Comments on the Central Corridor Transitway

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1 Introduction

This memo outlines a number of the issues associated with the Central Corridor Transitway, in particular how it relates to the University of Minnesota. Of the two proposed alignments, I believe the at-grade Washington Avenue alignment better serves the needs of campus students, employees, and visitors, as well as through travelers. That alignment has a number of unresolved issues that will affect its success, but presents a number of opportunities that would enhance the daily lives of those in the campus community.

2 The Washington Avenue alignment vs. the Northern Alignment

The net advantages of the Washington Avenue alignment compared with the Northern Alignment are several.

- First, there is greater demand at the main station serving the East Bank of the University because the density of people working and attending school around the station along Washington Avenue exceeds that in Dinkytown. The Northern Alignment could serve future development in the area around that alignment if an additional station were built between Stadium Village and Dinkytown, however that would increase the train running time for all other passengers and may not be justifiable.

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• Second, the travel time for through passengers is lower on Washington Avenue because the distance is shorter (though this is compensated because the speed may be a bit lower).

• Third, the costs are lower for construction as no new right-of-way need be acquired and no new Mississippi River bridge built.

• Fourth, the View from the Train at-grade on Washington is better than below grade on Washington or the Dinkytown channel. From the perspective of the train passenger, the view is more interesting at-grade, as passengers travel along the mall, they may be edified and uplifted by seeing the University in its full glory. In contrast with a tunnel, where the view is entirely internal to the cars, or the channel, where one can view graffiti laden concrete walls. This view is free marketing for the University to reach riders who may not have a destination on campus.

• Fifth, it provides an opportunity to rebuild Washington Avenue through the heart of campus, which I will call the Washington Mall.

3 The extent of the Washington Mall

Planners are currently considering a pedestrian/transit mall that would extend along Washington Avenue from Pleasant Street to Walnut Street. Fuller consideration should be given to extending the Washington Mall from Cedar or 19th Avenue South (depending on the location of the West Bank Transit Center) across the Mississippi River to University Avenue.

In any case, I believe the proposed West Bank Transit Center and Parking Ramp should be located to the west of Cedar Avenue, making use of the dead space between Cedar Avenue and the freeway, bridging the existing depressed highway and maximizing the usable frontage along Washington Avenue on West Bank.

Walnut Street was chosen as a limit to continue to provide vehicular access to the Washington Avenue Ramp from Washington Avenue. I believe other options are feasible and should be investigated. The section below on Mitigating Washington Mall discusses issues with the Washington Avenue Ramp.
4 The character of the Washington Mall

The character of the Washington Mall is central to its success. A number of pedestrian and transit malls have been constructed throughout the world and in the United States, the closest example is Nicollet Mall in downtown Minneapolis. Urban designers will prepare a variety of sketches, but some key elements of the design I believe are as follows.

- The Mall should be unified. A single paving element should be used building face to building face, with LRT running (albeit slowly) on tracks in the middle of what is a pedestrian zone. Segregating traffic by mode, retaining sidewalks, asphalt, and tracks as separate corridors will result in a failure to realize the full potential of the Mall. The Mall should accommodate emergency vehicles as necessary.

- The Mall should be viewed as a great public space, with uses varying across the clock and calendar.

- The ground floor of some university buildings along the mall can be re-configured to alternative functions (e.g. cafes and small shops) to take advantage of the location along the transit line and generate revenue for the University. This should not affect the quad or other historic features, but would help integrate town and gown. Just as the University is expanding into Stadium Village, some of the elements of Stadium Village can penetrate the campus. Many universities are well integrated into the surrounding community: Oxford, Cambridge, and Berkeley to name a few, and that integration is important.

- The Mall should reinforce the University’s position as the most urban of the Big 10 schools, and be used as an element to attract prospective students, researchers, staff and faculty to work in the Twin Cities.

- The Mall should serve pedestrians, emergency vehicles, service vehicles in off-peak hours, and walked bicycles, and LRT, but not buses, this is discussed more below.

Some images of transit and pedestrian malls are provided on the following pages\(^1\). No one of these is a perfect fit to the context of the University.

\(^1\)Photos by author unless otherwise noted
An issue has arisen as to whether buses should use Washington Mall. Given the new LRT line, it is important to design a bus system that complements the new system, maximizing system efficiency, and best serves campus. Consistent with the images of pedestrian/transit malls throughout the world, only a single vehicle mode (LRT) should be encouraged through the Mall. The current Metro Transit and suburban bus system serve several markets.

