

North Whitfield County Roadway Corridor Study

Report #3: Summary and Implementation Plan

MA Project 11501

September 22, 2011

**Prepared For:
Greater Dalton Metropolitan Planning Organization**

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1.0 Introduction

1.1 Summary of Previous Reports

Report #1, *Existing Conditions, Projections, and Findings* established the guidelines and boundaries where projects would be evaluated. It was important to establish the study area, evaluate the current transportation plan with the currently planned improvements, and evaluate the existing roadway and traffic conditions.

Report #1 established that the North Whitfield County area is growing, but at a lower rate than in previous years. This was expected given the economic downturn that the country as a whole has gone through. Nevertheless, a slow growth in travel demand was evident in an examination of the traffic data.

A field review of the studied roadways shown in Figure 1 evaluated their utility as cross-county arterials and their ability to provide for future growth in trucking and commuting traffic. Visual surveys showed several stretches of SR 2 and SR 201 with shoulders in need of upgrading to current American Association of State Highway and Transportation Officials (AASHTO) guidelines. Other roadways such as SR 71 and US 41 were well designed for higher-volume traffic except for short portions near the border with Catoosa County (US 41) and the State of Tennessee (SR 71).

An analysis of crash records provided by the Georgia Department of Transportation (GDOT) showed that there were several hot spots of crash activity in the studied corridors, namely around the SR 71 & SR 2 intersection, along SR 2 near the eastern border of the county and along SR 201 between I-75 and SR 2.

The report further analyzed the capacity of the studied roadways based upon standard methods from the *Highway Capacity Manual* (HCM). These analyses showed several locations that would have deficient levels of service by the analysis year of 2035.

Report #1 concluded with a list of future needs, as identified by the various analyses and field reviews documented in the report.

Report #2, *Unconstrained Alternatives* established a list of projects designed to address the needs of the studied area that were identified in Report #1. These projects were sorted by type. The report also established the methodology by which the projects were evaluated for costs and benefits.

Costs for each of the identified projects were based on planning-level cost estimation tools. Benefits for each project were calculated using the methods established by the HCM, the *Highway Safety Manual*, and a standard benefit cost calculator used by GDOT.

The projects were ranked within the report by various measures including benefit cost ratio, improvement to level of service, and by improvement to capacity.

Report #2 concluded with a discussion of potential funding sources applicable to the County and non-traditional methods that might be employed to develop financing for each of the identified projects.

This document, Report #3, will conclude the study process by recommending an implementation plan of projects that will address the identified needs of the studied roads of North Whitfield County.

1.2 Purpose of this report

The purpose of this report is to provide the Greater Dalton Metropolitan Planning Organization (GDMPO) a list of recommended projects which will improve the potential capacity of the studied roadways in order to attract development opportunities in northern Whitfield County. Along with the recommendations will be an implementation plan which will address the short, medium, and long term strategy for constructing the projects in question.

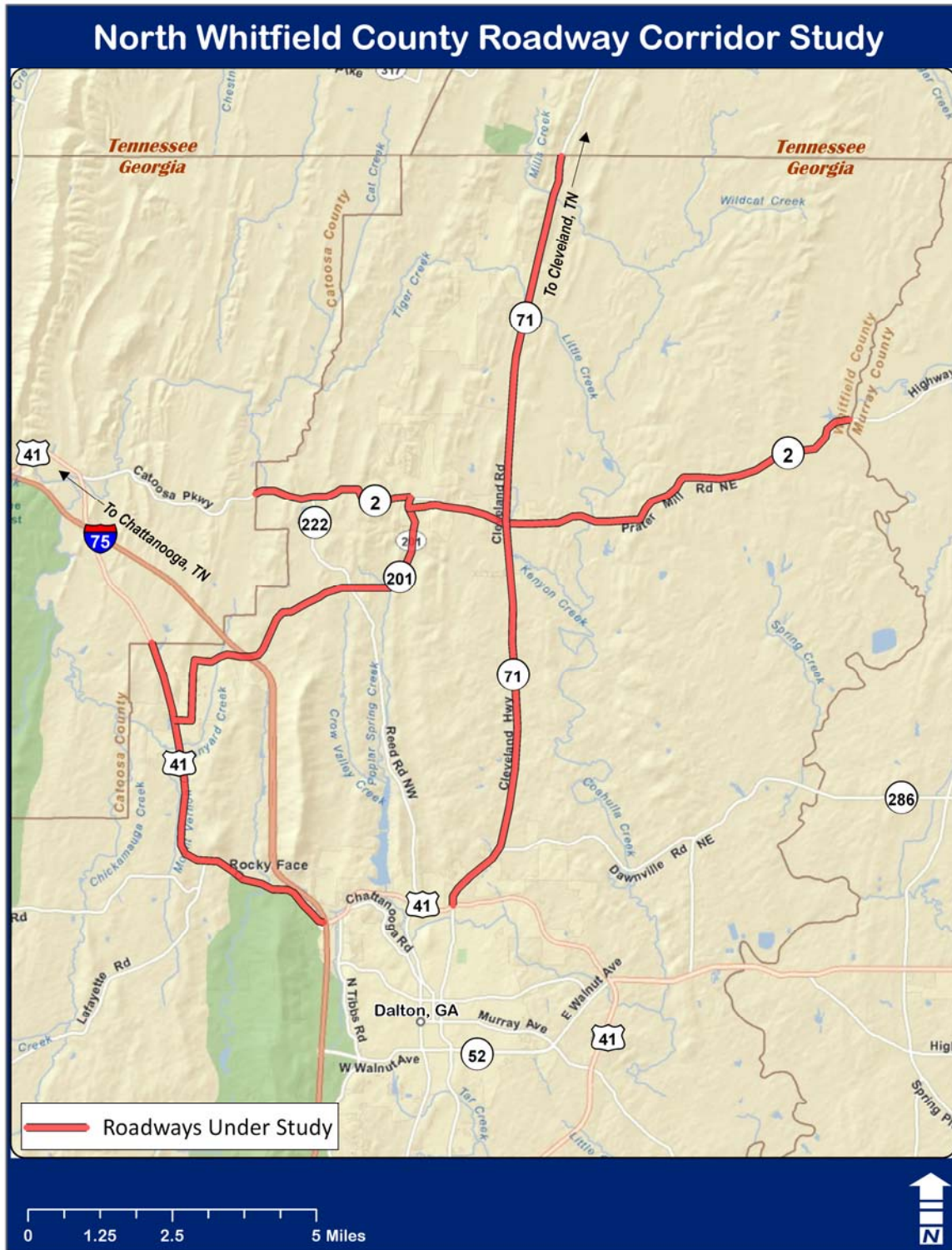
The studied roadways have been identified as major corridors for traffic flows to and from Hamilton and Bradley Counties in Tennessee and Catoosa and Murray Counties in Georgia. The impetus for this study is the anticipated growth in traffic along these corridors that will result from the development of major employment centers in Tennessee, such as the Volkswagen Assembly Plant in Hamilton County and the Wacker Manufacturing Plant in Bradley County. The roadways under study are the following: State Route 2 (SR 2), from Murray County to Catoosa County; State Route 201 (SR 201), from State Route 2 to US Highway 41; State Route 71 (SR 71), from the North Dalton Bypass to the Georgia/Tennessee State line; and US Highway 41 (US 41) from Catoosa County line to Interstate 75. Figure 1: Roadways under Study illustrates the project study area.

1.3 Organization of the Report

Moreland Altobelli Associates, Inc. (MA) developed an existing conditions analysis and created a report entitled *North Whitfield County Corridor Study: Existing Conditions, Projections, and Findings*. The report was published on July 11, 2011 and reviewed by the GDMPO. Report #2, entitled *North Whitfield County Corridor Study: Unconstrained Alternatives* is being submitted simultaneously with this report.

This report is the third in a series of three and will present a series of recommended improvements, their costs, benefits, and an implementation plan.

Figure 1: Roadways under Study



Source: Moreland Altobelli Associates, Inc.

2.0 Implementation Plan

Whitfield County has finite resources and must spend the tax dollars it accrues wisely. Thus an implementation plan for deploying the projects as recommended in order to justify the expenditures required.

Table 1: Implementation Plan, by Priority, lists all of the improvements that were examined during the second phase of the corridor study and are detailed in Report #2, *Unconstrained Alternatives*. With the exception of project number 16—the widening of SR 2 from SR 201 to SR 71—all examined projects are recommended for inclusion in the short, medium, and long range plans.

