

Columbia Avenue Widening & Improvements Project (TDOT PIN 121454.00)

Project Questions from Concerned Citizen and Project Team Responses

Staff received an email with a list of questions from a concerned citizen regarding the Columbia Avenue Widening and Improvements Project. The text of that email request is listed below in *italics*, along with responses by the project team in **RED**. This list of questions and answers will also be posted to the project website for Columbia Avenue.

Introductory Section

First, I would like to thank you all for your time and attention at the work session, and apologize for exceeding the time limits. If you can find the time to read this email, I will try diligently to not waste your time with its contents and give you the best input possible.

My concern, and reason for injecting my opinion, is that as the decision makers of this project you guys need the best data possible to make sound decisions.

I have witnessed what has appeared as a sales pitch for roundabouts both privately and in the public meetings, and if taken at face value during the presentations, the clear choice is the roundabout concept. I believe however there is a significant amount of information being omitted or overlooked which hopefully I can cover in part with my list of questions that I think everyone needs an answer to.

The presentations were not intended to be a “sales pitch” for any specific intersection type. A significant amount of discussion centered around the roundabout concept, because there were simply more questions from both the public and BOMA about it. Staff’s goal was to present the best data possible to help the Board of Mayor and Aldermen (BOMA) make an informed decision on how to proceed with the project. The data was presented in the categories of: operations, safety and physical impact.

My first question, “What is the deadline to spend the granted funds?” was answered to indicate there isn’t one, but at some point with no progress on the project the funds could potentially be withdrawn. The point of this question was to identify how rapidly this project really needs to move forward. The statement was made that we need to do something now because Mack Hatcher isn’t coming, while it surely seems to be the case I would challenge accepting that and feel I can make a pretty good case to back it up.

It is correct to say that there is no specific deadline to spend the federal funds. The Federal Surface Transportation Block Grant (STBG) funds were granted specifically to the Columbia Avenue project, and continual progress must be shown, or the funding will be reallocated to another project on the Nashville Area Metropolitan Planning Organization’s (MPO) list of projects. Typically, with an STBG funded project, federal funds contribute 80 percent of the total project cost, while the local government contributes the remaining 20 percent. Because Columbia Avenue is both a U.S. Route (US-31) and a State Route (SR-6), TDOT has agreed to participate in the project by providing the 20 percent match.

The Mack Hatcher Parkway Northwest Extension, between SR-96 West and Hillsboro Road is funded and scheduled to be let for construction bids in Spring 2018. City staff is working with the Tennessee Department of Transportation (TDOT) to ensure that this project is ready to bid early next year. Upon completion of this project, the Mack Hatcher Parkway loop will be three-quarters complete.

The only remaining section of Mack Hatcher Parkway to be built is the southwest quadrant, between Columbia Avenue and SR-96W. It should be noted that staff continues to work with the state to widen the existing two lane sections of Mack Hatcher. Ultimately, all parties want the full Mack Hatcher Parkway loop completed.

As a side note, traffic levels on the section are just now returning to pre-recession levels according to TDOT historical data so I wouldn't act hastily without knowing there is a good solution first.

Even with no growth there is already a need for improvements. Recurring congestion occurs during AM and PM peak periods, and analysis of current conditions (2016 data) shows numerous locations that do not meet City standards for delay and queuing during rush hour. In addition, the collision data shows that the accident rates are two times higher than the state average. This is unacceptable and staff is recommending solutions that will help reduce this accident rate long term.

If you ask anyone involved in this project for an honest answer they would likely agree there is no GOOD solution to the traffic problem that is as simple as widening a short section of Columbia Avenue. The best they offered at the meeting was that either solution would be ACCEPTBLE.

This section of Columbia Avenue is one part of the region's roadway network, and there are a number of other projects in this portion of town that the City would like to pursue. However, improving this section of Columbia Avenue is a needed action to address existing deficiencies, regardless of whether upgrades at other locations can be made in the short term.

