

DEVELOPMENT OPTIONS

INTRODUCTION

Three alternative land use plans (see Figures 3-4, 3-5 and 3-6) were prepared to stimulate discussion concerning preferences and priorities for the long-term development of the Horace Williams property. The alternatives illustrate different land use combinations and circulation and transit approaches. Both the alternatives and the recommended final plan illustrate general land use and circulation patterns and relationships. They do not illustrate the layout of buildings, open spaces, roads or walkways within use zones.

Environmental protection zones and use districts are color coded and labeled on the plans. Vehicular entries to the Horace Williams property are shown as circles and major internal road corridors and transit routes are shown as thick lines; transit stations are illustrated with a large dot.

Density and transit/transportation management alternatives were also investigated to explore approaches to establishing the ultimate build out capacity of the Horace Williams property given the constraints which exist on off-site roadway capacity. After establishing a reasonable trip generation threshold for the site, alternative "packages" of transit/transportation management policies were prepared that range from the "status quo" to very aggressive efforts to encourage trip reduction and transit use. These policy alternatives were applied to the three land use plan alternatives to estimate a range of possible site development capacities in gross square feet of building space given the trip generation threshold.

The three alternative land use plans and the density and transportation management policy approaches were carefully evaluated by University and community advisory committees. These review comments were documented and served the basis for formulating the final plan.

LAND USE AND CIRCULATION ALTERNATIVES

Common Features

The three land use and circulation alternatives share the following characteristics.

1. No land acquisition is proposed.
2. The airport and University physical plant complex are retained and labeled as "prior committed" areas.
3. Consistent setbacks and buffers are provided along property edges.
4. The Weaver Dairy Road extension is shown intersecting Homestead Road in the alignment which best provides access to the Horace Williams property to create a northern entrance to the site.

5. A connection from Seawell School Road to Homestead Road is shown through the western portion of the Horace Williams property; this connection is aligned to avoid crossing Bolin Creek.
6. Major site entrances are illustrated to the north, south, east and west to ensure the efficient distribution of traffic.
7. Uses that attract a large number of people and/or visitors are located on site edges near major existing travel corridors to facilitate accessibility.
8. Uses that contribute to a positive development image are located along major travel corridors.
9. Uses which allow a small building footprint are located where topography is steep and valuable tree cover exists.
10. Housing is located along the perimeter of the site to complement adjacent off-site residential development.
11. Housing is also shown on the Home Site, located to the north of the Horace Williams property.
12. The municipal landfill and chemical burial site are shown as active recreation and/or open space.
13. No building development occurs in regulated natural areas (floodplain, wetland) or in the expanded buffer zone (averaging 150' from the flood plain) surrounding Bolin Creek and Crow Branch.
14. It is assumed that guidelines for environmentally responsive development will be applied in all sensitive natural areas (steep slopes, wooded areas).

Alternatives Comparison

The different characteristics of the three alternative plans, and their relative strengths and weaknesses, are summarized below.

Alternative A (Traditional Campus) Description. This alternative presents a typical approach to campus land use patterns, including traditional academic and university research uses, to offer a contrast to the mixed-use University Village approach proposed in Alternatives B and C. In Alternative A, a centrally located academic use area is surrounded by research and recreation. This academic core represents the highest density of development, while the balance of use districts spread a lower density of development fairly equally across the site.

The Visitor Destination district is located along Airport Road with an Independent Use district located to the west of Seawell School Road. Relatively small Housing districts are located on the western and southern edges of the site. A Utilitarian Use district is also located on the southern edge of the site to the east of Seawell School Road.

Three site entry points connect with a central loop road. The lower edge of this loop road forms a fairly continuous east-west connection across the site from Airport Road to Homestead Road. Transit in this alternative is provided by road-based bus service.

A combination of Housing and Independent Use is shown on the Home Site.

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T E C H N I C A L R E P O R T

Strengths and Weaknesses. The primary strengths and weaknesses of Alternative A, as compared to the other plan alternatives, are summarized below.

