APPENDIX 5
REIMAGINE 419
EXISTING INFRASTRUCTURE AND SITE REPORT

FEBRUARY 3, 2017

PREPARED BY:

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YOUR VISION ACHIEVED THROUGH OURS.

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Introduction

Timmons Group was invited, as a part of the overall Reimagine 419 team, to provide a report of the existing infrastructure and site constraints. The report's purpose was to evaluate the current infrastructure's availability and capacity.

The study area includes approximately 390 acres along Electric Road (Route 419). It is bounded on the north and the west by railroad tracks, just west of Bernard Drive, and on the east by the County/City line. The southern boundary of the study area extends to the edge of the existing Hunting Hills subdivision and includes the properties owned by the Old Heritage Corporation. Other specific areas within the study include Tanglewood Mall, properties along Starkey Road, and the South Peak development.

Review of Existing Infrastructure

The existing utility infrastructure was evaluated throughout the corridor, using information gathered from existing drawings, site data, and a group of interviews with the utility providers in Roanoke County on October 11, 2016.

In general, the wet and dry utilities did not feature any deficiencies of particular concern, as utilities were not only in good working order, but also had adequate capacity. Furthermore, improved broadband capabilities were under development for expansion, improving connection and reliability throughout the study area.

Water and Sanitary Sewer (Wet Utilities)

Water and Sewer are provided in and throughout the site, with both systems operated by the Western Virginia Water Authority (WVWA). The existing systems are appropriately sized for future development, with capacity for both water and sewer available.

While there are some unique existing elements, such as the interior waterline at Tanglewood Mall owned by the WVWA or a few private sanitary lines, there are no concerns for future development. Any redevelopment of the existing sites, would require that water and sanitary lines be placed in easements, alleviating any existing operational concerns.

The water system features 16" main lines running down Ogden Road, and then from Ogden Road to the east in Electric Road up to the County line. The Route 419 area is sourced by the Hidden Valley/Penn Forest system which has three primary storage facilities. The three storage tanks and their capacity are as follows: Algoma tank, located between Starkey Road and Chapparall Drive, with a capacity of 500,000 gallons; Oriole Lane tank, located on Oriole Lane (near Merriman Road), with a capacity of 250,000 gallons; and the Hidden Valley tank, located along Sugar Loaf Mountain Road (near Grandin Road Extension), with a capacity of 500,000 gallons. The system features a hydraulic grade line (HGL) at an elevation of 1388.

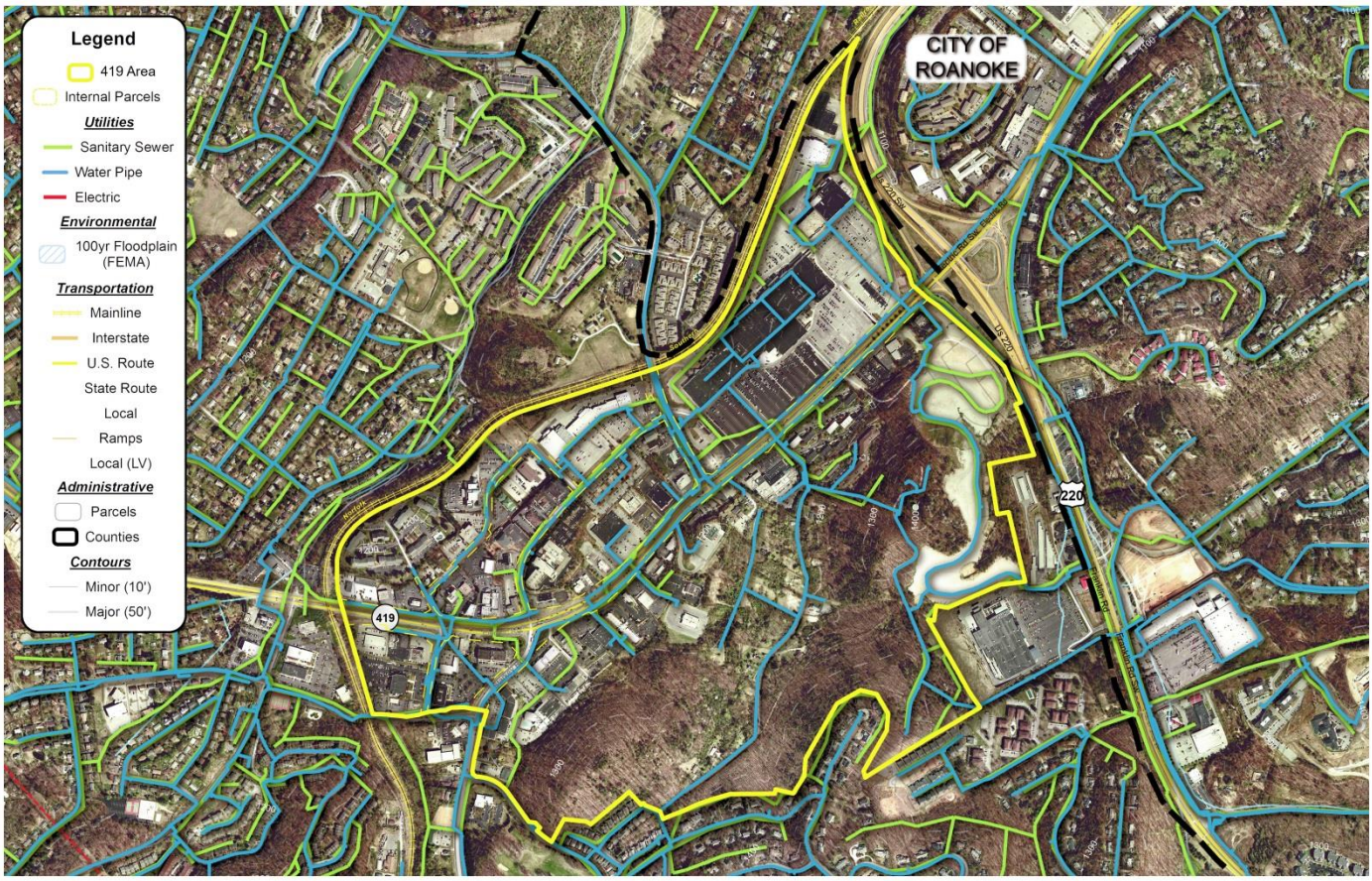

Image 1: Existing Water and Sanitary infrastructure within the study area

In addition to the water system that feeds the Route 419 area, there is redundancy from the system that supplies the South Peak development and area on the southeast side of Electric Road where the majority of the parcels are owned by Smith/Packett and Old Heritage Corporation. This area is fed by two systems, Carvins Cove and Spring Hollow, which have an HGL of 1550, with the peak of the study area located at approximately 1400 (according to GIS data). Carvins Cove features a 500,000 gallon tank, located on Route 220 near Rockydale Quarry, while Spring Hollow has a 1,000,000 gallon tank at Sugar Loaf Mountain. The redundancy this supply provides to the Route 419 corridor, requires pressure reducing valves at the connection points.

The sanitary system drains to the Roanoke Regional Water Pollution Control Plant, which has a capacity of 55 million gallons per day (MGD), but currently sees an average daily flow of 37 MGD. The redevelopment of the corridor will not put any unnecessary strain on the treatment plant, as it has more than adequate capacity for additional development.

There are some limitations along Fallowater Lane (5314, 5318, 5324, and 5332) and Bernard Drive SW (5301), as far as obtaining gravity sanitary service. Per discussions with the WVWA it has been

confirmed that the parcel on Bernard Drive SW would require pumping. The parcels along Fallowater Lane most likely will require pumping, although those needs have not yet been confirmed. There may be opportunity for service to be extended through a parcel along Electric Road, if an easement can be gained. The parcels in question are outlined in Image 2 below. These areas should be further researched to best understand what opportunities are available for future development, as it may be possible to install a small pump to better drain the sanitary system out of this area.

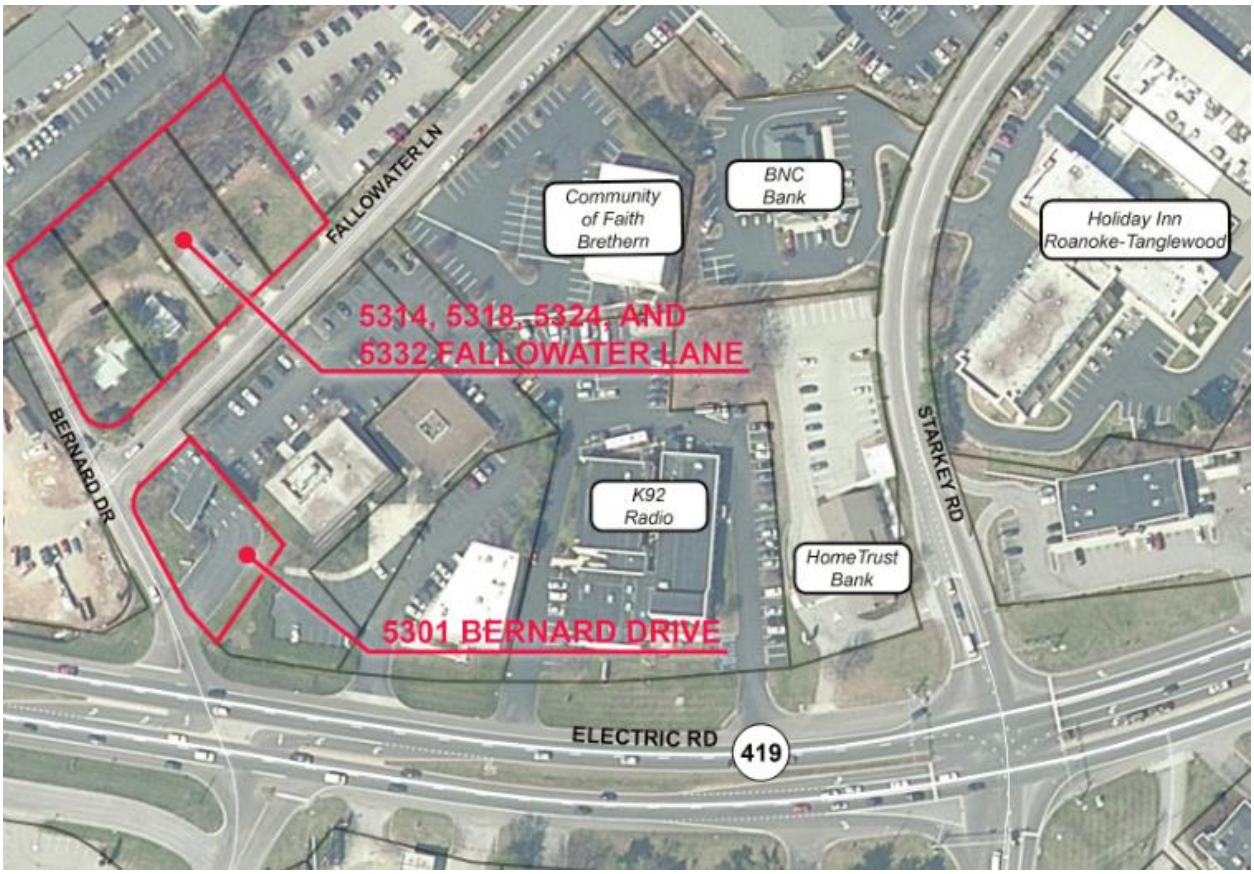

Image 2: Area along Fallowater Lane and Bernard Drive that most likely will require pumping

Electric, Gas, and Broadband (Dry Utilities)

Meetings with Appalachian Electric Power and Roanoke Gas confirmed that both utilities are available to provide supply to the redevelopment in the area. Both services, power and gas, noted that the existing infrastructure would support increased useage and that improvements and service could be expanded during redevelopment to meet the needs of new residential and commercial development.

The Roanoke Valley Broadband Authority is in the middle of a fiber expansion project, which will broaden the bandwith throughout the region. The second phase of the project is scheduled to expand

the fiber network 25 miles, with a portion of this running through the Electric Road corridor. This expansion will provide high speed (200 gigabit) fiber through Electric Road, providing a pure play optical network, with low latency.

Stormwater

Currently, the majority of the study area just off of Electric Road is highly impervious. This will allow improvements to occur with the benefit of the redevelopment guidelines, as outlined in the Type IIB Stormwater guidelines. These guidelines, which make use of the Runoff Reduction Method Spreadsheet, will require redevelopment of impervious surfaces to treat approximately 20% of the generated pollutant load.

In addition, flow runoff from future development in the currently developed areas, will benefit by being able to more easily meet the requirements of the downstream channel. The downstream channel, if inadequate, requires analysis to demonstrate that the post-developed flow rate is equal or less than the pre-developed flow multiplied by a reduction factor and a ratio of the predeveloped volume to the post-developed volume. This ratio for the highly impervious existing parcels could be greater than one, especially if some green spaces are added as a part of the revitalization.

Lastly, the existing storm infrastructure appears to be in good standing. The largest concern is the storm infrastructure at Tanglewood Mall, as a large pipe runs underneath the existing building. Ideally, this condition will be remedied during some phasing of infrastructure improvements and redevelopment of this parcel, as this storm line conveys the majority of the site's drainage area to Ore Branch, the stream that runs along Route 220.

Review of Topography

The topography of the Electric Road study area features some significantly steep terrain. The areas that are located on the southeast side of the study area (where the majority of parcels are owned by Smith/Packett or Old Heritage Corporation) are particularly mountainous, with the majority of the property over 15% slopes and a large amount exceeding 25%, as seen in Image 3. This area features the majority of the steep 25% slopes for the entire area of study.

Development on the steep terrain will most likely require a larger amount of earthwork, as well as the construction of retaining walls, increasing construction costs. Recent construction, as a part of the South Peak development, demonstrates the extent of walls that could be necessary. Additionally, longer access drives and roads may be required to navigate across the excessive grade. While no geotechnical borings have been done as a part of this study, it is reasonable to expect to encounter rock while performing earthwork in this area.

The northwest side of Electric Road features slopes that are 15% or less and easier to be redeveloped. While some of these areas may require the use of retaining walls, the magnitude of that need is greatly reduced, allowing for development costs to be saved against the need for retaining walls.

The area immediately to the southeast of Electric Road features some steep slopes and existing retaining walls, however there is an opportunity for commercial redevelopment on approximately the first two hundred feet from the road, as these areas were previously developed and graded out.

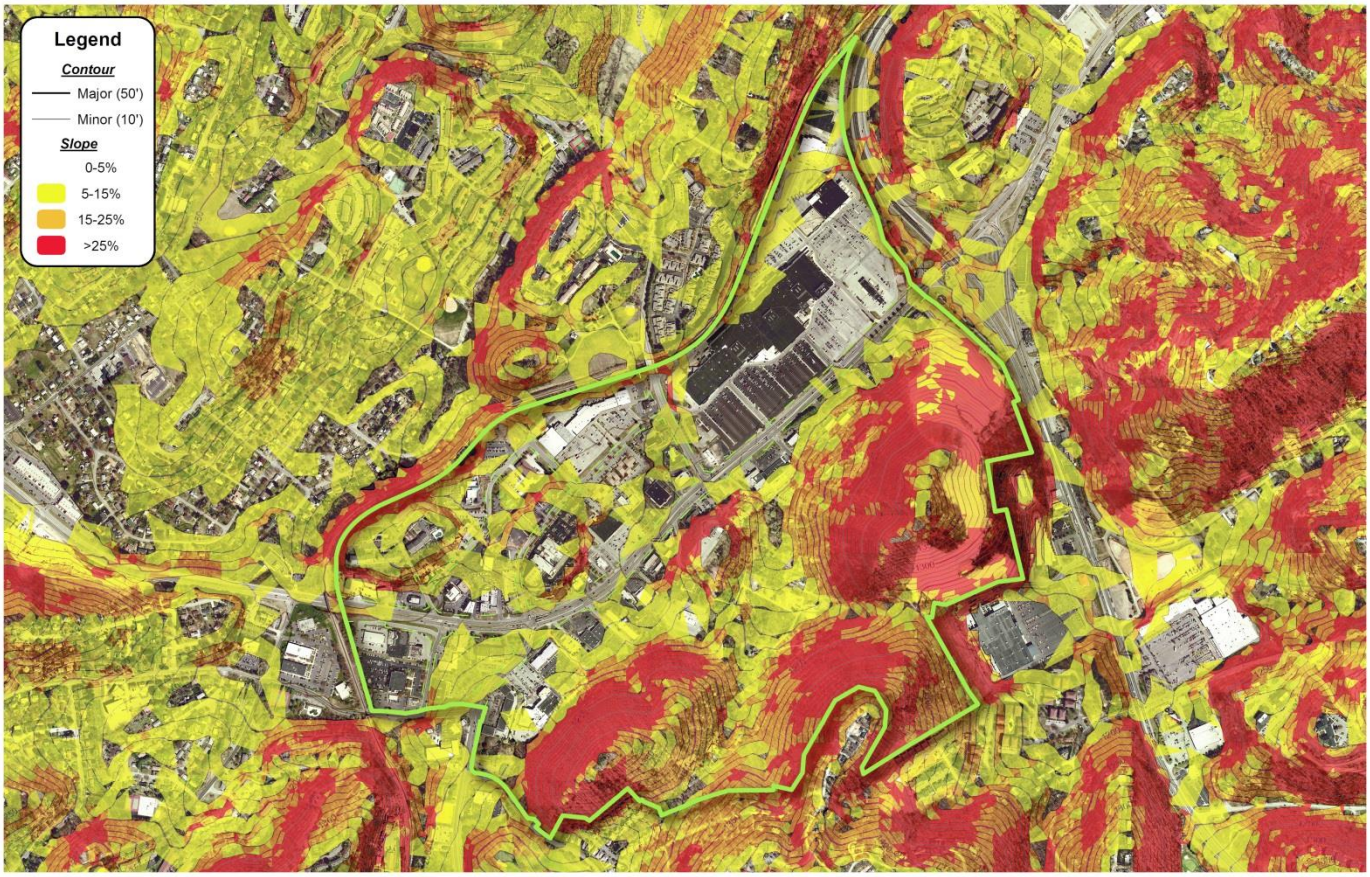

Image 3: Topographic Map Indicating Slope

The previously developed areas along the Electric Road corridor are fairly level, as they were graded out during the original development of these parcels. These areas include Tanglewood Mall and the Old Country Plaza at the corner of Ogden Road and Starkey Road, as seen in the areas featuring no shading in the Topographic Map in Image 3 above.

Conclusions

The Reimagine 419 study area currently features adequate utility supply to support a denser redevelopment, with water and sewer infrastructure currently in place. Dry utilities within the area, can be expanded, as redevelopment occurs, providing support to additional users over time.

The biggest challenge for redevelopment is the terrain. While the northwest side of the study area and the immediate areas to the southeast are developable, there are pockets of areas that feature steep terrain among them, which will require retaining walls during development. The area on the southeast of the overall study area features the majority of the steep slopes and will require significant retaining walls and access considerations during its development.