In terms of preferences, the project team agreed to describe both proposed concepts as "acceptable" prior to the meeting in order to avoid appearances of favoritism towards either concept and allow the BOMA to explore the relative merits of each based on the data alone. The project team feels that either alternative, the 5-Lane Access Controlled and Roundabout concepts, would be a significant benefit to the corridor. However, since there is no single alternative that "wins" across all performance measures (i.e. operations, safety, and physical impacts), the exact weighting of those factors is left for the BOMA to decide.

Remaining Questions

1. *As I pointed out, In May we were presented lots of statistics, and the most measurable one, the time to travel from Mack Hatcher to Downs Blvd. without traffic, was over estimated by 47%. If you need the details it was proposed to be 3 minutes and 10 seconds, however the 1.1 mile section has a 40MPH speed limit except for the last .2 mile is 30MPH. That travel time calculates to 1 minute 45 seconds by my math which if you drive it off peak and make the lights is pretty accurate. I downloaded the original presentation as I suspected it would be corrected, however instead of correcting the base travel time and any assumptions or comparisons based on it, they*

changed the distance instead to be from Winstead elementary to battle avenue. While that almost corrects the inaccuracy of the time I just don't understand how changing the beginning and end points has any context since they have nothing to do with the proposed project. How is this explained? Did we really mean to be talking about that commute to begin with or did we manipulate the only truly measurable piece of data that all the other speculation is derived from or against? With the correct commute time for the applicable section of road what would the corrected comparisons look like?

Travel time runs along this corridor were conducted on Thursday, April 28 and Saturday, April 30, 2016. Southbound runs were conducted from Battle Avenue to Winstead Elementary School. Northbound runs were conducted from the intersection of Mack Hatcher & Southeast Parkway running north to Battle Avenue. Each of these corridors runs for approximately 2 miles. The baseline travel time mentioned above was calculated based on speed limits for the southbound corridor: (2,600' at 30 MPH) + (7,660' at 40 MPH) = 190 sec = 3 min 10 sec.

At Public Meeting No. 3 on May 16, 2017, the travel time distance was noted as "between Mack Hatcher Parkway and Downs Boulevard" to inform the audience that this travel time included the full extent of the corridor. Unfortunately, this oversimplification caused confusion. Therefore, in subsequent presentations, beginning with the BOMA Work Session on June 13, 2017, the actual limits of the travel runs, "from Battle Avenue to Winstead Elementary School" were shown. This simplification was not intended to mislead the audience. The travel time data is merely presented to show the level of congestion that currently exists along the corridor.

- The presentation points to the current accident rate of this section of Columbia Avenue having 1.23 Fatal/Injury collisions per million vehicle miles which since it is a 1.1 mile section with an average of 18,900 cars per day it should relate to an injury crash every 43 days. I have been on this corridor the whole time and that sounds pretty high, I only remember 1 fatality in this section many years ago when a tractor trailer ran over a bicyclist at Downs Blvd. There were a few really bad crashes in front of Chick fil-a before the red light there, but otherwise I haven't seen a lot of serious accidents, mostly people running into the ditch in front of Market Master because they turn too soon. Total collisions is listed as one per week (6.85 Days). While simple crashes are not talked about much and can happen all hours of the day, injury crashes or fatalities are usually well known. Are we sure that crash data is actually the 1.1 mile section in question and not all of Columbia Avenue in Williamson county? Or within the city limits?*

The data used in the presentation was based on state records of police collision reports along only Columbia Avenue, between the top of the hill south of Mack Hatcher Parkway and Fairground Street, which is a distance of 1.59 miles. The data covered January 2013 through May 2016, or 3.42 years. During this period, there were a total of 289 crashes, of which 46 were severe (e.g. injury or fatality) crashes, which works out to one crash every 4.3 days and one severe crash every 27 days. The resulting crash rate calculation for severe collisions, for instance, is:

$$\text{Crash Rate} = \frac{(\# \text{ of Crashes}) \times 10^6}{(365 \text{ days}) \times \text{years} \times \text{volume} \times \text{length}} = \frac{46 \times 10^6}{365 \times 3.42 \times 18,900 \times 1.59} = 1.23 \text{ crashes/MVM}$$

- Do the 2041 car count estimates include the 100% completion of Mack Hatcher? If so, what happens if it doesn't get completed?*

In all presentations, staff has stated that the proposed volumes assume a complete Mack Hatcher Parkway loop. This was done to ensure that the project was justified based on land use projections. The growth rates used in the 2021 and 2041 models were determined by TDOT using their estimates of future traffic volumes, which are based on a combination of future population growth, changes in land use patterns, and new roadway developments.

