



## *City of Raleigh* *North Carolina*

June 30, 2011

### **MEMORANDUM**

**TO:** J. Russell Allen  
City Manager

**FROM:** Eric J. Lamb, PE  
Manager, Office of Transportation Planning

**SUBJECT:** Issues Regarding Proposed Light Rail Alternatives in Downtown Raleigh

On June 20, 2011 the City's appointed Passenger Rail Task Force (PRTF) met to deliberate regarding Triangle Transit's proposed light rail alternatives through downtown Raleigh. The task force's approach to this deliverable has been focused on providing a recommendation that is best for the City. The PRTF utilized the best information at hand provided by staff from Triangle Transit (TTA) and the City.

City staff has analyzed the alternatives at hand with respect to implementation, engineering, and functionality. Where the PRTF analysis focused more on the "what," our evaluation centered more on the "how" and assesses the challenges associated with all of the proposals at hand. This memorandum seeks to outline these challenges and to provide details for the City Council's consideration.

### **Overview & Alternatives**

In prior deliberations the PRTF had considered the overall route for the City but had deferred considerations for the downtown alternatives until receiving more information from TTA. There are several alternatives that TTA has presented to the task force and to the public with multiple options for traversing downtown. As a result of their deliberations, the task force chose to develop a hybrid alternative called D6a that was not previously considered or studied by TTA.

Alternative D6a, as recommended by the task force, is effectively a hybrid between TTA's Alternative D6, which utilizes Morgan Street for streetcar-style operation, and the northern portion of Alternative D5, which proposed to utilize the Salisbury/Wilmington couplet streetcar-style for light rail service through downtown. The PRTF added westbound service along Hillsborough Street to pair with eastbound service on Morgan Street to address some issues with the intersection of Salisbury and Morgan. There are significant engineering issues associated with D5 on the southern end of downtown that make it extremely difficult to implement. For this reason and others, the task force voted unanimously to disregard this

alternate. But the task force felt strongly about trying to connect the system into the state government complex north of Union Square for the purposes of increasing ridership, which became the genesis behind considering a hybrid alternative.

The majority of the PRTF members felt that a system more closely connected to the Central Business District (CBD) was worth evaluating. But if such an alternative were proved to be infeasible, those same task force members clearly stated they would support Alternate D6. City staff, TTA's design team, and at least one PRTF member felt that D6 provided sufficient access to the CBD and that there were significant potential obstacles associated with Alternate D6a.

#### **Ridership Projections & Station Locations**

Alternates D2 and D6 both establish stations on the northern and western side of the CBD, with locations on Harrington Street between Jones Street and Lane Street and along the CSX Rail Corridor over Peace Street adjacent to Seaboard Station (see Attachments A and B). North of Union Square, Alternates D5 and the hybrid D6a both have stations paired along Salisbury Street and Wilmington Street, with one-way platforms located between Edenton Street and Jones Street and just north of Polk Street (see Attachment C).

As Triangle Transit has not developed an official scenario for this alternative, no 2035 ridership projections are available. City staff attempted to extrapolate possible ridership numbers for this alternative based on TTA's projections for D6 and D5. Ridership for D6 was projected to be roughly 14,500 riders per day and D5 was projected to be 15,300 riders per day. Since the D6a would utilize Salisbury/Wilmington north of Morgan Street and would not be directly adjacent to the southern business core of the City, it is anticipated that D6a would not have ridership as high as that of D5. For the purposes of discussion, it was estimated that the ridership for this option would be roughly 15,000 riders per day.

Table 1 – 2035 Ridership and Travel Time Projections

	D2	D5	D6	D6a
Estimated Daily Ridership	14,400	15,300	14,500	15,000*
Total Travel Time	34 min	38 min	35 min	36-37 min*

\* extrapolated estimates

The differential in ridership between D6 and D6a is estimated to be 3.4%. TTA utilizes a regional transportation model that takes into account socioeconomic data and origin/destination projections to generate transportation ridership across the region. The margin of error for future year projections for the Triangle regional model has never been established; however, it is reasonable to think that those estimates of a margin of error for a 2035 ridership projection could be plus or minus five to ten percent. Therefore in the context of ridership projections, any differential between these alternatives could either be effectively negligible or greater than projected. The presumed increase in ridership was a key factor in the task force's support for Alternate D6a and will require additional study.

The task force was concerned that the Harrington Street station proposed in Alternates D2 and D6 was not sufficiently proximal to the state government complex. A walk radius of one-quarter to one-half mile is typically used as a standard for considering how far patrons will walk to transit stations. In using this standard, it is clear that the stations in D2/D6 are within adequate

walking distance to the state government complex (see Attachments A and B). PRTF members expressed concerns regarding the “barrier effect” of Dawson Street and McDowell Street, which are high-volume one-way streets. The majority of members felt the Harrington Street station was not sufficiently accessible to the State Government complex because of this impediment.

Previous City planning efforts have emphasized the importance of Jones Street as a pedestrian corridor to connect this area to Glenwood South, and the Harrington Street station included in Alternates D2 and D6 would seem to reinforce this goal. Also, the proposed station over Peace Street is one block away from the northern end of the state government complex, and it provides direct access to the burgeoning Seaboard Station area. PRTF members have suggested that if Alternate D6a moves forward, additional stations should be considered along Hillsborough and Morgan and along Halifax Street north of Peace Street.

### **Value Capture & Redevelopment**

City staff conducted an analysis of vacant or under-utilized privately owned parcels (see Attachment D). This type of Soft Site Analysis can be used to determine the potential for expansion and additional construction of higher intensity development in the downtown area to support the light rail system. Based on staff’s analysis, the majority of developable and re-developable land in downtown appears to exist in the area west of Dawson Street between the CBD and Glenwood South. All alternatives have the proposed Union Station complex anchoring the south end of Glenwood South. Both Alternates D2 and D6 also include a station adjacent to Glenwood South that would be located on Harrington Street between Jones Street and Lane Street as mentioned above. This station would likely facilitate a higher level of development around this station area than is currently projected.

Generating additional development density with transit stations is the goal of “value capture,” where additional value related to a specific infrastructure investment is used to help pay for the investment. Revenues from value capture techniques can also be used to pay for additional infrastructure to support the principal investment. Please note that there is no official consideration of any value capture mechanisms (e.g., TIF, synthetic TIF, special assessment districts) under consideration by the City for any area of this project at this time.

