



CITY OF LEE'S SUMMIT

PUBLIC WORKS DEPARTMENT/ENGINEERING DIVISION
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MEMORANDUM

August 19, 2005

To: Steve Arbo,
Assistant City Administrator

Through: Chuck Owsley, PE
Director of Public Works

From: Jeff McKerrow, PE, PTOE
Senior Staff Engineer

**Re: Ward Road Improvements
Route 150 to County Line Road**

This memorandum has been prepared to provide information to the City Council related to the pending Ward Road improvements associated with the recently approved Kensington Farms Development. Specifically, the impact of the Ward Road improvements from Route 150 to County Line Road will be discussed in detail as these improvements will likely require the acquisition of right-of-way or easements to construct the improvements. This memorandum will address existing conditions, the pre-annexation agreement with Pulte Homes, the use of public right-of-way, typical arterial cross-sections, the issues that have been raised by this project, options for the improvements on Ward Road, input received from the impacted property owners, and staff's recommendation for the Ward Road improvements.

Existing Conditions

This project will focus on the widening of Ward Road between Route 150 and County Line Road, a distance of slightly less than one mile. Ward Road tapers just south of Route 150 to a two-lane rural cross-section with drainage ditches on both sides of the roadway. While the pavement width and right-of-way vary along this section of road, they generally include 18 to 20 feet of pavement in 60 feet of right-of-way. Recent traffic counts on Ward Road indicate a volume of 6,289 vehicles per day. Ward Road is designated as an arterial street in the both the City's current Thoroughfare Master Plan and Comprehensive Plan.

Pre-Annexation Agreement

As part of the Pre-Annexation Agreement with Pulte Homes, improvements on Ward Road to one-half of the ultimate arterial road cross-section were required from Route 150 to County Line Road. There were three primary reasons for these improvements:

- 1) To enhance capacity on Ward Road, offsetting the additional traffic generated by the proposed development.
- 2) To build a permanent section of the roadway that would allow the City to keep Ward Road substantially open during the first phase of construction (associated with the Kensington Farms development) and to maintain two-way traffic during the final phase of construction (anticipated as a City project in an unspecified year). This would also allow us to better utilize the monies invested in this project for the ultimate solution and minimize the amount of temporary work that would be discarded when the project is completed.
- 3) To utilize the resources of a private developer to acquire a substantial portion of the Right-of-Way that was ultimately envisioned along this corridor.

Use of Public Right-of-Way

Public right-of-way serves a variety of purposes and one of these uses, arguably the most recognized, is to facilitate travel by the public through the City. However, this travel is not just limited to automobiles, but is also granted by right to pedestrians and non-motorized vehicles such as bicycles. Per the City's standards, pedestrian accommodations are provided for on both sides of arterial streets and the majority of collector streets. Local streets and industrial collectors are required to facilitate pedestrians on one side. For arterials that fall along the City's Greenway Plan, it is the City's practice to provide a multi-use path (for use by pedestrians, bicycles, etc.) on one side of the roadway to provide essential linkages to other trails and parks throughout the community. These trails are continually ranking high in popularity on citizen surveys for Lee's Summit.

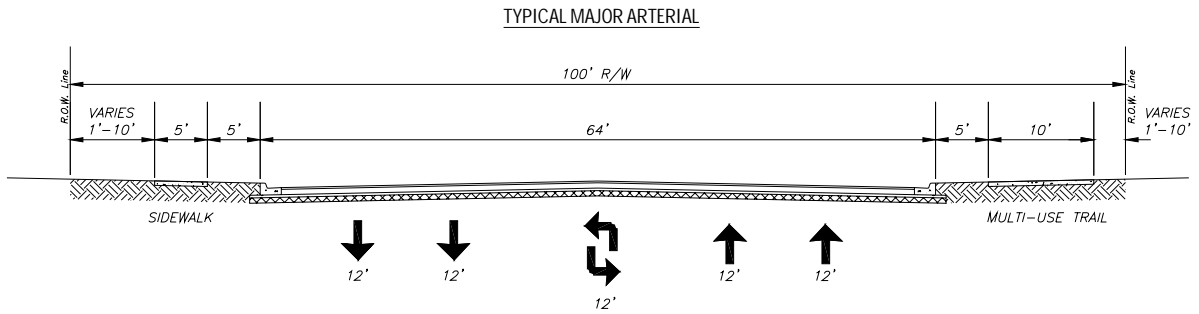
The second use of public right-of-way, and one that is essential for the operation of the city, is its use by utilities (gas, sewer, water, electricity, telecommunications, etc.). These utility companies contract with the City through franchise agreements and provide the infrastructure backbone essential to the City's residents and businesses. While some of these utilities can be located under the actual roadway pavement, doing so significantly increases the cost of maintenance. Maintenance activities for utilities under pavement can negatively impact the traveling public.

