FAYETTE County
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State Route 279 Corridor Study
Concept Development Report

Fayette County Public Works
2017 SPLOST No. 17 TAT

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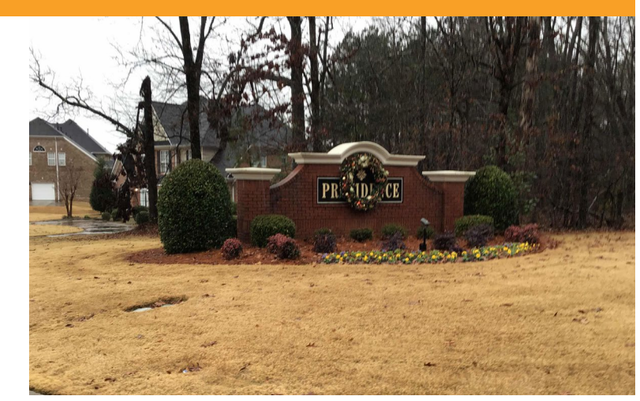


Mission Statement:

The State Route 279 corridor study recognizes the regional and local importance of the corridor. The primary goal of the study is to address, in cooperation with our state, regional and local stakeholders, issues and concerns related to safety, connectivity and capacity; and formulate multi-modal mobility concepts, proposals, recommendations and projects. Additionally, the study will develop proposals and recommendations to protect the human and natural environment as Fayette County and its cities continue to grow. The projects will formulate a complementary infrastructure improvement plan that will improve the corridor aesthetics and enhance the quality of life of the adjoining neighborhoods.

Chapter 4:
Concept Development Report

4.1 Introduction - Page 4
This section of the report introduces the concept development report and discusses the structure of the document.

4.2 Concept Development Process - Page 4
The approach and process undertaken to develop the concepts are defined in this section.

4.3 Weighted Scoring - Page 5
This section identifies the formal weighted scoring process used to streamline the draft concepts.

4.4 Preliminary Draft Concepts - Page 8
This segment discusses the preliminary draft concepts identified and presented to the public and also presents feedback from citizens.

4.5 Evaluation Results - Page 11
This section identifies the results obtained from the formal weighted scoring process.

4.1 Introduction

The Concept Development Report is the fourth section of the SR 279 Corridor Study. The precedents to this report are the Existing Conditions report which detailed the current conditions of the area around the corridor; the Needs Assessment report which identifies insights into the current and future needs of the corridor; and the Community Engagement report which describes the outreach efforts and feedback.

This chapter highlights the concept development approach utilized as part of the SR 279 corridor planning process and discusses the approach and process undertaken to develop the preliminary concepts and arrive at the preferred alternatives. This includes the draft concepts, feedback from citizens, formal weighted scoring process used to streamline the draft concepts, project justification and the preferred concept.

Preferred alternative analyses include cost impacts to right of way, the environmental, and utilities.Concepts developed represent potential combinations of safety improvements, operational improvements, and multi-modal accommodations per the corridor's Needs Assessment Evaluation and public feedback from the first Public Information Open House (PIOH).