The majority of land along the Salisbury/Wilmington corridor north of Union Square is owned and controlled by the State of North Carolina. It is unknown as to whether or not consideration of Alternatives D5 or D6a would induce the State to divest itself of these properties for the purposes of re-development. The majority of the property owned by the State in this area is already substantially developed or approved for redevelopment, such as the LNR Blount Street Commons Project. Please note that development approved prior to a transit plan would not be subject to potential value capture programs.

### **Historic Property Impacts**

All of the alternatives under consideration entail some level of real or potential historic property impacts, most of which are indirect or visual impacts. Many areas within downtown contain some element of historic property or historic district designation; therefore selecting any alternative for light rail service will be predicated upon determining which alternative has the least amount of impacts.

Alternative D6a may face substantial hurdles in this category relative to the aforementioned grade-separated structure adjacent to Peace College (an historic district) and the adjacency of the State Capitol Building located on Union Square (a national historic landmark). The national historic landmark designation requires the highest level of historic preservation in Federal law. Any proposal to introduce light rail service adjacent to Union Square must clear a high level of scrutiny by historic resource agencies.

Alternates D2 and D6 share a historic property conflict relative to the alignment and station proposed over Peace Street. These alternates would necessitate a direct physical impact to one of the former rail canopies used for the former Seaboard train station, which now reside next to Logan's Trading Company. None of these potential historic conflicts for any of these alternatives have been determined to be insurmountable "fatal flaws" at this time.

#### **Dawson/McDowell Corridor Conflicts**

In informal conversations with NCDOT regarding options for running light rail transit throughout downtown Raleigh, NCDOT staff raised concerns related to potential conflicts with the operation of the Dawson/McDowell one-way pair. Dawson Street and McDowell Street are both designated as US highway routes (US 70/401) and carry a significant volume of traffic. Combined this couplet carries between 40,000 to 50,000 vehicles per day. The traffic signal system in downtown Raleigh operates on a pre-timed coordinated system that is optimized for time of day. This creates complications relative to serving a light rail system without providing preemption to give the trains preference in signal operation. Some level of signal preemption will likely be necessary to occur due to the streetcar-style operation proposed in all alternates under consideration.

Triangle Transit anticipates operating train sets composed of up to three 90-foot vehicles, making each train set a maximum of 270 feet in length. An average city block in downtown Raleigh is approximately 400 feet long. It is also anticipated that operating this system streetcar-style will occur in mixed traffic, i.e. it will not be within a dedicated lane exclusively for transit use. If queues or more than four or five passenger cars already exist for eastbound or westbound traffic at either Dawson or McDowell Streets, an approaching train would queue across the previous intersection while waiting for the traffic signal.

NCDOT staff is concerned about the impacts that rail preemption would have on the coordinated operation of the Dawson/McDowell corridor during peak hours. TTA is anticipating utilizing 10-minute headways during peak travel hours, so the conflicts under Alternate D6a would be frequent. Or, if NCDOT refuses to allow rail preemption, the potential spillover and blocked intersections would create adverse conditions for all modes of transportation (cars, bikes, pedestrians, and buses). Alternates D2 and D6 have no operational conflicts with the Dawson/McDowell corridor, as they will cross with an aerial structure just north of Lane Street.

If Alternate D6a is recommended for approval, additional research and study will be needed to overcome these operational issues. Experience in developing solutions for these types of at-grade light rail conflicts with major roadway corridors may be gained from peer systems in Denver, Minneapolis, Portland, and Phoenix.

### **Travel Time Impacts**

As part of the evaluations for each alternative, Triangle Transit developed estimates for travel time between each station in each alternative they developed. One of the disadvantages of any type of streetcar-style operation is the time lost due to operating in mixed traffic on the surface street system, as opposed to being in a dedicated right-of-way. Triangle Transit estimates that the D5 alternative would add around four minutes to the overall operating time of the system. No estimates exist at this point for alternative D6a, however, it is estimated that the time lost compared against alternative D6 would be approximately two additional minutes (see Table 1). Alternate D2 would operate in more dedicated right-of-way than any other alternative under consideration, which results in the best potential overall travel time.

### **Streetcar Considerations**

It is worth noting that discussions of streetcar operation arose more than once during these deliberations. None of TTA's alternatives provide streetcar service, but rather they would operate light rail trains "streetcar-style" on surface streets. There will be no stops between any designated stations, and there would be no direct benefit from having a train operate in front of these adjacent properties, apart from being within the walk radius for a station.

Staff has discussed the need for assessing the feasibility of a streetcar system for the City and would like to pursue this in the near future. A true modern streetcar system utilizing the Salisbury/Wilmington pair may be feasible and would be a strong complement to a light rail system constructed under either Alternates D2 or D6. There are two Action Items in the 2030 Comprehensive Plan supporting this request:

#### Action T 4.4 - Streetcars

Explore future streetcar service for key multi-modal corridors including New Bern and Glenwood Avenues, and South Saunders and Hillsborough streets.

#### Action T 4.5 - Transit Infrastructure

Study and implement a network of premium transit infrastructure that builds upon the STAC recommendations and augments the planned regional transit with enhanced local transit service, such as light rail transit, bus rapid transit, and/or streetcar lines to provide travel options, better connect Raleigh, and improve surface-level public transportation.

### **Station Area Sidewalk Impacts**

In order to utilize a light rail system along surface streets, station platforms must be elevated roughly 17 inches above street grade. Platforms are located directly adjacent to the street and include hardware for benches, kiosks, and canopies. In order to achieve the 17-inch platform height from street grade, there are two types of modifications sidewalk modifications that typically occur. The first modification involves ramping the existing sidewalk grade in a manner consistent with ADA requirements. If 100% of the sidewalk is ramped on each end approaching a station, this can create issues with pre-existing development adjacent to the elevated section of sidewalk.

The second modification is potentially providing a barrier separation between the elevated platform queuing area and the regular sidewalk elevation for through foot traffic. Alternate D6a likely entails more of these potential sidewalk modifications in developed areas around the state government complex along Salisbury Street and Wilmington Street. Alternates D2 and D6 both require dealing with this issue around the proposed Harrington Street station, however it is anticipated that the block face adjacent to this station would be completely redeveloped. Alternate D6 has an additional station requiring platform location considerations along Morgan Street west of Glenwood Avenue. Additional research and experience from peer systems would be needed to evaluate the proper design elements for each proposed station location.

### **Impacts to On Street Parking**

A key consideration for streetcar-style operation is the radius requirement at each intersection. Based on our initial evaluations of Alternate D6a, there were conflicts routing service southbound on Salisbury Street to westbound on Morgan Street that impacted much of the existing on-street parking, required shifting the rail line from one side of the street to the other, and potentially restricted some of the existing traffic flow. To avoid these conflicts, the PRTF modified Alternate D6a from its original Morgan Street-only operation concept to instead operate as a couplet utilizing westbound Hillsborough Street. There has been no detailed evaluation of this suggestion at this time, and the PRTF understands that TTA would need to determine the feasibility of this scenario.

Construction of an on-street system also entails the loss of on street parking in the immediate vicinity of the proposed stations. Given the geometry of Salisbury and Wilmington Streets and the limited right-of-way behind the curbs, it is likely that station construction may entail the loss of on street parking on both sides of a station block in the D6a and D5 alternatives. Additional research and experience from peer systems would be needed to evaluate the proper design elements to minimize this conflict.

Please note that another major obstacle to removing on-street parking may occur adjacent to the North Carolina General Assembly (NCGA). In 1998 the NCGA took control of these streets for the purpose of establishing exclusive use of on street parking for legislators and their staffs (see NCGS § 120-32.1). Operating a light rail system along Salisbury and Wilmington may require the removal of this reserved parking and will ultimately require the permission of the Legislature as an encroachment on the legislative grounds.

### **Cost Estimates**

A summary of the system costs for each alternative is included below. Please note that TTA has not conducted any analysis of Alternate D6a and the cost estimates for this alternate have been extrapolated from costs for D5 and D6.

Table 2 – Light Rail System Cost Estimates

	D2	D5	D6	D6a
Downtown Segment Cost	\$270 Million	\$435 Million	\$265 Million	\$330-350 Million*
Total System Cost	\$1.425 Billion	\$1.590 Billion	\$1.420 Billion	\$1.485-1.505 Billion*

\* extrapolated estimates

## Summary

The Passenger Rail Task Force was very diligent in examining the downtown light rail alternatives in developing a recommendation to the City Council. Staff's assessment should not be taken as a dismissal of their recommendations, but rather as a refinement of the complexity of the issues at hand in considering any alternative. The majority of the task force feels that Alternate D6a is important when taking the long view of what's best for the City.

The staff's perspective is that this position does not appear to be directly supported by the data. Our analysis of existing and extrapolated data concludes that the hybrid Alternate D6a will likely cost more, will operate less efficiently, has potentially greater historic property impacts, and may not generate sufficiently higher ridership to warrant further consideration. Alternates D2 and D6 are functionally equivalent to each other with respect to station locations and overall functionality. Although both Alternates D2 and D6 are generally less proximal to the State Government Complex and the Central Business District, they provide better service to Glenwood South and Seaboard Station than D6a. This is not to say that Alternates D2 or D6 are not without their respective issues or impacts, but they both appear to have fewer hurdles than Alternate D6a.

With regard to next steps, Triangle Transit can carry one or more alternatives from the Alternatives Analysis (AA) into the Environmental Impact Statement (EIS) phase. The EIS can conduct more thorough evaluations of any issues raised in the AA document. The EIS process can refine the details for more than one alternative and make better determinations of impacts.

As TTA has not officially considered Alternate D6a in the AA process, a recommendation by the City Council in favor of this hybrid will require TTA to develop this alternate in detail and provide opportunities for additional public input.

If you have additional questions about this analysis, please advise.