Lastly, portions of the right-of-way are often used to buffer the more intensive uses (such as the travel lanes) from adjacent property owners. On local streets the right-of-way often provides 11 feet from the back-of-curb to the adjacent property line. This distance typically increases with the functional classification of the streets where arterials often provide up to 20 feet or more of buffer space.

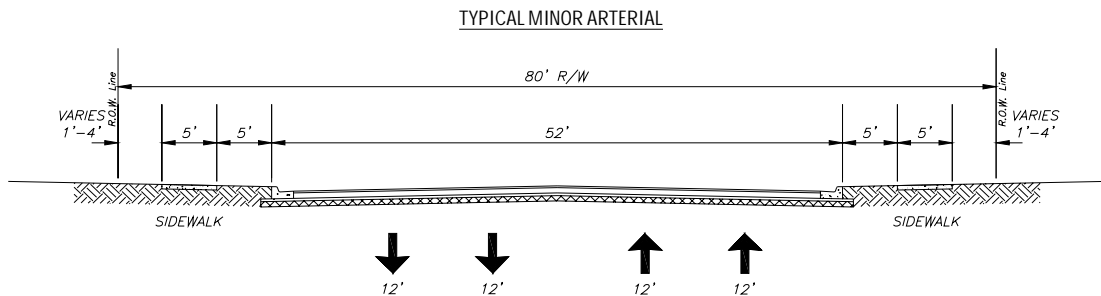
Typical Arterial Cross-Sections

The City has typical cross-sections that, in general, define the use of right-of-ways. For arterial streets that includes both Major Arterials and Minor Arterials. The difference between these are described below and graphically illustrated on the attached figures.

Major Arterials generally include two through lanes in each direction and either a center turn lane or a raised median. This is accomplished within 100' of right-of-way and includes 12' travel lanes, a sidewalk on one side of the roadway and either a second sidewalk or a multi-use path on the other side of the roadway.



Minor Arterials generally include two through lanes in each direction and do not include a center turn lane or raised median. This is accomplished within 80' of right-of-way and includes 12' travel lanes and sidewalks on both sides of the roadway. This limited right-of-way width generally provides adequate width for the occasional provision of a center turn lane or the use of a multi-use path on one side of the roadway, but not both.



The differences between the Major Arterial and Minor Arterial focus primarily on the provision for a center turn lane and the flexibility to accommodate a multi-use path. From a vehicular capacity standpoint, a minor arterial can generally accommodate between 12,000 and 18,000 cars per day while a major arterial could accommodate between 25,000 and 35,000 vehicles per day. As a point of reference, a three-lane roadway (with one lane in each direction and a center turn lane) can accommodate about the same amount of traffic as a minor arterial.

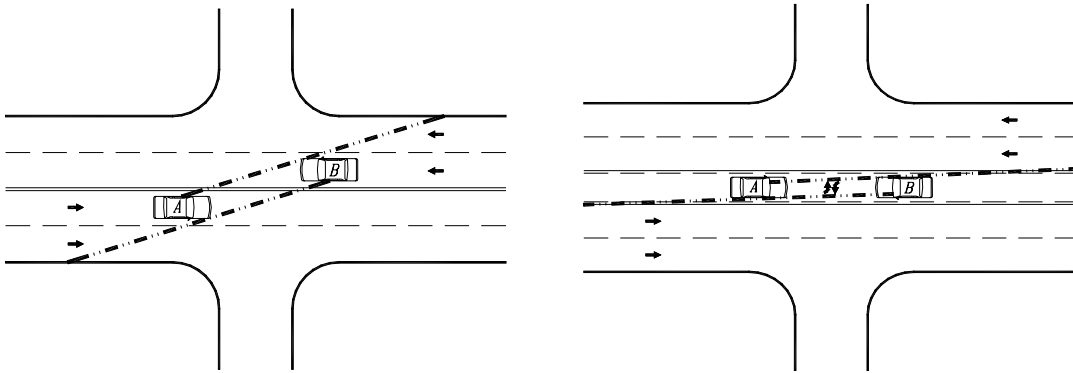
Issues Raised on Ward Road

Several issues have been raised by the residents along Ward Road through a number of forums, including City Council meetings, neighborhood meetings and individual meetings with City staff. The following is a summary of the comments heard followed by staff’s input on these design issues.