4.2 Concept Development Process

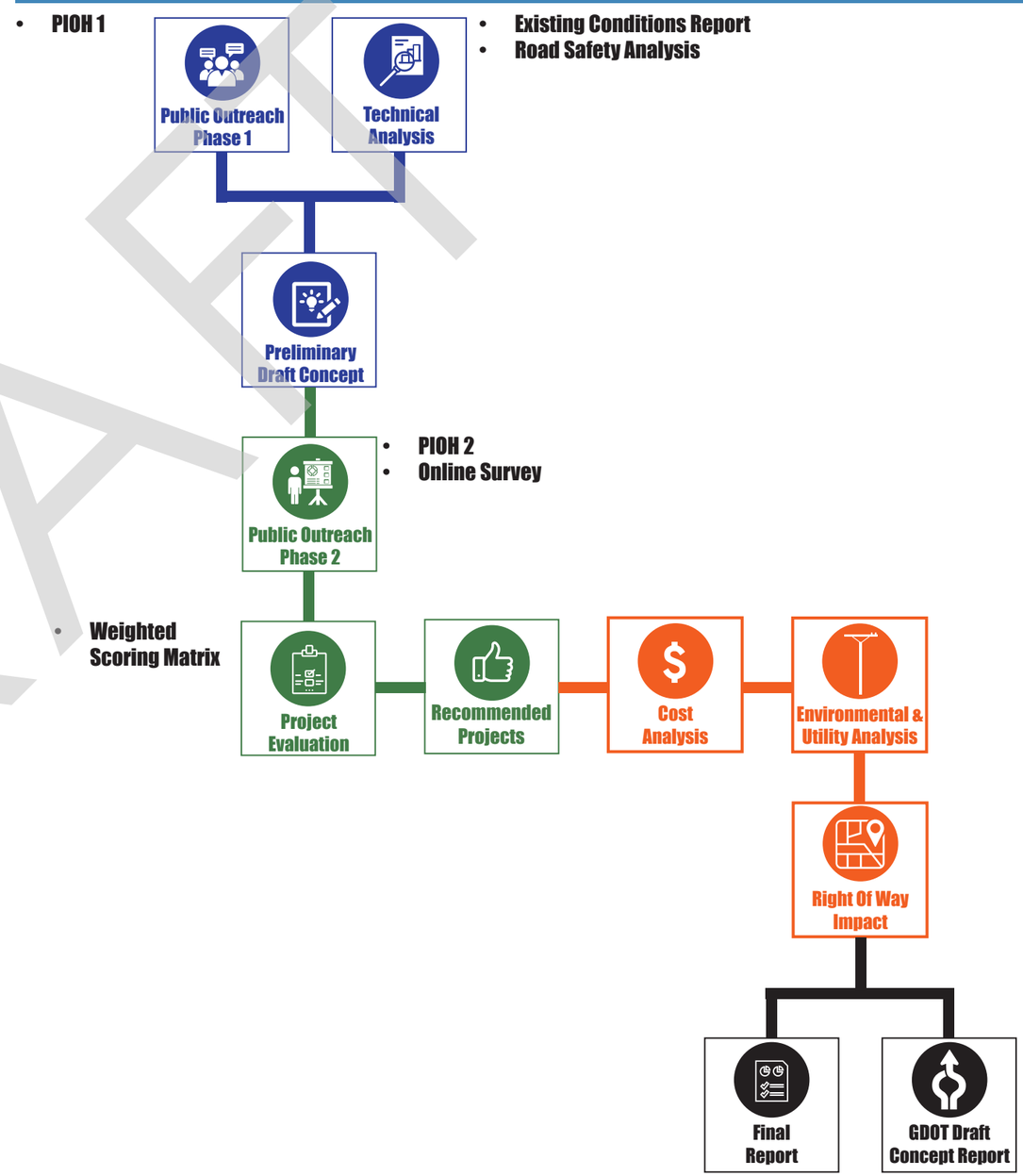
After the County's current and projected future transportation needs along the SR 279 corridor were analyzed, feedback was compiled from the first round of public outreach – the Public Information Open House (PIOH) and online submissions. This analysis was directed to identify concepts and solutions to address citizen concerns in alignment with the goals and vision for the corridor.

Preliminary draft concepts were presented to the citizens. Concept boards included descriptions, image renderings, and listing of benefits and impacts. Citizens were given various opportunities to provide feedback on the draft concepts, including sticker stations, online survey stations and detailed comment forms.

After compiling the second round of public feedback through the outreach sessions and online surveys, the set of draft recommendations were assessed using robust project evaluation and prioritization processes. A scoring matrix was created to evaluate and prioritize the projects keeping the objectives as the driving force of the process.

Project justification including traffic operations modeling and safety benefits were provided to identify the preferred alternative. The cost analysis, right of way, environmental and utility impacts for this alternative were also assessed. The concept development process is detailed in Graphic 1.

Graphic 1 - SR 279 Concept Development Process



4.4 Weighted Scoring

To assess the performance of each alternate improvement with regard to the study's vision, a quantitative and qualitative approach was developed. An evaluation matrix was prepared to quantitatively compare and "score" the performance of each concept. The qualitative approach included comparing the concepts to Fayette County's policies included in the pending Comprehensive Transportation Plan (CTP) to ascertain how well each concept supports the CTP. This section details the tools and methodology used to evaluate the transportation concepts developed for SR 279 as detailed in the previous section.