Table 1: Implementation Plan, by Priority

| No. | Location | Type | Cost (Millions) | B/C | Priority | Implementation Schedule |
|-----|---------------------|----------------------|-----------------|------|-----------------|-------------------------|
| 2 | SR 201 | Shoulder | \$2.28 | 1.39 | 1 | Short |
| 7 | SR 201 | Restriping | \$0.11 | - | 2 | Short |
| 9 | SR 201, Lees Chapel | Safety | \$1.63 | 3.13 | 3 | Short |
| 12 | SR 71, SR 2 | Safety | \$1.37 | 2.61 | 4 | Medium |
| 11 | SR 201, I-75 | Safety | \$1.70 | 5.53 | 5 | Medium |
| 10 | SR 201, Reed | Safety | \$1.48 | 2.94 | 6 | Medium |
| 13 | SR 201 | Major Reconstruction | \$4.60 | 1.19 | 7 | Medium |
| 15 | US 41 | Widening | \$4.99 | 1.34 | 8 | Long |
| 14 | SR 71 | Widening | \$7.46 | 1.08 | 9 | Long |
| 17 | SR 201 - 4 lane | Widening | \$13.47 | 0.98 | 10 [‡] | Long |
| 18 | SR 201 - 3 Lane | Widening | \$5.40 | 0.99 | 10 [‡] | Long |
| 1 | SR 2 | Shoulder | \$2.41 | 0.99 | 11 | Long |
| 16 | SR 2 | Widening | \$7.69 | 0.79 | 12 | - |
| 3 | SR 2 | Resurfacing | \$2.55 | - | M1 [‡] | Medium |
| 4 | SR 71 | Resurfacing | \$1.82 | - | M2 [‡] | Medium |
| 5 | US 41 | Resurfacing | \$6.41 | - | M3 [‡] | Medium |
| 8 | US 41 | Bicycle | \$0.26 | - | M4 [‡] | Short |
| 6 | SR 201 | Resurfacing | \$1.71 | - | M5 [‡] | Medium |

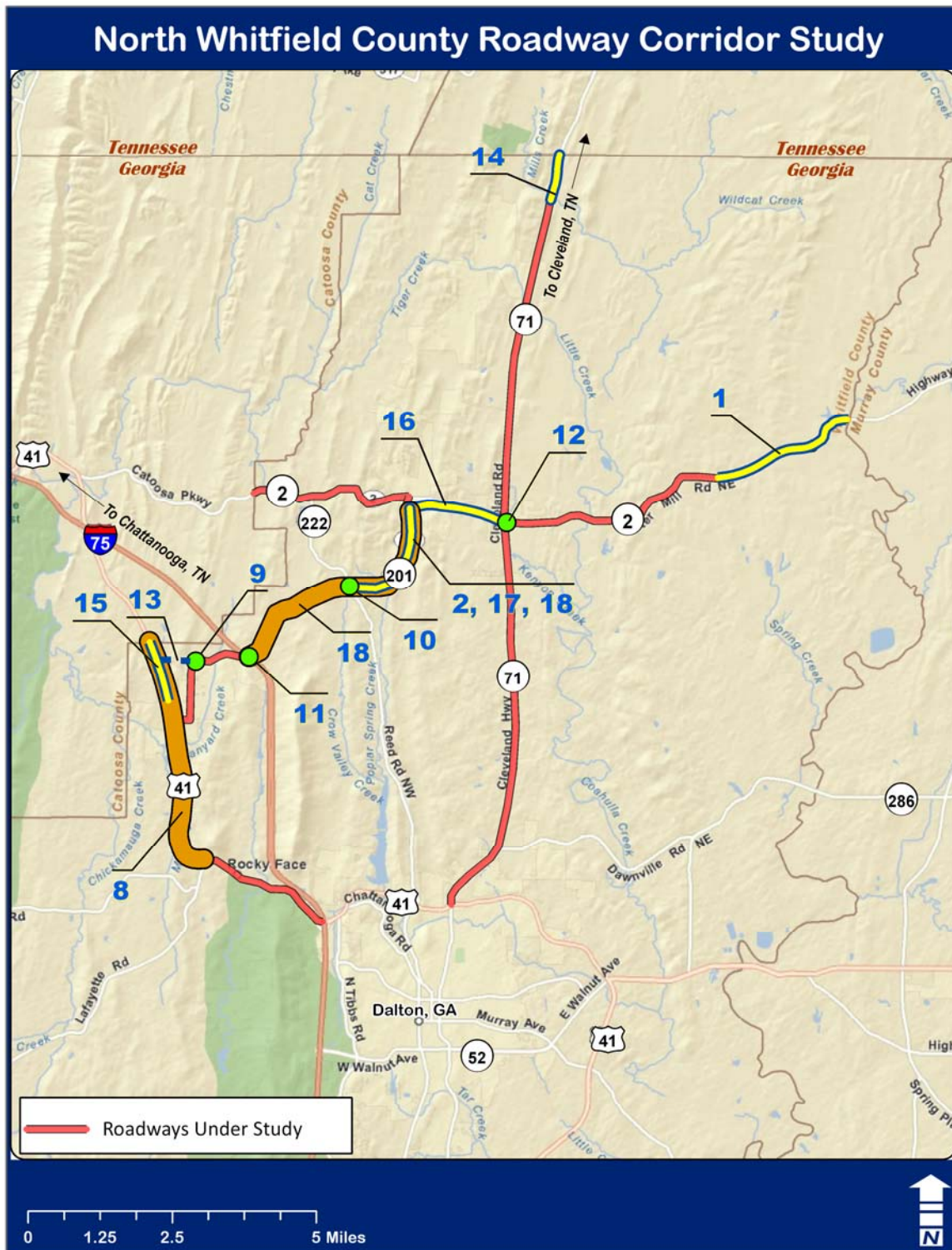
Source: Moreland Altobelli Associates, Inc.

[‡]Priority beginning with "M" are classified as maintenance projects

[‡]Projects 17 and 18 are mutually exclusive

Each of the numbered improvements is shown on Figure 2: Proposed Improvements, with the exception of project numbered 3 to 8, as these are maintenance improvements that cover the entire length of the studied roadways. Note that project numbers 17 and 18 are mutually exclusive.

Figure 2: Proposed Improvements



Source: Moreland Altobelli Associates, Inc.

Note: Projects 3-7 are not shown. They consist of restriping and resurfacing projects which occupy the full length of studied roadways

2.1 Short Term Implementation Plan

Short term projects are projects recommended for inclusion in the next GDMPO Transportation Improvement Program amendment, for the three to five year construction program. Table 2: Short Term Projects, lists these projects.

Table 2: Short Term Projects

| Short Term Project List | | | | | | |
|-------------------------|---------------------|--------------------|-----------------|------|-----------------|-------------------------|
| No. | Location | Type | Cost (Millions) | B/C | Priority | Implementation Schedule |
| 2 | SR 201 | Shoulder | \$2.28 | 1.39 | 1 | Short |
| 7 | SR 201 | Restriping | \$0.11 | - | 2 | Short |
| 9 | SR 201, Lees Chapel | Safety | \$1.63 | 3.13 | 3 | Short |
| 8 | US 41 | Bicycle (Shoulder) | \$0.26 | - | M4 [†] | Short |
| Total | | | \$4.28 | | | |

Source: Moreland Altobelli Associates, Inc.

†Priority beginning with "M" are classified as maintenance projects

Project Number 2

SR 201 – From Reed Road to SR 2. The scope of the project is to improve the shoulders of the roadway to establish adequate clear zone for vehicular recovery and increase roadway capacity. This project will serve to address the capacity concerns of the roadway network by increasing the average speed of vehicles traversing the county on their way to I-75, US 41, or SR 2.

Project Number 7

SR 201 – From US 41 to SR 2. The scope of the project is to restripe the existing roadway to establish adequate retroreflectivity and conspicuity. This project will address capacity concerns by reducing the potential for run-off-the-road collisions.

Project Number 9

SR 201 and Lees Chapel Road. The scope of the project is to realign the SR 201 intersection with Lees Chapel Road to provide better sight distance and traffic calming. Alternately, install a roundabout at this location with provisions to handle Major Reconstruction Project #13. This project will enhance capacity by reducing the potential for collisions and by making this section of SR 201 easier to traverse. Project number 9 would be invalidated if project number 13, the new location reconstruction of SR 201 between Lees Chapel Road and US 41 is moved up in the schedule.

Project Number 8

US 41 – From SR 201 (south) to Catoosa County line. The scope of the project is to install and/or retrofit bicycle friendly shoulders. Replace rumble strips with gapped strips for access by cyclists. This project will improve the ability of cyclists to move along a marked State Bicycle Route. This project could be combined with project number 5, the repaving of US 41, thereby shifted to the medium term project list.

2.2 Medium Term Implementation Plan

Medium term projects are projects recommended for inclusion at the tail end of the next GDMPO Transportation Improvement Program amendment, for the three to five year

construction program, or for inclusion in the next long term transportation plan update. Table 3: Medium Term Projects, lists these projects.