Number of Lanes – Staff is recommending that the ultimate improvements for Ward Road contain a five-lane cross-section with two through lanes in each direction and a center turn

lane while several residents have voiced a preference for a four-lane cross-section without a center turn lane. Staff's recommendation for the center turn lane due to three reasons: safety, capacity and the staging of left-turns from the driveways.

In regards to safety, the absence of a center turn lane will significantly increase the potential for rear-end crashes along Ward Road as vehicles stop in the through lane to wait to turn left. Additionally, if two opposing vehicles are waiting to turn left into opposite streets or driveways, the driver's sight distance is restricted by the opposing left-turn vehicles, making it difficult to see oncoming traffic. This is alleviated by the center turn lane as the opposing vehicles can more readily see around the opposing cars as illustrated in the figures below. On the figures, the combination dash/dotted lines represents the drivers' lines of sight.



Sight Distance Impacts

As previously mentioned the impact on capacity is quite significant with or without a center turn lane. Adding this lane can nearly double the capacity of a roadway, increasing it from between 12,000 and 18,000 vehicles a day on a four-lane facility to between 25,000 and 35,000 vehicles per day on a five-lane facility.

Finally, the center turn-lane can provide drivers the opportunity to stage their left-turns off of the side streets or driveways. That is, turning into the center turn lane and then waiting to find a point to turn into the drive lane. While this maneuver can pose additional safety concerns due to its complexity, it is a common practice that increases the ability for drivers to turn left onto a busy street. City staff firmly recommends that any option for the widening of Ward Road include a center turn lane to preserve the capacity of this investment and to provide a safe facility.

Multi-Use Trail – The west side of Ward Road is planned to include the continuation of the multi-use trail on Ward Road. Several residents have expressed questions related to this trail and its apparent lack of use north of Route 150. It is important to remember that this is a developing area in the City and several hundred homes are planned for the near future in close proximity to this trail. This trail will also include linkages to parks planned in the Arborwalk and Kensington Farms developments and the lack of the trail would create a significant gap in the greenway plan for the City. The trail is proposed on the west side of Ward Road for a number of reasons:

- The trail is currently on the west side of Ward Road north of Route 150.

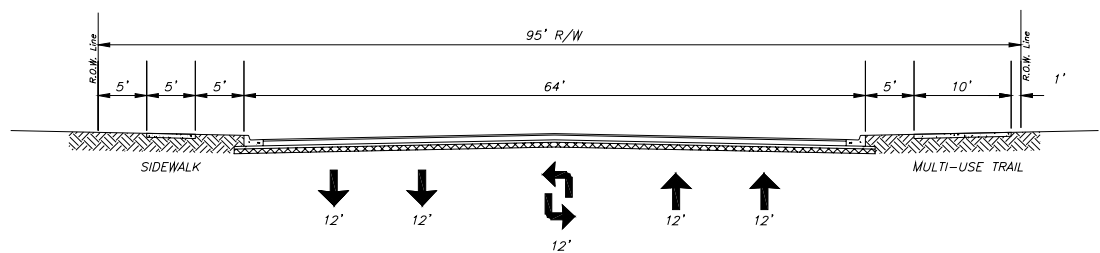
- There are two planned parks on the west side of Ward Road, one in the Arborwalk development and another in the Kensington Farms development.

Lane Widths – While the city’s standard is to provide 12’ travel lanes, several comments have been raised as to the appropriate width of through lanes. While 12’ lanes are the ideal, narrower lanes can function efficiently with little impact to capacity or safety on multi-lane roads (more than one lane in each direction), particularly in residential areas. Eleven foot (11’) lanes are an accepted standard for multi-lane roads in suburban communities similar to Lee’s Summit throughout the nation and in parts of the metropolitan community. Narrower lanes (10’) can be permitted for turn lanes, however they do pose an increased risk for sideswipe crashes and are generally less desirable and used only in cases of significant right-of-way constraints.