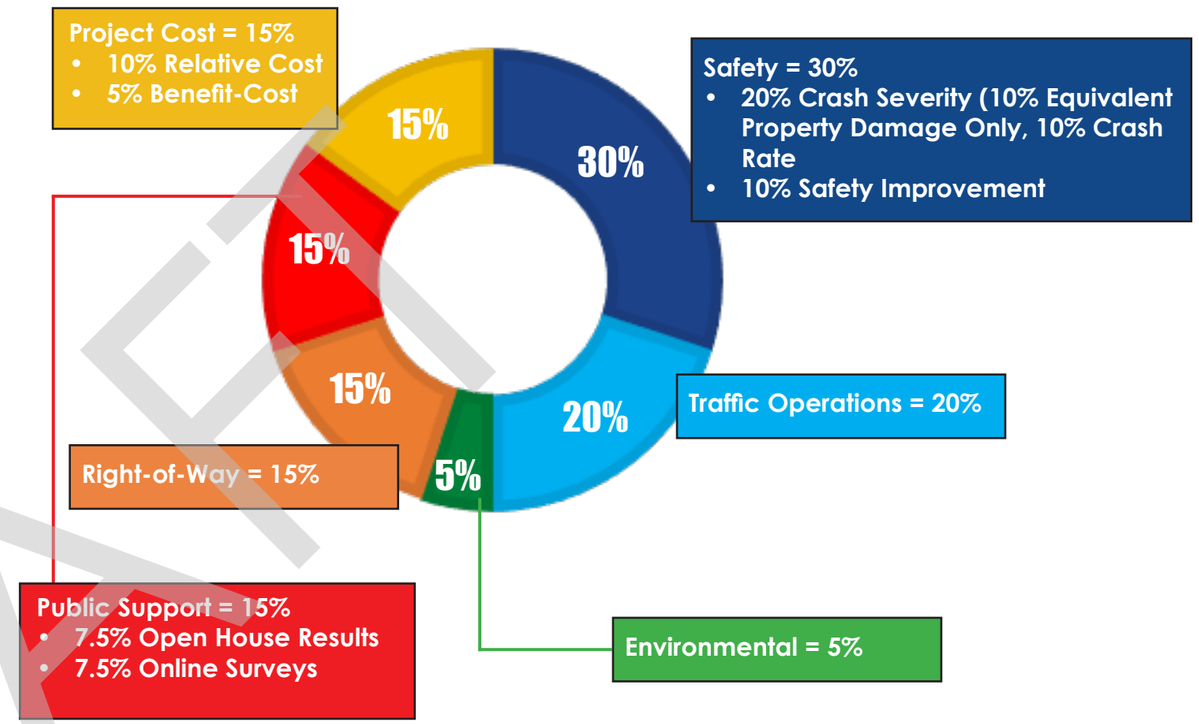
Quantitative Approach – Evaluation Matrix

The categories evaluated in the evaluation matrix for each concept were safety, traffic operations, environmental impact, right-of-way acquisition, project cost, and public support. For each category, performance measures were selected and/or developed as a means of evaluating the relative performance of each concept in terms of each specific scoring category.

Within the evaluation matrix, a weighted system was used to assign each category points totaling to 100 points. Graphic 2 and 3 summarize the performance measures, descriptions, data sources, and methodology by category. The concept evaluation worksheets for each category is included in the appendix.

Graphic 2 - Weighted Scoring Categories

Graphic 8 - Weighted Scoring Categories



- **Safety (30 Points)**

To score safety, each concept was analyzed based on the current crash severity at the location and the potential improvement to safety that can be realized by the proposed concept design. To calculate the crash severity, crash data was obtained from the Georgia Electronic Accident Reporting System (GEARS) database. Crash records were collected along SR 279 between 2014 and 2018.

The crash data was sorted by crash severity based on the KABCO scale per intersection and road segment. The KABCO Injury Classification scale for crash severity defines levels of injury severity. If several people are injured in a crash, the most severe injury level is used to set crash severity.

Table 1 - Injury Severity	
INJURY SEVERITY LEVEL	DESCRIPTION
K (Fatality)	FATAL INJURIES INCLUDE DEATHS WHICH OCCUR WITHIN THIRTY DAYS FOLLOWING INJURY IN A MOTOR VEHICLE CRASH.
A (Incapacitating Injury)	INCAPACITATING INJURIES INCLUDE SKULL FRACTURES, INTERNAL INJURIES, BROKEN OR DISTORTED LIMBS, UNCONSCIOUSNESS, SEVERE LACERATIONS, SEVERE BURNS, AND UNABLE TO LEAVE THE SCENE WITHOUT ASSISTANCE.
B (Non-Incapacitating Injury)	NON-INCAPACITATING INJURIES INCLUDE VISIBLE INJURIES SUCH AS A "LUMP" ON THE HEAD, ABRASIONS, AND MINOR LACERATIONS.
C (Complaint Injury)	MINOR INJURIES INCLUDE HYSTERIA, NAUSEA, MOMENTARY UNCONSCIOUSNESS, AND COMPLAINT OF PAIN WITHOUT VISIBLE SIGNS OF INJURY.
O (Property Damage Only)	NO FATALITY OR INJURY; PROPERTY DAMAGE ONLY

Crash Severity (20 points)

The first component of the Safety Score for each concept is the crash severity currently experienced at the project location. The crash severity at the each proposed project's location was scored based on its EPDO (Equivalent Property Damage Only) value and the intersection or road segment crash rate at the location. The equivalent property damage only (EPDO) value for a crash location weighs factors related to the societal costs of fatal, injury, and property damage-only crashes. The relative costs are assigned to crashes by severity to develop an equivalent property damage-only score that considers frequency and severity of crashes. Each concept's EPDO Score was normalized relative to the EPDOs for the four Fayette Corridor Studies with the maximum value being 10 points.

A road segment or intersection's crash rate is calculated to determine relative safety compared to other similar roadways, segments, or intersections. Crash rate analysis typically take into account data such as traffic volumes or roadway mileage to provide a more effective means of comparing crash frequency at locations and prioritizing safety issues at similar locations. Each concept's Crash Rate Score was normalized relative to 2016 statewide average crash rate with the maximum value being 10 points.

Crash Reduction Factor (10 points)

The second component of the Safety Score for each concept is the project's potential to reduce the number of crashes at the project's location. To determine this value, the FHWA's Highway Safety Manual was used to identify the crash reduction factor(s) (CRFs) for each concept. A crash reduction factor (CRF) is the percentage crash reduction that might be expected after implementing a given countermeasure at a specific site. Each concept's Safety Improvement Score was normalized to 100% with the maximum value being 10 points.

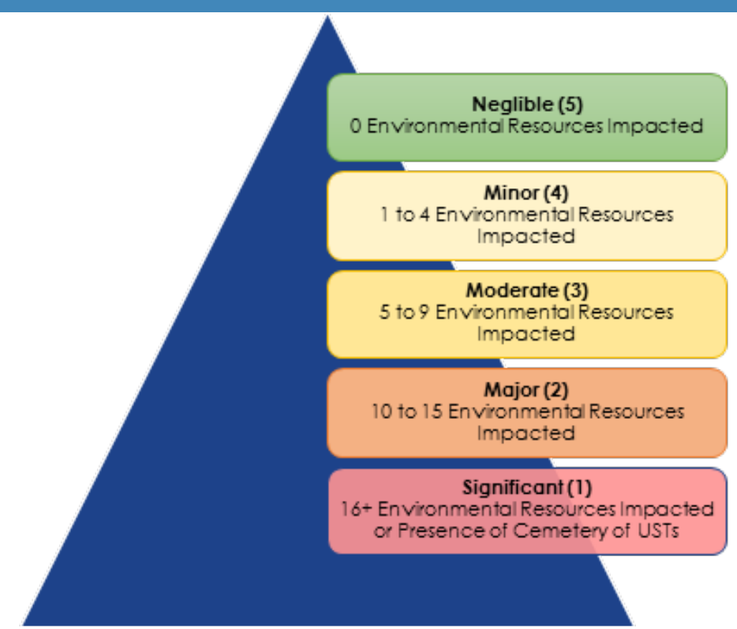
- **Traffic Operations (20 points)**

To score traffic operations, each concept was analyzed based on the net difference in delay or road capacity between a 2040 Build scenario and the 2040 No Build scenario. The net difference in delay or capacity between the 2040 Build and No Build scenarios was calculated for the AM and PM peak hours. The peak hour with the greatest reduction in delay or increase in capacity was selected and used to rank the concept's potential improvement to traffic operations based on a ranking from 1 to 10. The ranking was then converted to the overall Traffic Operations score for the concept, with the maximum score being 20 points.

- **Environmental (5 points)**

To score environmental impacts, each concept was analyzed based on the number of environmental resources potentially impacted by the construction of the project. The potential environmental impact was ranked on a scale from Negligible (5 ranking) to Significant (1 ranking). The total number of environmental resources impacted by a project was determined based on the number of resources present within a quarter mile radius of the project. Moreover, if there is a presence of a cemetery or underground storage tank (UST), the concept automatically received an impact score of Significant. The ranking was then converted to the overall Environmental Impact score for the concept, with the maximum score being 5 points.