However, it is important to note that even the completion of Mack Hatcher Parkway is not expected to significantly change the projected Columbia Avenue traffic volumes. The southwest extension of Mack Hatcher would only capture a small portion of the traffic currently using Columbia Avenue based on the expected future travel patterns. Current estimates indicate that, at most, 20 percent of the cars along Columbia Avenue would divert to the bypass. This means that future Columbia Avenue volumes would be 20 percent higher if the Mack Hatcher Parkway southwest extension is not completed.

Local Traffic <i>(percent of cars using Columbia Ave side streets, from presentation)</i>	Through Traffic <i>(percent of cars traveling between Downs and Mack Hatcher without turning, from presentation)</i>	
55% <i>(these cars will continue to use Columbia Avenue no matter what)</i>	45% <i>(some of these cars may divert to the Mack Hatcher SW extension depending on their destination)</i>	
	Through, To/From West via Downs	Through, To/From North via Downtown
	20% <i>(may benefit from using SW Mack Hatcher) 2,920 of 6,797 (43%) vehicles turn to/from Downs at Columbia & Downs during the analysis period</i>	25% <i>(likely to continue using Columbia) 3,877 of 6,797 (57%) vehicles head north/south at Columbia & Downs during the analysis period</i>

It is expected that local traffic along Columbia Avenue will continue using Columbia Avenue regardless of the completion of Mack Hatcher Parkway, and that the vast majority of traffic to/from Downtown will continue to use Columbia Avenue as well. The remaining traffic heading to/from the west via Downs Boulevard is the most likely candidate for diversion to the future southwest extension of Mack Hatcher Parkway, but a significant percentage of this 20 percent of overall traffic will likely still use Columbia Avenue to access destinations closer to Columbia Avenue, along Downs or West Main Street. Therefore, it is reasonable to expect that even if Mack Hatcher Parkway is not completed that Columbia Avenue will likely still handle a comparable volume of traffic.

4. *How do the people who protect Franklin and Williamson county via this section of road feel about the proposed road options? It seems the emergency services agency heads should have been consulted. Given the Rescue Squad and EMS (Ambulances) are on Downs Blvd, Sheriffs Dept. is on Century Court and EMA is at the back of Beasley it seems they should have input as*

well as the city Police and Fire chiefs with such a vital section of road potentially losing turn lanes which are critical for emergency equipment to pass during rush hour.

All streets are designed to accommodate the vehicles that will be using them, including emergency services. Emergency services personnel are highly trained and carefully operate through adverse traffic conditions on a daily basis.

Ideally, Columbia Avenue, as a 3-lane, 4-lane, or 5-lane section would have shoulders on each side to accommodate disabled vehicles and emergency equipment. Unfortunately, many urban roadway do not have shoulders, because this would further impact the adjacent properties. The project team will work with local emergency services during the final design phase to investigate and incorporate ways to mitigate the effects of heavy traffic on emergency response.

- 5. While meeting with the project designer he explained to me that red lights collect chunks of traffic and then let it pass where roundabouts keep traffic flowing continuously, this was as he was explaining to me that red lights don't mix well with roundabouts, specifically in response to a counter proposal I made about only a couple roundabouts in the center of the section for U-turns. Given that information, how is it that 5 roundabouts trapped between 2 red lights are expected to flow at all?*

While it would be preferable to have only 1 type of intersection control within the corridor, the current Roundabout Concept layout with 5 roundabouts, rather than 6 as previously conceived, is projected to function effectively from an operational standpoint. While queueing can be a concern at the interface between signal control and roundabout control, due to the different traffic flow patterns, both of the outer intersections are spaced sufficiently to prevent queuing from being a concern.