Phasing of Improvements – Several comments have been made by the residents along Ward Road desiring to see the full improvements completed, rather than the phased approach currently proposed. With the pre-annexation agreement, Kensington Farms would complete approximately one-half of the roadway while the remaining half would be completed at some point in the future that has yet to be determined. The City currently does not have funding in place to complete these improvements.

City staff has prepared three options for consideration on Ward Road. Each of these options maintains a five-lane facility with a sidewalk on the east side and a multi-use path on the west side as these conditions are consistent with the City’s adopted Access Management Code and Greenway Plan. The varying components include lane width and the provisions for utilities, either in the right-of-way or in a separate utility easement. On all of these alternatives, no right-of-way is anticipated to be needed from the single-family homes in either the Raintree Lake or Stoney Creek subdivisions.

Option A – 95’ of Right-of-Way

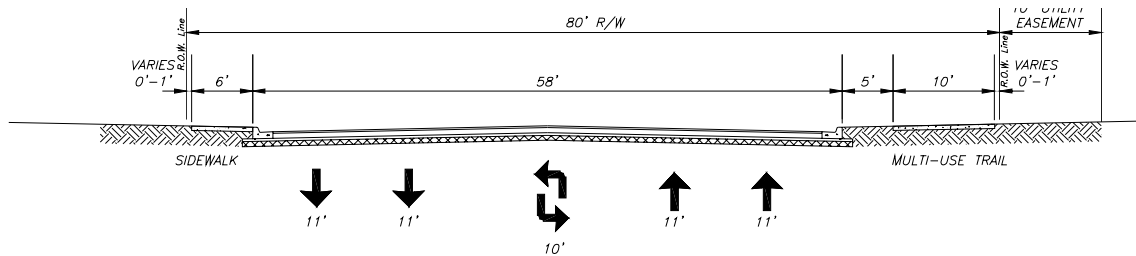


Key points related to Option A:

- On the west side of Ward Road, north of Stoney Creek, the closest home would be approximately 50’ from the Right-of-Way and 68’ from the driving lane.
- In Stoney Creek, on the west side of Ward Road, homes are typically 50’ from the ROW Line and 68’ from the driving lane. The closest home, near the north end of Stoney Creek, would be 23’ from the ROW and 41’ from the driving lane.
- On the east side of Ward Road, homes are typically located 25’ from the ROW line and approximately 42’ from the driving lane.
- Approximately 15’ of Right-of-Way will be needed on the west side of Ward Road north of Stoney Creek.

- The project can be phased with the west side constructed first (the ultimate southbound lanes) and the east side at a later time (the ultimate northbound lanes).
- The existing water line, on the east side of Ward Road, would not need to be replaced and upgraded at this time.
- This option includes 12' lanes for all through lanes and turn lanes.

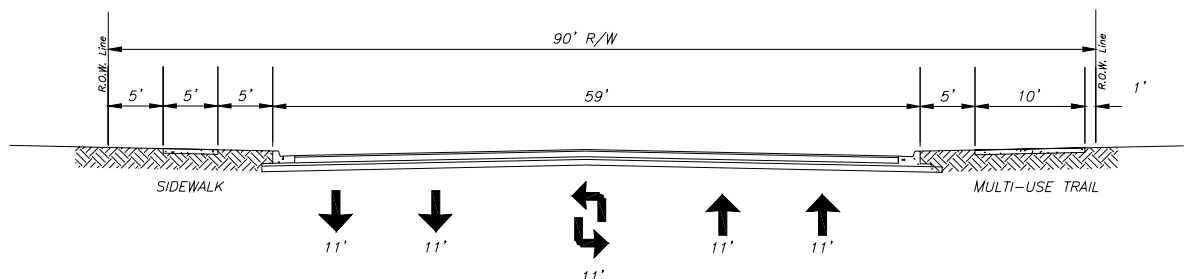
Option B – 80' of Right-of-Way plus 10' Easement



Key points related to Option B:

- On the west side of Ward Road, north of Stoney Creek, the closest home would be approximately 65' from the Right-of-Way and 83' from the driving lane.
- In Stoney Creek, on the west side of Ward Road, homes are typically 65' from the ROW Line and 83' from the driving lane. The closest home, near the north end of Stoney Creek, would be 38' from the ROW and 56' from the driving lane.
- On the east side of Ward Road, homes are typically located 25' from the ROW line and approximately 33' from the driving lane.
- A 10' Utility Easement will be needed on the west side.
- The project can be phased with the east side constructed first (the ultimate northbound lanes) and the west side (the ultimate southbound lanes) at a later time.
- The existing water line, on the east side of Ward Road, would need to be replaced and upgraded at this time. This would be an additional City expense of approximately \$700,000.
- This option includes 11' through lanes and a center turn lane which is 10' in width.