Two of the projects recommended as a part of this study are already included in the Transportation Investment Act (TIA) Regional Roundtable constrained list of projects. Those projects are number 13, the SR 201 extension on new location from Lees Chapel Road to US 41 and number 11, the SR 201 at I-75 intersection improvements. If the TIA list is approved by voters in 2012, it is recommended that project number 13 be shifted to the short term projects list, displacing project number 9. In the event of voter approval, project number 11 should also be considered for shifting to the short term project list.

Table 3: Medium Term Projects

| Medium Term Project List | | | | | | |
|--------------------------|--------------|----------------------|-----------------|------|-----------------|-------------------------|
| No. | Location | Type | Cost (Millions) | B/C | Priority | Implementation Schedule |
| 12 | SR 71, SR 2 | Safety | \$1.37 | 2.61 | 4 | Medium |
| 11 | SR 201, I-75 | Safety | \$1.70 | 5.53 | 5 [†] | Medium |
| 10 | SR 201, Reed | Safety | \$1.48 | 2.94 | 6 | Medium |
| 13 | SR 201 | Major Reconstruction | \$4.60 | 1.19 | 7 [‡] | Medium |
| 3 | SR 2 | Resurfacing | \$2.55 | - | M1 [†] | Medium |
| 4 | SR 71 | Resurfacing | \$1.82 | - | M2 [†] | Medium |
| 5 | US 41 | Resurfacing | \$6.41 | - | M3 [†] | Medium |
| 6 | SR 201 | Resurfacing | \$1.71 | - | M5 [†] | Medium |
| Total | | | \$21.63 | | | |

Source: Moreland Altobelli Associates, Inc.

[†]Priority beginning with "M" are classified as maintenance projects

[‡]Projects 13 and 11 are included in the Regional Roundtable constrained project list

Project Number 12

SR 71 at SR 2, access control and intersection safety improvements. The scope of this project is to install raised concrete medians on the approaches to the intersection to provide for access control and reduce the potential for crossing/angle collisions in the near vicinity of the signalized intersection. Additional concrete islands and pedestrian elements would be installed to upgrade the intersection to full Americans with Disabilities Act compliance and provide cross-intersection pedestrian connectivity, extending the existing sidewalk. The upgrade of this intersection would improve capacity by potentially reducing the frequency and severity of collisions that occur in the vicinity of the intersection.

Project Number 11

SR 201 at I-75, northbound and southbound ramp terminal improvements. The scope of this project is to realign the ramp terminals or provide roundabouts to improve sight distance and reduce the potential for crashes. This project has been included in the Transportation Investment Act constrained project list as of August, 2011. The list is currently pending approval by the Regional Roundtable. This project has the highest benefit cost ratio of any project analyzed in this report.

Project Number 10

SR 201 and Reed Road. The scope of this project is to realign Reed road to intersect with SR 201 at as close to a 90 degree angle as possible. Signal modifications would be necessary. This project would improve capacity by potentially reducing the frequency and severity of collisions that occur in the vicinity of the intersection.

Project Number 13

SR 201 – From SR 201/Lees Chapel Road to US 41. The scope of this project is to provide a new location roadway connecting existing SR 201 to US 41, bypassing the city of Tunnel Hill and the attendant dense residential areas. This project has been included in the Transportation Investment Act constrained project list as of August, 2011. The list is currently pending approval by the Regional Roundtable. As noted previously, if the TIA list is approved by voters in 2012, it is recommended that this project be shifted to the short term projects list for immediate design and construction. This project will improve capacity by shortening the route between I-75 and US 41, avoiding numerous residential access points along the existing SR 201, and increasing the average speed of all traffic between the end points.

Project Number 3

SR 2 Resurfacing – entire length of the Whitfield County. The scope of this project is to overlay or replace the surface course of pavement on the existing footprint of SR 2. This project would increase capacity by reducing maintenance wear and tear on vehicles using the roadway.

Project Number 4

SR 71 Resurfacing – From North Dalton Bypass to the Tennessee State line. The scope of this project is to overlay or replace the surface course of pavement on the existing footprint of SR 71. This project would increase capacity by reducing maintenance wear and tear on vehicles using the roadway.

Project Number 5

US 41 Resurfacing – From I-75 to the Catoosa County line. The scope of this project is to overlay or replace the surface course of pavement on the existing footprint of US 41. This project would increase capacity by reducing maintenance wear and tear on vehicles using the roadway. This project could be combined with project number 8, the bicycle friendly shoulder improvements to replace the existing rumble strips with bicycle friendly rumble strips.

Project Number 6

SR 201 Resurfacing – From US 41 to SR 2. The scope of this project is to overlay or replace the surface course of pavement on the existing footprint of SR 201. This project would increase capacity by reducing maintenance wear and tear on vehicles using the roadway.

2.3 Long Term Implementation Plan

Long term projects are those recommended for inclusion in the next GDMPO Long Range Transportation Plan. Note that two of the projects included on Table 4: Long Term Projects, are mutually exclusive; project numbers 17 and 18 contain approximately the same end points. The total project cost at the bottom of Table 4 has the cost of the long term plan with either project 17, or project 18, as illustrated by the two costs.

Project number 16 has been discarded from the long term implementation plan as not cost effective based on the benefit cost ratio. The total cost of project number 16 is not included in the total of the long term implementation plan.

Table 4: Long Term Projects

| Long Term Project List | | | | | | |
|------------------------|-----------------|----------|-----------------|------|-----------------|-------------------------|
| No. | Location | Type | Cost (Millions) | B/C | Priority | Implementation Schedule |
| 15 | US 41 | Widening | \$4.99 | 1.34 | 8 | Long |
| 14 | SR 71 | Widening | \$7.46 | 1.08 | 9 | Long* |
| 17 | SR 201 - 4 lane | Widening | \$13.47 | 0.98 | 10 [‡] | Long |
| 18 | SR 201 - 3 Lane | Widening | \$5.40 | 0.99 | 10 [‡] | Long |
| 1 | SR 2 | Shoulder | \$2.41 | 0.99 | 11 | Long |
| 16 | SR 2 | Widening | \$7.69 | 0.79 | 12 | - |
| Total | | | \$28.33/\$20.26 | | | |

Source: Moreland Altobelli Associates, Inc.

[‡]Projects 17 and 18 are mutually exclusive

*Project number 14 is included in the Regional Roundtable constrained projects list

Project Number 15

US 41 – From Campbell Road north to the Catoosa County Line. The scope of the project is to widen US 41 from the existing two lane roadway to four lanes with a flush median. This would match the existing cross section of US 41 which ends at the approximate city limits of Tunnel Hill. The project would install curb, gutter, and sidewalk to match the existing cross section at Campbell Road. The project would increase the capacity of the roadway by adding lanes. Secondly, it would add capacity by preventing congestion due to stalled vehicles and collisions.

This project is placed in the long range plan because to realize its maximum utility, coordination with Catoosa County will be required for a continued five-lane section north to the next intersection with I-75.

Project Number 14

SR 71 – From 0.5 miles north of the Old Dalton-Cleveland Highway to the Tennessee State Line. The scope of this project is to widen the existing two lane roadway to four lanes with a flush median. It would also install 10' shoulders with rumble strips to match the existing cross section of SR 71 south of the beginning point of this project. This project has been included in the Transportation Investment Act constrained project list as of August, 2011. The list is currently pending approval by the Regional Roundtable. This project would add capacity to the roadway by adding lanes. Secondly, it would add capacity by preventing congestion due to stalled vehicles and collisions.

This project is placed in the long range plan because to realize its maximum utility, coordination with the State of Tennessee and/or Bradley County will be required for a continued five-lane section north to the next logical terminus.

Project Number 17

SR 201 – From I-75 Road to SR 2. The scope of this project is to widen the existing three lane/two lane roadway to four lanes. It would also improve the roadway shoulders to upgrade the roadside environment to current AASHTO guidelines. Note that this project is mutually exclusive with widening project number 18 in the long term implementation list, safety project number 10 in the medium term implementation list, and shoulder project number 2 in the short term implementation list. This project would increase roadway capacity by providing additional

lanes, making passing possible throughout the roadway section, and improving the shoulders to comply with clear zone guidelines.

Project Number 18

SR 201 – From Reed Road to SR 2. The scope of this project is to widen the existing roadway to three lanes with attendant shoulder and safety improvements at Reed Road. The third lane would be an alternating passing lane for trucks and other vehicles to be passed safely. Note that this project is mutually exclusive with widening project number 17 in the long term implementation list, safety project number 10 in the medium term implementation list, and shoulder project number 2 in the short term implementation list. This project would increase roadway capacity by providing additional lanes, making passing possible throughout the roadway section, and improving the shoulders to comply with clear zone guidelines.