- First there are lines that run through campus, and make stops on campus.
- Second there are lines that run to campus.

There is also a very important Campus Connector shuttle system that serves intra- and inter-campus transportation. The advantage of running buses on the Washington Mall are twofold

- Bus Service reduces transfers for passengers currently riding on buses.
Figure 2: Oxford, England pedestrian mall

Figure 3: Portland, Oregon Transit and pedestrian mall
Figure 4: Melbourne, Australia transit and pedestrian mall (source: Streetsblog)

Figure 5: Gent, Belgium; Zrich, Switzerland; Strasbourg, France; and Manchester, England malls (source: CityTransportInfo)
• Bus Service will better serve through bus passengers for routes that are configured in that way

The disadvantage of running buses on Washington Mall are several:

• Bus Service on the Mall interferes with pedestrian flows,

• Bus Service detracts from the character of the Mall, which will only see a transit vehicle once every 3 minutes or so if it is LRT only,

• Bus Service on the Mall reduces LRT ridership by providing directly competitive service, costing the system some economies of scale.

To make the corridor work, buses should serve the University community from several vantage points. Bus-rail transit transfer station are used in many places, one example is Hammersmith, London, where the Piccadilly and District lines of the Underground are topped by a main floor shopping arcade and one level up from that is the bus station where single and double-decker buses distribute travelers from the mainline to local destinations. Here the transit stations can be coupled with office buildings or parking ramps in addition to shopping. I suggest the following bus-transfer stations on the Minneapolis campus:

• Stadium Village (at Stadium Village station) (serving passengers from the east)

• West Bank (between Cedar and I-35W) adjacent to West Bank station (west)

• Huron Boulevard/I-94 (south)

• Dinkytown (north)

There should also be bus routes running along the edge of campus, which will have bus stops but not necessarily full stations

• University Avenue/4th Street through Marcy-Holmes, Dinkytown, and Stadium Village

• Riverside Avenue and 19th Avenue through West Bank
These bus stops should have much better signage and facilities for passengers than current Metro Transit stops.

Finally the Campus Connector and Campus Shuttle services need to be reconfigured, Parking and Transportation Services has a proposal along these lines for buses circulating through campus. These buses should be upgraded to electric or hybrid electric when the opportunity presents.

5.1 Optimizing buses on Washington Mall

If buses are required to run on Washington Mall (clearly an unfavored option), they should satisfy several requirements:

- Their number should be minimized.

- They should be electric (or hybrid and running in electric mode) to eliminate emissions and reduce local air pollution (there are more pedestrians here than anywhere else in the state), so the intake of emissions is higher here than anywhere else.

- They should run on the tracks except at points of boarding and alighting in order to minimize conflicts with pedestrians (who will cross tracks but be less likely to walk along them) and reduce space consumed by transportation. (Because the mall would be paved, as necessary buses could move off the track, but their main run would be on the track.)

6 Mitigating Traffic from Washington Mall

Closing Washington Avenue to traffic will require a number of measures to address campus access questions for cars, delivery trucks, and buses. It will
also displace a small amount of through traffic. The exact amount of traffic to be addressed is not easily identified beforehand.

The idea of induced demand, sometimes summarized as “if you build it, they will come” has garnered a great deal of attention in the transportation planning community in the past 14 years. The notion that adding capacity increases the total amount of traffic (though not necessarily congestion) is an important insight that affects how we design networks. The converse argument is that of reduced demand, what happens when facilities are taken away. The evidence suggests that for each 1 percent increase in lane capacity there is typically a 0.5 to 0.8 percent increase in total traffic. Similarly if lane capacity is reduced, we would expect to see traffic disappear. Before the I-35W Mississippi River Bridge collapsed, it had carried 140,000 vehicles per day. After the collapse, traffic counts on other the Mississippi River bridges found an additional 90,000 vehicles. This means 50,000 vehicles vanished, they no longer crossed the Mississippi on a daily basis. Practitioners suggest at 33/33/33 rule for traffic during road construction: one-third of traffic simply disappears, one-third follows the recommended detour, and one-third finds its own way.

The implication is that when Washington Avenue is closed, some of that traffic will just disappear, other traffic will re-route.

Where does it go? This is uncertain, but it must be remembered that the vast majority of traffic is discretionary, that is, travelers do not need to go to that particular destination at that particular time by that particular mode. Some of the trips just go to different destinations (eating at a different restaurant, for instance), travel at different times (going on the weekend to avoid rush hour), or change mode, which will become more feasible once a high quality transit facility is provided in the same corridor.

