Screen 1: Fatal Flaw Strategy Screen
Technical Memorandum
SR 20 Improvements from Canton to Cumming
(PI Nos. 0002862, 0003681, 0003682)

Prepared for the
Georgia Department of Transportation

November 15, 2013

Table of Contents

Figures

Table

Definitions of Acronyms

Agency Coordination Plan	ACP
Atlanta Regional Commission	ARC
Area of Potential Effect	APE
Citizens Advisory Committee	CAC
Code of Federal Regulations	CFR
Comprehensive Transportation Plan	CTP
Council on Environmental Quality	CEQ
Draft Environmental Impact Statement	DEIS
Economic Impacts Assessment	EIA
Environmental Protection Division (Department of Natural Resources)	EPD
Environmental Impact Statement	EIS
Environmental Procedures Manual	EPM
Final Environmental Impact Statement	FEIS
Federal Highway Administration	FHWA
Georgia Department of Transportation	GDOT
Interstate	I
Metropolitan Planning Organization	MPO
Moving Ahead for Progress in the 21st Century	MAP-21
National Environmental Policy Act	NEPA
Official Code of Georgia Annotated	OCGA
Public Involvement Plan	PIP
Public Information Open House	PIOH
Record of Decision	ROD
Regional Transit Committee	RTC
Regional Transportation Plan	RTP
Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users	SAFETEA-LU
State Route	SR
Technical Advisory Committee	TAC
Transportation Improvement Program	TIP
Transportation System Management	TSM

1.0 INTRODUCTION

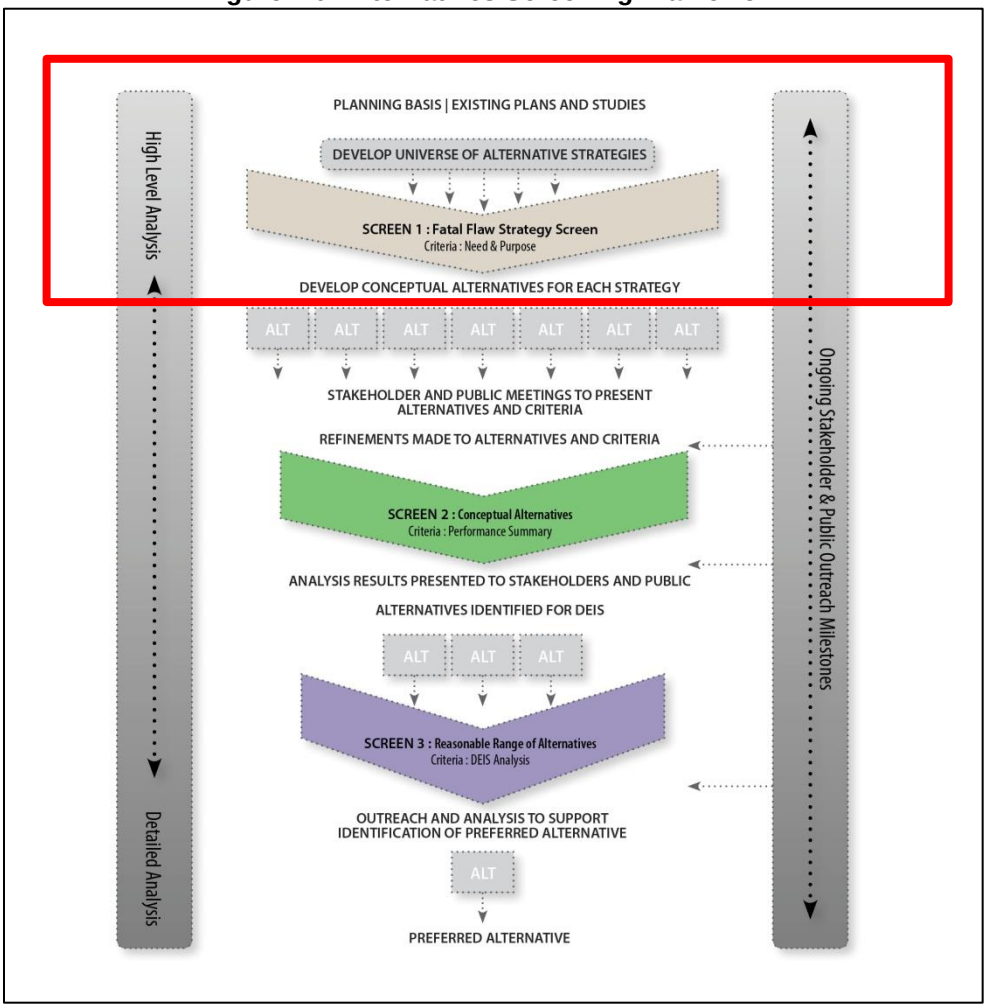
The Georgia Department of Transportation (GDOT) and the Federal Highway Administration (FHWA) have initiated the Environmental Impact Statement (EIS) for the proposed State Route (SR) 20 Improvements from between I-575 in Canton and SR 400 in Cumming as required by Section 6002 of Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and amended by Section 1305 of Moving Ahead for Progress in the 21st Century Act (MAP-21). The SR 20 Improvements project includes engineering and environmental studies to evaluate potential solutions to address congestion, mobility, and safety concerns along SR 20 between Canton and Cumming.

GDOT, as the project sponsor, in coordination with FHWA, the lead Federal agency, have developed an Alternatives Analysis Methodology to document the proposed process of identifying, evaluating, and advancing alternatives for further analysis, with an overall goal of identifying a preferred alternative during the DEIS process. The methodology includes the consideration of increasingly detailed analysis criteria consistent with the project's Need and Purpose, as well as discussion with stakeholders and the public, to be engaged in the process of advancing alternatives. The Council on Environmental Quality requires that agencies avoid, minimize, and mitigate impacts per the National Environmental Policy Act (NEPA) and FHWA mitigation policy requires mitigation to be included as an integral part of the proposed Administration action (as found in 23 CFR 771.105(d) http://environment.fhwa.dot.gov/projdev/tdmmitig2.asp).