- This alternative misses the opportunity to utilize the new model of mixed-use development presented by the University Village district. Consequently, it may be more difficult to create an appealing and distinctive identity for the Horace Williams property.
- The absence of the mixed-use University Village district also suggests that site users will have to travel elsewhere to obtain needed commercial and convenience services. As a result, trip generation on and off site is likely to be higher than in alternatives incorporating the higher density, mixed-use development approach.
- The location of higher density academic uses towards the center of the site and the dispersion of lower density development across the rest of the property do not appear to maximize efficient transit service. Neither does this alternative take advantage of the potential for dedicated busway or rail service within the University/Norfolk Southern rail corridor.
- The Utilitarian Use district located along Seawell School Road could adversely impact the surrounding residential uses.
- Housing and Recreation districts are well located to complement surrounding residential development.
- The Visitor Destination district location on Airport Road maximizes access and visibility and could create a positive image along this important community entrance corridor.
- Roadway access is not now available to serve independent use on the Home Site.

Alternative B (University Village East) Description. This alternative locates the higher density, mixed-use University Village district on the eastern edge of the property, adjacent to Airport Road. The developable area in this location is limited because Crow Branch creates a separation between development zones, and constraints on future development are likely in the area of the old municipal landfill. In this alternative, it is assumed that transit will be provided by road-based bus service, with a major transit stop located on Airport Road where development density is highest.

The large developable area in the center of the site is dedicated to Independent Use and the development zone between Seawell School Road and Bolin Creek is shown as Housing. Visitor Use is located on the north edge of the site, where it can be accessed directly from the planned extension of Weaver Dairy Road. High School Road is also extended into the site from the west to create another point of entry. East-west access across the site is very similar to Alternative A.

Housing use is shown on the Home Site.

OUTLYING PARCELS LAND USE PLANS
TECHNICAL REPORT

Strengths and Weaknesses. The primary strengths and weaknesses of Alternative B include:

- The University Village district has high visibility to create a positive image on Airport Road. This higher density, pedestrian-oriented, mixed-use development approach could give the Horace Williams property a positive identity and appeal for both University and non-University users.
- The location of the University Village district restricts its size and dictates a dependency on road-based bus transit service. The potential value of the rail corridor as a dedicated busway or rail transit route is lost. While road-based transit is a low-risk, relatively low-cost approach, faster service on a dedicated busway or rail line may be more convenient and attractive to potential users and could more effectively reduce traffic impacts on Airport Road.
- The amount of area dedicated to Independent Use is comparatively large and may be too large in relation to likely demand for this type of development.
- Housing on either side of the Bolin Creek corridor will capitalize on the visual and recreational value of this important natural feature. With careful development, lower density housing in this area could minimize potential negative impacts on the creek.
- Housing developed at low and moderate densities cannot capitalize on the potential of the rail corridor as a high capacity transit route.
- The large land area dedicated to Housing will likely exceed the land area needed to meet the needs of University students, faculty and staff.
- Utilitarian Use along the south side of Estes Drive provides a logical extension of the University's existing physical plant complex, but could negatively impact the residential area to the south.
- Housing on the Home Site complements existing development to the east; no roadway access is currently available from the west.

Alternative C (Central University Village) Description. In this alternative, a large University Village district is located on the major development zone in the center of the site, adjacent to rail corridor and Seawell School Road. As a result, the rail corridor's potential to provide dedicated busway or rail transit service can be used to maximize transit convenience and capacity. Road-based buses will also provide transit service to and from the site and to the rail corridor transit stop from development zones which are beyond walking distance.

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An Independent Use district is located between Seawell School Road and Bolin Creek as in Alternative A. Similarly, Housing is shown to the west of Bolin Creek. In Alternative C, Housing is also located on the eastern edge of the Horace Williams property, north of Crow Branch.

Two Visitor Destination districts are included in this alternative: one on the north edge of the site (to be accessed by the extension of Weaver Dairy Road) and the other adjacent to Airport Road. On Airport Road, commercial use is shown as an alternative to the Visitor Destination district. Utilitarian Use is located south of the airport on Seawell School Road, as in Alternative A.

While the roadway alignment connecting the northern and eastern entrances to the site is similar to Alternative B, east-west access across the property is less continuous.