The point is the total amount of traffic that needs to find new routes upon the closure of Washington Avenue is less than the total amount currently using Washington Avenue. As mentioned in other documents there are a variety of mitigations that will be required.

6.1 Through traffic

Dealing first with the through traffic, much of that can take I-94, Riverside Avenue, and University Avenue/4th Street. Some will take the Central Corridor. However as the University/4th one way pair will gain importance for campus access, an additional campus bypass, Granary Road, should be
constructed from Mn-280 through to Main Street.

6.2 Access traffic

The access traffic is comprised of several parts:

- Access by students
- Access by employees
- Access by visitors

To maintain the nature of campus and be consistent with the transportation objectives as described in the forthcoming Campus Master Plan, these groups should be encouraged to walk, bike, or take bus or the new LRT, but that won’t work for everyone.

Students and employees who drive currently park in the outer campus parking lots and campus parking ramps, and it is anticipated this would continue.

Visitors themselves comprise a number of markets. There are people visiting university activities on campus, who should be encouraged to reroute to access campus from the north, where most public parking facilities will be located.

Those visiting the hospital will need to be guided from University Avenue and I-94/Huron Boulevard to the appropriate parking ramp or patient drop-off area. This is going to require reconfiguration of the one-way street system and new signage in the district to the east of the Academic Health Center. I believe the Parking and Transportation Services office has traffic mitigation ideas along these lines, and I am sure these are solvable problems.

Finally there is a small amount of internal vehicle traffic on campus (people driving from East Bank to West Bank), which should be discouraged, and trucks and delivery vehicles can be appropriately routed. There is also internal traffic between the hospitals on either side of the river, which takes East River Road/Franklin Avenue/Riverside Avenue. One might envision an aerial cable car across the river between the hospital campuses, but whether this is viable would need to be determined by economic or engineering analysis.
6.3 East River Road

The road that is least equipped to see an increase in traffic is East River Road. Important existing and emergent bottlenecks include

- East River Road/Franklin Avenue/27th Street. - A recent Masters Thesis in Civil Engineering by Reuben Collins tested a variety of solutions and found a modern roundabout to be the most effective.

- East River Road/Harvard Street/Fulton Street - This will need to be reconfigured to handle increased flows from Fulton to Harvard and Harvard to Fulton. A roundabout here might work as well, but requires careful engineering. This route will likely become the primary vehicle entrance to and exit from the Academic Health Center for traffic coming from Huron Boulevard and I-94, and should be signed and marked accordingly. Fulton Street currently has two travel lanes and two parking lanes, this might need to be reconfigured depending on traffic levels and requires further investigation. The issues are compounded by the presence of truck loading and emergency vehicles associated with the AHC.

- East River Road/Pleasant Street - if the Washington Mall is extended across the Washington Avenue bridge, very little traffic is likely to use this intersection. Under the current plan to continue to allow private cars across the Bridge, this intersection will be severely impacted.

- East River Road extension to University Avenue and intersection with Granary Road. These can help distribute traffic away from campus and away from the Washington Mall.

6.4 Accessing the Washington Avenue Ramp

While I believe that Washington Avenue Ramp was poorly placed initially, given that it exists and would be costly to replace, access continues to need to be provided.

Three routes will be able to provide sufficient access for the ramp.

- For eastern access: Walnut Street to University Avenue along with Beacon Street extended to Oak Street,\(^2\)

\(^2\)Extending Beacon Street to Oak Street would also require relocation of the Alumni
• For southern access: Harvard Street to Fulton or East River Road

• For northern and western access: Union Street/Pillsbury Drive (or Pillsbury Drive extended)/Church Street

As staff has suggested, this is a complicated access pattern and probably means that the ramp would be reserved for the staff who can learn the route, and perhaps for Radisson guests.

Removing private vehicles from Washington Avenue between Walnut Street and University Avenue would affect access to businesses, which would then be primarily be accessed by car from a north-south direction. I suspect that with the LRT many of those blocks would be redeveloped to a higher density, creating an opportunity to more appropriately locate parking access.

6.5 Properties on Washington Avenue

Roads serve two functions: land access and movement. The property access questions associated with parcels on Washington Avenue need to be addressed. However, once the main section of Washington Avenue is closed, there is little reason to keep the remaining sections open from a movement perspective unless other streets are at capacity.

7 Washington Avenue Bridge

When the Washington Avenue Bridge is reconfigured to carry the LRT it provides an opportunity to adjust the uses of the bridge. Currently the bridge serves motor vehicle traffic on the lower deck and pedestrians and bicycles on the upper deck. There is an opportunity to provide more value by exploiting the fabulous view of the Mississippi River found on the upper deck. The bridge could serve as a building as well.