In accordance with the *SR 20 Improvements from Canton to Cumming Alternatives Analysis Methodology Memorandum*, *October 2013*, this document summarizes the findings of Screen 1, the Fatal Flaw Strategy Screen. The Alternatives Screening Framework in Figure 1.0 presents the process by which potential improvements will be developed and evaluated. The current phase of screening, the Fatal Flaw Strategy Screen, is highlighted in red in the figure.

SAFETEA-LU coordination milestones include: Notice of Intent, Need and Purpose, methodologies, range of alternatives, technical studies, Draft EIS, identification of preferred alternative, Final EIS, and record of decision as found in the Agency Coordination Plan (www.dot.ga.gov/sr20improvements). Alternatives development incorporates agency and public involvement, affording the opportunity to review and comment on the strategies considered, the technical evaluation, and the relative performance of each strategy.

Figure 1.0: Alternatives Screening Framework



Note: The graphic above is illustrative in nature and the actual number of alternatives to be carried forward through each stage of screening is dependent on results of additional analysis.

2.0 TRANSPORTATION IMPROVEMENT MODE

2.1 Introduction

The first step in the alternatives analysis process is to determine the universe of alternative strategies. This step will support the identification of a preferred transportation mode as well as initial improvement strategies consistent with the project's planning basis for action. The determination of a transportation mode will be based upon the consideration of previous plans and studies that have identified transportation needs and potential solutions within the study area as well as the need for improvements to SR 20.

Consistency with the goals, objectives, and policies of the federally-adopted long-range Regional Transportation Plan (RTP) for the region, the Atlanta Regional Commission's

(ARC) Plan 2040, is among the considerations for advancement of strategies for further consideration and refinement. The ARC is the designated metropolitan planning organization (MPO) for the metro Atlanta region. As the MPO, ARC is responsible for implementing federal metropolitan transportation planning requirements, which includes the development of a multi-modal, financially constrained long-range transportation plan. The study area, which includes both Cherokee and Forsyth Counties, is part of the ARC MPO area and therefore is included in Plan 2040.

2.2 Identification of Transportation Improvement Mode

The planning basis for the proposed project is documented in regional and local transportation planning initiatives as summarized in the *SR 20 Improvements from Canton to Cumming Need and Purpose Statement, October 2013*. The Alternatives Screening Process first establishes the universe of transportation improvement modes (e.g. roadway, transit, and rail) that may address the project's Need and Purpose. Then, the findings of previous planning efforts and studies in the corridor that include technical analysis and stakeholder input regarding these modes are considered. Findings are summarized below.

Mode 1 (M1) - Roadway

The ARC's current RTP, *Plan 2040,* and 2012-2017 Transportation Improvement Program (TIP) identify roadway improvements to the SR 20 corridor. Specifically, PI 0002862 is listed as ARC Project FT-061A (identified in RTP and TIP); PI 0003681 is listed as ARC Project CH020B (identified in RTP and TIP); and PI 0003682 is listed as ARC Project FT-313 (identified in RTP). These improvements have been evaluated and validated by transportation planning initiatives including the ARC Regional Freight Mobility Plan, the ARC Strategic Regional Thoroughfare Plan, and the Atlanta Strategic Truck Route Master Plan (ASTRoMaP), as well as the locally-sponsored Forsyth County Comprehensive Transportation Plan (CTP) and the Cherokee County CTP.

Roadway improvements potentially address mobility, congestion, and safety concerns along SR 20 between Canton and Cumming as validated and documented in the studies above. The RTP and TIP include preliminary cost considerations for potential roadway improvements that reflect the fiscal constraint of the region.

Mode 2 (M2) – Transit

The Atlanta region's official long-range transit vision, *Concept 3 (*http://www.atlantaregional.com/transportation/transit/transit-planning), was adopted in 2008 and updated in 2012, and serves as the transit element of the RTP, Plan 2040, and included considerations of all forms of public transit including rail and bus. This collaborative, multi-year analysis effort led by the Atlanta region's Transit Planning Board, the predecessor to the existing Regional Transit Committee (RTC), identified candidate corridors for future transit investment based on detailed technical analysis of cross-regional transportation patterns. The SR 20 corridor from Canton to Cumming was not identified as a candidate for future regional transit investment as a result of this study, which included technical analysis as well as stakeholder and public involvement.

Public Transportation in Cherokee County is provided by the Cherokee Area Transportation System (CATS). CATS provides transportation service to rural residents throughout the county, including para-transit services. CATS also operates a fixed route bus system providing service in and around downtown Canton. Express bus service is jointly provided by Cherokee County and the Georgia Regional Transportation Authority (GRTA), which provides a transportation option to commuters between Canton/Woodstock and midtown and downtown Atlanta. There are currently four proposed transit improvements in Cherokee County noted in the March 2008 CTP, including the Canton Intermodal Facility and expansion of CATS and GRTA bus service on SR 20 near the project corridor in Canton within the proposed project vicinity. The planned Intermodal Facility would serve as a transfer station for riders transferring between Canton's fixed route trolley/bus system and the CATS Bus Rapid Transit service that would run from to downtown Atlanta. These improvements are limited to specific sites on the western end of the SR 20 corridor.