Option C – 90' of Right-of-Way



Key points related to Option C:

- On the west side of Ward Road, north of Stoney Creek, the closest home would be approximately 55' from the Right-of-Way and 73' from the driving lane.
- In Stoney Creek, on the west side of Ward Road, homes are typically 55' from the ROW Line and 73' from the driving lane. The closest home, near the north end of Stoney Creek, would be 28' from the ROW and 46' from the driving lane.
- On the east side of Ward Road, homes are typically located 25' from the ROW line and approximately 42' from the driving lane.
- Approximately 10' of Right-of-Way will be needed on the west side of Ward Road north of Stoney Creek.
- The project can be phased with the west side constructed first (the ultimate southbound lanes) and the east side (the ultimate northbound lanes) at a later time.
- The existing water line, on the east side of Ward Road, would not need to be replaced and upgraded at this time.
- This option includes 11' lanes for all through lanes and turn lanes.

Neighborhood Meeting, August 16, 2005

City staff met with the neighbors on Ward Road on Tuesday, August 16, 2005, at the Holy Spirit Catholic Church to review these alternatives and to seek additional input. After presenting much of the material that was in this memorandum, some additional questions were brought up by the residents:

- There was a question on how close the road improvements would be to the homes in Stoney Creek. That issue has been addressed earlier in this memorandum.
- There is a drainage issue related to Stoney Creek north of Georgetown Drive. While we will attempt to improve this situation with the Ward Road project, it is not directly tied to the roadway widening itself. The City Engineer has indicated that staff will continue to work with the impacted property owners to try and find a resolution to this condition. The improvements to Ward Road, while potentially helping this situation, will not make it worse.
- Residents brought up the apparent conflict between staff's current recommendations and the South M-291/M-150 Corridor study conducted by Bucher, Willis & Ratliff in 2003, which indicated Ward Road should be constructed as a minor arterial with four lanes of travel and no center turn lane. While this was the recommendation, the study also recommended the development of access management guidelines to better define city standards for access on city streets. The City adopted the current Access Management Code approximately one year after that study and the center turn lane is recommended as a component of that later document.

Near the end of the neighborhood meeting a poll was taken of the residents and property owners along Ward Road with 24 residents voting. City staff and representatives from Pulte Homes did not participate in the voting. The poll indicated a range of viewpoints on the various components of the plans, with little consensus to a preferred alternative.

- **Multi-use Trail** - 19 were for the trail, 3 opposed and 2 had no opinion.
- **Center Turn Lane** - 12 were for the center turn lane, 7 were against it, 5 did not vote.
- **Phasing** - All were for completing Ward Road under one project rather than holding Phase 2 to some undetermined year.

- *Option A (95' ROW)* - 5 were for this option.
- *Option B (80' ROW plus 10' UE)* - 18 were for this option.
- *Option C (90' ROW)* - 1 was for this option.
- Those who voted for Option A or Option B all agreed that Option C was their second choice.

Staff Recommendation

While each of these alternatives can be constructed following minimum recommended guidelines for design, they each have their own strengths and weaknesses. After reviewing each of these alternatives in detail, staff recommends Option C as the preferred alternative for a number of reasons:

- Option C minimizes the additional ROW needed over Option A.
- Option C provides additional separation from the travel lanes on Ward Road to the homes on the east side of Ward Road that are predominately closer to the roadway than the homes on the west side.
- As with Option A, Option C provides separation of the sidewalk on the east side of the roadway to the travel lanes. This is a more desirable configuration than having the sidewalk immediately adjacent to the roadway.
- As with Option A, Option C would allow the improvements to be phased over several years. This would also allow the City to postpone approximately \$700,000 in additional costs for relocating and upgrading the water line that exists on the east side of the roadway.