestrian sidewalks on both sides of the street and standard crosswalks at most intersections. Marietta Street represents the southwestern border of the Georgia Tech campus.

Reducing traffic congestion on these primary corridors is a regional issue which is beyond the specific control of Georgia Tech. While some short-term congestion may be manageable with operational modifications to traffic signals or pavement markings, as enrollment and congestion increase, the Institute will need to prioritize new alternative forms of transportation to provide a balance between growth and accessibility.

However, Georgia Tech can take an approach toward improving these corridors to both complement future campus development and modify the character of these roadways. These changes would give drivers the impression that these corridors function more for the purpose of access to Georgia Tech than as regional commuter routes. Similar to the planned streetscape improvements described in the North Avenue Corridor Study, this approach involves more fully integrating these corridors into the Georgia Tech campus and identifying context-sensitive transportation improvements for different corridor segments and individual locations. Sample improvement strategies include the following:

- Install standardized streetlights
- Install new street trees
- Construct wider sidewalks and pedestrian plazas, with a standardized paver or Institute-specific design pattern
- Remove fencing or other barriers to the Georgia Tech campus
- Construct Georgia Tech monuments or signage identifying the campus “gateway” access points
- Provide on-street bicycle lanes from Marietta Street linking to campus bicycle lane and path systems
- Consider spot widening to construct pedestrian refuge islands or roadway medians
- Reduce the number of curb cuts to campus or commercial properties
- Consider aesthetic and multi-use bridge improvements on 10th Street and North Avenue, similar to the 5th Street bridge

The Institute should monitor operations along the primary corridors and key intersections bordering campus and develop solutions which fit the context of each corridor, intersection, or campus development location. The scope of contractor duties on new development projects should be expanded beyond the limits of the project’s frontage to including these types of streetscape and roadway improvements whenever possible.
Parking and Transportation Master Plan

Future Conditions Assessment – Campus Roadway, Pedestrian, and Bicycle Facilities

Campus Roadway Corridors

The campus roadway corridors are identified in blue and orange on Exhibit 30; blue identifies roadways which have previously been improved to include on-street bicycle lanes. These corridors provide for on-campus vehicular circulation and access to institute buildings and parking facilities. All of the corridors in red should be evaluated in greater detail for the potential to provide on-street bicycle lanes and improved pedestrian sidewalks, crosswalks, and crossing treatments at intersections.

Ferst Drive

Ferst Drive is a two-lane, undivided roadway, which is the primary spine road through the interior of the Georgia Tech campus. Ferst Drive provides concrete pedestrian sidewalks on both sides of the street and standard crosswalks at most intersections. On-street parking is allowed on parts of Ferst Drive and the portion of Ferst Drive to the east of Spring Street provides on-street bicycle lanes in both directions.

The existing improvements implemented along Ferst Drive, to the east of State Street, should be extended along the full length of Ferst Drive, past the Campus Recreation Center, to Cherry Street. Provision of on-street bicycle lanes along both sides of Ferst Drive will provide separation between the various transportation modes on one of the most heavily used roadways within the campus. Bicycle lanes on Ferst Drive would serve as the first step to linking the other “hub-and-spoke” pedestrian/bicycle corridors envisioned.

5th Street

Fifth Street is a two-lane, undivided roadway, which connects Ferst Drive with Tech Square, via the multi-use 5th Street bridge over I-75/85. Fifth Street has been recently improved and provides concrete pedestrian sidewalks on both sides of the street, modern crosswalks, and ADA-compliant crossing treatments at all intersections. Fifth Street also provides on-street bicycle lanes in both directions.

Future recommendations for the 5th Street corridor are minimal, but Georgia Tech should review the traffic signal operations at the 5th Street/Spring Street and 5th Street/West Peachtree Street intersections. Optimization of the settings for these signals could improve pedestrian crossing operations and/or reduce congestion on 5th Street.

Hemphill Avenue

Hemphill Avenue is a two-lane, undivided roadway, which connects Ferst Drive with 10th Street. Hemphill Avenue provides concrete pedestrian sidewalks on both sides of the street and standard crosswalks at most intersections. On-street parking is allowed on both sides of Hemphill Avenue.

Georgia Tech should provide bicycle accommodations along Hemphill Avenue, which is likely wide enough to retain on-street parking and provide shared arrow (or “sharrow”) pavement markings indicating bicycle traffic is present. The Institute could also consider eliminating on-street parking on one or both sides of the street to provide dedicated bicycle lanes.