Public transportation in Forsyth County includes the Xpress 400 bus, which offers weekday service between the City of Cumming and the North Springs MARTA rail station near Perimeter Center and direct service to downtown Atlanta. The express bus service is provided jointly by Forsyth County and GRTA. In the City of Cumming, a park and ride lot is available to commuters wishing to car pool into the city of Atlanta or wishing to utilize the Xpress 400 bus. This park and ride lot is the terminus for the Xpress 400 express bus that travels to the City of Atlanta. Forsyth County also offers a Dial-A-Ride program to meet the needs of county residents, and includes para-transit service.

These public transportation options and future plans have been developed in response to current and future travel patterns and transit demand in the study area. *Concept 3*, as well as the Cherokee County CTP and the Forsyth County CTP have not identified a transit strategy along the SR 20 as a feasible transportation solution in the corridor, due to the dispersed nature of activity centers and origins and destinations along the project corridor.

Since the nature of activity centers are dispersed along the corridor and trip patterns are not aligned along SR 20, the transit strategy would not be expected to draw enough riders from existing SR 20 between Canton and Cumming to reduce traffic volumes that could address the congestion, safety, and mobility components of the Need and Purpose.

Mode 3 (M3) – Rail

As explained above, *Concept 3* considered future transit rail corridors for the Atlanta region. The SR 20 corridor from Canton to Cumming was not identified as a candidate for future regional transit investment as a result of this study, which included a technical analysis as well as stakeholder and public involvement. Similarly, GDOT's current Georgia State Rail Plan, completed in 2009, does not include future rail investment along the SR 20 corridor between Canton and Cumming.

Further, investment in rail transit would be a significant expenditure. According to calculations based on data included in the FTA Capital Cost Database

(http://www.fta.dot.gov/12305_11951.html), an investment in a light rail transit alternative costs on average $120 million to $180 million / mile. Investment in heavy rail averages $250 million / mile. The level of investment required for the 25 mile SR 20 corridor goes well beyond the region's fiscal constraints as documented in *Plan 2040*.

Since the nature of activity centers are dispersed along the corridor and trip patterns are not aligned along SR 20, the rail strategy would not be expected to draw enough riders from existing SR 20 between Canton and Cumming to reduce traffic volumes that could address the congestion, safety, and mobility components of the Need and Purpose.

Recommendation: As a result of this screening, roadway is recommended to advance as the transportation mode for improvement alternatives based on consistency with the established planning basis for action as identified in: 1) the project's Need and Purpose statement, and 2) previous plans and studies, which include a technical analysis and stakeholder input from regional stakeholders and residents in the vicinity of the corridor.

3.0 SCREEN 1: FATAL FLAW STRATEGY SCREEN

3.1 Improvement Strategy Screening

Subsequent to the identification of the roadway transportation improvement mode, a universe of alternative strategies is evaluated based on the ability to address transportation issues along the corridor, as documented in the project's Need and Purpose statement. The universe of alternative strategies includes a full range of roadway improvement options including:

- **No Build Alternative**
- **Strategy 1 (S1) -Transportation System Management** (Spot Improvements such as adding turn lanes, signal optimization, intersection improvements)
- **Strategy 2 (S2) –Widen Existing Roadway**
- **Strategy 3 (S3) –New Location Roadway**
- **Strategy 4 (S4) –Widen Existing / Partial New Location Roadway**
- **Strategy 5 (S5) –Widen Existing / Rerouting / Partial Rerouting** of the SR 20 designation along other existing facilities (for example, along SR 400 North to Exit 15, Bald Ridge Marina Road)

In addition, NEPA requires a **No Build Alternative (NB),** or "no project" alternative to be considered for comparative analysis alongside the build alternatives.

A series of criteria highlighting each strategy's potential to address the project's Need and Purpose and supporting objectives is considered. Rationale for each strategy's ability to address the project's Need, Purpose, and Objectives is provided in the section that follows, and captured in the Table 3.2.1: Fatal Flaw Strategy Screening Summary on page 18. A qualitative rating of "exceeds", "meets", or "needs improvement" is provided based on an assessment of the degree to which each strategy can potentially address a series of considerations identified for the Need and Purpose Statement goals and objectives based on a relative comparison.

No Build Alternative

Need: Improve Mobility for People and Goods

Objective 1: *Accommodate local trip movements*

Consideration: *Can the strategy potentially address local trips?*

The No Build alternative cannot impact local trip movements since no improvements to the existing roadway would be implemented. Rating: *Needs Improvement*

Objective 2: *Accommodate regional trip movements*

Consideration: *Can the strategy potentially address regional trips?*

The No Build alternative cannot impact regional trip movements since no improvements to the existing roadway would be implemented. Rating: *Needs Improvement*

Objective 3: *Maximize operational efficiency*

Consideration: *Can the strategy potentially improve efficiency by increasing vehicular throughput?*

The No Build alternative cannot potentially improve efficiency since no improvements to the existing roadway would be implemented. Rating: *Needs Improvement*

Objective 4: *Improve access to regional activity centers for passenger and freight vehicles*

Consideration: *Can the strategy potentially decrease travel times?*

The No Build alternative cannot potentially decrease travel times since no improvements to the existing roadway would be implemented. Rating: *Needs Improvement*

Objective 5: *Improve east-west mobility for passenger and freight vehicles*

Consideration: *Can the strategy potentially address east-west movements?*

The No Build alternative cannot potentially address east-west movements since no improvements to the existing roadway would be implemented. Rating: *Needs Improvement*

Need: Reduce Congestion

Objective 1: *Accommodate current and future travel demand*

Consideration: *Can the strategy potentially enhance capacity by adding lanes or shifting traffic to parallel facilities?*

The No Build alternative cannot accommodate current and future travel demand since no improvements to the existing roadway would be implemented that could address capacity and congestion. Rating: *Needs Improvement*

Objective 2: *Reduce traveler delay*

Consideration: *Can the strategy potentially decrease travel times?*

The No Build alternative cannot potentially decrease travel times since no improvements to the existing roadway would be implemented that could address capacity and congestion. Rating: *Needs Improvement*