Project Number 1

SR 2 – From Deep Springs Road to the Murray County line. The scope of the project is to improve the existing roadway shoulders to establish adequate clear zone for vehicular recovery. This project would increase capacity by providing a safer and more easily drivable roadway section, increasing the average speed of drivers.

3.0 Conclusion

The North Whitfield County corridor study was intended to develop an appreciation and analysis of the effects that growth will have on four studied roadways. Those roadways were SR 2 from Catoosa to Murray Counties; US 41 from I-75 to Catoosa County; SR 71 from the North Dalton Bypass to the Tennessee State line; and SR 201 from US 41 to SR 2. Particular attention was paid to the ability of these roadways to carry freight and commuter traffic through the study year of 2035. With economic development occurring in Tennessee to the north of the study area, the study's initiators wanted to ensure that Whitfield County is well placed to provide roadway access that will encourage businesses and residents to locate within the study area.

They study examined the roadway conditions with respect to existing traffic volumes, crash history, and the physical condition of the roadway environment. The traffic volumes were projected to 2035 and average daily traffic for that year was projected.

The roadway crash history was analyzed to determine if any sections of roadway were showing a predilection to crashes, and of what type. Several roadway sections along SR 2 and SR 201 showed hot spots of crash activity, attributable to intersections and to roadway shoulders that were not suitable for vehicle recovery if a driver left the road surface.

Using the existing conditions as a base, a general list of roadway needs was developed, discussing the general types of roadway improvements that might be required to meet the stated goal of the study, to encourage freight and passenger movement well into the 21st century.

The study continued by developing a more specific list of roadway projects that would address the needs of the study area. These projects were analyzed for their costs and anticipated benefits. The results were tabulated and an implementation plan was developed. This plan is shown here in Table 5: Implementation Plan. Each project is also shown on Figure 2: Proposed Improvements.

The short term implementation plan is recommended for inclusion in the next Greater Dalton Metropolitan Planning Organization (GDMPO) modification to the transportation improvement plan (TIP), the three to five year construction program.

The medium term implementation plan is recommended for inclusion at the end of the next TIP update, or to be included in the Long Range Transportation Plan (LRTP).

The long term implementation plan is recommended for inclusion in the next update to the LRTP.



Table 5: Implementation Plan

| No. | Location | Type | Cost (Millions) | B/C | Priority | Implementation Schedule |
|-----|---------------------|----------------------|-----------------|------|-----------------|-------------------------|
| 2 | SR 201 | Shoulder | \$2.28 | 1.39 | 1 | Short |
| 7 | SR 201 | Restriping | \$0.11 | - | 2 | Short |
| 9 | SR 201, Lees Chapel | Safety | \$1.63 | 3.13 | 3 | Short |
| 12 | SR 71, SR 2 | Safety | \$1.37 | 2.61 | 4 | Medium |
| 11 | SR 201, I-75 | Safety | \$1.70 | 5.53 | 5 | Medium |
| 10 | SR 201, Reed | Safety | \$1.48 | 2.94 | 6 | Medium |
| 13 | SR 201 | Major Reconstruction | \$4.60 | 1.19 | 7 | Medium |
| 15 | US 41 | Widening | \$4.99 | 1.34 | 8 | Long |
| 14 | SR 71 | Widening | \$7.46 | 1.08 | 9 | Long |
| 17 | SR 201 - 4 lane | Widening | \$13.47 | 0.98 | 10 [‡] | Long |
| 18 | SR 201 - 3 Lane | Widening | \$5.40 | 0.99 | 10 [‡] | Long |
| 1 | SR 2 | Shoulder | \$2.41 | 0.99 | 11 | Long |
| 3 | SR 2 | Resurfacing | \$2.55 | - | M1 [‡] | Medium |
| 4 | SR 71 | Resurfacing | \$1.82 | - | M2 [‡] | Medium |
| 5 | US 41 | Resurfacing | \$6.41 | - | M3 [‡] | Medium |
| 8 | US 41 | Bicycle (Shoulder) | \$0.26 | - | M4 [‡] | Short |
| 6 | SR 201 | Resurfacing | \$1.71 | - | M5 [‡] | Medium |

Source: Moreland Altobelli Associates, Inc.

Note: There is no project number 16 in this table

‡Projects 17 and 18 are mutually exclusive



Appendix A. Benefit Cost Worksheets

GDOT Benefit Cost Calculator

enter information in green cells

Project Information

| | |
|-------------|------------------------|
| ID | |
| Description | SR 2 Shoulder Widening |

Cost Estimate

| | |
|------------------|--------------|
| Date of estimate | 9/10/11 |
| PE cost | \$ 185,467 |
| ROW cost | \$ 269,280 |
| UTILITY cost | \$ 100,000 |
| CST cost | \$ 1,854,675 |

Total \$ 2,409,422

Traffic in 2035

| | |
|------------------------|--|
| Source of traffic data | |
|------------------------|--|

Without project (nobuild)

| | |
|---------------------|--------|
| Annual VMT | 78,621 |
| Annual VHT | 0 |
| Average speed (mph) | 0 |

With project (build)

| | |
|---------------------|--------|
| Annual VMT | 71,832 |
| Annual VHT | 0 |
| Average speed (mph) | 0 |

| Parameters | Default | Override | Used |
|-------------------------------|---------|----------|-------|
| Analysis year | 2035 | 2035 | 2035 |
| Discount rate | 7.0% | 7.0% | 7% |
| Design life (years) | 25 | 20 | 20 |
| Base year of cost estimate | N/A | 2011 | 2011 |
| Current CST program year | N/A | 2015 | 2015 |
| Fuel price (\$/gallon) | 3.22 | 3.22 | 3.22 |
| Fuel economy (mpg) | 18.03 | 18.03 | 18.03 |
| Value of auto travel (\$/hr) | 13.75 | 13.75 | 13.75 |
| Value of truck travel (\$/hr) | 72.65 | 72.65 | 72.65 |
| Percent trucks | 12% | 12% | 12% |
| Include GSP benefits | No | No | No |

| Costs | | | |
|-----------------------------|----|-----------|--|
| Total cost | \$ | 2,409,422 | |
| Annualized cost | \$ | 142,266 | |
| Auto Delay Costs | | | |
| Nobuild | \$ | 951,314 | |
| Build | \$ | 869,167 | |
| Auto delay savings | \$ | 82,147 | |
| Truck Delay Costs | | | |
| Nobuild | \$ | 685,418 | |
| Build | \$ | 626,231 | |
| Truck delay savings | \$ | 59,187 | |
| Fuel Costs | | | |
| Nobuild | \$ | - | |
| Build | \$ | - | |
| Fuel cost savings | \$ | - | |
| Change in GSP | | | |
| Auto delay cost adjustment | | NA | |
| Truck delay cost adjustment | | NA | |
| Fuel cost adjustment | | NA | |
| Total benefit adjustment | | NA | |
| Benefits in 2035 | \$ | 141,333 | |
| Benefit-Cost Ratio | | 0.99 | |

Notes

Vehicle hours traveled derived from HCS+ comparisons of before after shoulder construction, and an assumption of 6 hours of benefit

GDOT Benefit Cost Calculator

enter information in green cells

Project Information

ID
Description

SR 201 Shoulder Widening

Cost Estimate

Date of estimate
PE cost
ROW cost
UTILITY cost
CST cost

9/10/11
\$ 176,820
\$ 237,600
\$ 100,000
\$ 1,768,200

Total \$ 2,282,620

Traffic in 2035

Source of traffic data

Without project (nobuild)
Annual VMT
Annual VHT
Average speed (mph)

101,178
0

With project (build)
Annual VMT
Annual VHT
Average speed (mph)

92,199
0

| Parameters | Default | Override | Used |
|-------------------------------|---------|----------|-------|
| Analysis year | 2035 | 2035 | 2035 |
| Discount rate | 7.0% | 7.0% | 7% |
| Design life (years) | 25 | 20 | 20 |
| Base year of cost estimate | N/A | 2011 | 2011 |
| Current CST program year | N/A | 2015 | 2015 |
| Fuel price (\$/gallon) | 3.22 | 3.22 | 3.22 |
| Fuel economy (mpg) | 18.03 | 18.03 | 18.03 |
| Value of auto travel (\$/hr) | 13.75 | 13.75 | 13.75 |
| Value of truck travel (\$/hr) | 72.65 | 72.65 | 72.65 |
| Percent trucks | 12% | 12% | 12% |
| Include GSP benefits | No | No | No |

| | | | |
|-----------------------------|----|-----------|--|
| Costs | | | |
| Total cost | \$ | 2,282,620 | |
| Annualized cost | \$ | 134,779 | |
| Auto Delay Costs | | | |
| Nobuild | \$ | 1,224,254 | |
| Build | \$ | 1,115,608 | |
| Auto delay savings | \$ | 108,646 | |
| Truck Delay Costs | | | |
| Nobuild | \$ | 882,070 | |
| Build | \$ | 803,791 | |
| Truck delay savings | \$ | 78,279 | |
| Fuel Costs | | | |
| Nobuild | \$ | - | |
| Build | \$ | - | |
| Fuel cost savings | \$ | - | |
| Change in GSP | | | |
| Auto delay cost adjustment | | NA | |
| Truck delay cost adjustment | | NA | |
| Fuel cost adjustment | | NA | |
| Total benefit adjustment | | NA | |
| Benefits in 2035 | \$ | 186,925 | |
| Benefit-Cost Ratio | | 1.39 | |

Notes

Vehicle hours traveled derived from HCS+ comparisons of before after shoulder construction, and an assumption of 6 hours of benefit

GDOT Benefit Cost Calculator

enter information in green cells

Project Information

ID [redacted]
 Description SR 201 & Lees Chapel Road Safety Improvement [redacted]

Cost Estimate

Date of estimate 9/10/11
 PE cost \$ 123,444
 ROW cost \$ 220,750
 UTILITY cost \$ 50,000
 CST cost \$ 1,234,442
 Total \$ 1,628,636

Traffic in 2035

Source of traffic data [redacted]

Without project (nobuild)

Annual VMT [redacted]
 Annual VHT [redacted]
 Average speed (mph) #DIV/0!

With project (build)

Annual VMT [redacted]
 Annual VHT [redacted]
 Average speed (mph) #DIV/0!

Parameters

| Parameters | Default | Override | Used |
|-------------------------------|---------|----------|-------|
| Analysis year | 2035 | 2035 | 2035 |
| Discount rate | 7.0% | 7.0% | 7% |
| Design life (years) | 25 | 20 | 20 |
| Base year of cost estimate | N/A | 2011 | 2011 |
| Current CST program year | N/A | 2015 | 2015 |
| Fuel price (\$/gallon) | 3.22 | 3.22 | 3.22 |
| Fuel economy (mpg) | 18.03 | 18.03 | 18.03 |
| Value of auto travel (\$/hr) | 13.75 | 13.75 | 13.75 |
| Value of truck travel (\$/hr) | 72.65 | 72.65 | 72.65 |

Percent trucks 12%

Include GSP benefits No

| Costs | | | |
|-----------------------------|----|-----------|--|
| Total cost | \$ | 1,628,636 | |
| Annualized cost | \$ | 96,164 | |
| Crash Savings \$ 301,000 | | | |
| Truck Delay Costs | | | |
| Nobuild | \$ | - | |
| Build | \$ | - | |
| Truck delay savings | \$ | - | |
| Fuel Costs | | | |
| Nobuild | \$ | - | |
| Build | \$ | - | |
| Fuel cost savings | \$ | - | |
| Change in GSP | | | |
| Auto delay cost adjustment | | NA | |
| Truck delay cost adjustment | | NA | |
| Fuel cost adjustment | | NA | |
| Total benefit adjustment | | NA | |
| Benefits in 2035 | \$ | 301,000 | |
| Benefit-Cost Ratio | | 3.13 | |

Notes

[redacted]

GDOT Benefit Cost Calculator

enter information in green cells

Project Information

ID [redacted]
 Description SR 201 & Reed Road Safety Improvement [redacted]

Cost Estimate

Date of estimate 9/10/11
 PE cost \$ 113,448
 ROW cost \$ 135,000
 UTILITY cost \$ 100,000
 CST cost \$ 1,134,482
 Total \$ 1,482,930

Traffic in 2035

Source of traffic data [redacted]

Without project (nobuild)

Annual VMT [redacted]
 Annual VHT [redacted]
 Average speed (mph) #DIV/0!

With project (build)

Annual VMT [redacted]
 Annual VHT [redacted]
 Average speed (mph) #DIV/0!

Parameters

| Parameters | Default | Override | Used |
|-------------------------------|---------|----------|-------|
| Analysis year | 2035 | 2035 | 2035 |
| Discount rate | 7.0% | 7.0% | 7% |
| Design life (years) | 25 | 20 | 20 |
| Base year of cost estimate | N/A | 2011 | 2011 |
| Current CST program year | N/A | 2015 | 2015 |
| Fuel price (\$/gallon) | 3.22 | 3.22 | 3.22 |
| Fuel economy (mpg) | 18.03 | 18.03 | 18.03 |
| Value of auto travel (\$/hr) | 13.75 | 13.75 | 13.75 |
| Value of truck travel (\$/hr) | 72.65 | 72.65 | 72.65 |

Percent trucks 12%

Include GSP benefits No

| Costs | | | |
|-----------------------------|----|-----------|-------------|
| Total cost | \$ | 1,482,930 | |
| Annualized cost | \$ | 87,561 | |
| Crash Savings \$ 257,500 | | | |
| Truck Delay Costs | | | |
| Nobuild | \$ | - | |
| Build | \$ | - | |
| Truck delay savings | \$ | - | |
| Fuel Costs | | | |
| Nobuild | \$ | - | |
| Build | \$ | - | |
| Fuel cost savings | \$ | - | |
| Change in GSP | | | |
| Auto delay cost adjustment | | NA | NA |
| Truck delay cost adjustment | | NA | NA |
| Fuel cost adjustment | | NA | NA |
| Total benefit adjustment | | NA | NA |
| Benefits in 2035 | \$ | 257,500 | |
| Benefit-Cost Ratio | | | 2.94 |

Notes

[redacted]

GDOT Benefit-Cost Calculator

enter information in green cells

Project Information

| | |
|-------------|----------------------------------|
| ID | |
| Description | SR 2 & SR 71 Safety Improvements |

Cost Estimate

| | |
|------------------|------------|
| Date of estimate | 9/14/11 |
| PE cost | \$ 91,386 |
| ROW cost | \$ 64,000 |
| UTILITY cost | \$ 300,000 |
| CST cost | \$ 913,863 |

Total \$ 1,369,249

Traffic in 2035

| | |
|------------------------|--|
| Source of traffic data | |
|------------------------|--|

Without project (nobuild)

| | |
|---------------------|---------|
| Annual VMT | |
| Annual VHT | |
| Average speed (mph) | #DIV/0! |

With project (build)

| | |
|---------------------|---------|
| Annual VMT | |
| Annual VHT | |
| Average speed (mph) | #DIV/0! |

| Parameters | Default | Override | Used |
|-------------------------------|---------|----------|-------|
| Analysis year | 2035 | 2035 | 2035 |
| Discount rate | 7.0% | 7.0% | 7% |
| Design life (years) | 25 | 20 | 20 |
| Base year of cost estimate | N/A | 2011 | 2011 |
| Current CST program year | N/A | 2015 | 2015 |
| Fuel price (\$/gallon) | 3.22 | 3.22 | 3.22 |
| Fuel economy (mpg) | 18.03 | 18.03 | 18.03 |
| Value of auto travel (\$/hr) | 13.75 | 13.75 | 13.75 |
| Value of truck travel (\$/hr) | 72.65 | 72.65 | 72.65 |
| Percent trucks | 12% | | 12% |
| Include GSP benefits | No | | No |

| | | | |
|-----------------------------|----|-----------|--|
| Costs | | | |
| Total cost | \$ | 1,369,249 | |
| Annualized cost | \$ | 80,848 | |
| Crash Savings | | | |
| | \$ | - | |
| | \$ | - | |
| Crash Savings | \$ | 210,937 | |
| Truck Delay Costs | | | |
| Nobuild | \$ | - | |
| Build | \$ | - | |
| Truck delay savings | \$ | - | |
| Fuel Costs | | | |
| Nobuild | \$ | - | |
| Build | \$ | - | |
| Fuel cost savings | \$ | - | |
| Change in GSP | | | |
| Auto delay cost adjustment | | NA | |
| Truck delay cost adjustment | | NA | |
| Fuel cost adjustment | | NA | |
| Total benefit adjustment | | NA | |
| Benefits in 2035 | \$ | 210,937 | |
| Benefit-Cost Ratio | | 2.61 | |

Notes

Only relevant Benefit information used for this project was the annual savings in crash related damage and injuries. This was input directly into the spreadsheet to take advantage of the developed discounting formulas.

GDOT Benefit Cost Calculator

enter information in green cells

Project Information

ID
Description

SR 201 Major Reconstruction

Cost Estimate

Date of estimate
PE cost
ROW cost
UTILITY cost
CST cost

9/10/11
\$ 224,663
\$ 750,000
\$ 750,000
\$ 2,875,337

Total \$ 4,600,000

Traffic in 2035

Source of traffic data

Without project (nobuild)

Annual VMT
Annual VHT
Average speed (mph)

54,250
0

With project (build)

Annual VMT
Annual VHT
Average speed (mph)

38,750
0

Parameters

| Parameters | Default | Override | Used |
|-------------------------------|---------|----------|-------|
| Analysis year | 2035 | 2035 | 2035 |
| Discount rate | 7.0% | 7.0% | 7% |
| Design life (years) | 25 | 20 | 20 |
| Base year of cost estimate | N/A | 2011 | 2011 |
| Current CST program year | N/A | 2015 | 2015 |
| Fuel price (\$/gallon) | 3.22 | 3.22 | 3.22 |
| Fuel economy (mpg) | 18.03 | 18.03 | 18.03 |
| Value of auto travel (\$/hr) | 13.75 | 13.75 | 13.75 |
| Value of truck travel (\$/hr) | 72.65 | 72.65 | 72.65 |
| Percent trucks | 12% | 12% | 12% |
| Include GSP benefits | No | No | No |

| | | | |
|-----------------------------|----|-----------|--|
| Costs | | | |
| Total cost | \$ | 4,600,000 | |
| Annualized cost | \$ | 271,610 | |
| Auto Delay Costs | | | |
| Nobuild | \$ | 656,425 | |
| Build | \$ | 468,875 | |
| Auto delay savings | \$ | 187,550 | |
| Truck Delay Costs | | | |
| Nobuild | \$ | 472,952 | |
| Build | \$ | 337,823 | |
| Truck delay savings | \$ | 135,129 | |
| Fuel Costs | | | |
| Nobuild | \$ | - | |
| Build | \$ | - | |
| Fuel cost savings | \$ | - | |
| Change in GSP | | | |
| Auto delay cost adjustment | | NA | |
| Truck delay cost adjustment | | NA | |
| Fuel cost adjustment | | NA | |
| Total benefit adjustment | | NA | |
| Benefits in 2035 | \$ | 322,679 | |
| Benefit-Cost Ratio | | 1.19 | |

Notes

Assumes NO difference in speed (45 MPH) between build and no build, which is an extremely conservative assumption. Actual BC ratio will be higher.

GDOT Benefit Cost Calculator

enter information in green cells

Project Information

ID [redacted]
 Description SR 71 Widening [redacted]

Cost Estimate

Date of estimate 9/10/11
 PE cost \$ 562,674
 ROW cost \$ 1,169,184
 UTILITY cost \$ 100,000
 CST cost \$ 5,626,742

Total \$ 7,458,600

Traffic in 2035

Without project (nobuild)
 Annual VMT [redacted]
 Annual VHT [redacted]
 Average speed (mph) [redacted]

With project (build)

Annual VMT [redacted]
 Annual VHT [redacted]
 Average speed (mph) [redacted]

| Parameters | Default | Override | Used |
|-------------------------------|---------|----------|-------|
| Analysis year | 2035 | 2035 | 2035 |
| Discount rate | 7.0% | 7.0% | 7% |
| Design life (years) | 25 | 20 | 20 |
| Base year of cost estimate | N/A | 2011 | 2011 |
| Current CST program year | N/A | 2015 | 2015 |
| Fuel price (\$/gallon) | 3.22 | 3.22 | 3.22 |
| Fuel economy (mpg) | 18.03 | 18.03 | 18.03 |
| Value of auto travel (\$/hr) | 13.75 | 13.75 | 13.75 |
| Value of truck travel (\$/hr) | 72.65 | 72.65 | 72.65 |
| Percent trucks | 12% | 12% | 12% |
| Include GSP benefits | No | No | No |

| | | | |
|-----------------------------|----|-----------|------|
| Costs | | | |
| Total cost | \$ | 7,458,600 | |
| Annualized cost | \$ | 440,398 | |
| Auto Delay Costs | | | |
| Nobuild | \$ | 656,425 | |
| Build | \$ | 511,225 | |
| Auto delay savings | \$ | 145,200 | |
| Truck Delay Costs | | | |
| Nobuild | \$ | 472,952 | |
| Build | \$ | 368,336 | |
| Truck delay savings | \$ | 104,616 | |
| Crash Savings | \$ | 226,250 | |
| Change in GSP | | | |
| Auto delay cost adjustment | | NA | NA |
| Truck delay cost adjustment | | NA | NA |
| Fuel cost adjustment | | NA | NA |
| Total benefit adjustment | | NA | NA |
| Benefits in 2035 | \$ | 476,066 | |
| Benefit-Cost Ratio | | | 1.08 |

Notes

[redacted]

GDOT Benefit Cost Calculator

enter information in green cells

Project Information

ID [redacted]
 Description US 41 Widening [redacted]

Cost Estimate

Date of estimate 9/10/11
 PE cost \$ 300,833
 ROW cost \$ 882,480
 UTILITY cost \$ 800,000
 CST cost \$ 3,008,325

Total \$ 4,991,638

Traffic in 2035

Without project (nobuild)
 Annual VMT [redacted]
 Annual VHT 107,750
 Average speed (mph) 0

With project (build)

Annual VMT [redacted]
 Annual VHT 96,500
 Average speed (mph) 0

| Parameters | Default | Override | Used |
|-------------------------------|---------|----------|-------|
| Analysis year | 2035 | 2035 | 2035 |
| Discount rate | 7.0% | 7.0% | 7% |
| Design life (years) | 25 | 20 | 20 |
| Base year of cost estimate | N/A | 2011 | 2011 |
| Current CST program year | N/A | 2015 | 2015 |
| Fuel price (\$/gallon) | 3.22 | 3.22 | 3.22 |
| Fuel economy (mpg) | 18.03 | 18.03 | 18.03 |
| Value of auto travel (\$/hr) | 13.75 | 13.75 | 13.75 |
| Value of truck travel (\$/hr) | 72.65 | 72.65 | 72.65 |

Percent trucks 12%
 Include GSP benefits No

| | | | |
|-----------------------------|----|-----------|------|
| Costs | | | |
| Total cost | \$ | 4,991,638 | |
| Annualized cost | \$ | 294,734 | |
| Auto Delay Costs | | | |
| Nobuild | \$ | 1,303,775 | |
| Build | \$ | 1,167,650 | |
| Auto delay savings | \$ | 136,125 | |
| Truck Delay Costs | | | |
| Nobuild | \$ | 939,365 | |
| Build | \$ | 841,287 | |
| Truck delay savings | \$ | 98,078 | |
| Crash Savings | \$ | 161,250 | |
| Change in GSP | | | |
| Auto delay cost adjustment | | NA | NA |
| Truck delay cost adjustment | | NA | NA |
| Fuel cost adjustment | | NA | NA |
| Total benefit adjustment | | NA | NA |
| Benefits in 2035 | \$ | 395,453 | |
| Benefit-Cost Ratio | | | 1.34 |

Notes

[redacted]

GDOT Benefit Cost Calculator

enter information in green cells

Project Information

ID [redacted]
 Description SR 2 Widening [redacted]

Cost Estimate

Date of estimate 9/10/11 [redacted]
 PE cost [redacted]
 ROW cost [redacted]
 UTILITY cost [redacted]
 CST cost [redacted]

Total \$ -

Traffic in 2035

Source of traffic data [redacted]

Without project (nobuild)

Annual VMT [redacted]
 Annual VHT [redacted]
 Average speed (mph) #DIV/0!

With project (build)

Annual VMT [redacted]
 Annual VHT [redacted]
 Average speed (mph) #DIV/0!

Parameters

| Parameters | Default | Override | Used |
|-------------------------------|---------|----------|-------|
| Analysis year | 2035 | 2035 | 2035 |
| Discount rate | 7.0% | 7.0% | 7% |
| Design life (years) | 25 | 20 | 20 |
| Base year of cost estimate | N/A | 2011 | 2011 |
| Current CST program year | N/A | 2015 | 2015 |
| Fuel price (\$/gallon) | 3.22 | 3.22 | 3.22 |
| Fuel economy (mpg) | 18.03 | 18.03 | 18.03 |
| Value of auto travel (\$/hr) | 13.75 | 13.75 | 13.75 |
| Value of truck travel (\$/hr) | 72.65 | 72.65 | 72.65 |

Percent trucks 12%

Include GSP benefits No

| | | | |
|-----------------------------|----|--|---------|
| Costs | | | |
| Total cost | \$ | | - |
| Annualized cost | \$ | | - |
| Auto Delay Costs | | | |
| Nobuild | \$ | | - |
| Build | \$ | | - |
| Auto delay savings | \$ | | - |
| Truck Delay Costs | | | |
| Nobuild | \$ | | - |
| Build | \$ | | - |
| Truck delay savings | \$ | | - |
| Fuel Costs | | | |
| Nobuild | \$ | | - |
| Build | \$ | | - |
| Fuel cost savings | \$ | | - |
| Change in GSP | | | |
| Auto delay cost adjustment | | | NA |
| Truck delay cost adjustment | | | NA |
| Fuel cost adjustment | | | NA |
| Total benefit adjustment | | | NA |
| Benefits in 2035 | \$ | | - |
| Benefit-Cost Ratio | | | #DIV/0! |

Notes

[redacted]

GDOT Benefit Cost Calculator

enter information in green cells

Project Information

| | |
|-------------|------------------------|
| ID | SR 201 Widening 4 Lane |
| Description | |

Cost Estimate

| | |
|------------------|--------------|
| Date of estimate | 9/10/11 |
| PE cost | \$ 807,226 |
| ROW cost | \$ 3,594,480 |
| UTILITY cost | \$ 1,000,000 |
| CST cost | \$ 8,072,263 |

Total \$ 13,473,969

Traffic in 2035

| | |
|------------------------|--|
| Source of traffic data | |
|------------------------|--|

Without project (nobuild)

| | |
|---------------------|---------|
| Annual VMT | 220,250 |
| Annual VHT | 0 |
| Average speed (mph) | 0 |

With project (build)

| | |
|---------------------|---------|
| Annual VMT | 195,250 |
| Annual VHT | 0 |
| Average speed (mph) | 0 |

Parameters

| Parameters | Default | Override | Used |
|-------------------------------|---------|----------|-------|
| Analysis year | 2035 | 2035 | 2035 |
| Discount rate | 7.0% | 7.0% | 7% |
| Design life (years) | 25 | 20 | 20 |
| Base year of cost estimate | N/A | 2011 | 2011 |
| Current CST program year | N/A | 2015 | 2015 |
| Fuel price (\$/gallon) | 3.22 | 3.22 | 3.22 |
| Fuel economy (mpg) | 18.03 | 18.03 | 18.03 |
| Value of auto travel (\$/hr) | 13.75 | 13.75 | 13.75 |
| Value of truck travel (\$/hr) | 72.65 | 72.65 | 72.65 |

Percent trucks 12%

Include GSP benefits No

| | | | |
|-----------------------------|----|------------|------|
| Costs | | | |
| Total cost | \$ | 13,473,969 | |
| Annualized cost | \$ | 795,579 | |
| Auto Delay Costs | | | |
| Nobuild | \$ | 2,665,025 | |
| Build | \$ | 2,362,525 | |
| Auto delay savings | \$ | 302,500 | |
| Truck Delay Costs | | | |
| Nobuild | \$ | 1,920,140 | |
| Build | \$ | 1,702,190 | |
| Truck delay savings | \$ | 217,950 | |
| Crash Savings | \$ | 257,500 | |
| Change in GSP | | | |
| Auto delay cost adjustment | | NA | NA |
| Truck delay cost adjustment | | NA | NA |
| Fuel cost adjustment | | NA | NA |
| Total benefit adjustment | | NA | NA |
| Benefits in 2035 | \$ | 777,950 | |
| Benefit-Cost Ratio | | | 0.98 |

Notes

| | |
|-------|--|
| Notes | |
|-------|--|

GDOT Benefit Cost Calculator

enter information in green cells

Project Information

| | |
|-------------|------------------------|
| ID | SR 201 Widening 3 Lane |
| Description | |

Cost Estimate

| | |
|------------------|---------------------|
| Date of estimate | 9/10/11 |
| PE cost | \$ 285,916 |
| ROW cost | \$ 2,056,400 |
| UTILITY cost | \$ 200,000 |
| CST cost | \$ 2,859,165 |
| Total | \$ 5,401,481 |

Traffic in 2035

| | |
|---------------------------|---------|
| Source of traffic data | |
| Without project (nobuild) | |
| Annual VMT | 103,250 |
| Annual VHT | 0 |
| Average speed (mph) | |
| With project (build) | |
| Annual VMT | 100,500 |
| Annual VHT | 0 |
| Average speed (mph) | |

| Parameters | Default | Override | Used |
|-------------------------------|---------|----------|-------|
| Analysis year | 2035 | 2035 | 2035 |
| Discount rate | 7.0% | 7.0% | 7% |
| Design life (years) | 25 | 20 | 20 |
| Base year of cost estimate | N/A | 2011 | 2011 |
| Current CST program year | N/A | 2015 | 2015 |
| Fuel price (\$/gallon) | 3.22 | 3.22 | 3.22 |
| Fuel economy (mpg) | 18.03 | 18.03 | 18.03 |
| Value of auto travel (\$/hr) | 13.75 | 13.75 | 13.75 |
| Value of truck travel (\$/hr) | 72.65 | 72.65 | 72.65 |
| Percent trucks | 12% | 12% | 12% |
| Include GSP benefits | No | No | No |

| Costs | | | |
|-----------------------------|--|----|----------------|
| Total cost | | \$ | 5,401,481 |
| Annualized cost | | \$ | 318,934 |
| Auto Delay Costs | | | |
| Nobuild | | \$ | 1,249,325 |
| Build | | \$ | 1,216,050 |
| Auto delay savings | | \$ | 33,275 |
| Truck Delay Costs | | | |
| Nobuild | | \$ | 900,134 |
| Build | | \$ | 876,159 |
| Truck delay savings | | \$ | 23,975 |
| Crash Savings | | \$ | 257,500 |
| Change in GSP | | | |
| Auto delay cost adjustment | | | NA |
| Truck delay cost adjustment | | | NA |
| Fuel cost adjustment | | | NA |
| Total benefit adjustment | | | NA |
| Benefits in 2035 | | \$ | 314,750 |
| Benefit-Cost Ratio | | | 0.99 |

Notes

| | |
|-------|--|
| Notes | |
|-------|--|

Whitfield County

SUMMARY OF PROJECT COSTS

SR 2 Shoulder Improvements

From Deep Springs Road to Murray County

Non-Construction Costs

| | | |
|----|------------------------|------------------|
| A. | Right-of-Way | \$269,280 |
| B. | Reimbursable Utilities | \$100,000 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$249,333 |
| E. | Drainage | \$171,770 |
| F.. | Base and Paving | \$794,864 |
| H. | Signing and Striping | \$84,784 |
| I. | Guardrail | \$101,800 |
| J. | Traffic Control & Mobilization | \$200,000 |
| K. | Landscaping and Erosion Control | \$207,123 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$1,854,675 |

Engineering & Contingencies; 10% \$185,467

Total Construction Cost **\$2,040,142**

Total Project Costs **\$2,409,422**

Whitfield County

SUMMARY OF PROJECT COSTS

SR 201 Shoulder Improvements

From Reed Road to SR 2

Non-Construction Costs

| | | |
|----|------------------------|------------------|
| A. | Right-of-Way | \$237,600 |
| B. | Reimbursable Utilities | \$100,000 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$220,000 |
| E. | Drainage | \$235,270 |
| F.. | Base and Paving | \$701,351 |
| H. | Signing and Striping | \$75,280 |
| I. | Guardrail | \$101,800 |
| J. | Traffic Control & Mobilization | \$200,000 |
| K. | Landscaping and Erosion Control | \$189,499 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$1,768,200 |

Engineering & Contingencies; 10% \$176,820

Total Construction Cost **\$1,945,020**

Total Project Costs **\$2,282,620**

Whitfield County

SUMMARY OF PROJECT COSTS

SR 2 Widening

From Catoosa Co. to Murray Co.

Non-Construction Costs

| | | |
|----|------------------------|-----|
| A. | Right-of-Way | \$0 |
| B. | Reimbursable Utilities | \$0 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$0 |
| E. | Drainage | \$0 |
| F.. | Base and Paving | \$1,932,153 |
| H. | Signing and Striping | \$239,488 |
| I. | Guardrail | \$0 |
| J. | Traffic Control & Mobilization | \$100,000 |
| K. | Landscaping and Erosion Control | \$0 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$2,316,641 |

Engineering & Contingencies; 10% \$231,664

Total Construction Cost **\$2,548,305**

Total Project Costs **\$2,548,305**

Whitfield County

SUMMARY OF PROJECT COSTS

SR 71 Resurfacing

From North Dalton Bypass to Tennessee

Non-Construction Costs

| | | |
|----|------------------------|------------|
| A. | Right-of-Way | \$0 |
| B. | Reimbursable Utilities | \$0 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$0 |
| E. | Drainage | \$0 |
| F.. | Base and Paving | \$5,101,104 |
| H. | Signing and Striping | \$582,688 |
| I. | Guardrail | \$0 |
| J. | Traffic Control & Mobilization | \$100,000 |
| K. | Landscaping and Erosion Control | \$0 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$5,828,792 |

Engineering & Contingencies; 10% \$582,879

Total Construction Cost **\$6,411,672**

Total Project Costs **\$6,411,672**

Whitfield County

SUMMARY OF PROJECT COSTS

US 41 Resurfacing

From I-75 to Catoosa Co.

Non-Construction Costs

| | | |
|----|------------------------|------------|
| A. | Right-of-Way | \$0 |
| B. | Reimbursable Utilities | \$0 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$0 |
| E. | Drainage | \$0 |
| F.. | Base and Paving | \$1,123,750 |
| H. | Signing and Striping | \$284,051 |
| I. | Guardrail | \$0 |
| J. | Traffic Control & Mobilization | \$100,000 |
| K. | Landscaping and Erosion Control | \$0 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$1,552,801 |

Engineering & Contingencies; 10% \$155,280

Total Construction Cost **\$1,708,081**

Total Project Costs **\$1,708,081**

Whitfield County

SUMMARY OF PROJECT COSTS

SR 201 Resurfacing

From US 41 to SR 2

Non-Construction Costs

| | | |
|----|------------------------|------------|
| A. | Right-of-Way | \$0 |
| B. | Reimbursable Utilities | \$0 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$0 |
| E. | Drainage | \$0 |
| F.. | Base and Paving | \$1,356,897 |
| H. | Signing and Striping | \$150,573 |
| I. | Guardrail | \$0 |
| J. | Traffic Control & Mobilization | \$100,000 |
| K. | Landscaping and Erosion Control | \$0 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$1,652,470 |

Engineering & Contingencies; 10% \$165,247

Total Construction Cost **\$1,817,717**

Total Project Costs **\$1,817,717**

Whitfield County

SUMMARY OF PROJECT COSTS

SR 201 Shoulder Improvements

From US 41 to SR 2

Non-Construction Costs

| | | |
|----|------------------------|------------|
| A. | Right-of-Way | \$0 |
| B. | Reimbursable Utilities | \$0 |

Construction Costs

| | | |
|-----|----------------------------------|------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$0 |
| E. | Drainage | \$0 |
| F.. | Base and Paving | \$0 |
| H. | Signing and Striping | \$93,440 |
| I. | Guardrail | \$0 |
| J. | Traffic Control & Mobilization | \$10,000 |
| K. | Landscaping and Erosion Control | \$0 |
| L. | Miscellaneous Construction Items | \$0 |
| | Construction Cost Subtotal | \$103,440 |

Engineering & Contingencies; 10% \$10,344

Total Construction Cost \$113,784

Total Project Costs \$113,784

Whitfield County

SUMMARY OF PROJECT COSTS

US 41 Shoulder

From SR 201 (South) to Catoosa County line

Non-Construction Costs

| | | |
|----|------------------------|------------|
| A. | Right-of-Way | \$0 |
| B. | Reimbursable Utilities | \$0 |

Construction Costs

| | | |
|-----|----------------------------------|------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$0 |
| E. | Drainage | \$0 |
| F.. | Base and Paving | \$209,883 |
| H. | Signing and Striping | \$0 |
| I. | Guardrail | \$0 |
| J. | Traffic Control & Mobilization | \$25,000 |
| K. | Landscaping and Erosion Control | \$0 |
| L. | Miscellaneous Construction Items | \$0 |
| | Construction Cost Subtotal | \$234,883 |

Engineering & Construction; 10% \$23,488

Total Construction Cost \$258,372

Total Project Costs \$258,372

Whitfield County

SUMMARY OF PROJECT COSTS
SR 2 & Lees Chapel Road

Non-Construction Costs

| | | |
|----|------------------------|------------------|
| A. | Right-of-Way | \$220,750 |
| B. | Reimbursable Utilities | \$50,000 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$100,000 |
| E. | Drainage | \$118,593 |
| F.. | Base and Paving | \$591,533 |
| H. | Signing and Striping | \$38,000 |
| I. | Guardrail | \$20,350 |
| J. | Traffic Control & Mobilization | \$200,000 |
| K. | Landscaping and Erosion Control | \$120,966 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$1,234,442 |

Engineering & Contingencies; 10% \$123,444

Total Construction Cost **\$1,357,886**

Total Project Costs **\$1,628,636**

Whitfield County

SUMMARY OF PROJECT COSTS
SR 201 & Reed Road

Non-Construction Costs

| | | |
|----|------------------------|------------------|
| A. | Right-of-Way | \$135,000 |
| B. | Reimbursable Utilities | \$100,000 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$100,000 |
| E. | Drainage | \$118,593 |
| F.. | Base and Paving | \$504,554 |
| H. | Signing and Striping | \$42,000 |
| I. | Guardrail | \$15,650 |
| J. | Traffic Control & Mobilization | \$200,000 |
| K. | Landscaping and Erosion Control | \$108,685 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$1,134,482 |

Engineering & Contingencies; 10% \$113,448

Total Construction Cost **\$1,247,930**

Total Project Costs **\$1,482,930**

Whitfield County

SUMMARY OF PROJECT COSTS
SR 201 & I-75

Non-Construction Costs

| | | |
|----|------------------------|------------------|
| A. | Right-of-Way | \$140,000 |
| B. | Reimbursable Utilities | \$300,000 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$100,000 |
| E. | Drainage | \$118,593 |
| F.. | Base and Paving | \$518,360 |
| H. | Signing and Striping | \$42,000 |
| I. | Guardrail | \$11,900 |
| J. | Traffic Control & Mobilization | \$200,000 |
| K. | Landscaping and Erosion Control | \$106,446 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$1,142,299 |

Engineering & Contingencies; 10% \$114,230

Total Construction Cost **\$1,256,529**

Total Project Costs **\$1,696,529**

Whitfield County

SUMMARY OF PROJECT COSTS
SR 2 & SR 71

Non-Construction Costs

| | | |
|----|------------------------|------------------|
| A. | Right-of-Way | \$64,000 |
| B. | Reimbursable Utilities | \$300,000 |

Construction Costs

| | | |
|-----|----------------------------------|------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$44,444 |
| E. | Drainage | \$85,449 |
| F.. | Base and Paving | \$324,740 |
| H. | Signing and Striping | \$56,000 |
| I. | Guardrail | \$11,900 |
| J. | Traffic Control & Mobilization | \$200,000 |
| K. | Landscaping and Erosion Control | \$146,330 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$913,863 |

Engineering & Contingencies; 10% \$91,386

Total Construction Cost **\$1,005,249**

Total Project Costs **\$1,369,249**

Whitfield County

SUMMARY OF PROJECT COSTS

US 71 Widening

From North of Old Dalton-Cleveland Highway to Tennessee

Non-Construction Costs

| | | |
|----|------------------------|--------------------|
| A. | Right-of-Way | \$1,169,184 |
| B. | Reimbursable Utilities | \$100,000 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$1,129,333 |
| E. | Drainage | \$219,520 |
| F.. | Base and Paving | \$3,541,442 |
| H. | Signing and Striping | \$203,149 |
| I. | Guardrail | \$60,050 |
| J. | Traffic Control & Mobilization | \$200,000 |
| K. | Landscaping and Erosion Control | \$228,248 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$5,626,742 |

Engineering & Contingencies; 10% \$562,674

Total Construction Cost **\$6,189,416**

Total Project Costs **\$7,458,600**

Whitfield County

SUMMARY OF PROJECT COSTS

US 41 Widening

From Campbel Road to Catoosa County

Non-Construction Costs

| | | |
|----|------------------------|------------------|
| A. | Right-of-Way | \$882,480 |
| B. | Reimbursable Utilities | \$800,000 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$523,111 |
| E. | Drainage | \$344,183 |
| F.. | Base and Paving | \$1,697,985 |
| H. | Signing and Striping | \$92,394 |
| I. | Guardrail | \$32,400 |
| J. | Traffic Control & Mobilization | \$100,000 |
| K. | Landscaping and Erosion Control | \$173,253 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$3,008,325 |

Engineering & Construction; 10% \$300,833

Total Construction Cost **\$3,309,158**

Total Project Costs **\$4,991,638**

Whitfield County

SUMMARY OF PROJECT COSTS

SR 2 Widening

From SR 201 to SR 71

Non-Construction Costs

| | | |
|----|------------------------|------------------|
| A. | Right-of-Way | \$846,800 |
| B. | Reimbursable Utilities | \$300,000 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$864,000 |
| D. | Grading and Earthwork | \$1,283,333 |
| E. | Drainage | \$279,020 |
| F.. | Base and Paving | \$2,697,336 |
| H. | Signing and Striping | \$229,760 |
| I. | