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12/12/2016*



**DATE:** December 12, 2016

**TO:** Michael O. Geisel, P.E.  
City Administrator

**FROM:** James A. Eckrich, P.E. *JAE*  
Public Works Director / City Engineer

**RE:** Wildhorse Parkway Drive

Each year the City of Chesterfield completes a Five Year Capital Improvement Plan (Plan) in order to plan for the reconstruction of its streets. With a total of 176 miles of public streets, such planning is imperative to ensure streets are addressed at the appropriate time in the pavement lifecycle.

One of the biggest factors in the creation of the City's Plan is the directive from City Council that the City primarily use concrete for its streets. Concrete is an excellent material that, when constructed properly, yields a useful pavement life in excess of thirty years. In order to maximize the expected life of our concrete streets, the City has created extensive pavement specifications, and conducts on-site inspection and testing to ensure those specifications are met. The result is a street network which is in overall very good condition.

The City Staff has no objection to concrete as the primary material utilized on City streets. However, there are times when other materials, specifically asphalt, can be effective, and even more appropriate, than concrete. Asphalt is not the material of choice in the City of Chesterfield for a number of reasons. These include the fact that asphalt requires surface treatments (chip and seal, microsurfacing, slurry seal, etc.) which can be objectionable to residents. Additionally, asphalt, ruts, "shoves", and wears differently than concrete. These are all practical, and perfectly acceptable reasons why the City of Chesterfield prefers concrete. However, asphalt can be an effective material in certain applications. In fact, asphalt is quieter (fewer joints) and allows more cost effective repairs than concrete. Most pavement experts will tell you that one material is not globally preferable to another; it all depends upon the application.

Most of the City's streets are subdivision streets comprised of concrete with three inch rolled curb. The use of concrete streets with rolled curb dates back to the 1950s and 1960s and the post-World War II housing boom. Streets were constructed in this manner because they allowed the developer to quickly install streets prior to laying out the locations of driveways, as each driveway would abut a rolled curb which could be navigated by the owner's vehicle (as opposed to vertical curbs). As

these concrete streets aged and deteriorated government agencies were challenged with their maintenance. The primary problem was that these streets were built over a relatively short time, and in many cases deteriorated at the same time.

Reconstruction was expensive and not an option for many governments. Accordingly, in the 1970s and 1980s many of these agencies overlaid the concrete streets with asphalt. Essentially, this "covered up" the problem, while creating additional problems. The asphalt overlay did not correct pavement base deficiencies, "reflective cracking" occurred over each underlying concrete joint, and the asphalt filled the curb, reducing curb capacity and creating storm water problems.

Absent other viable options, the City Staff does not generally recommend using asphalt to overlay subdivision concrete streets with rolled curb. We rely on more effective maintenance techniques such as crack sealing, partial depth repair, selective slab repair, and, when necessary, reconstruction. These repairs avoid the negative consequences of overlaying a deteriorating subdivision street.

Notwithstanding the details provided above, there are certain applications where asphalt overlays can be effective maintenance treatments. These applications typically occur when there is no curb, or a six inch (or greater) vertical curb which the asphalt can be placed against without eliminating the curb capacity.

Additionally, the pavement must not be showing signs of base failure, and cannot have deteriorated to such an extent that the concrete deficiencies will simply "reflect through" any asphalt overlay.

I bring these details to your attention because I believe the consideration of an asphalt overlay is warranted for Wildhorse Parkway Drive from Wildhorse Creek Road to the bridge just north of Bridgeway Circle Drive. Wildhorse Parkway is in mostly good condition, with small sections of deteriorated concrete pavement that have been patched with asphalt. These patches require regular maintenance and are unsightly to area residents, who frequently complain about them. One means of addressing these patches would be to perform "selective slab replacement" and remove and replace only the deteriorated sections of concrete. However, this treatment is NOT recommended by the City Staff in this application. If the City were to proceed in this manner, the selective slab repair required would be substantive enough that it would cause damage to the remaining slabs. The result would be new concrete slabs surrounding older concrete slabs disturbed and damaged by the construction. Those slabs would begin to show signs of further distress and failure, and we would create a cycle whereby the City was regularly addressing small sections of slabs on Wildhorse Parkway Drive. For this reason, selective slab replacement is not recommended at this time.

Without an option for another material, the City Staff's recommendation would be to reconstruct Wildhorse Parkway starting at the bridge and working toward Wildhorse Creek Road. This treatment is currently in the five-year plan in year 2020. The estimated cost of this concrete reconstruction project is \$1,100,000.

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However, Wildhorse Parkway Drive is an unusual case in a number of respects. First, it is a collector road that is comprised of six inch vertical curb, not three inch rolled curb. Second, the deterioration patterns on Wild Horse Creek are unusual in that many sections of the roadway are not showing significant signs of deterioration. Third, the high traffic volumes on Wildhorse Parkway Drive mean large scale construction would have an impact on a large number of area residents.

After reviewing the matter at length, it is my recommendation that the City of Chesterfield consider a two-inch asphalt overlay with a geotextile fabric interlayer on Wildhorse Parkway Drive, subject to City Council approval. A properly constructed asphalt overlay would cost approximately \$450,000, which is less than half of the cost of concrete reconstruction. Additionally, please be advised that we are recommending a *properly constructed asphalt overlay*, not a band-aid. The City of Chesterfield would remove concrete slabs which have deteriorated to the point that they cannot effectively be overlaid. Further, the City would install a geotextile fabric interlayer to prevent water infiltration into the pavement base and help reduce reflective cracking.

An asphalt overlay on this street is particularly appealing due to the high traffic volumes. An asphalt overlay will reduce pavement noise and will provide a much smaller impact to area motorists. The six inch vertical curb will allow the two-inch asphalt overlay to abut the curb without negatively affecting storm water capacity / conveyance. Additionally, there are very few driveway approaches which front Wildhorse Parkway Drive, alleviating the need to address driveway problems potentially caused by raising the surface of the road two inches.

An asphalt overlay will involve challenges, including tie-ins to existing side streets and determining where base repairs are needed. However, the City Staff is aware of these challenges and believe we can design an effective asphalt overlay on Wildhorse Parkway Drive. **Accordingly, it is my opinion that the City of Chesterfield should pursue an asphalt overlay on Wildhorse Parkway Drive. Such an overlay will cost approximately \$450,000, and will increase the pavement life by approximately 15 years, including regular maintenance and surface treatments.**

Please be advised that the City Staff believes this to be a fairly unusual circumstance and unique condition. We do not believe that a substantive number of concrete streets would be good candidates for asphalt overlay projects in Chesterfield.

#### **Action Recommended**

This matter should be presented to the Planning and Public Works Committee for consideration. Should the Committee desire to proceed with an asphalt overlay for Wildhorse Parkway Drive, the City Staff will design an asphalt overlay and include it in the City Budget for 2018. If the PPW Committee does not favor the use of an asphalt overlay, the City Staff will keep Wildhorse Parkway Drive in the Plan as a concrete reconstruction project, with a potential construction date as early as 2020.

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