Need: Address Safety

Objective 1: *Reduce potential for crashes*

Consideration: *Can the strategy potentially reduce the potential for severe crashes by adding shoulders, correcting skews, and other geometric improvements?*

The No Build alternative cannot reduce the potential for crashes since no improvements to the existing roadway would be implemented that could address deficiencies to address crashes. Rating: *Needs Improvement*

Objective 2**:** *Minimize conflicts (vehicle/vehicle, vehicle/non-vehicle, access [e.g. intersections, driveways, etc.])*

Consideration: *Can the strategy potentially reduce access conflicts and vehicular conflicts through access management treatments such as medians, reduced driveways, and intersection improvements?*

The No Build alternative cannot minimize conflicts since no improvements to the existing roadway would be implemented. Rating: *Needs Improvement*

Strategy 1 (S1) -Transportation System Management (TSM) (Spot Improvements such as adding turn lanes, signal optimization, intersection improvements)

Need: Improve Mobility for People and Goods

Objective 1: *Accommodate local trip movements*

Consideration: *Can the strategy potentially address local trips?*

TSM improvements can impact local trip movements by addressing localized deficiencies such as access concerns and intersection delays. By definition, TSM improvements are localized in nature and therefore are effective at addressing local trip patterns. For example, an intersection turning movement can be optimized based on traffic volumes. Rating: *Exceeds*

Objective 2: *Accommodate regional trip movements*

Consideration: *Can the strategy potentially address regional trips?*

TSM improvements can potentially address delays that impact regional trips by adding turn lanes and optimizing intersections to better accommodate through movements. However, to address regional trip patterns, it would require a combination of many local-scale TSM improvements that may be better accomplished by build alternatives, such as

widening segments of the roadway or constructing new location or partial new location to add capacity. Rating: *Meets*

Objective 3: *Maximize operational efficiency*

Consideration: *Can the strategy potentially improve efficiency by increasing vehicular throughput?*

TSM improvements may increase vehicular throughput by reducing delay at traffic signals through signal optimization and signal coordination and/or providing grade separation at highly-congested intersections. While capacity projects, such as additional lanes, have a more significant impact on throughput, adding turn lanes removes stopped or slower turning vehicles from the through lanes, thereby improving operational efficiency. Rating: *Meets*

Objective 4: *Improve access to regional activity centers for passenger and freight vehicles*

Consideration: *Can the strategy potentially decrease travel times?*

TSM improvements may decrease travel times along the corridor by increasing throughput and minimizing delay, thereby improving vehicular movements to activity centers. However, the potential travel time impact of a TSM improvement is likely not as significant as a capacity project such as an additional lane. Rating: *Meets*

Objective 5: *Improve east-west mobility for passenger and freight vehicles*

Consideration: *Can the strategy potentially address east-west movements?*

TSM improvements can decrease travel times along the corridor by specifically addressing issues that impact east-west delays, such as signal timing and / or intersection queues that may be improved with additional through lanes, thereby optimizing facilities for east-west travel. Rating: *Exceeds*

Need: Reduce Congestion

Objective 1: *Accommodate current and future travel demand*

Consideration: *Can the strategy potentially enhance capacity by adding lanes or shifting traffic to parallel facilities?*

Operational efficiencies do not increase capacity, and therefore TSM improvements are not likely to impact the ability to accommodate additional vehicles, however, additional demand may be accommodated by increased throughput realized from more efficient use of the roadway. Rating: *Needs Improvement*

Objective 2: *Reduce traveler delay*

Consideration: *Can the strategy potentially decrease travel times?*

Some travel time savings may be realized from TSM improvements if intersection delay is reduced and turning movements are better protected through intersection treatments that minimize interaction between through trips and local trips. Delay can be minimized if through trips can continue moving without slowing or stopping to accommodate turning movements. However, the potential travel time impact of a TSM improvement is likely not as significant as a capacity project such as adding travel lanes. Rating: *Meets*

Need: Address Safety

Objective 1: *Reduce potential for crashes*

Consideration: *Can the strategy potentially reduce the potential for severe crashes by adding shoulders, correcting skews, and other geometric improvements?*

TSM strategies include spot improvements that may include adding shoulders, correcting skews, increasing clear zone, and addressing other geometric deficiencies that may reduce the potential for future crashes. Rating: *Exceeds*

Objective 2**:** *Minimize conflicts (vehicle/vehicle, vehicle/non-vehicle, access [e.g. intersections, driveways, etc.])*

Consideration: *Can the strategy potentially reduce access conflicts and vehicular conflicts through access management treatments such as medians, reduced driveways, and intersection improvements?*

TSM strategies provide opportunities to reduce access conflicts through turning lanes, medians, and other treatments that remove left turning vehicles from through lanes and protect left-turn movements. These strategies can be strategically implemented on portions of the corridor where vehicle/vehicle and vehicle/non-vehicle conflicts currently exist, thereby reducing the potential for crashes. However, conflict reduction associated with build alternatives such as limited access, grade separation, and new location bypass may be more significant. Rating: *Meets*

Strategy 2 (S2) –Widen Existing Roadway

Need: Improve Mobility for People and Goods

Objective 1: *Accommodate local trip movements*

Consideration: *Can the strategy potentially address local trips?*

Widening the existing roadway can address local trip movements by increasing available capacity and providing an opportunity to better accommodate and control localized access through the strategic placement of access points, turn lanes, passing lanes, and medians. Rating: *Exceeds*

