

## Transit and Parking Forecast

### 3.1 Potential Park-and-Ride Users

The existing site serves Chapel Hill Transit (CHT) riders, Triangle Transit Authority (TTA) riders and carpoolers. Generally, drivers are using at least 350 of the 400 parking spaces on a daily basis. New ridership will be attributable to organic growth, new land development and expanded service.

The existing boarding and alighting patterns show the peak of activity at the Park-and-Ride during the morning. 31% of the daily trips occur in the morning; 6% during the midday peak hour and 24% during the evening peak.

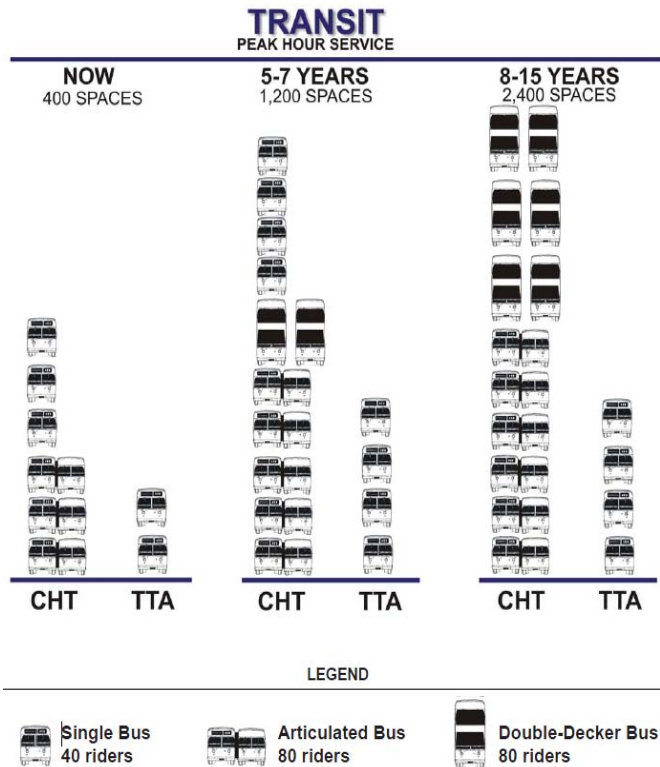
Successful transit programs provide frequent, reliable and affordable service. CHT has shown it is prepared to meet the increasing demand. Providing greater transit capacity is essential to capturing as many trips to public transit as possible to reduce traffic impacts and traffic congestion.

A portion of the anticipated potential ridership will come from the proposed land development adjacent to the existing Park-and-Ride site. The land development program for the adjacent site is discussed in the next section in more detail and is expected to follow a traditional transit-oriented development pattern which allows individuals to create a lifestyle of sustainable transportation use.

Ridership will also increase in relation to reduced headways and increased service area. Specific service providers and destinations include potential expanded service by Triangle Transit Authority (TTA), Durham Area Transit Authority (DATA) and the Piedmont Area Regional Transit (PART), in addition to stops within Carolina North, Hillsborough Hospital and other new campus locations. Refinement of routes to provide optimum use between residential areas and employment centers will continue through maintenance of the transit program and enhanced facilities.

CHT ridership boardings are forecasted to increase from 300 per day up to 950 with peak days up to 2,450 per day. To meet this demand, the existing 10-minute headways in 240 seats per hour will need to increase to 5-minute headways and 480-960 seats per hour. Figure 3-1, Transit Demand, illustrates seating capacity needed to support the existing and forecasted peak hour service demand.

Figure 3-1: Transit Demand



Current service is provided with three articulated buses, three regular buses and two Triangle Transit Authority (TTA) buses on ten minute headways during peak periods. Service will expand through the operation of a larger fleet of additional buses with larger capacity on a higher service frequency schedule.

Based on the identification of potential users of the Eubanks Road Park-and-Ride facility and the assessment of their needs, a set of initial building program phases were developed. These phases intend to show the phases of when the expanded facility will be needed to meet demand. The forecasted utilization was established by applying the 1.5% annual growth rate to the existing utilization, doubling the commuter service of TTA, and adding in the support for Carolina North. Following the results of the analysis from the 2009 *Carolina North Transportation Impact Study*, forecasting for the parking space demand followed from applying the measured vehicle occupancy ratio (VOR) of 1.08 and turnover rate of 1.25.