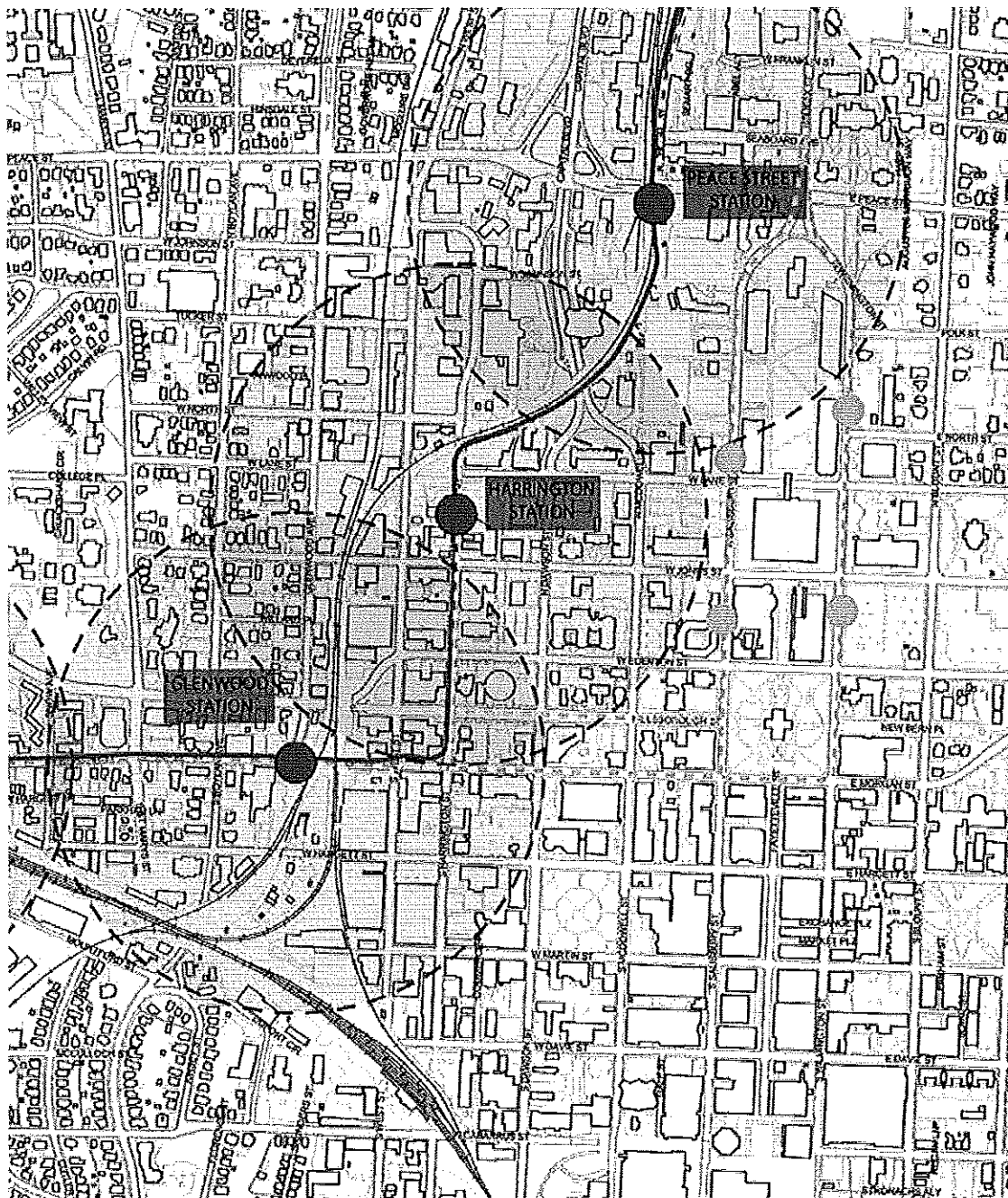
## Attachments

Cc: Mitchell Silver  
Ken Bowers  
Roberta Fox  
David Eatman  
Passenger Rail Task Force Members  
Greg Northcutt, Triangle Transit

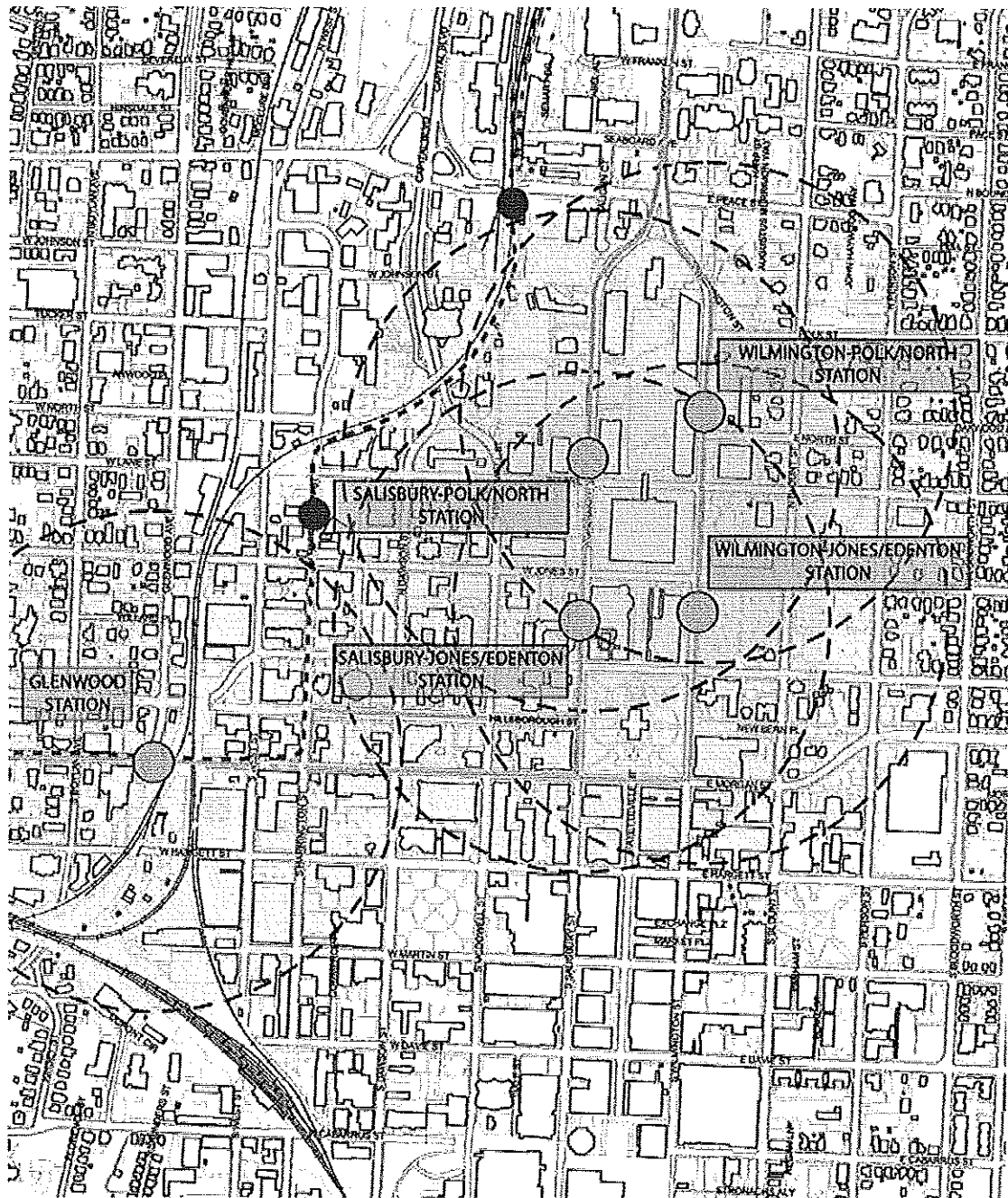
This is a detailed black and white map of the downtown area of Peabody, Massachusetts. The map shows a dense grid of streets and building footprints. The Peabody River is visible on the left side of the map. Three train stations are labeled: Union Station, Harrington Station, and Peace Street Station. The map also shows various other streets and landmarks, including the Peabody River, the Peabody River Bridge, and the Peabody River Ferry. The map is oriented with North at the top.