Objective 2: *Accommodate regional trip movements*

Consideration: *Can the strategy potentially address regional trips?*

Widening the existing roadway can address regional trip movements by increasing available capacity for through trips and better accommodating and controlling regional access through the strategic placement of access points, turn lanes, and medians. However, because regional trips require less localized access, regional trip patterns may be better addressed by new location facilities with limited access. Rating: *Meets*

Objective 3: *Maximize operational efficiency*

Consideration: *Can the strategy potentially improve efficiency by increasing vehicular throughput?*

Widening the existing roadway adds capacity and can therefore increase vehicular throughput. It is also an opportunity to optimize and coordinate signal timing along the new facility to maximize operational efficiency. Rating: *Exceeds*

Objective 4: *Improve access to regional activity centers for passenger and freight vehicles*

Consideration: *Can the strategy potentially decrease travel times?*

Additional roadway capacity resulting from widening would increase the volume of trips that can be accommodated on SR 20 and potentially reduce travel times by improving traffic flow, which would afford all vehicles improved access to regional activity centers. The addition of turn lanes and medians that could occur as a result of widening can also improve access and traffic flow by streamlining vehicle turning movements, e.g., by limiting turns that impact through movements with a focus on better management of left turns and U-turn protection at signalized intersections. Rating: *Exceeds*

Objective 5: *Improve east-west mobility for passenger and freight vehicles*

Consideration: *Can the strategy potentially address east-west movements?*

East-west movements can be addressed through improved traffic flow and potentially reduced travel times based on additional capacity, the addition of turn lanes and medians that optimize east-west travel, and improved operational efficiencies realized through signal timing optimization and coordination. These roadway changes would result in improved east-west mobility for all vehicles. Rating: *Exceeds*

Need: Reduce Congestion

Objective 1: *Accommodate current and future travel demand*

Consideration: *Can the strategy potentially enhance capacity by adding lanes or shifting traffic to parallel facilities?*

Widening the roadway can reduce congestion by accommodating current and future demand through additional capacity. Rating: *Exceeds*

Objective 2: *Reduce traveler delay*

Consideration: *Can the strategy potentially decrease travel times?*

Travel times may be reduced by the additional capacity of a widened facility and associated operational improvements. Rating: *Exceeds*

Need: Address Safety

Objective 1: *Reduce potential for crashes*

Consideration: *Can the strategy potentially reduce the potential for severe crashes by adding shoulders, correcting skews, and other geometric improvements?*

Shoulders, skew corrections, and other geometric improvements would be addressed during the construction of additional lanes. Reduced congestion as a result of widening would allow for an increase in space between vehicles, providing more reaction time and thereby reducing the potential for crashes. Rating: *Exceeds*

Objective 2**:** *Minimize conflicts (vehicle/vehicle, vehicle/non-vehicle, access [e.g. intersections, driveways, etc.])*

Consideration: *Can the strategy potentially reduce access conflicts and vehicular conflicts through access management treatments such as medians, reduced driveways, and intersection improvements?*

Access management treatments can be added during the construction of additional lanes including the addition of medians to control and limit turns while providing better protection for vehicles turning left. Rating: *Exceeds*

Strategy 3 (S3) –New Location Roadway

Need: Improve Mobility for People and Goods

Objective 1: *Accommodate local trip movements*

Consideration: *Can the strategy potentially address local trips?*

Constructing a new roadway may address local access on existing facilities by providing an alternative route to divert some traffic, thereby alleviating congestion along SR 20 which would better accommodate local trip movements. However, a new location facility may include limited access that does not specifically address localized trip patterns. Rating: *Meets*

Objective 2: *Accommodate regional trip movements*

Consideration: *Can the strategy potentially address regional trips?*

Constructing a new location roadway provides an opportunity to specifically address regional trips that require fewer local access points and operate at higher speeds. Rating: *Exceeds*

Objective 3: *Maximize operational efficiency*

Consideration: *Can the strategy potentially improve efficiency by increasing vehicular throughput?*

A new location facility may attract traffic from the existing roadway, thereby reducing the volume of vehicles along SR 20 and resulting in positive operational efficiencies along SR 20. Rating: *Exceeds*

Objective 4: *Improve access to regional activity centers for passenger and freight vehicles*

Consideration: *Can the strategy potentially decrease travel times?*

The additional capacity provided by a new location facility would improve access to regional activity centers. The diversion of traffic away from SR 20 that would result greater access through reduced trip times and increased frequency of travel to these regional activity centers. Rating: *Exceeds*

Objective 5: *Improve east-west mobility for passenger and freight vehicles*

Consideration: *Can the strategy potentially address east-west movements?*

The additional east-west capacity provided by a new location facility can potentially decrease travel times along SR 20 by attracting east-west through movements and improve mobility for all vehicles. Rating: *Exceeds*

Need: Reduce Congestion

Objective 1: *Accommodate current and future travel demand*

Consideration: *Can the strategy potentially enhance capacity by adding lanes or shifting traffic to parallel facilities?*

A new location roadway would add capacity and connectivity to the roadway infrastructure linkages in the area, which would allow for redundancy in the transportation network that would reduce congestion and accommodate current and future demand. Rating: *Exceeds*

Objective 2: *Reduce traveler delay*

Consideration: *Can the strategy potentially decrease travel times?*

A new location roadway can reduce traveler delay on SR 20 by providing an alternative facility with additional capacity in the area that attracts some trips away from existing SR 20. Rating: *Exceeds*

Need: Address Safety

Objective 1: *Reduce potential for crashes*

Consideration: *Can the strategy potentially reduce the potential for severe crashes by adding shoulders, correcting skews, and other geometric improvements?*

A new location roadway facility would incorporate design features based on AASHTO guidelines that would meet current design and safety standards. Appropriate shoulders, intersection skew angles, clear zone, and other geometric improvements can be addressed during construction of a new location roadway, which would allow for a facility that addresses driver expectations and reduces the potential for crashes. Since no physical improvements would be made to the existing SR 20 corridor, any crash reductions associated with physical geometry would not be realized. However, indirect benefits of removing traffic off existing SR 20 would be anticipated. The reduced volumes would increase gaps between vehicles, allowing more time for drivers to make decisions and execute turning movements; thereby potentially reducing the number of crashes. Rating: *Meets*

Objective 2**:** *Minimize conflicts (vehicle/vehicle, vehicle/non-vehicle, access [e.g. intersections, driveways, etc.])*

Consideration: *Can the strategy potentially reduce access conflicts and vehicular conflicts through access management treatments such as medians, reduced driveways, and intersection improvements?*

A new roadway facility would incorporate design features that minimize conflicts and therefore have the potential to reduce crashes. Limiting access points reduces locations for conflicting movements such as left turns at driveways and intersections thereby reducing potential for conflicts. Providing appropriate accommodations for other users such as bicycles and pedestrians reduces the potential for on roadway conflicts between these different users. Although no physical improvements along existing SR 20 would occur, the new location roadway would be expected to draw vehicles off existing SR 20. Therefore, this strategy would have the potential to reduce the number of conflicts and crashes along existing SR 20. Rating: *Meets*

Strategy 4 (S4) –Widen Existing / Partial New Location Roadway

Need: Improve Mobility for People and Goods

Objective 1: *Accommodate local trip movements*

Consideration: *Can the strategy potentially address local trips?*

A partial new location facility accommodates local trip movements by diverting trips of a regional nature that don't require local access and allowing the local trip movements to proceed along the existing facility. A partial new location roadway would likely be provided around congested areas such as in Buffington or other unincorporated communities that have significant development and driveway access points on both sides of existing SR 20. Rating: *Exceeds*

Objective 2: *Accommodate regional trip movements*

Consideration: *Can the strategy potentially address regional trips?*

A partial new location facility provides an opportunity to accommodate regional trip movements by diverting through-trips of a regional nature that don't require local access points. Rating: *Exceeds*

Objective 3: *Maximize operational efficiency*

Consideration: *Can the strategy potentially improve efficiency by increasing vehicular throughput?*

A partial new location facility can maximize operational efficiency by diverting through-traffic in congested areas that create bottlenecks, resulting in positive operational efficiencies that can be realized along the entire SR 20 corridor. Access points (such as intersections) would be consolidated to a few sites along the new location roadway, thereby reducing the amount of turning movements from SR 20 and improving overall throughput and travel times. Rating: *Exceeds*

Objective 4: *Improve access to regional activity centers for passenger and freight vehicles*

Consideration: *Can the strategy potentially decrease travel times?*

A partial new location facility adds capacity to the network by avoiding congested areas that cause trip delay, thereby improving access to regional activity centers with reduced travel times and increased frequency of travel. Rating: *Exceeds*

Objective 5: *Improve east-west mobility for passenger and freight vehicles*

Consideration: *Can the strategy potentially address east-west movements?*

The additional capacity and operational efficiencies provided by a partial new location facility can improve travel times between destinations located at opposite ends of the corridor by avoiding congested areas and providing additional capacity for through trips. Rating: *Exceeds*

Need: Reduce Congestion

Objective 1: *Accommodate current and future travel demand*

Consideration: *Can the strategy potentially enhance capacity by adding lanes or shifting traffic to parallel facilities?*

A partial new location facility would add capacity in congested areas and reduce congestion by providing an additional facility to accommodate through movements, thereby accommodating current and future demand. Rating: *Exceeds*

Objective 2: *Reduce traveler delay*

Consideration: *Can the strategy potentially decrease travel times?*

Partial new location facilities can provide additional capacity, increase operational efficiencies, and increase available roadway network options that in turn reduce traveler delay and improve travel times on the SR 20 corridor. Rating: *Exceeds*

Need: Address Safety

Objective 1: *Reduce potential for crashes*

Consideration: *Can the strategy potentially reduce the potential for severe crashes by adding shoulders, correcting skews, and other geometric improvements?*

Partial new location facilities would incorporate design features based on AASHTO guidelines that would meet current design and safety standards. Appropriate shoulders, intersection skew angles, clear zone, and other geometric improvements would be designed for a partial new location roadway, which would allow for a facility that meets driver expectations and reduces the potential for crashes. The diversion of traffic away from SR 20 onto partial new location facilities may reduce the number of vehicles and reduce potential for conflicts that could lower crash rates on the existing facility in these locations. The reduced volumes would increase gaps between vehicles, allowing more time for drivers to make decisions and execute turning movements; thereby potentially reducing the number of crashes. However, since no physical improvements would be made along certain segments of the existing SR 20 corridor, any crash reductions associated with physical geometry of the existing facility in these locations would not be realized. Rating: *Meets*

Objective 2**:** *Minimize conflicts (vehicle/vehicle, vehicle/non-vehicle, access [e.g. intersections, driveways, etc.])*

Consideration: *Can the strategy potentially reduce access conflicts and vehicular conflicts through access management treatments such as medians, reduced driveways, and intersection improvements?*

Partial new location facilities would incorporate design features that minimize conflicts and reduce crashes. Limiting access points reduces locations for conflicting movements such as left turns at driveways and intersections thereby reducing potential for conflicts. Providing appropriate accommodations for other users such as bicycles and pedestrians reduces the potential for on roadway conflicts between these different users. Although no physical improvements along existing SR 20 would occur in some locations, the partial new location roadways would be expected to draw vehicles off existing SR 20. Therefore, this strategy would have the potential to reduce the number of conflicts and crashes along some segments of existing SR 20. Rating: *Meets*

Strategy 5 (S5) –Widen Existing / Rerouting / Partial Rerouting of the SR 20 designation along other existing facilities (for example, along SR 400 North to Exit 15, Bald Ridge Marina Road)

Need: Improve Mobility for People and Goods

Objective 1: *Accommodate local trip movements*

Consideration: *Can the strategy potentially address local trips?*

Rerouting or partial rerouting of traffic may reduce volume on the existing or previously signed SR 20 corridor, thereby freeing up existing capacity along existing SR 20 to accommodate local trip movements. However, rerouting of a facility does not necessarily

change localized trip patterns and would depend upon changes in driver behavior to have a significant impact. Rating: *Meets*

Objective 2: *Accommodate regional trip movements*

Consideration: *Can the strategy potentially address regional trips?*

Rerouting or partial rerouting of traffic may redirect regional trips to surrounding facilities thereby providing shorter trip times to accommodate longer-range trip movements. However, rerouting of a facility does not necessarily change regional trip patterns and would depend upon changes in driver behavior to have a significant impact. Rating: *Meets*

Objective 3: *Maximize operational efficiency*

Consideration: *Can the strategy potentially improve efficiency by increasing vehicular throughput?*

Rerouting or partial rerouting can include operational improvements to increase the throughput of traffic on surrounding facilities. The rerouting or partial rerouting would have greater impact on efficiency if complimented by additional strategies such as the addition of turn lanes and / or medians to specifically address through trips and localized trips. Rating: *Meets*

Objective 4: *Improve access to regional activity centers for passenger and freight vehicles*

Consideration: *Can the strategy potentially decrease travel times?*

Rerouting or partial rerouting that redirects traffic to surrounding facilities can potentially reduce travel times to regional activity centers along SR 20 for all vehicles. However, the redirection of traffic to surrounding facilities would depend upon changes in driver behavior to have a reduction in trips significant enough to decrease travel times. Rating: *Meets*

Objective 5: *Improve east-west mobility for passenger and freight vehicles*

Consideration: *Can the strategy potentially address east-west movements?*

Rerouting or partial rerouting that redirects traffic to other facilities can potentially reduce east-west travel times by focusing on re-designation that addresses the east-west through trips along existing SR 20. However, the redirection of traffic to surrounding facilities would depend upon changes in driver behavior to have a reduction in trips significant enough to decrease travel times. Rating: *Meets*

Need: Reduce Congestion

Objective 1: *Accommodate current and future travel demand*

Consideration: *Can the strategy potentially enhance capacity by adding lanes or shifting traffic to parallel facilities?*

Rerouting or partial rerouting can potentially enhance capacity by shifting traffic to other facilities that can accommodate the future travel demand. However, the rerouting of trips would depend upon changes in driver behavior and may require incentives such as significant travel time savings to realize the benefits of the available capacity. Rating: *Meets*

Objective 2: *Reduce traveler delay*

Consideration: *Can the strategy potentially decrease travel times?*

Rerouting or partial rerouting of some traffic to other facilities can potentially decrease travel times along existing SR 20. However, the rerouting of trips would depend upon changes in driver behavior to realize travel time savings on other facilities in the area. Rating: *Meets*

Need: Address Safety

Objective 1: *Reduce potential for crashes*

Consideration: *Can the strategy potentially reduce the potential for severe crashes by adding shoulders, correcting skews, and other geometric improvements?*

Rerouting or partial rerouting would divert traffic from existing SR 20, potentially reducing the potential for crashes that are associated with congestion conditions along the facility. However, the diversion would require changes in driver behavior. Rating: *Meets*

Objective 2**:** *Minimize conflicts (vehicle/vehicle, vehicle/non-vehicle, access [e.g. intersections, driveways, etc.])*

Consideration: *Can the strategy potentially reduce access conflicts and vehicular conflicts through access management treatments such as medians, reduced driveways, and intersection improvements?*

Rerouting or partial rerouting can redirect vehicles to facilities that better accommodate all users, such as pedestrians and bicyclists, thereby reducing the amount of vehicle / non-vehicle conflicts. Rerouting vehicles to facilities with more access control can also reduce the potential for crashes. However, rerouting and redirecting vehicles depends upon changes in driver behavior. Rating: *Meets*

3.2 Improvement Strategy Screening Summary / Recommendations

A summary of each strategy's potential to address the project's Need and Purpose, is summarized in Table 3.2.1 on the following page. The alternative strategies S1- S5 identified in Table 3.2.1 are consistent with the project's Need and Purpose and are recommended to advance to Screening Phase 2 as indicated. As such, Strategies S1-S5 would be further developed into specific conceptual alternatives. The S1-S5 strategies would be discussed at the TAC, CAC, and Public Information Open Houses so that agencies, stakeholders, and the public have an opportunity to comment.

Table 3.2.1: Fatal Flaw Strategy Screening Summary

		Objectives	Criteria	Considerations	No Build Alternative *	Alternative Strategies				
						S1.Transportation System Management	S2. Widen Existing Roadway	S3. New Location	S4. Widen Existing / Partial New Location	S5. Widen Existing / Rerouting / Partial Rerouting
Need and Purpose Statement Goals	Improve Mobility for People and Goods	1. Accommodate local trip movements	Travel patterns	Can the strategy potentially address local trips?	○	●	●	◒	●	◒
		2. Accommodate regional trip movements	Travel patterns	Can the strategy potentially address regional trips?	○	◒	◒	●	●	◒
		3. Maximize operational efficiency	Efficiency	Can the strategy potentially improve efficiency by increasing vehicular throughput?	○	◒	●	●	●	◒
		4. Improve access to regional activity centers for passenger and freight vehicles	Travel time savings	Can the strategy potentially decrease travel times?	○	◒	●	●	●	◒
		5. Improve east-west mobility for passenger and freight vehicles	Travel patterns	Can the strategy potentially address east-west movements?	○	●	●	●	●	◒
	Reduce Congestion	1. Accommodate current and future travel demand	Capacity	Can the strategy potentially enhance capacity by adding lanes or shifting traffic to parallel facilities?	○	○	●	●	●	◓
		2. Reduce traveler delay	Travel time savings	Can the strategy potentially decrease travel times?	○	◓	●	●	●	◓
	Address Safety	1. Reduce potential for severe crashes	Design Features	Can the strategy potentially reduce the potential for severe crashes by adding shoulders, correcting skews, and other geometric improvements?	○	●	●	◓	◓	◓
		2. Minimize conflicts (vehicle/vehicle, vehicle/non-vehicle, access [e.g. intersections, driveways, etc.])	Access Management	Can the strategy potentially reduce access conflicts and vehicular conflicts through access management treatments such as medians, reduced driveways, and intersection improvements?	○	◓	●	◓	◓	◓