Tying the ridership and the parking rates together, the following phases of facility demand resulted. Table 3-1 presents the level of demand and recommended supply for three horizon years with the 2015 as a planning stage.

Table 3-1: Parking Demand and Supply Forecast

Parking Space Demand	2011	Annual Growth	2015	2020	2035
Existing P&R Lot	350	1.5%	371	375	505
TTA Expanded Service			135	135	180
Carolina North <sup>1,2</sup>			160	460	1,515
<b>Total Demand</b>			<b>666</b>	<b>970</b>	<b>2,200</b>
<b>Supply</b>	<b>400</b>		<b>740</b>	<b>1,200</b>	<b>2,400</b>

<sup>1</sup> Contingent upon development implementation

<sup>2</sup> Assumes 260,000 SF of Research space

## 3.2 Conceptual Design

The broad concept for phasing the Park-and-Ride expansion is to construct 1,200 parking spaces and then build in a second phase approximately fifteen years later 1,200 more spaces, or when demand dictates. The lot and the garage each leave a different footprint. Figure 3-2 illustrates the space differences each phase will require, followed by Figure 3-3 illustrating the footprint that a single garage will have on the existing site.

### 3.2.1 Lot Design

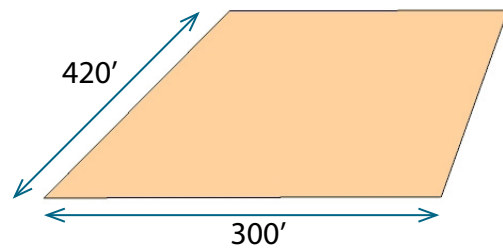
The existing parking lot could initially be expanded and reconfigured within the existing property to provide 497 spaces, plus 30 more spaces if a site design exception is granted, at an approximate cost of \$450,000. When the demand for 1200 spaces is present, expansion onto adjacent property with a lot approximately 615' x 615' would be necessary. The cost per space is approximately \$4,000 per space, equaling \$4.8 M to build the first phase.

### 3.2.2 Garage Design

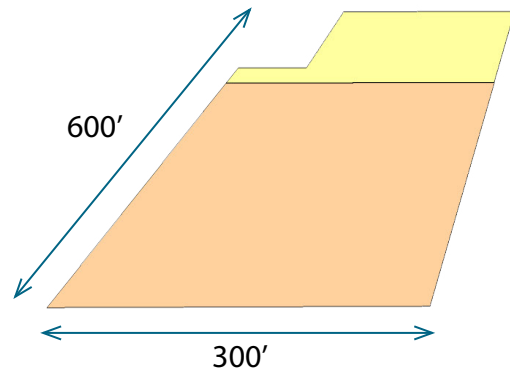
The garage alternative allows phasing the expansion to construct a 1,200 space parking structure and then build a second 1,200 space structure in a later phase. The parking garages will likely utilize pre-stressed, precast concrete elements to be both cost effective and to reduce the construction time frame. All of the precast elements are typically designed, detailed and fabricated at the manufacturer's facility and delivered to the site ready for installation. This method minimizes the amount of laydown area the contractor will need as these pieces are generally lifted directly off the delivery truck and set into their final location.

Ideally, the garage layout will be very open providing parking spaces without columns between them, enhancing the maneuverability of the vehicles in and out of the parking spaces. The garage will likely be designed as an 'open' structure with significant portion of the perimeter defined by parapet walls. This both eliminates the need for mechanical ventilation as well as provides a garage that does not make the occupants feel enclosed. If the garage is designed to span over the bus lanes, then additional clearance for the first level or a means to provide exhaust ventilation will be needed.