Techwood Drive

Techwood Drive is a two-lane, undivided roadway, which connects 6th Street with North Avenue, through the heart of the residential east campus. Techwood Drive provides concrete pedestrian sidewalks on both sides of the street and standard crosswalks at all intersections. On-street parking is allowed on both sides of Techwood Drive. Techwood Drive becomes Centennial Olympic Park Boulevard to the south of North Avenue, at which point the roadway expands to four lanes with on-street parking on the east side of the street, next to the North Avenue Apartments.

Georgia Tech should conduct a traffic signal warrant analysis for the intersection of Techwood Drive and Bobby Dodd Way and consider removal of this signal. Bicycle lanes on Techwood Drive could benefit residents in the east campus, but would likely require elimination of on-street parking.
Future Conditions Assessment – Campus Roadway, Pedestrian, and Bicycle Facilities

Gateway and Campus Intersections

Through the process of campus reconnaissance and stakeholder meetings, a number of key gateway intersections within the “congestion” zone corridors and focal intersections on-campus were identified as locations of pedestrian and vehicular conflicts. These intersections include the following locations:

- Gateway Intersections
  - Northside Drive at 10th Street
  - 10th Street at Hemphill Avenue
  - 10th Street at State Street
  - 10th Street at Atlantic Drive
  - 10th Street at Fowler Street
  - North Avenue at Tech Parkway
  - North Avenue at Cherry Street
  - North Avenue at Techwood Drive/Centennial Olympic Park Boulevard
- Key Campus Intersections
  - Hemphill Avenue at Ferst Drive
  - Ferst Drive at State Street
  - Fifth Street at Fowler Street
  - Spring Street at Fifth Street
  - Spring Street at Third Street
  - Techwood Drive at Bobby Dodd Way

Campus Pathways

Many of recommended corridor improvements would also improve conditions for pedestrians at these intersections, but Georgia Tech could pursue additional measures to improve pedestrian safety, particularly for those crossing at the campus gateway intersections. The North Avenue at Techwood Drive/Centennial Olympic Park Boulevard is of primary concern because the North Avenue Apartments, housing approximately 2,000 students, are located at this intersection. The following safety-related improvement measures should be considered at all of the primary gateway intersections to the Institute campus to improve pedestrian safety:

- High visibility crosswalks, potentially including in-ground lighting systems, alternative pavement materials/color schemes, signage in the roadway, and overhead signage
- Fully operational pedestrian signals, including push buttons and countdown timer signals, on all approaches of each intersection
- Pedestrian crossing flags
- Lead phasing and/or longer pedestrian signal phases to further protect pedestrians in crosswalks
- Prohibition or restrictions of right-tums-on-red for vehicles
- Sidewalk widening or physical separation between sidewalks and roadways
- Curb extensions at crosswalk locations to minimize crossing distance or construction of median refuge islands in roadway
- Additional pedestrian crossing and speed limit signage along North Avenue

Exhibit 30 shows the recommended pathway corridors for such improvements in green. With the Landscape Master Plan’s design corridors as a general guide, the primary pathway corridors recommended in Exhibit 30 use the Tech Green, Student Center, and future CULC as a focal point within the central campus, for a “hub-and-spoke” system of pedestrian and bicycle facilities. In particular, the 6th Avenue/Williams Street area and the 3rd Street tunnel have been identified for further evaluation and potential treatments are discussed on the next page.

As part of this initiative, Georgia Tech should consider widening all of the off-street pathway corridors to a minimum of 10 feet to provide multi-use functions for various non-auto modes. The existing pathway connecting the Ferst Drive/8th Street intersection with the Student Center is an excellent example of such a multi-use pathway. Furthermore, while some of the existing pathways within the Georgia Tech campus are already designed for multi-use purposes, the Institute should also consider further improvement to provide separation between pedestrians and bicyclists, as shown in the image at right.

Beyond recommendations to improve future pedestrian and bicycle corridors, field investigation throughout campus revealed a general scarcity of visible bicycle storage facilities. In residential areas, simple bicycle racks were often not provided or not obviously situated for student use. Many activity centers within the central campus were similarly lacking bicycle racks or lockers, or appeared to be capable of providing additional racks. Construction of a new transit center represents an opportunity to provide additional bicycle storage racks and/or lockers for student and employee use in proximity to some of the busiest activity centers in the center of campus. Covered bicycle storage can also be provided in existing or future parking garages with relative ease. In some cases, the simple visibility of appealing and well-utilized bicycle storage can encourage further use of bicycles by the campus community.
The 6th Street and McMillan Street corridors represent an example of a location on which substantial bicycle and pedestrian improvements could be accomplished. One of the priorities identified during the stakeholder meetings and discussions with Institute officials is to provide better connectivity between the west residential campus and the central academic campus. Heavy pedestrian and bicycle travel between these regions has been observed and additional focus on improvements between the regions could improve safety for all users.