Legend

Exceeds = ● Meets = ◓ Needs Improvement = ○

*Required per NEPA for Comparative Analysis

Explanation of Ratings:

The 'Exceeds' rating is applied to an objective of the Need and Purpose when the strategy (e.g., No Build, S1, S2, S3, S4, or S5) has a high potential to satisfy the objective based on the qualitative analysis provided herein.

The 'Meets' rating is applied to an objective of the Need and Purpose when the strategy has some potential to satisfy the objective based on the qualitative analysis provided herein.

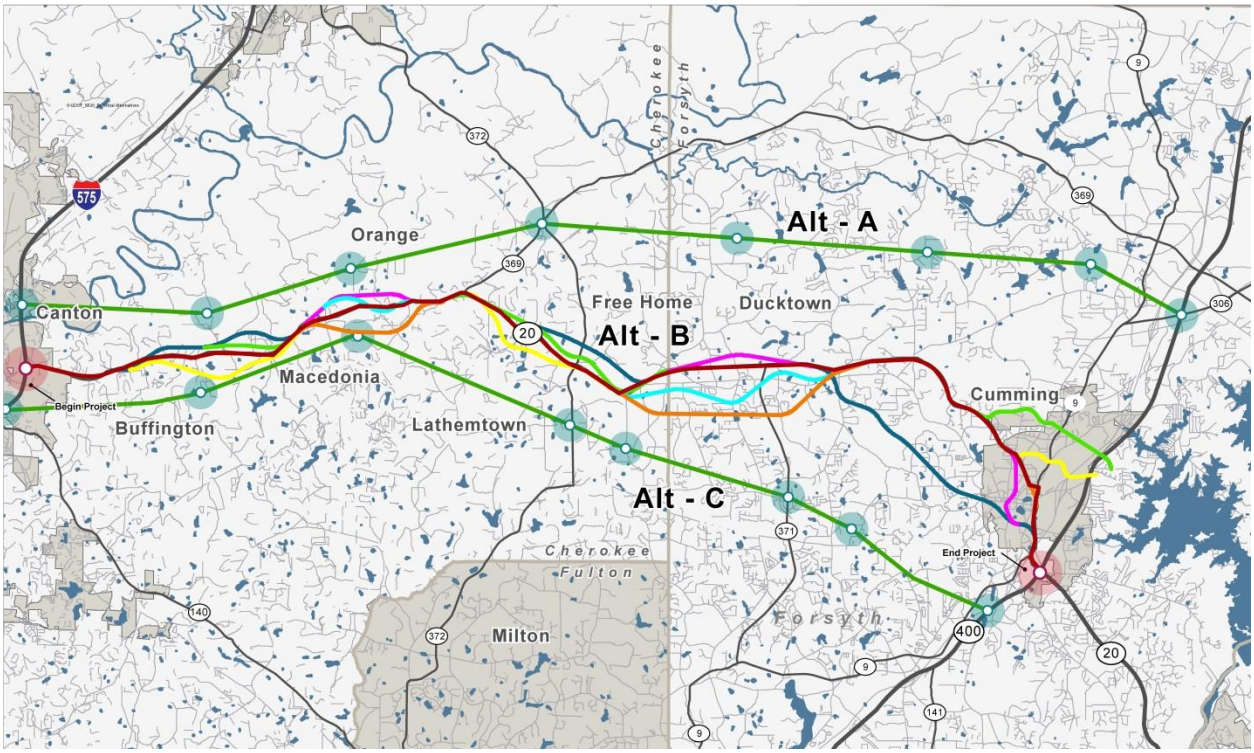
The 'Needs Improvement' rating is applied to an objective of the Need and Purpose when the strategy has a low potential to satisfy the objective based on the qualitative analysis provided herein.

Advance to Screen 2: Conceptual Alternatives Development

4.0 NEXT STEPS

Strategies S1-S5 would advance into Screen 2 of the alternatives analysis process. Screen 2 will analyze potential solutions and performance criteria consistent with the project's Need and Purpose, and identify alternatives that will advance for more detailed analysis as described in the *SR 20 Improvements from Canton to Cumming Alternatives Analysis Methodology Memo, October 2013*. Conceptual engineering details will be developed for each, including corridor location and typical section, such that performance can be measured against criteria in the areas of transportation performance, environmental resources, cost, and community impacts. The schematic in Figure 4.0 provides a preliminary look at how strategies S2-S5 may develop into conceptual alternatives for further analysis during Screen 2. The No-Build Alternative Strategy is not represented on the figure since no physical improvements would be implemented as part of the alternative.

Figure 4.0: Improvement Strategy Schematic



*-This information is preliminary and will be refined based on feedback from planning partners, stakeholders, and the public during the Screen 1 public outreach process.
**- The No Build Alternative Strategy is not represented on the figure since no physical improvements would be implemented as part of the alternative.