The decision to utilize signal control at Mack Hatcher Parkway and Downs Boulevard, regardless of the design concept chosen, was based on the following factors:

- The roundabout concept always included a signalized intersection at Mack Hatcher Parkway as an attempt to maintain consistent intersection types along the parkway
- There was concern that the high-volume intersection at Downs Boulevard would be unable to process the projected future volumes in 2041. Although data from comparable roundabout installations and outputs from the project's traffic models indicate that this intersection can handle the projected volumes as a roundabout and would function with less delay under roundabout control, it can also function effectively as a traffic signal. (Calculated 2041 overall intersection delay for all study periods at Downs & Columbia: delay as signal = 21.6 sec; delay as roundabout = 16.7 sec)
- Staff was asked if roundabouts and signals could be used together. While you typically do not want to switch back-and-forth between roundabouts and signals on a corridor, signals can be used to gate (e.g. control) the ends of a roundabout corridor.

The latest Roundabout Concept is intended as a compromise to address the factors noted above.

- 6. Since the biggest problem with Columbia Avenue's traffic is southbound between 3pm and 5pm weekdays, and the entire corridor backs up from Mack Hatcher all the way past Battle Avenue at times, why is there no roundabout at Mack Hatcher to let traffic outflow? Wasn't it in the*

original plan? It seems this is the only hope of aiding in outbound traffic flow even though Mack Hatcher and 31 South are likely at or near capacity already during this period of time.

As discussed in Response 5, the intersection at Mack Hatcher Parkway has been presented as a signalized intersection in all official concepts. Initial testing conducted last fall indicated that the intersection can meet the City's operational standards under either control strategy.

- 7. Where did the roundabout at Downs Blvd go? It was in the previous plan as well. Though Downs Blvd isn't nearly the road block Mack Hatcher is, it seems mixing the roundabouts and red lights is logically a bad practice as explained.*

As discussed in Response 5, the Downs Boulevard intersection was originally conceived as a roundabout in the Roundabout Concept but has been reverted to signal control in the current concept. The intersection is projected to meet the City's operational standards under either control strategy.

- 8. If the section will not have all the roundabouts needed to maintain traffic flow then why would it have any at all? Is this purely a cosmetic gesture at this point? You cannot really accomplish a lot by putting 5 roundabouts in 8 tenths of a mile with red lights on each end of it, can you?*

Providing a full roundabout corridor would maximize the benefits of roundabout control. However, as discussed in Response 5, the number of roundabouts was reduced based on community input. The remaining roundabouts are still expected to provide significant benefits in terms of delay reduction and safety improvements.

- 9. Related to number 5 above, with more than enough traffic to stop both potential southbound lanes during peak times trying to exit the city if the red light remains at Mack Hatcher, how does emergency traffic travel the corridor in the roundabout solution with medians between the roundabouts? Are they expected to travel the opposing lane for the entire corridor?*

The City currently operates a number of other access-managed corridors with median dividers such as Mallory Lane, Cool Springs Boulevard, Carothers Parkway, and others. At these locations, medians are present to limit dangerous mid-block left turns and inherently require that emergency vehicles travel some additional distance before turning around. Any roadway can be challenging to navigate during peak traffic conditions. Each particular style of roadway has its own individual challenges.

The spacing of median breaks within the Roundabout Concept is also not unusual for the City. For instance, for the length of the access-managed portions of Carothers Parkway within the City limits (Franklin Commons Court to approximately Bakers Bridge Avenue, a distance of 3.65 miles) there are 26 median breaks, or one every 750'. This is comparable to the spacing of median breaks along the proposed access managed section of Columbia Avenue (Mack Hatcher Parkway to Confederate Drive/Werthan Circle; 6 median breaks in 0.94 miles) where roundabouts would be spaced, on average, every 825 feet. Also, the inside median would have mountable (e.g. sloped) curbs, which would allow emergency vehicles to cross the median if the need arises.

Regarding operations at Mack Hatcher, both concepts would expand the number of lanes on the side streets and make improvements to signal timings at the Mack Hatcher signal that would reduce the expected queues to more manageable levels. In the near term, the fact that both designs provide hatched-out lanes for future added north-south through lanes at this location would provide a partial bypass/maneuvering area in the event an emergency vehicle needs to travel the corridor during PM rush. In the longer term, these hatched-out lanes could be upgraded to “auxiliary through lanes” even in the event that Columbia Avenue is not widened to the south, providing additional capacity at the intersection itself then merging back down into 2 lanes south of the intersection.

