Blended Solution Set

It is recommended to adopt a blended solution set for the Route 29 corridor containing various elements of each solution set previously identified within COR-6. The blended solution set listed in **Table 20** was developed based on the evaluation measures, public and stakeholder input, and costs.

Table 20
Blended Solution Set Planning Level Costs

Blended Solution Set				
Solution Element	**Solution Set Category**	**# Sites**	**Cost per site (2016)**	**Total Element Cost**
Closure of Median Crossovers Low Cost	1 & 2	2	$10,000	$20,000
Closure/Modification of Median Crossovers High Cost	1 & 2	10	$25,000	$250,000
Lengthen Left Turn Lane Storage & Taper	1 & 2	15	$100,000	$1,500,000
Install Left Turn Lane	1 & 2	8	$225,000	$1,800,000
Lengthen Right Turn Lane Storage & Taper	1 & 2	6	$100,000	$600,000
Install Right Turn Lane	1 & 2	5	$225,000	$1,125,000
Various Signal Improvements (Calohan Road)	1 & 2	1	$10,000	$10,000
Access Modification - Antsey Road	1	1	$25,000	$25,000
Access Modification - Realignment of Leyland Drive @ Hyland Heights Church	1, 2 & 3	1	$775,000	$775,000
Access Modification - Realignment of Rangoon Street	1, 2 & 3	1	$50,000	$50,000
Install RCUT Median Access Points	1 & 2	4	$1,250,000	$5,000,000
Sidewalks - Calohan to Rt. 460	4	1	$2,750,000	$2,750,000
Shared Use Path - Calohan to Rt. 460	4	1	$6,200,000	$6,200,000
Speed Limit Reduction	2	2	N/A	$0
Total Estimated Cost				**$20,105,000**

Blended Solution Set Elements

Median Crossover Closures and Modifications – The median crossover locations chosen for closure and modifications (median left-in with right-in/right-out) were recommended for the blended solution set based on VDOT Access Management guidelines. Majority of these crossovers were serving U-turn movements or an access a small residential area of business. The closure/modification of these median crossovers would not hinder crucial access because there is nearby intersections for vehicles to utilize.

Turn Lane Extensions and New Turn Lanes – Various locations of new turn lanes and turn lane extensions in accordance with VDOT standards are recommended in the blended solution set. A turn lane gives vehicles time to safely decelerate out of the mainline traffic lane. The common rear-end crashes that occur as vehicles access businesses and residential areas without appropriate turn lanes can be reduced by this solution element.

Signal Improvement at the Calohan Road Intersection – A flashing yellow arrow (FYA) at the Calohan Road intersection for the southbound left turn movement on Route 29 to eastbound Calohan Road is a

low cost solution that would decrease delay for vehicles. A FYA is installed at 3 of the northern signals within this corridor, so both the commuter and local traffic would be familiar with the operation of the proposed FYA.

Restricted Crossing U-Turn (RCUT) Intersection – RCUT intersections are proposed at 4 locations and are recommended in the blended solution as they reduce the number of conflicts in comparison to a traditional median crossover. Even though the cost is relatively high per installation (estimated at $1,250,000), the delay for the side street movements will significantly decrease.

Speed Limit Reduction – There are 3 areas suggested for reducing the existing speed limit. The recommendation was made in order to have a consistent flow of traffic from the beginning to the end of the Route 29 study corridor. The recommendation outlined in Solution Set 2 suggests that the first segment from the Colonial Highway intersection to the Calohan Road intersection be reduced from 60 MPH to 55 MPH. The next segment from the Calohan Road intersection to the Lawyers Road intersection would be reduced from 60 MPH to 45 MPH. The third segment from the Lawyers Road intersection to the U.S. Route 460 Interchange is suggested to be reduced from 45 MPH to 35 MPH. A compromise in balancing travel time (higher speed limits) and safety (lower speed limits) is reached by modifying the speed limit to 45 MPH for both segments 2 and 3 (which is different than what is presented in Solution Set 2). Segment 1 is recommended to be reduced from 60 MPH to 55 MPH as originally described.

Multi-modal Facilities – Pedestrian and bicycle facilities are non-existent along the Route 29 corridor. It is important that these facilities be provided for the percentage of the population that cannot operate a motorized vehicle or do not have access to one. The recommended facilities of sidewalks and shared-use paths can be completed in phases when funding is available. This is an important element to include in the blended solution set as it provides vital access to residential areas and businesses for all users.

New Realignments/Roadway Modifications – The new realignment or roadway modification of Lynbrook Road, Lawyers Road, Rangoon Street, and Anstey Road are recommended in the blended solution set based on stakeholder and public input. These 4 locations have sight distance, geometric, and access management concerns which create safety issues for travelers.

Solution Elements Eliminated

Two-Way Left-Turn Lane (TWLTL) – It was determined that the high cost ($12,000,000) for installing a TWLTL along the Route 29 corridor median space was not worth the benefit gained of providing direct access for vehicles. Even though the performance evaluation measures showed a reduction in EPDO and a high travel time reliability index, there are alternative solutions that are substantially less in cost. These more cost effective solutions include the turn lane extensions and new turn lanes along the corridor with a total cost of $5,025,000. The left turn volume on majority of the corridor, in both existing and future year conditions, does not have operational demands that would indicate a need for a TWLTL.

Continuous Right Turn Lane – A continuous right turn lane along the Route 29 corridor was eliminated from the blended solution set for the same reasons as the TWLTL, the cost outweigh the benefits.

Traffic Management System (TMS) – The traffic management system along the Route 29 corridor would include a combination of red-light cameras, speed enforcement cameras, and an update to the signals' optimization/adaptive control. The 4 northernmost signals within this corridor (English Tavern Road – northern connection, Lawyers Road, Russell Woods Drive, and Terminal Drive/Liberty Mountain Drive) have INSYNC adaptive traffic control for responding to the corridor's real time traffic conditions. These solution elements were eliminated due to the corridor's current traffic conditions as well as input from the stakeholders and Campbell County Comprehensive Plan that the addition of new signals along the corridor is not favored. Therefore, the TMS solution element for the existing 6 signals along the corridor is a low priority.

Future Signalized Intersections – New signalized intersections were proposed at 4 locations including Moorman Mill Road, Patterson Road, Lynbrook Road, and Hyland Drive. These signalized intersections were proposed to accommodate future land development areas along the corridor. Based on the input from the stakeholders, it was recommended that additional signals not be installed along the Route 29 corridor. There are benefits from signalized intersections, mostly with economic development; however, the intersection would have to undergo a signal warrants analysis. Without substantial growth, it is unlikely that these intersections will meet warrant conditions.

Modify the Transportation Corridor Overlay District – Modifying the current Transportation Corridor Overlay District would help minimize future development of properties with small lot frontages. Access management and capacity and throughput of the Route 29 corridor could be improved with this type of solution. However, this solution element was eliminated based on input from the stakeholders and the amount of collaboration that would be required from property owners to agree upon shared access points instead of their existing direct access on the Route 29 corridor.