A number of improvement options, with varying levels of impact to existing operations on the 6th Street and McMillan Street corridors, were developed. These options, which were presented to and discussed with the PTMP Advisory Committee, included:

Option 1 – Eliminate existing on-street parking and widen the existing sidewalk along 6th Street
Option 2 – Eliminate existing parking, shift 6th Street travel lane to the north, and construct a multi-use path along the southern edge of 6th Street
Option 3 – Close 6th Street and southern McMillan Street to all vehicles; construct a dedicated multi-use path for pedestrians and bicycles with improved crossing treatments on Ferst Drive; and eliminate parking on McMillan Street to provide two-way travel south of 8th Street.

Both Options 1 and 2 would retain the existing one-way vehicle travel pattern on both 6th Street and McMillan Street and would not disrupt existing transit service along these corridors. Exhibit 31 shows the possible treatments on 6th Street under Option 3, which is the most aggressive improvement option.

Exhibit 31 shows the Option 3 concept, which includes the provision of two-way travel along northern McMillan Street. All on-street parking along this portion of McMillan Street would be eliminated and the existing driveway at the Fitten Residence Hall would be converted into a shuttle turn-around. Because of the elimination of vehicle travel on 6th Street, the Red and Blue Stinger routes would utilize Hemphill Avenue, 8th Street, and McMillan Street to provide transit access to the residential areas on the west campus.

3rd Street Tunnel

The existing 3rd Street tunnel, connecting Bobby Dodd Way on the east campus with 3rd Street to the east of I-75/85, provides a useful connection between the opposite sides of the freeway but is currently an uninviting route for pedestrians. There is currently no active, 24-hour control of the entrances and past safety incidents reported by tunnel users have resulted in periodic closures of the tunnel to all user activity.

Georgia Tech should consider improvements to the tunnel entrances to locate them within secure structures, including card readers, security phones, security cameras, and bright lighting. This measure would reduce the potential for anyone not affiliated with the Institute to access the tunnel and would likely minimize the potential for future incidents in or around the tunnel. The proposed controls on the tunnel entrances could be included within other facilities, such as new parking structures or campus service buildings, which would serve dual purposes and provide increased campus-member activity in and around the tunnel.
Master Plan Summary and Conclusions

This Parking and Transportation Master Plan (PTMP) defines a comprehensive transportation strategy and implementation recommendations that will enhance mobility for Georgia Institute of Technology (Georgia Tech) employees, students and visitors. Through evaluation of existing and future parking and transportation operations and finances, over short-term and intermediate time frames, the PTMP identifies projected deficiencies and opportunities in the parking and transportation systems. The PTMP is designed to improve the overall transportation experience at Georgia Tech; address critical facilities and operations; and suggest investment priorities.

Parking System

Based on development plans from the 2004 CMPU and schedule projections provided the Office of Capital Planning and Space Management, a total of over 2,500 spaces are expected to be replaced by open space or development by 2019. An additional loss of 1,950 parking spaces is expected after 2019.

Through the evaluation of Georgia Tech population projections, parking occupancy, and commuter mode split data, the PTMP projects that the Institute's parking demand will continue to grow, despite reasonable migration of up to 10 percent of commuters out of single-occupant vehicles into alternative modes. Based on the future demand evaluation, the PTMP projects that the Institute will require construction of approximately 2,500 parking spaces, providing a total Institute parking supply of approximately 13,000 on-campus parking spaces, by 2019. After evaluation of multiple locations, potential locations for parking expansion have been identified to address projected parking supply deficiencies in the west, central, north, and east campuses. Potential locations have been grouped into multiple tiers according to their benefits and disadvantages, with Tier 1 sites representing the most advantageous locations. Tier 1 sites include West Campus, Ferst Drive, 3rd Street to the east of I-75/85, and Bobby Dodd Way.