- 10. It was also explained to me the roundabouts are designed to drastically slow down traffic entering the circle to prevent fatal collisions to cars entering the circle or pedestrians in crosswalks since they have no signals to cross. What speed can be maintained through the designed roundabouts? Since this will be a 24hr problem unlike our current one that's about 3 hours a day, and this is a heavy truck route, how much do those slowdowns and re-accelerations increase travel times and emissions output from vehicles that would normally be uninterrupted during non peak hours?*

Roundabouts improve safety by controlling the speed of vehicles passing through the intersection. The reduced speeds are also a significant contributor to increased efficiency and capacity. Lower speeds exponentially increase reaction time for potential conflicts and lowers gap acceptance between conflicting users, providing more opportunities for side street vehicles to enter the main roadway and for pedestrians to cross.

Speed design checks are part of the design process for all roundabouts. Traversable speed is based on a number of factors, including lane width, circle diameter, and deflection angles at the entry and exit. The roundabouts in the Roundabout Concept vary from one to another but are generally designed to have a traversable speed of 15-25 MPH, depending on the movement involved. More information on roundabout analysis and performance measures is available in the FHWA's National Cooperative Highway Research Program Report 672: <https://nacto.org/docs/usdg/nchrprpt672.pdf>

The benefits of roundabout control relative to signal control in terms of delay are highest during off-peak periods. During much of the off-peak time, traffic along all approaches to the intersection, including the side streets, will be met with no opposing traffic and will be able to enter the roundabout without stopping. At signals, vehicles will still encounter red phases and be required to stop during off-peak periods, particularly at side streets.

Similarly, emissions are worse when vehicles must come to a complete stop, idle, and then start up. This is compounded by signals which cause a number of vehicles to stop, idle for an extended period, then start up again. Roundabouts reduce emissions by generally not requiring vehicles to come to a complete stop except during peak conditions. Even in peak conditions, in most instances, roundabout queues are moving queues as opposed to the fully static, stacked and staged queues that are seen at signals. As a result, the overall number of stops, delays, and emissions at roundabouts is not a concern during off-peak periods.

- 11. I have illustrated in the meeting and will attach to this email, when a roundabout is clogged in one direction and any traffic needs to cross that flow, the entire roundabout gridlocks in all*

directions until the congested path clears. The example seen in the attached photo is northbound traffic backs up all the way from the BGA Lower School (Harpeth river and franklin rd), through a series of red lights, around the square and down main street every morning between 7:30 and 8:00 am. The same happens opposite in the peak afternoon times of 3pm to 5pm southbound through the square as the red lights on main street are clogged with traffic and it backs up around the square and up franklin road. During these times, the east/west lanes are blocked and a couple vehicles trying to cross them in turn block the lane opposite the congested traffic flow as well. Downtown has the advantage of no allowed truck traffic but Columbia Avenue is the truck route, wouldn't this problem be drastically worse on Columbia where by eliminating left turns and forcing tractor trailers to circle the roundabout to go in the opposite direction? It would seem every truck that needed to turn around would have the potential to shut down all traffic during peak traffic times. Downtown has the added advantage of multiple ways to bypass downtown through side streets, a luxury Columbia does not have.

The scenario described above can and does occur at any type of intersection. Motorists must be aware at all times not to block an intersection.

The roundabout circulating lane widths have been selected such that only the longest trucks would need to take up both lanes to pass through the roundabout. The vast majority of commercial traffic should be able to use the corridor without impeding traffic any more than they do today when attempting to make left-turns into or out of side streets.

Closing Section

Thank you if you made it to the bottom of this list, as I have said before, I would not want to be in your positions as you face an impossible decision. The 5-lane solution is less safe, that's easy to see, however it might help a little with traffic, at least as much as widening a 1.1 mile section of a much larger problem section of road could, at least it won't impede emergency vehicle response or delay traffic in non-peak hours. The roundabouts as proposed just do not make sense, it's a safer plan but it's hard to see how it will be a positive gain for traffic, at least as proposed.