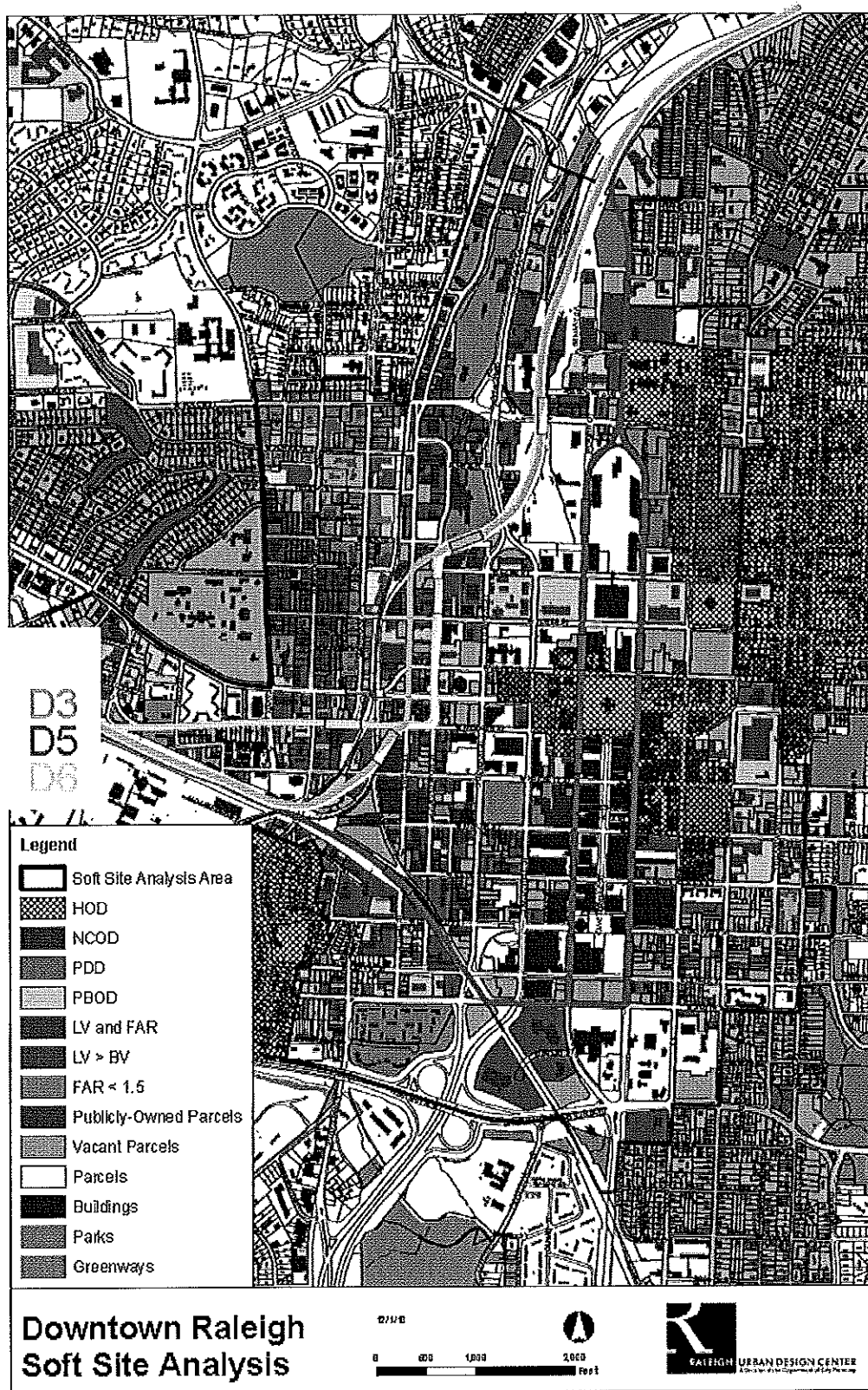
ATTACHMENT B – Alternate D6 with 1/4 Mile Station Radius



ATTACHMENT C – Alternate D6a with 1/4 Mile Station Radius



Attachment D – Soft Site Analysis



## Attachment D – Legend Explanation

HOD	Historic Overlay District – All uses permitted in the underlying zoning district. Exterior changes require issuance of Certificate of Appropriateness by the Historic Districts Commission.
NCOD	Neighborhood Conservation Overlay District – All uses permitted in the underlying zoning district. New construction must meet guidelines to encourage compatible infill development.
PDD	Planned Development Conditional Use Overlay District – All uses permitted in the Thoroughfare District, in accordance with a Master Plan approved by City Council.
LV and FAR	Parcels with both high land value compared to building value; and low floor area ratio. Typically used as an indicator of areas which are likely to redevelop.
LV > BV	Parcels where the land value is higher than the building value
FAR < 1.5	Parcels considered to have a low floor area ratio for an urban area
Publicly Owned Parcels	Publicly owned parcels which have a potential for redevelopment; does not include parks or state owned parcels which are considered “firm” at this time
Vacant Parcels	Parcels with no buildings or built improvements
Buildings	Existing building footprints
Parks	Existing park lands
Greenways	Existing (or planned) greenways

# Passenger Rail Task Force

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RALEIGH CITY COUNCIL

June 27, 2011

Mayor Charles Meeker  
Raleigh City Council  
Raleigh, North Carolina

Dear Mayor Meeker and Councilors:

The Passenger Rail Task Force (PRTF) was directed by the Raleigh City Council to “*recommend the preferred Triangle Transit mode and track alignment for Raleigh’s Union Station.*”

## EXECUTIVE SUMMARY

The Passenger Rail Task Force respectfully recommends that the Raleigh City Council adopt as Raleigh’s Locally Preferred Alternative (LPA) the downtown route known as D6a, and that the system use Light Rail Transit (LRT) railcars electrically powered by overhead wires as the preferred mode.

The D6a route is not among the official Alternative Alignments for downtown Raleigh studied by Triangle Transit. It is a hybrid route proposed by the Passenger Rail Task Force that uses parts of two official TTA Alternative Alignments named D6 and D5. A detailed explanation of the PRTF’s rationale for creating and proposing the hybrid route D6a can be found below this Executive Summary.

Going east and north, the recommended D6a route would diverge from the NCRR rail corridor just south of Charlie Goodnight’s Nightclub on West Morgan Street and proceed east along West Morgan Street, passing the north edge of the Union Station area at the West Morgan Street bridge over the railroad tracks in the Boylan Wye, then continue east to Capitol Square, where it would turn north onto Wilmington Street and continue north until it joined the CSX rail corridor.