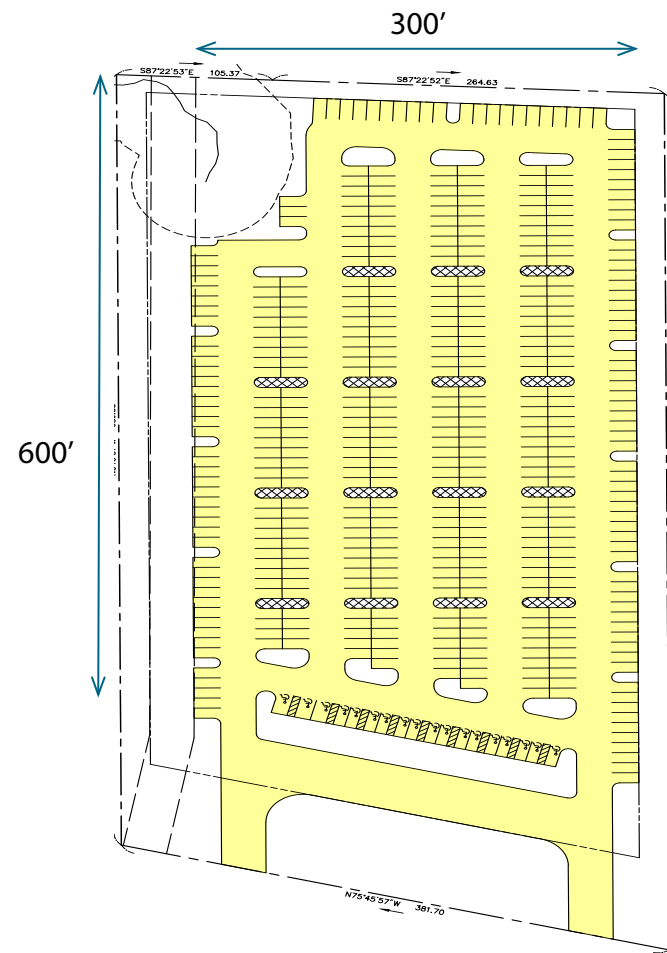
400 Parking Spaces  
Existing Parking Lot



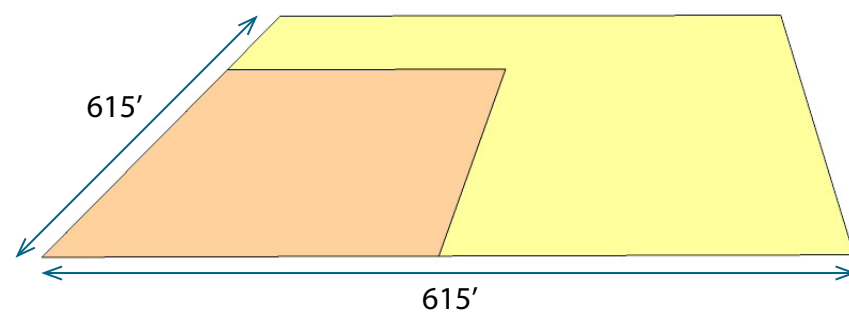
497 Parking Spaces  
Parking Lot on Existing Property



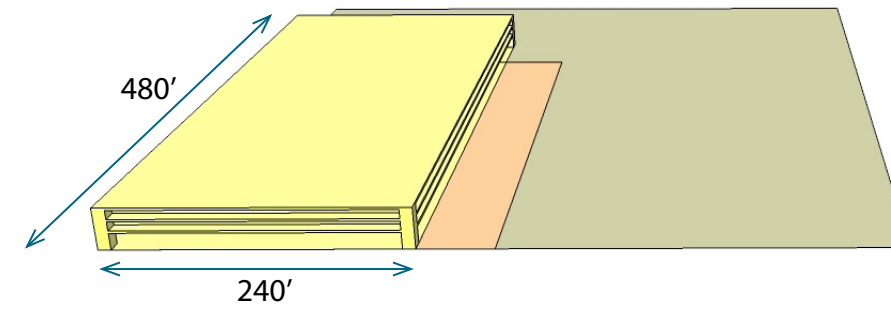
497 Parking Spaces  
30 Additional Spaces from Island Removal  
(with Site Plan Exception)