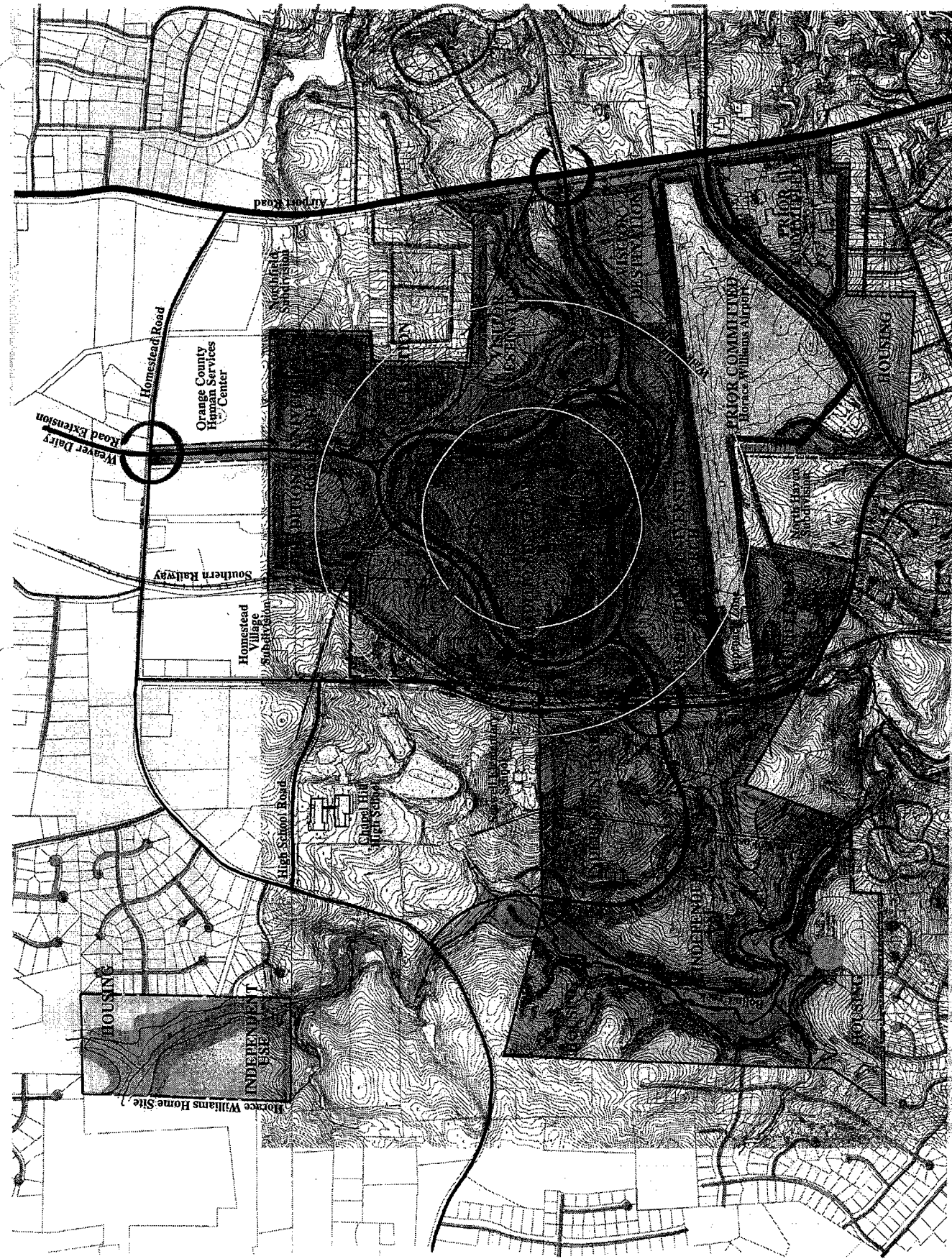
As in Alternative B, Housing use is shown on the Home Site.

Strengths and Weaknesses. The comparative strengths and weaknesses of Alternative C include:

- The location of the University Village district takes full advantage of the largest and most developable segment of the property to maximize the extent of higher density, pedestrian-oriented, mixed-use development.
- The larger size of the higher density, mixed-use area will provide increased support (ridership) for efficient transit service.
- Commercial use on Airport Road is well located for visibility and access, but will also be a major traffic generator, attracting customers from the region, as well as the immediate area.
- Visitor Destination districts are well located for regional roadway access, but are not within walking distance of the proposed rail corridor transit stop.
- Housing on the site's perimeter adjacent to existing residential uses is expanded to maximize off-site compatibility.
- The discontinuous east-west roadway alignments are likely to slow and discourage through-site traffic.

DENSITY AND TRANSPORTATION MANAGEMENT ALTERNATIVES

The land use and circulation patterns illustrated in Alternatives A, B and C raise a number of important issues for the future development of the Horace Williams property by presenting choices concerning:



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Outlying Properties Land Use Plans
September 1, 1998

ALTERNATIVE A



Horace Williams Property
Figure 3-4

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ALTERNATIVE B

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Horace Williams Property
Figure 3-5



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ALTERNATIVE C

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Horace Williams Property
Figure 3-6

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- The types of potential uses which can best be located in particular site development zones;
- The relative extent of each use district; and
- The major roadway connections needed to serve the property, complement the community circulation network and distribute traffic effectively.