Going south and west, the D6a route would diverge from the CSX rail corridor to follow Salisbury Street going south, would turn west onto Hillsborough Street, then would turn south onto Harrington Street, and finally turn west to rejoin West Morgan Street, passing the north edge of the Union Station area at the West Morgan Street bridge over the railroad tracks in the Boylan Wye. The route would continue west to join the NCRR rail corridor south of Charlie Goodnight’s Nightclub on West Morgan Street.

Between Charlie Goodnight’s Nightclub and Harrington Street, the D6a route would therefore have two light rail tracks running in West Morgan Street, one for eastbound LRT trains and one for westbound LRT trains. LRT trains in both directions would operate together with vehicular traffic in this section of West Morgan Street. The hybrid D6a route and D6 route are identical between Charlie Goodnight’s and Harrington Street.

The PRTF believes this route through downtown Raleigh will best serve Raleigh citizens for the present and future by providing the best opportunities for ridership and economic development while ensuring safe transportation and minimizing impacts to traffic, urban design, noise, contextual planning, historic resources, and long term options for roadway and to connectivity improvements, all at a reasonable cost compared to other alternatives.

June 27, 2011

As stated above, the recommended route called D6a is not one of the official Alternative Alignments for downtown Raleigh studied by Triangle Transit. Though it is a hybrid of two Alternative Alignments that are official, D6a must nonetheless be fully analyzed by TTA as a discrete route just as thoroughly as the official route options were studied. In the event that the recommended route D6a is deemed infeasible after such analysis, then the PRTF recommends that the route called D6 be adopted instead by the Raleigh City Council as Raleigh's Locally Preferred Alternative through downtown.

Going east and north, the D6 route would diverge from the NCRR rail corridor just south of Charlie Goodnight's Nightclub on West Morgan Street and proceed east along West Morgan Street, passing the north edge of the Union Station area at the West Morgan Street bridge over the railroad tracks in the Boylan Wye, then would turn north onto Harrington Street and continue north until it joined the CSX rail corridor next to the West At North condominium project.

Going south and west, the D6 route would diverge from the CSX rail corridor next to the West At North condominium project to follow Harrington Street going south, then would turn west onto West Morgan Street, passing the north edge of the Union Station area at the West Morgan Street bridge over the railroad tracks in the Boylan Wye. The D6 route would continue west to join the NCRR rail corridor south of Charlie Goodnight's Nightclub on West Morgan Street.

Between Charlie Goodnight's Nightclub and Harrington Street, the D6 route would therefore have two light rail tracks running in West Morgan Street, one for eastbound LRT trains and one for westbound LRT trains. LRT trains in both directions would operate together with vehicular traffic in this section of West Morgan Street.

Route D6 is an official TTA Alternative Alignment. In fact Alternative D6 (West Morgan to Harrington) is the route recommended by Triangle Transit in its Draft Alternatives Technical Report as Raleigh's LPA for the downtown area. Alternative D6 is also the route preferred by one PRTF member who did not vote to recommend D6a.

We will provide a fully detailed explanation and reasoning for these choices during our joint workshop with City Council to understand this matter. We hope the joint workshop will be held before the end of July.

Before then, please find below a chronological history of the meetings held to study and arrive at this recommendation, as well as a summary explanation of the rationale for choosing D6a and a short minority report.

June 27, 2011

### MEETING HISTORY PERTAINING TO THIS DELIVERABLE

Between August, 2010 and June, 2011, the PRTF learned about, studied, discussed, deliberated, and arrived at a recommendation for this deliverable during the course of seven meetings, including a special bus tour of possible downtown Raleigh light rail routes conducted by TTA, and four Triangle Transit (TTA) workshops:

- August 30, 2010
  - Triangle Transit leaders presented details of the federally-required Alternatives Analysis process and the expected timeline for determining Raleigh's Locally Preferred Alternative (LPA). This process involved winnowing down the possible alternative routes studied for light rail through downtown Raleigh to just one designated alternative route as the LPA.
  - TTA reminded us that the overall program is called the TRTP, which stands for the Triangle Region Transit Program. The TRTP is divided into three discrete projects:
    - (1) A commuter service running from the Wake County/Johnston County line to west of Durham;
    - (2) A light rail line running from downtown Durham to downtown Chapel Hill; and
    - (3) A light rail service running from north Raleigh near I-540 and the Triangle Town Center mall to downtown Raleigh and continuing from downtown Raleigh to northwest Cary.
  - In this recommendation we are concerned only with the light rail alternative alignments through downtown Raleigh.
  - TTA officials explained that the optimal mode ("mode" means the kind of rail car and the way the car's engine is powered) has been determined to be a Light Rail Transit (LRT) vehicle. These would be electrically-powered rail cars, running singly or in sets of two or three coupled together, getting electricity through an overhead catenary wire.
  - These light rail cars would travel in their own rail corridor rather than sharing existing rail tracks with freight trains. Each car would be 90 feet long, thus 270' long in a full 3-car set.
  - The PRTF decided at this meeting to adopt TTA's LRT approach as the preferred mode.
- September 14, 2010 – PRTF members attended the TTA workshop at Chavis Center to learn about the upcoming process and to listen to citizen feedback.
- March 21, 2011 – TTA officials explained what to expect at the upcoming TTA public workshops which revealed the full details of alternative alignments through downtown Raleigh.
- March 22, 2011 – PRTF members attended the TTA public workshop at Triangle Town Center

June 27, 2011

mall to learn about and study details of the alternative alignments through downtown Raleigh and to listen to citizen feedback.