Therefore, I asked if the no build solution is still a choice. When I heard you were going to do something to help the traffic on Columbia Avenue, like most I was excited, but when you involved me in the solution, it opened my eyes to how hard that really is. The real problem is the lack of Mack Hatcher's completion. The construction phase of Mack Hatcher will hardly impact existing traffic until completion and then it would be a huge relief without question. Widening a mile of Columbia Avenue in the city without addressing 31 southbound or Mack Hatcher eastbound, to give the traffic somewhere to go, is still going to leave the traffic piled up at the Mack Hatcher intersection as it is today. I invite you to come to my shop, look up the hill, and imagine two roundabouts between me and the top of the hill, then try to visualize how that's going to help anything when everyone is stuck at Mack Hatcher?

If unlimited funding were available, it would be ideal to address all traffic issues. However, this is certainly not the case. Projects must be phased based upon available funding.

I can tell you with absolute certainty that the construction phase of Columbia Avenue will have a devastating effect on traffic for years, and our businesses that sit along it will suffer the entire

time and have to adjust to the property loss and reconfiguration done in the process. Please consider how wasteful this whole exercise will have been if it does not actually improve traffic as I'm suggesting.

Construction, especially road work, can be a difficult process, especially for the property owners that are directly impacted. Unfortunately, this is an issue that will continue to be a struggle for all growing communities. The City of Franklin is committed to working with affected property owners to mitigate any negative effects during construction.

Could we at least see if the northwest section of Mack Hatcher helps first before we make this mess since the funds don't have a timeline?

As discussed in Response 3, the northwest section of Mack Hatcher is not expected to have a measurable impact on traffic volumes or traffic operations along this corridor.

It has been said this money can only be spent to address traffic on this section of road, building Mack Hatcher will cure, not address, the traffic problem on this section of road, so what do we have to do to get that point across to the state? Seems to me this grant is just hush money to take our eyes off the real problem. If the state won't build Mack Hatcher, how can they tell the city it can't? Maybe you acquire property on Hillview lane and beyond, widen it and connect it to Carters Creek, then let the state have it for Mack Hatcher some day in the future?

The City received federal funds for this project after specifically requesting that Columbia Avenue be added to Nashville Area MPO's Long Range Transportation Plan, and subsequently the Transportation Improvement Plan. State funds only became available after the allocation of federal funds.

One last thing, I found an interesting news report on the debate of roundabouts in Wisconsin, which in particular addresses issues with the one large one used as the most relevant example at the meeting in De Pere, (the series of roundabouts in Prairie Du Chien seemed to be in a somewhat residential area and looks to have half our car count according to the state car count website so it seems a bit irrelevant). <http://www.wearegreenbay.com/news/you-paid-for-it-roundabouts-part-one/160238929>

In part 2 they address the problems with heavily congested areas and truck routes <http://www.wearegreenbay.com/news/you-paid-for-it-roundabouts-part-two>

And in the third they are still trying to teach people how to use them with some really funny commercials <http://www.wearegreenbay.com/news/you-paid-for-it-roundabouts-part-three>

A simple internet search can be used to find information and opinions both for and against almost any issue or topic. It is the duty of everyone involved to determine the best solution to reach a common goal for a specific issue.

The Marquette Road corridor in Prairie du Chien carries State Route 35 through downtown Prairie du Chien, the county seat of Crawford County, Wisconsin. WisDOT has a count station at the midpoint of the roundabout corridor which shows daily traffic of 11,700 vehicles as of 2016. The roundabout conversion project was completed in 2014. Both the town and traffic volumes

along the Marquette Road corridor are smaller, but this corridor was chosen to demonstrate operations at closely-spaced roundabouts. On Marquette Road, 3 multi-lane roundabouts are installed in a span of 1,000 feet, about the same as the distance from Southeast Parkway to Century Court.

There are nearly 4,000 roundabouts in the US at present and many instances of roundabout corridors with closely spaced roundabouts, handling in excess of 30,000 vehicles per day. The design team is not concerned about the proposed Roundabout Concept being able to handle the expected 2041 volumes.