In the new bridge, LRT (and perhaps vehicles) will continue to use the lower deck. The upper deck could be fully enclosed and climate controlled, and provide a location for vendors, restaurants, and conference rooms with a view of the Mississippi River. On top of the upper deck (the roof) open air dining and pedestrian and bicycle transportation paths could be located.

Wall, which in my view was an aesthetic mistake that cuts off campus from the surrounding neighborhood.
The rents captured from the use of the bridge could help support additional amenities on the transit line. As this is remodeling an existing bridge rather than new construction, the environmental consequences of this are minor.

I am not aware of an exact analog for this, though buildings on bridges are at least as old as the medieval London Bridge and can be seen on the Ponte Vecchio, as shown in the following images.

Clearly engineering studies would need to be conducted to ensure strength and stability. Further, the bridge should be usable as a learning environment for Civil Engineering students. As we were recently reminded, bridges are dynamic structures. A smart bridge, with real-time monitoring of stresses and strains and traffic loads (weight, axle loadings, and counts) would be essential for travelers and bridge users to have confidence in its sturdiness and to provide a laboratory for engineering education.

8 Additional comments

8.1 The Boat

The “boat” section of the Central Corridor between 29th Ave SE and Stadium Village, where the line leaves University Avenue, has always seemed a remnant of a previous plan (getting the alignment correct for a Washington
Avenue tunnel) that was never properly rectified. I have seen rationales for this, but nothing that seems to justify leaving University Avenue. The boat results in added construction and operating costs and additional travel time for both drivers and rail passengers, particularly if the Washington Avenue at-grade alignment is selected. I think the University has a stake in this as it is adjacent to University property, and the issue should be re-evaluated objectively. In favor of the Boat is that it places the tracks nearer the stadium. The question is whether the stadium (in full use only a few weekends a year) should be driving the line a block north of where it best lies the other 358 days per year.

8.2 Rail vs. Bus

The mode selected for the proposed Central Corridor route is rail. The rest of this memo is premised on that, however it should be noted that the decision is not an obvious one.

There would be a lot of advantages in terms of route flexibility associated with bus rapid transit (BRT) compared to light rail transit (LRT). Buses can better reach into neighborhoods along the line, thereby reducing transit access and egress times. BRT does not require the maintenance of a new infrastructure, as it can exploit pavement already constructed. Buses are in general safer than LRT for those not on the vehicle, as they can stop more quickly and swerve. BRT usually has lower capital costs, and buses are much less expensive than light rail trains because of economies of scale in production. Finally, BRT is not as vulnerable to system outages or blockages as buses can easily and dynamically reroute. For a successful example of bus rapid transit one need look no farther than the University of Minnesota’s Campus Connector service between the Minneapolis and St. Paul campuses. The use of electric and hybrid buses, as now running on Nicollet Mall, greatly reduces their environmental impact.

The main advantages of LRT are fewer. They have somewhat lowered per passenger operating costs, i.e. the greater ridership per unit of labor. Second, as the ”new” mode, LRT maintains a psychological advantage because of the historic underinvestment in bus transit, giving bus transit a poor reputation in Minnesota. That advantage may result in rail getting somewhat more ridership for the same service frequency and travel time. New LRT systems may have a somewhat smoother ride quality.
8.3 Washington Avenue At-Grade vs. Tunnel

The tunnel option was dropped primarily for cost reasons, however, from a transportation perspective there are several reasons running LRT at-grade on Washington Avenue is superior to a tunnel. First, an at-grade line has lowered access costs. Travelers do not need to descend to the station, saving precious seconds both on access and egress. The stairwell itself can be hazardous, especially when travelers are rushing. Elevators are especially slow. Further, running the LRT at-grade is a constant reminder of effective transit services, that an underground line will hide. This reminder is in a sense free advertising for LRT among those most favorably inclined to it. At-grade is also simpler to navigate for passengers, there is less risk of winding up on the wrong side of the street, as often happens when emerging from underground stations in large systems like London. Again, the View from the Train for an above-ground route is also superior. Finally it should be noted that Washington Avenue would probably need to be closed during construction of a tunnel anyway.

The advantage of the below-grade option was that cars can continue to run on Washington Avenue as there would be fewer conflicts. Travel speeds of the trains might be slightly higher. Train/pedestrian and train/bicycle conflicts would be reduced. I don’t think this outweighs the added costs or the missed opportunities.