- March 28, 2011 – PRTF members attended the TTA public workshop at Mt. Peace Baptist Church to learn about and study details of the alternative alignments through downtown Raleigh and to listen to citizen feedback.
- March 30, 2011 – PRTF members attended the TTA public workshop at McKimmon Center to learn about and study details of the alternative alignments through downtown Raleigh and to listen to citizen feedback.
- April 11, 2011 – Joint TTA/PRTF bus tour of the remaining alternative routes through downtown Raleigh and the official PRTF meeting for the month of April. TTA officials presented and discussed in detail the Raleigh light rail alternative alignments to be studied and explained the reasons for reducing the possible routes from 10 to 4:
  - Originally there were 10 alignment alternatives studied by TTA for light rail routes through downtown Raleigh. TTA named these D1, D2, D3, D4a, D4b, D5, D6, D7, D8, and D9. Six of these alternatives were “*dropped from further consideration*” by TTA by April 11 for various reasons.
  - The possible routes dropped included alternative D4a and D4b, called “*Wilmington/Salisbury via Hargett/Morgan or via Martin/Hargett.*”
  - The remaining four alternatives were advanced by TTA for further study on April 11:
    - D2 – Leaving the rail corridor adjacent to the Bloomsbury project to proceed east via a rail bridge over Boylan Avenue into the Union Station area and then proceeding north along Harrington Street
    - D3 – Leaving the rail corridor adjacent to the Bloomsbury project to proceed east via a rail bridge over Boylan Avenue into the Union Station area and then proceeding north along West Street
    - D5 – Leaving the rail corridor near the Bloomsbury project to proceed east via a rail bridge over Boylan Avenue into the Union Station area near the current Amtrak station and then proceeding southeast along a 6000’ bridge 30’ high to South Street, and then proceeding north along Wilmington Street, returning south along Salisbury Street
    - D6 – Leaving the rail corridor at Charlie Goodnight’s to proceed east along West Morgan Street into the Union Station area and then proceeding north along Harrington Street
  - During the April 11 meeting and bus tour, PRTF members expressed a desire to see a hybrid alignment of D6 (Morgan to Harrington) and D5 (Boylan to South to Wilmington/ Salisbury) which would use West Morgan Street all the way east to Capitol



June 27, 2011

Square (instead of turning onto Harrington) and then turn north on Wilmington, returning south to Morgan via Salisbury. This was the genesis of the hybrid route that became known as D6a which was ultimately recommended by the PRTF to the City Council as the preferred downtown Raleigh LRT alignment.

- Presented with the D6a option as a possible new route, Triangle Transit stated that they believed that the turning radius required by the 90' light rail car selected would make it impossible for the LRT trains to make the turn from Salisbury onto Morgan without cutting off the corner of the Revenue Building. TTA agreed to analyze the alignment and radii issues regarding hybrid route D6a and get back to us.

- May 2, 2011

- TTA officials presented more detail and joined in our study and discussion of the remaining four light rail alternative alignments through downtown Raleigh. Further discussion ensued over the proposed hybrid solution, eventually named D6a, which had been suggested at the April 11 meeting and bus tour.
- TTA officials produced engineering drawings showing that D6a could not safely turn the corner at Salisbury and West Morgan without cutting off the corner of the Revenue Building because of the wide turning radius required by the 90' LRT rail cars selected.
- PRTF members argued that we are tasked to determine what is best for Raleigh, and the turning radius is an engineering problem related to how the system would be built unrelated to what is best for Raleigh. We therefore agreed to continue analyzing the hybrid D6a alternative.
- From the inception of the PRTF, members agreed to make decisions and recommendations objectively using quantitative data. Thus, an alternatives analysis evaluation matrix, similar to the one used by the PRTF for determining the optimal high speed rail route into downtown Raleigh in the summer of 2010, was introduced and discussed. PRTF members agreed to use the matrix for evaluating the TTA light rail alternatives, using these 13 criteria:
  - Traffic/transportation impacts
  - Ridership
  - Urban design impacts
  - Economic development potential/value capture potential
  - Aesthetics/street appeal
  - Noise/vibration impacts
  - Contextual planning impacts
  - Impacts to historic resources
  - Long term options for roadway, transit, and connectivity improvements
  - Project constructability/operability
  - Private property impacts
  - Safety/security impacts
  - Cost

June 27, 2011

- May 16, 2011 – TTA officials made a significantly important presentation, this one full of empirical data detail such as ridership and cost figures which the PRTF needed to complete its evaluation using the matrix adopted at the May 2 meeting. This was followed by PRTF member Paul Morris presenting an overview of Value Capture Mechanism for Transit Funding in the Triangle. A basic understanding of Value Capture was deemed a foundation for comparative analysis of competing light rail route economic development opportunities.
- May 27, 2011
  - TTA officials provided more useful data and information requested by PRTF from previous meetings
  - This was followed by a presentation and beneficial discussion by City of Raleigh staff pertaining to such issues as the operational challenges of light rail crossing the McDowell/Dawson downtown couplet at grade and a map of underutilized and undeveloped property as well as historic resources and districts in downtown Raleigh.
  - PRTF members suggested that the route for the D6a hybrid alternative going south should turn west at Hillsborough Street instead of at West Morgan in order to resolve the turning radius issue at the Revenue Building. The D6a route would then follow Hillsborough past the McDowell/Dawson couplet and turn back south on Harrington to join West Morgan again and continue westward side by side with the eastbound track.
  - The PRTF voted unanimously to eliminate TTA alternatives D3 (bridge over Boylan to West Street) and D5 (bridge over Boylan along 6000' bridge to South Street to Wilmington/Salisbury). D3 was eliminated because of the future plans to improve West Street to make it an important north-south corridor. D5 was eliminated because the mile-long bridge 30' high was deemed unsightly and would also create an economic dead zone for a block or more on both sides along its entire 6000' length.
  - The task force was left to evaluate only three alternatives: D2 (bridge over Boylan to Harrington Street), D6 (West Morgan to Harrington), and the hybrid D6a (West Morgan to Wilmington going east and north, Salisbury to Hillsborough to West Morgan going south and west).
- June 20, 2011
  - The task force continued the discussion of the alternatives evaluation matrix criteria related to the three remaining alternatives.
  - The Draft TTA "Volume 1: Detailed Definition of Alternatives Technical Report" made available to task force members the week prior to the June 20 meeting stated that the TTA Project Team eliminated alternative D2 (bridge over Boylan to Harrington) because *"this aerial structure would be an imposition to the viewshed of the area"* and because the D2 *"proposed platform location would tend to bifurcate the site, which could prove to be problematic from a land use perspective."*

June 27, 2011

- The Draft TTA report also observed in the Executive Summary that *“D2 and D6 have the greatest potential to catalyze the redevelopment of underutilized sites, which is a key policy of the City’s Comprehensive Plan”* and thus concluded that the TTA *“Project Team’s recommendation is to carry forward Alternative D6 through the downtown Raleigh area as part of the LPA”*
- After discussion of the remaining two alternatives, D6a and D6, the PRTF voted 6-1 to:
  - Recommend the hybrid route D6a (West Morgan to Wilmington going east and north, Salisbury to Hillsborough to West Morgan going south and west) as Raleigh’s Locally Preferred Alternative to the City Council; and
  - In the event that the preferred hybrid route D6a is deemed infeasible after being fully studied by TTA, the PRTF recommended, with one member opposing, that the route called D6 (West Morgan to Harrington) be adopted instead by the Raleigh City Council as Raleigh’s Locally Preferred Alternative through downtown.