However, questions related to density also require investigation to explore the total amount of development which can and should occur at Horace Williams. These density questions are critical to the University because they help to quantify the property's development capacity and long-term value. They are also critical to the community because they serve as a basis for understanding the infrastructure and service demands (impacts) likely to result from development. (The character of the built environment resulting from differing intensities of development is also an important issue. Given the limited level of information currently available for identifying future uses, only broad principles are appropriate at this time. Nevertheless, both University and community participants in the planning process support using the Central Campus as a model of the development density and character to be emulated in more detailed, future phases of planning for the Horace Williams property.)

Estimating Build Out Capacity: Standard Approaches

The total amount of development, or build out capacity, of a given site can be estimated in several ways. A private developer would typically start with the total developable land area, the density allowed under existing zoning and/or a program of uses defined through market analyses (for example, so many housing units of given sizes and prices, so many square feet of commercial space, etc.) in estimating the total amount of building square footage to be provided. In the case of the Horace Williams property, the Environmental Summary has identified approximately 550 acres that can be developed while retaining existing University uses and protecting sensitive natural features (see Table 4 in Recommendations Plan chapter to follow). Given the existing zoning for the Horace Williams property, over 9 million square feet of building development could occur on the site's 550 developable acres. If that same acreage were developed to the average density which exists today on the entire Central Campus, approximately 9.6 million square feet of building space could be constructed.

Unlike a private developer, the University will undertake development of the Horace Williams property over an extended time period (30 - 50 years or longer) and cannot accurately predict today the quantity of particular types of uses that may be needed to accomplish its mission over the next 30 - 50 years. Nevertheless, both Chapel Hill and Carrboro need the most definitive answers which can be provided to determine whether the existing site zoning is appropriate and what alternative development regulations might better offer the University the flexibility it needs to achieve its academic, research and service objectives in a manner supportive of community goals. For these reasons, a different approach to determining the ultimate amount of development on the Horace Williams property was investigated. This approach uses an estimate of the number of average week day automobile trips to and from the site which can be accommodated while maintaining a reasonable level of service on the surrounding road network.

Traffic Generation Threshold: A Performance-based Approach

Early in the planning process, traffic carrying capacity and future congestion (Level of Service) on the local road network were identified as especially sensitive areas of impact to be considered in determining the development density, and ultimate magnitude of building square footage, on the Horace Williams site. As a result, the number of week day car trips to be generated to and from the site at full build out is a significant determinant of total development capacity from the community perspective. If, as the University has agreed, development of the property is undertaken in a manner that (1) respects the need for compatibility with the adjacent residential context and (2) protects sensitive environmental features, the community's greatest concerns related to external (off-site) development impacts can be met if agreement can be reached on an appropriate threshold for traffic generated from development on the Horace Williams property.

Establishing the Threshold. The process of identifying a traffic generation threshold began by determining the capacity of the roadway network surrounding the site assuming that only those major road improvements already included in existing Thoroughfare Plans and Transportation Improvement Programs would be implemented. As agreed by the Town of Chapel Hill, projected traffic volumes on the road network were determined using forecasts for the year 2015 derived from the North Carolina Department of Transportation, the Triangle Transit Authority and the Town of Chapel Hill (see Table 1). These forecasts account for increases in traffic generated by new development in the area (background traffic) with the exception of the Horace Williams property. Then, the distribution of trips to and from the Horace Williams site at full development was determined. Approximately 50% of the trips to the site are projected to come from the north, where access will be relatively good given planned improvements to Airport Road and Weaver Dairy Road. Most of the remaining trips (up to 50%) are expected to come to/from the south (Central Campus, downtown Chapel Hill) on roadway segments where no improvements are planned. By comparing roadway capacities to projected volumes of background traffic, and given the likely distribution of traffic from the site, it was determined that the road system to the south will constrain total site traffic to 45,000 automobile trips on an average week day, resulting in a Level of Service E at peak hours. The critical roadway links imposing this constraint are Estes Drive, Greensboro Road north of Main Street in Carrboro and Airport Road south of Estes Drive.