Graphic 9 - Environmental Categories

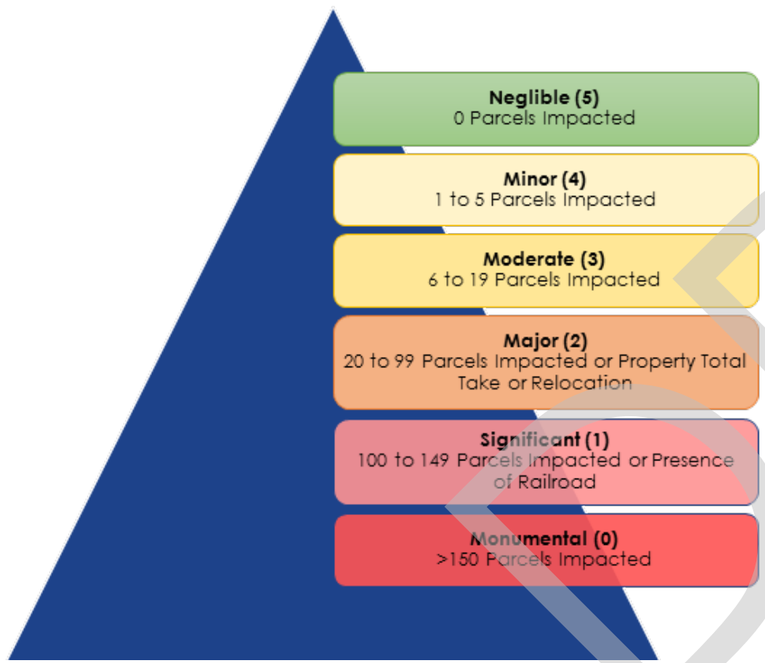


- **Right-of-Way (15 points)**

To score right-of-way impacts, each concept was analyzed based on the number and type of parcels potentially impacted by the construction of the project. To account for the current zoning of the parcels impacted, an undeveloped parcel is equal to 1 impact, a developed residential parcel is equal to 2 impacts, and a developed commercial parcel is equal to 5 impacts.

The potential right-of-way impact was ranked on a scale from Negligible (5 ranking) to Monumental (0 ranking). Moreover, if a project requires a total take or relocation of an occupant, the concept automatically received an impact score of "Major". if there is a presence of a railroad within the project limits, the concept automatically received an impact score of "Significant". The ranking was then converted to the overall Right-of-Way score for the concept, with the maximum score

Graphic 10 - Right-of-Way Categories



- **Project Costs (15 points)**

To score project costs, each concept was analyzed based on its overall construction costs and the project's benefit-cost ratio. To calculate the Project Cost score, a planning-level construction cost estimate was prepared for each concept. Each project's construction cost estimate was used to calculate a Relative Project Cost score and a Benefit-Cost score. For project scoring purposes, design and right-of-way costs were not considered.

Relative Project Cost (10 points)

The first component of the Project Costs Score for each concept is its projected construction cost ranked on a scale from 0 to 5. For each concept, its Relative Project Cost is based on the price range and was ranked accordingly. The ranking was then converted to the Relative Project Cost score for the concept, with the maximum score being 10 points.

Benefit-Cost Ratio (5 points)

The second component of the Project Costs Score for each concepts is its benefit-cost ratio. The benefit-cost ratio was calculated by dividing the total monetary value of the potential benefits of the project by the projected construction cost for the project.

The monetary value of the potential benefits was the sum of the potential crash cost savings over a 20-Year horizon and the travel time savings over a 20-Year horizon. Crash Costs savings were calculated per Property Damage Only (PDO) Crash Costs in GDOT's Highway Safety Improvement Program Report (2016).

Travel Time savings were calculated by assigning monetary values to the reduction in automobile delay and truck delay and by accounting for fuel cost savings. The ranking was then converted to the Benefit-Cost Ratio score for the concept, with the maximum score being 5 points.

- **Public Support (15 points)**

To score public support, each concept was analyzed based on documented comments received at the second Public Open House and the results from the Phase II Online Survey. The information was then converted to an overall Public Support score for each concept, with the maximum score being 7.5 points for the comment forms and 7.5 points for the online surveys.

4.4 Preliminary Draft Concepts

Preliminary project were identified to address current and projected future transportation needs. These concepts were presented to the citizens at the second PIOH. Citizens were given various opportunities to provide feedback on the draft concepts, including sticker stations, online survey stations and detailed comment forms. As aforementioned, around 250 citizens attend, 176 comments received via comment forms, and 515 comments received via the online survey.

Following a review of the results from the first Public Open House and completion of the Phase 1 online survey. The project management team discussed and developed a series of projects that addressed the concerns identified by the public. With the completion of the Needs Assessment Report, concept ideas were refined and additional concepts were added to address the current facility needs.

Below is the final list of concepts evaluated for inclusion in the final recommendation:

- Intersection Improvement at Kenwood Road
- SR 279 and Corinth Road Realignment
- Widen Corridor from SR 138 To SR 314 (4 Lane Median Divided)
- Widen Corridor from SR 138 To SR 314 (3 Lane with Center Turn Lane)

Each concept's project description and potential benefits are listed in the following sections.

LOS - Levels of Service. Qualitative measure to rate quality of traffic flow based on perfromance measures such as vehicle speed density, congestion, etc. The rating is from A to F. A = good; F = fail
Legend: $ < $250,000 $$ < $500,000 $$$ < $1,000,000 $$$$ < $2,000,000 $$$$$ < $5,000,000

1. Concept: Intersection Improvement at Kenwood Road

Based on the Needs Assessment and public comments, an intersection improvement at Kenwood Road was warranted for additional consideration. Two concepts were proposed: the first adding turn lanes at the intersection and the second installing a roundabout. Either concept would improve safety and traffic operations at the intersection.

Average No. Crashes Per Year	2018 LOS (AM/PM)	Time Frame	Benefits	Cost
4.4*	B/C	2 - 5 years	Safety, Access Management, Operations	$$$$

** crash frequency higher than state average*

Graphic 2 - Concept: Turn Lanes and Access Management at Kenwood Road

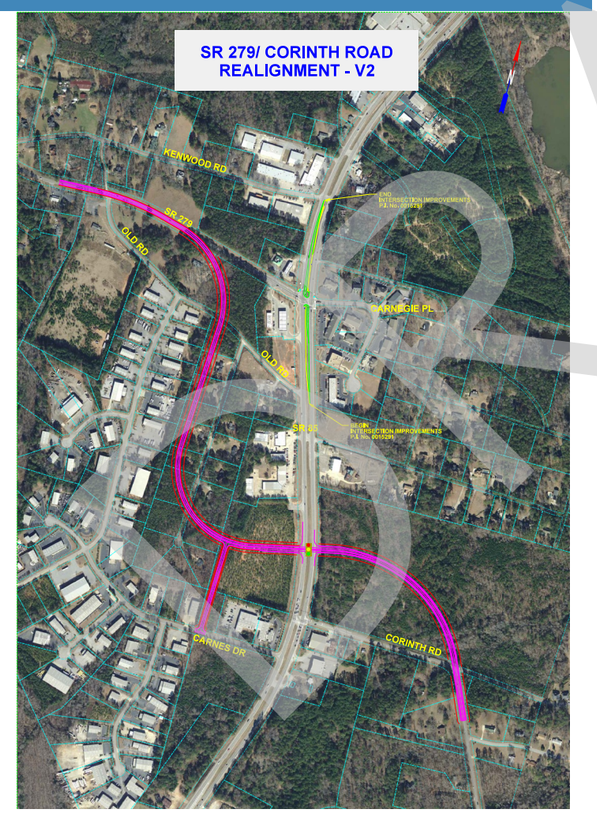
Graphic 3 - Concept: Roundabout at Kenwood Road

2. Concept: SR 279 and Corinth Road Realignment

SR 279 and SR 85 intersect approximately one-half mile north of the SR 85 and Corinth Road intersection. Both intersections are controlled with traffic signals, and experience queuing traffic for vehicles trying to make left turns from SR 85 onto SR 279 in the morning and from SR 85 to Corinth Road in the afternoon. This project entails aligning Corinth Road and SR 279, thereby eliminating a traffic signal and the associated turning movements. The project will also correct some geometric deficiencies along the corridors.

Average No. Crashes Per Year	2018 LOS (AM/PM)	Time Frame	Benefits	Cost
21	C/C	5 - 10 years	Capacity, Operations	$$$$$

Graphic 3 - Concept: SR 279 and Corinth Road Realignment Version 1 & 2



Graphic 4 - Concept: SR 279 and Corinth Road Realignment Version 3 & 4

3. Concept: Widen Corridor from SR 138 to SR 314

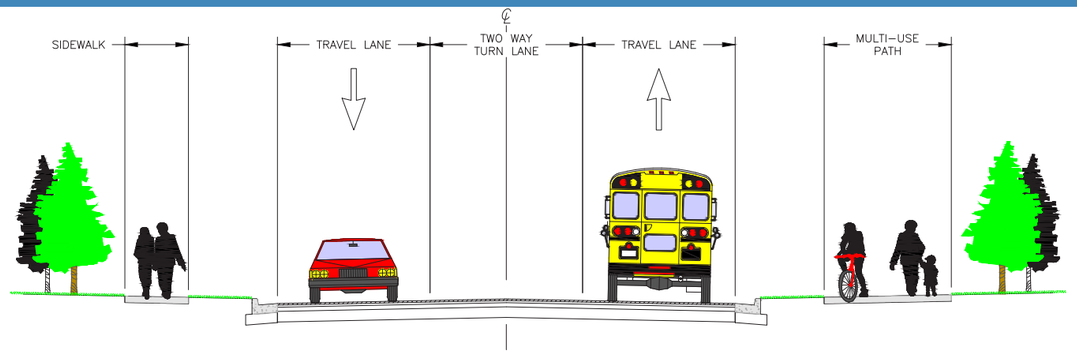
Based on the Needs Assessment and public comments, capacity and safety improvements along SR 279 warranted additional consideration. Following a traffic operations analysis, SR 279 from SR 138 to SR 314 benefited the most from capacity and safety improvements given the significant volumes traveling that section each day. The proposed project involves widening the SR 279 corridor from SR 138 to SR 314.

Two concepts were proposed, widen to 3 lanes with a center two-way-left-turn lane or widen to 4 lanes with a raised landscaped median. The corridor is envisioned to have multi-use path on one side of the road and a sidewalk on the other. This project aims to address capacity, safety and access management challenges and allows for multi-modal use.

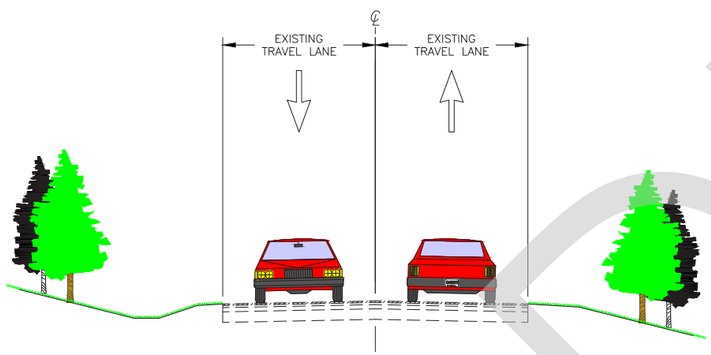
Average No. Crashes Per Year	2018 LOS (AM/PM)	Time Frame	Benefits	Cost
46.8*	C/E	10 - 20 years	Safety, Capacity	$$$$$

** crash frequency higher than state average*

Graphic 4 - Concept: Widen to 3 Lanes with Multi-Use Path

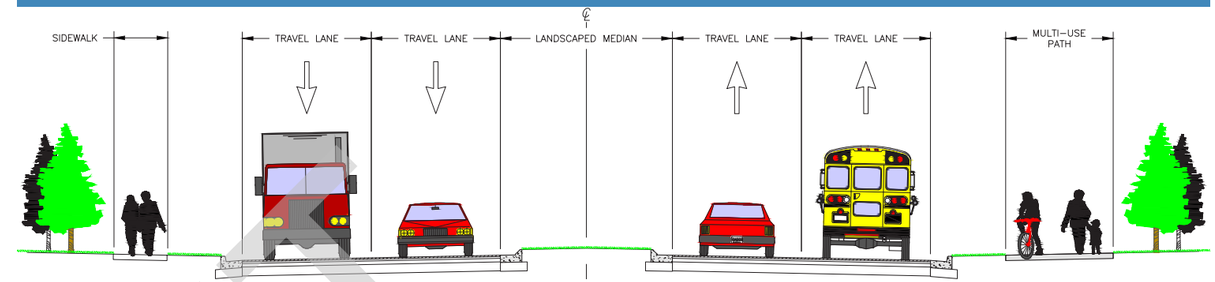


PROPOSED SR 279
3-LANE CORRIDOR

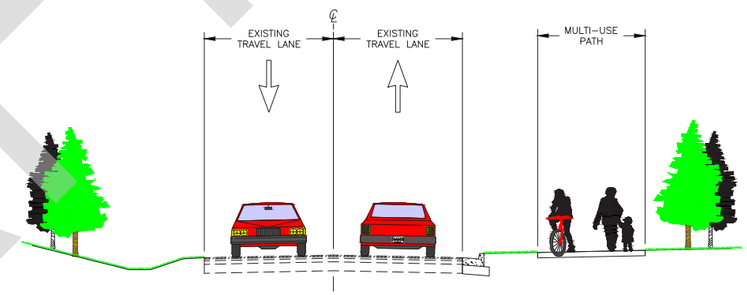


EXISTING SR 279
2-LANE CORRIDOR

Graphic 5 - Concept: Widen to 4 Lanes with Multi-Use Path



PROPOSED SR 279
4-LANE DIVIDED CORRIDOR



SR 279
2-LANE CORRIDOR

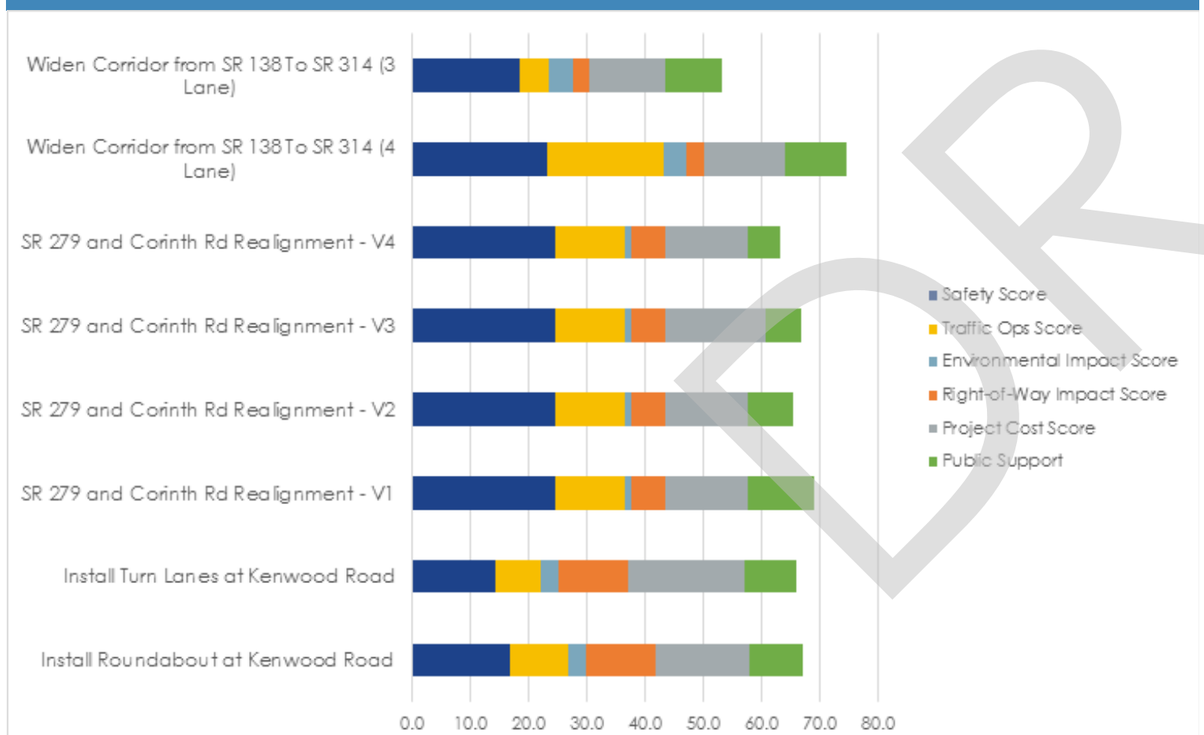
4.5 Evaluation Results

Using the methodology detailed in the previous sections, each concept was evaluated in the Evaluation Matrix for SR 279. The results of the scoring matrix are detailed per category in the table below. The overall project score is shown in a stacked bar.

Table 1 - Evaluation Results

Project Name	Safety (Max 30 pts)	Traffic Operations (Max 20 pts)	Project Cost (Max 15 pts)	Environmental Impact	R/W Impact	Public Support (Max 15 Pts)
• Improvement at Kenwood Road (Roundabout Option)	16.9	10.0	16.0	Moderate	Moderate	9.1
• Improvement at Kenwood Road (Turn Lanes Option)	14.2	8.0	20.0	Moderate	Minor	8.9
• SR 279 and Corinth Rd Realignment - V1	24.5	12.0	14.0	Significant	Significant	11.5
• SR 279 and Corinth Rd Realignment - V2	24.5	12.0	14.0	Significant	Significant	7.8
• SR 279 and Corinth Rd Realignment - V3	24.5	12.0	17.0	Significant	Significant	6.3
• SR 279 and Corinth Rd Realignment - V4	24.5	12.0	14.0	Significant	Significant	5.6
• Widen Corridor from SR 138 To SR 314 (4 Lane)	23.0	20.0	14.0	Minor	Significant	10.6
• Widen Corridor from SR 138 To SR 314 (3 Lane)	18.5	5.0	13.0	Minor	Significant	9.8

Graphic 18 - Overall Concept Score



The results of the evaluation matrix for the SR 279 concepts provide the opportunity to objectively judge each concept idea using a quantifiable methodology. The overall project score for each project is a tool to be used when selecting the preferred alternatives for each corridor in conjunction with a qualitative approach including each project's support of goals outlined in Fayette County's Comprehensive Plan, available funding sources, and implementation plan.