### THANK YOU, TRIANGLE TRANSIT

The Passenger Rail Task Force commends and thanks Triangle Transit staff for their unstinting assistance to us in arriving at this recommendation. Altogether TTA staff provided 10 lengthy and richly detailed documents full of relevant facts and empirical data, plus many small supplementary analyses and studies. TTA officials and staff attended every PRTF meeting on this subject since August, 2010, and they participated in every discussion and analysis where TTA input was needed. We are very grateful for their generosity and transparency in regard to attitude, time, energy, and content in support of our deliberations.

### SUMMARY OF RATIONALE FOR RECOMMENDATION

Ridership, especially for state workers downtown, was a major consideration in this recommendation. Ridership for option D6a had to be estimated because it was a hybrid alternative alignment and no official ridership study was done. The PRTF estimated the ridership for D6a (Morgan to Wilmington/Salisbury) to be 15,100 riders/day versus 14,700 riders/day for D6 (Morgan to Harrington) calculated by TTA.

However, despite the uncertainty of the D6a ridership numbers, we felt the D6a route would penetrate the heart of the state government complex of 12,000 workers and was preferable to the D6 route which would traverse Harrington and the CSX rail corridor three blocks west of the heart of the state government complex. We felt the hybrid D6a route, even though soft on data, would produce much better ridership compared to D6, and that assumption was a major driver in our preference for route D6a.

In support of the D6a ridership estimate it should be noted that TTA’s calculations for the route called D5 (bridge over Boylan to South Street to Wilmington/Salisbury) showed the highest ridership numbers of any route studied at 15, 500/day. Our estimate assumed that many of those extra riders were state government workers.

June 27, 2011

The potential for economic development was a major driver in our consideration of route alternatives. The PRTF felt the potential for economic development/redevelopment was about equal for both route options D6 and D6a. Along West Morgan between the Charlie Goodnight's Nightclub and Harrington Street the opportunities are identical. And because D6 and D6a do not penetrate the Boylan Wye area where the new Raleigh Union Station will be, land use opportunities in that area are not compromised at all by either alternative route.

The PRTF did not identify any significant challenges for either D6 or D6a regarding impacts relating to noise/vibration, urban design, aesthetics/street appeal, contextual planning, private property, safety/security, or to long term options for roadway, transit, and connectivity improvements.

With regard to historic resources City staff informed the PRTF of the potential for significant historic site impacts, especially conflicts at Union Square and adjacent to Peace College due to the proposed LRT bridge over Peace Street to reach Salisbury Street required for southbound trains to avoid conflicts with vehicular traffic at that intersection. However, these historic site impacts along the D6a route, which route is identical to the official D5 route in these areas, had not been the cause for eliminating the official D5 route by TTA, and the PRTF therefore believes that D6a remains a viable alternative pending further study.

The task force identified a potential traffic issue for hybrid D6a in crossing the downtown couplet of McDowell and Dawson at grade. NCDOT-Highway informed city staff that the computer-controlled lights along McDowell and Dawson would not be modified to give preference to LRT trains crossing either street. The PRTF considered and discussed this challenge. Subject matter experts on the task force with long experience in similar LRT systems across the country stated that solutions had been found at analogous at-grade crossings in other systems. One PRTF member then specifically queried a TTA expert and a city staff expert for their professional opinions as to whether crossing McDowell and Dawson at grade was fatal to consideration of the hybrid D6a option. The answer from both sources was that it was not fatal, but the City expert stated clearly that the crossing would be "*highly problematic*." The PRTF took this to mean that the crossing would be a surmountable engineering challenge. Thus because crossing the couplet at grade wasn't declared impossible, D6a remained a viable alternative pending the results of further study.

### MINORITY REPORT

One PRTF member did not support hybrid route D6a because it had not yet been officially analyzed by TTA. Specifically, the member wished to know about D6a, among other things:

- The city's and TTA's determination, after consultation with NCDOT-Highway, regarding the feasibility of LRT crossing the McDowell/Dawson downtown couplet at grade;
- The results of definitive engineering studies of the viability of turning the LRT vehicles west onto Hillsborough Street from Salisbury and south onto Harrington from Hillsborough;
- Whether the General Assembly would permit LRT tracks to run along Wilmington and Salisbury Streets since they control those streets in the vicinity of the GA and state government complex; and

## Passenger Rail Task Force

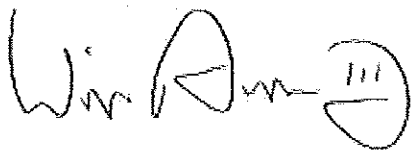
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June 27, 2011

- Whether Triangle Transit determines that a public process component is required to add a new Alternative Alignment since the hybrid D6a was not part of TTA's public workshops conducted over the past six months.

In the absence of these and other data regarding hybrid route D6a, this member did not feel comfortable voting to recommend D6a. Instead, this member favored official route D6 (West Morgan to Harrington). (As stated above, PRTF members voted to recommend D6 as the preferred route in the event that the recommended hybrid route D6a is deemed infeasible.)

Sincerely,



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William A. Allen III  
Co-chair, Passenger Rail Task Force

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Maha A. Chambliss, PE  
Co-chair, Passenger Rail Task Force

### Passenger Rail Task Force members:

Gerry Cohen	Dan Douglas	Paul Morris
Daniel Coleman	Saf Fahim	Adam Terando
Fred Day	Betsy Kane	Stephen Votino