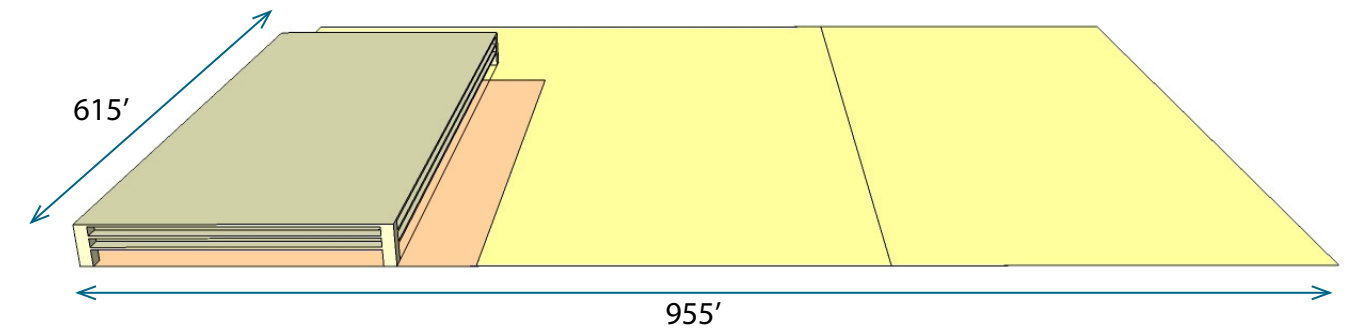
1,200 Parking Spaces  
Parking Lot



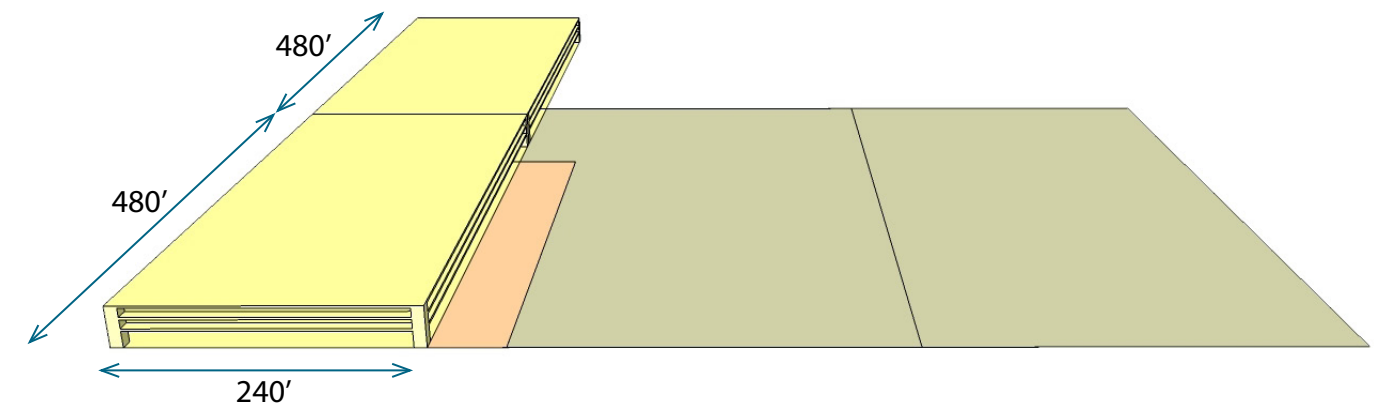
1,200 Parking Spaces  
Parking Garage



2,400 Parking Spaces  
Parking Lot (No Garage)