A set of policy guidelines was developed to inform future parking decisions on the Georgia Tech campus and maintain the Institute’s financial and sustainability goals. Adherence to the following guiding principles for locating and managing new parking will provide Georgia Tech with an efficient and sustainable path toward providing the appropriate amount and types of parking on the campus:

- Manage parking demand through TDM and alternative commute modes to enhance campus sustainability
- Use cost to inform decisions on new facilities
- Locate new parking facilities to balance regional traffic impacts, on-campus traffic and parking, and maximize opportunities to share parking resources
- Support campus sustainability initiatives by considering and incorporating pedestrian, bicycle, carpool, and transit amenities
- Design facilities consistent with Institute goals and aesthetics
- Incorporate technology to improve parking operations and access

Transportation System

The proposals for improvement of the Georgia Tech campus transportation system include possible construction of a centrally-located transit service to provide a hub for most existing and potential transit routes. The PTMP provides a preliminary design concept which involves the conversion of the E41 parking lot to accommodate multiple transportation modes.

The PTMP identifies a number of on-ground lighting systems, alternative pavement materials/color schemes, and overhead signage to be used in conjunction with other improvements identified in the PTMP. The Institute also suggests the development of a new connector route to downtown Atlanta activity centers.

Transportation Demand Management

The PTMP discusses a range of improvement options for the transportation corridors surrounding the campus. By identifying context-sensitive transportation improvements, such as the following measures, the Institute can potentially affect both the operations and characteristics of these roadways:

- Install standardized streetlights and new street trees
- Construct wider sidewalks and pedestrian plazas, with a standardized paver or Institute-specific design pattern
- Provide off-street bicycle lanes on Maryetta Street linking to campus bicycle lane and path system
- Consider pedestrian refuge islands or roadway medians
- Consider pedestrian crossing flags
- Use cost to inform decisions on new facilities
- Pedestrian crossing flags and/or pedestrian signal phases to further protect pedestrians in crosswalks
- Pedestrian safety is a primary concern for students, employees, and visitors to Georgia Tech. The PTMP has identified a number of gateway intersections to the campus which are potential candidates for future pedestrian safety improvements. As discussed in previous sections, the following safety-related improvement measures should be considered at all of the primary gateway intersections to the campus:

- High visibility crosswalks, potentially including in-ground lighting systems, alternative pavement material/color schemes, and overhead signage
- Fully operational pedestrian signals, including push buttons and countdown timer signals, on all approaches of each intersection
- Sidewalk widening, physical separation between sidewalks and roadways, and curb extensions, median refuge islands at crosswalk locations
- Additional pedestrian crossing and speed limit signage along North Avenue

The PTMP has identified a system of roadway and pathway corridors, using the Tech Green, Student Center, and future CULC as a focal point within the central campus, to encourage a “hub-and-spoke” system of improved pedestrian and bicycle facilities. Pathway improvements to separate pedestrians from bicyclists and provision of more bicycle storage facilities would encourage additional use of these modes. Additionally, a number of operational or safety-related improvements are identified for campus roadways and gateway intersections. These improvement measures include traffic signal modifications/removal, bicycle accommodations, high-visibility crosswalks, pedestrian refuge islands, pedestrian signals, curb extensions at crosswalk locations, and additional signage for pedestrian crossings and speed limits.

Off-campus Roadways

The PTMP discusses a range of improvement options for the transportation corridors surrounding the campus. By identifying context-sensitive transportation improvements, such as the following measures, the Institute can potentially affect both the operations and characteristics of these roadways:

- Provide transportation options that are competitive and convenient compared to drive-alone commuting
- Direct incentives are the most effective way to encourage the use of alternative transportation and reduce driving
- Coordinate campus land use and parking management
- Apply consistent transportation demand management strategies throughout campus
- Institutionalize transportation options throughout campus by providing infrastructure and policies to support it
- Communicate the benefits of alternative transportation to the campus community

The scope of contractor duties on new development projects should be expanded beyond the limits of the project's frontage to include these types of streetscape and roadway improvements whenever possible.

Pedestrian Safety

Pedestrian safety is a primary concern for students, employees, and visitors to Georgia Tech. The PTMP has identified a number of gateway intersections to the campus which are potential candidates for future pedestrian safety improvements. As discussed in previous sections, the following safety-related improvement measures should be considered at all of the primary gateway intersections to the Institute campus:

- High visibility crosswalks, potentially including in-ground lighting systems, alternative pavement materials/color schemes, and overhead signage
- Fully operational pedestrian signals, including push buttons and countdown timer signals, on all approaches of each intersection
- Pedestrian crossing flags
- Pedestrian crossing flags and/or pedestrian signal phases to further protect pedestrians in crosswalks
- Sidewalk widening, physical separation between sidewalks and roadways, and curb extensions, median refuge islands at crosswalk locations
- Additional pedestrian crossing and speed limit signage along North Avenue
The PTMP discusses a variety of infrastructure improvements which Georgia Tech should consider as part of an overall plan to reduce the use of single-occupant vehicles on the campus. The following is a summary of bicycle and pedestrian accommodations, which would support reduced use of single-occupant vehicles as the Institute transitions to construct new buildings, open spaces, and the Eco-Commons Plan.