Increasing Build Out Capacity Through Trip Reduction

If transportation management strategies for trip reduction and transit could be successfully implemented, the quantity of development which could be accommodated on the Horace Williams site at full build out could be increased while achieving the traffic generation threshold of 45,000 automobile trips per average week day. Four alternative trip reduction "packages" were defined to demonstrate the potential additions to site build out capacity which could be achieved in land use Alternatives A, B and C with varying policy approaches.

These trip reduction/transit "packages" were structured to represent points on a spectrum from the "status quo" to very aggressive (see Table 3-2). The alternative trip reduction packages were applied to the three land use and circulation alternatives to gauge the amount of building square footage that could be accommodated at each of four different levels of trip reduction while limiting week day automobile trip generation to/from site to 45,000.

The trip reduction/transit packages are based on four important transportation management principles. The first is that an investment in higher cost transit alternatives (such as a dedicated busway or rail) is very difficult to justify unless higher density development concentrates a significant number of potential transit users within easy walking distance of the transit corridor. The second principle is that fixed guideway (dedicated busway or rail) transit approaches are more attractive to potential users because they reduce travel times as compared to road-based bus service. The third principle is that people will not give up the convenience of driving their own car unless road congestion and delays substantially reduce that convenience (by increasing the travel time) and parking is hard to find and/or costly at their destination. The fourth principle is that significant cooperation is needed between local, state and regional agencies to create the land use and transportation environment in which trip reduction/transit strategies can function effectively.

1. **Road-based Bus with Status Quo Trip Reduction Policies.** This trip reduction "package" includes road-based bus transit serving the Horace Williams property (with links to Central Campus) and the following on-site trip reduction policies:

- Provide bicycle and pedestrian paths to encourage alternative modes of travel within the Horace Williams property and to off-site destinations.
- Provide a ridesharing/transit coordinator to encourage and facilitate participation in carpools and the use of transit.
- Continue the transportation management policies currently in place on Central Campus.
- Offer flextime work schedules, four-day work weeks, staggered work hours and telecommuting options to staff/employees on the Horace Williams property.

The following external, or off-site, policies are also included:

- Maintain Chapel Hill Transit service at current levels and extend service onto the Horace Williams property.
- Implement municipal plans for off-site bicycle and pedestrian improvements.

2. **Improved Road-based Bus with Strong Trip Reduction Policies.** This trip reduction "package" includes all the policies described above, as well as improved road-based bus transit service (which provides a high level of service flexibility at a relatively low capital cost) and the following additional on-site policies:

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TECHNICAL REPORT

- Ensure site design approaches that provide easy transit access
- Establish parking fees for all University employees, as well as some parking restrictions (e.g., price, availability) for non-University employees.
- Provide incentives and subsidies for transit use.
- Guarantee a "ride home" for all employees who do not bring a car to the site.
- Offer expanded flextime work schedules, four-day work weeks, staggered work hours and telecommuting options to staff/employees on the Horace Williams property.

Additional off-site improvements include the following:

- Improve Chapel Hill Transit service on Airport Road by increasing frequency and extending hours of operation and by preempting traffic signals for buses to minimize delays; extend bus service throughout the Horace Williams property.
- Improve regional transit service and provide additional park-and-ride lots with shuttle service to employment concentrations.

3. **Dedicated Busway Transit Service with Aggressive Trip Reduction Policies.** This trip reduction package includes the development of a dedicated busway within the University/Norfolk Southern rail corridor through the Horace Williams property and connecting north through the Northwest Area to the Eubanks Road park-and-ride facility and south to downtown Carrboro. Because busway service will reduce travel times as compared to road-based bus service, it can provide a more efficient and appealing transit option and is likely to attract greater ridership as a result. Moreover, this corridor has the potential to generate high transit ridership from development proposed in the Northwest Area, the Horace Williams property, schools and apartments near the corridor, as well as downtown Carrboro and downtown Chapel Hill. In addition, because busway transit vehicles can leave the rail right-of-way at Carrboro and continue to Central Campus on the street, they have an advantage over rail transit (see below).

A preliminary, order-of-magnitude cost has been estimated for a busway located in the University/Norfolk Southern rail right-of-way (from Eubanks Road to the University cogeneration plant on Cameron Street). The cost of the busway will be relatively high given the narrow right-of-way and the embankment on which the existing track is placed. If the busway includes two 10-foot lanes, one on either side of the track, the total cost is estimated at \$19 million. (Note that this cross section does not allow for simultaneous rail and bus operations, although it would allow for