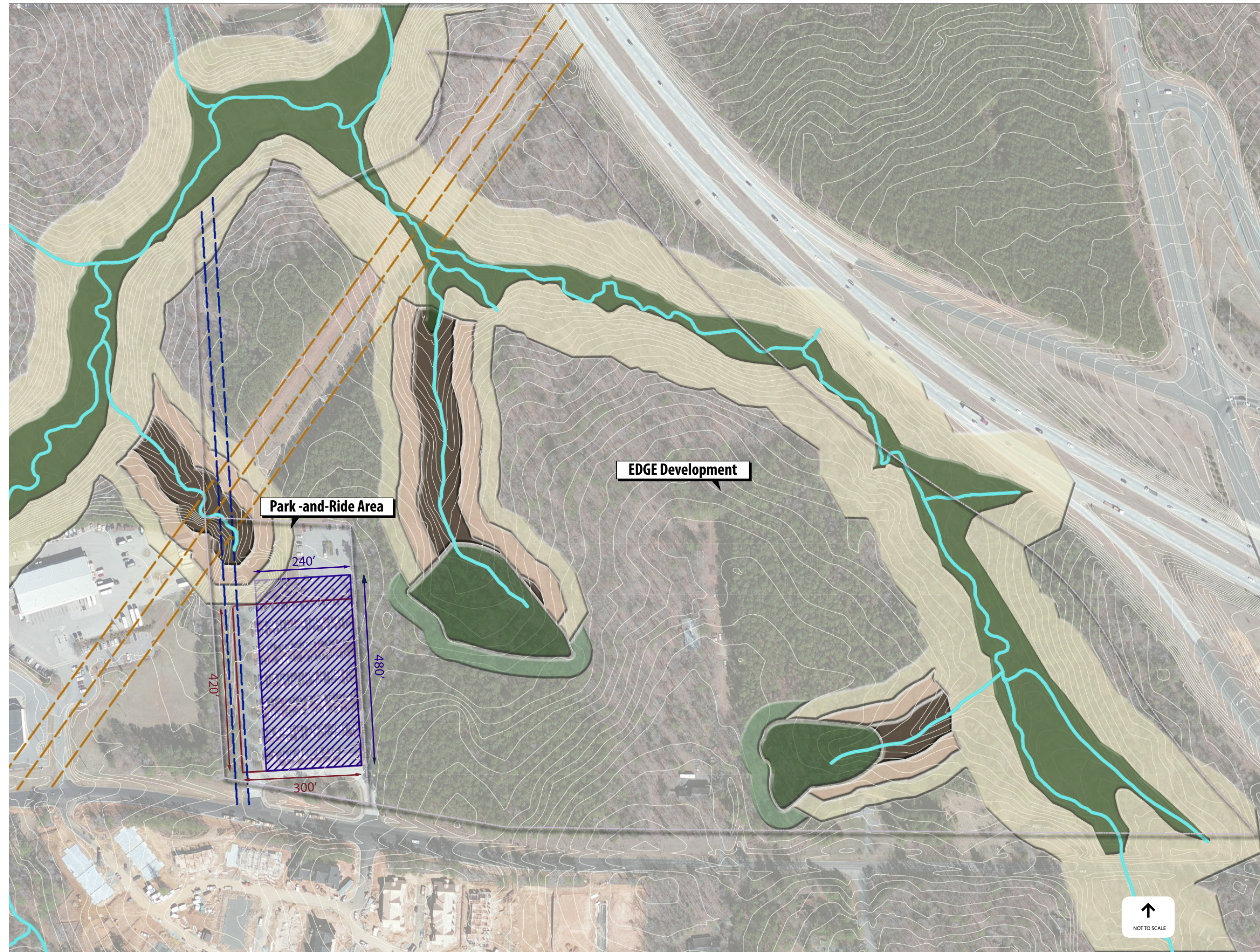
2,400 Parking Spaces  
Parking Garages (2)



Eubanks Road Expansion Park-and-Ride  
Feasibility Study  
Chapel Hill, North Carolina

Figure 3-2  
Parking Facility Size Comparison

Chapel Hill, North Carolina



**Eubanks Road Expansion Park-and-Ride  
Feasibility Study**  
*Chapel Hill, North Carolina*

Figure 3-3  
1,200 Space Parking Garage Footprint

Chapel Hill, North Carolina

To accommodate the required 1,200 parking spaces, the garage will be approximately 240 feet wide, which equates to 4-bays of drive aisles with parking on each side and 400-480 feet long, as illustrated in Figures 3-4 and 3-5. The length may vary depending on traffic flow patterns within the garage. The long garage allows for a secondary crossing lane on the upper floors providing cars two routes to exit the garage. This may be beneficial if the intended occupants will be arriving and leaving in short windows of time, or if there are surges when a high percentage of the parkers seek to enter or exit at the same time. Depending on the final site layout, one end of this garage can be designed for future expansion where it abuts the future 1,200 space garage. This could allow for both garages to effectively act as one 2,400 space garage. Designing for this option would double the number of entrances and exits that each vehicle can access.

A portion of the first floor level may include bus lanes to support an intermodal center, i.e. the Eubanks Road Intermodal Facility. Above those lanes the second floor level would need to be raised to accommodate the height required for the buses or some portion of the second floor eliminated entirely. In addition, the first floor will need to include space for maintenance/storage rooms, security offices, restroom/changing facilities and bicycle lockers. These amenities may be incorporated to fit the needs of the people using this facility as well as being needed to qualify for some level of LEED accreditation as specified by USGBC.

The proposed garage may be supported by shallow foundations if the soils are acceptable; however, there is a possibility that a deep foundation system or soil remediation system will be needed. Since the garage has long spans, the column loads will be large. It is not known if the existing soils would not be able to handle the column loads without settlement. Therefore, decisions on the foundation systems will be needed once a geotechnical report is completed for the site.