- Use the Tech Green, Student Center, and future CULC as a focal point within the central campus, for a “hub-and-spoke” system of pedestrian and bicycle facilities.
- Provide dedicated bicycle lanes or “sharrows” on primary campus roadways.
- Widens all of the off-street pathway corridors identified on Exhibit 30 to a minimum of 10 feet to provide multi-use functionality.
- Consider further pathway improvements to provide separation between pedestrians and bicyclists.
- Provide bicycle racks and lockers at most campus activity centers and residential dormitories.
- Covered bicycle storage in existing or future parking garages.

Financial Summary

The Institute generates parking revenue directly from fees, operations, and interest, with no apparent additional subsidies from the Institute or other agencies. Currently, the Institute receives more in parking revenue than it spends to run and maintain its parking system; however, accounting for the Institute’s funding of facility depreciation, the parking system has not been revenue-neutral since 2005.

The PTMP indicates that the Institute’s transportation system is funded adequately to provide the services currently in operation and produces surplus revenue of approximately $200,000. Based on the 2007 contract costs and ridership data for both the Stinger and Tech Trolley services, the average cost per ride for each of the shuttle ranged between $0.96 (Red Stinger) and $2.29 (Green Stinger), which compare well to other public and institutional transit systems.

The PTMP discusses numerous findings and recommendations for Georgia Tech transportation planning efforts over the next ten years. The following is a summary of the next steps for Georgia Tech to develop and implement the recommendations of the PTMP, in pursuit of Institute transportation and sustainability goals for the future.

Exploration of design concepts in more detail for identified parking structure sites

Georgia Tech should develop detailed design concepts for the Tier 1 parking structures to better define the size of each facility, site constraints, access locations, and access challenges.

Operational planning for campus transit recommendations

The PTMP transit recommendations provide a launching pad for development of new and improved services; however, additional planning is required to evaluate ridership and select preferred routes and services.

Operational planning efforts will also be necessary to integrate services into the existing campus transportation system and determine available revenue sources. Georgia Tech should consult with stakeholder groups for additional input on improving transit operations and possible development of innovative strategies.

Exploration of partnerships for off-campus transit options

Georgia Tech should develop relationships with strategic individuals or entities to facilitate the development of new transit services to off-campus destinations. The relationships may also serve to advance the Institute’s interests in the face of political or logistical challenges.

Pedestrian and bicycle wayfinding related to campus parking and transportation options

Georgia Tech should develop modern and innovative signage to manage traffic flow and direct pedestrians, bicycles, and vehicles to parking locations and transportation systems. The Institute may wish to consider monitoring and variable information technology to advise drivers regarding facility use and alternative options.

Exploration of parking information system integration (T2, Buzzcard, etc.)

Georgia Tech currently uses parking information and management systems on a limited number of newest parking facilities, such as the Tech Square garage. Expansion and integration of the systems into both existing and new parking facilities would provide the Institute with greater management resources for its parking supply and could allow the campus to transition to different pricing models, such as hourly or daily parking, or target specific campus populations.

Exploration of Home Park parking and travel patterns

Transportation studies can provide a better understanding of the parking and travel patterns in the Home Park neighborhood. Surveys and evaluation of off-campus resident and staff travel behavior would provide the Institute with greater knowledge of mode choice for residents of Home Park, parking restrictions in the neighborhood, and commuter student or faculty parking behavior. These evaluations would allow Georgia Tech to optimize transit service in the neighborhood and implement policies to maximize revenue from campus users currently parking in Home Park.

Develop implementation plan for expanded travel options, parking replacement, and transit service

Georgia Tech will be required to develop a detailed plan for implementation of PTMP recommendations, including a schedule, fee structure for revenue, design plans for bicycle and pathway improvements, further evaluation of impacts to existing campus facilities and users, and transportation management during construction activities.

Explore climate change implications of parking and transportation plan recommendations

Additional planning efforts are required to support the Master Plan goal of evaluating and reducing Georgia Tech’s emissions impacts on climate change. The Institute should inventory the existing transportation system’s emissions and study greenhouse gas (GHG) emissions reductions related to Georgia Tech’s preferred transportation improvements. Implementation of new transportation systems and evaluation of the Institute’s climate impacts will support goals included in the American College and University Presidents Climate Commitment.