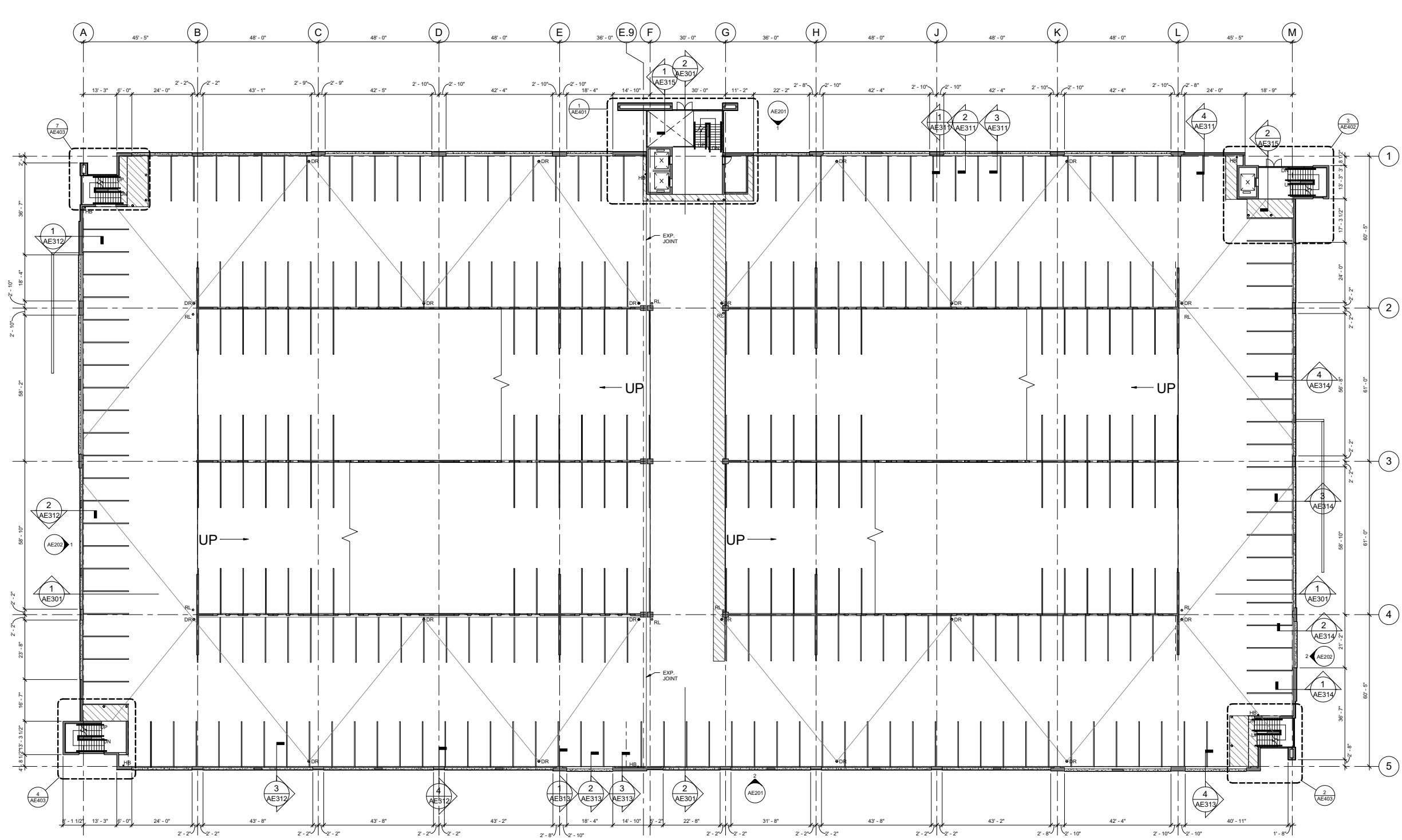
Cost of construction of one garage is estimated to be \$18M or \$15,000 per parking space. The first garage is anticipated to have more cost than the second in order to incorporate the bus activity protected from the weather, offices and other features.

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### 3.3 Amenities, Elements, and Features

Building the expansion of the Park-and-Ride into an intermodal facility requires incorporating amenities, elements and features that users expect to support their quality of life. Incorporating the facility into a mixed-use transit supportive development is ideal; however, there are some amenities that are best to be incorporated into the facility out of convenience. This section generally presents a variety of components to consider in preparing the overall program for a successful facility.

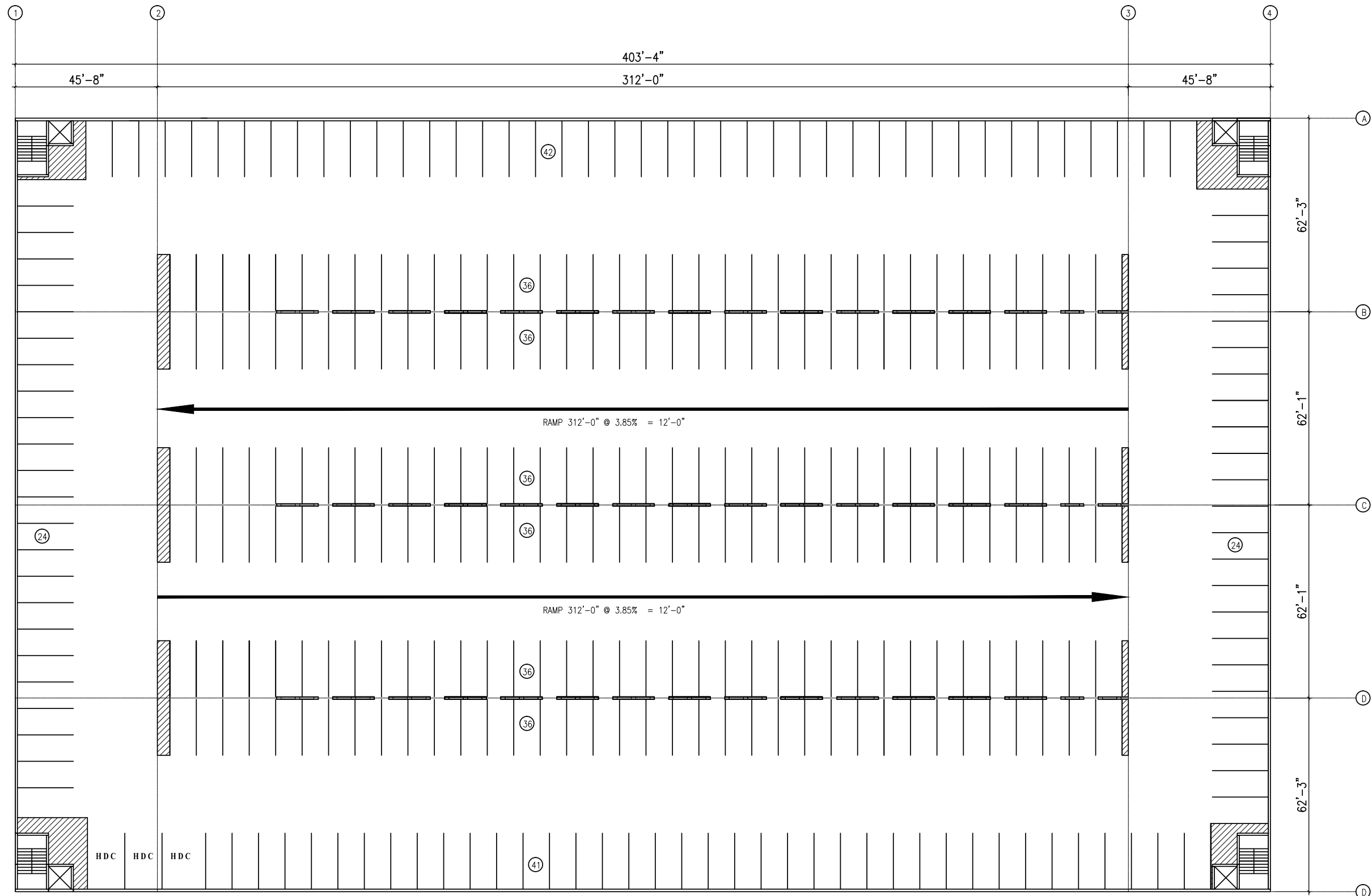
- An enclosed waiting area with a Wi-Fi hotspot (or the hotspot could be with a convenience commercial use),
- Next-bus signage,
- Lighting and Wayfinding signage
- Restrooms associated with a commercial use like a donut shop.
- Convenience commercial usage (dry cleaner, donut/coffee shop, sundries shop)
- Police substation



NOT TO SCALE

Eubanks Road Expansion Park-and-Ride  
Feasibility Study  
Chapel Hill, North Carolina

Figure 3-4  
4-Bay Cross Over Ramp



Eubanks Road Expansion Park-and-Ride  
Feasibility Study  
Chapel Hill, North Carolina

Figure 3-5  
Chapel Hill Park-and-Ride Parking Garage

NOT TO SCALE



Important considerations for convenience commercial use are visibility, space and convenient access for non-transit customers. Visibility to a public roadway and clear access from that roadway is essential for its success. There would not be sufficient traffic from the transit usage alone to support a convenience store; however, it could work if the site is attractive and visible enough. Additionally, quick in and out parking would be necessary for the non-transit customers. The advantages of having a convenience commercial usage on the site are:

- Restrooms for users
- Visual surveillance by the shop operators – which discourages wrongdoers
- Convenience for transit users
- Site occupancy – someone to call in an emergency
- Revenue – not much but some cash flow

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### 3.4 Ownership and Operations

Chapel Hill Transit is envisioned to own the intermodal facility. Support services and building area leased to service providers would be managed by Chapel Hill Transit or by a hired management firm. The service providers would be established as revenue generators to offset operating and maintenance costs.

An active Park-and-Ride facility stimulates synergetic benefits for the riders and creates an opportunity for adjacent land use development. The results of the analyses indicate that the expansion of the Park-and-Ride is independent of the adjacent land use; however, the facility does provide a life style which uses alternative transportation from the auto-centric suburbs. The adjacent land use concepts were introduced and brought into the evaluation of the existing site.

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### 3.5 Parking Garage Operating and Maintenance Costs

There are numerous variables that affect the cost to operate and maintain structured parking garages including at least the type of fare collection used, hours of operation, enforcement and patrol regimes, the energy and maintenance costs of elevators, lighting costs, cleaning and routing maintenance costs. Local labor rates and benefits also influence labor costs. Given the wide range of variables it was determined that the actual experience of Chapel Hill in its parking program would be the best point of departure to estimate the cost of operation and maintenance for the Eubanks Road Parking Garages.

The cost estimates presented in this section are based on a number of assumptions which will likely change. The values will need to be reviewed and revised during the facility design stages when additional information is available for a more refined estimate.

In the 2010 – 2011 budget for Chapel Hill the cost for off street parking operations and maintenance was \$1,358,420. This budget covered the annual operation of 745 off-street spaces located in Wallace Parking Deck and seven other off-street locations. The budget also includes significant debt service

payments on the Wallace Parking Deck and other off-street parking facilities that are not related to operations and maintenance costs. Published and estimated debt service costs based on budget information from the Chapel Hill Parking Services Division were subtracted from the Off Street Parking Fund budget to calculate an estimated annual operation and maintenance (O&M) cost of \$770,499. The average O&M cost per space for the year was, therefore, \$1,034.23 per space.

Because the Eubanks Road garages would provide all 2,400 spaces in one location, operation and maintenance of these spaces can be accomplished far more efficiently than the numerous dispersed locations now serviced by the Town of Chapel Hill. The planning team concluded that approximately 40% of the O&M cost could be saved due to the efficiency of a concentrated facility, which results in an annual per space cost of \$620.54. This is in the range of costs commonly cited by parking industry professionals for the operation and maintenance of structured parking garages.

Potential revenue from the planned Eubanks Road garages is dependent on occupancy. Parking meter usage data provided by Chapel Hill's Parking Services Division indicates all day parking utilization is approximately 50%. Since transit service (and commuting) is reduced on weekends and holidays, an annualization factor of 279 days was also applied to the projected 2,400 spaces. This results in projected parking space occupancy of 334,800 space days.

Using the discounted occupancy spaces per year and the annual operating and maintenance cost, the break-even parking charge is estimated at \$4.45 per day. This does not include debt retirement costs for construction of the garages. The total annual O&M cost for the 1,200 car garage is estimated at approximately \$750,000, and for the 2,400 car garage would be \$1,500,000.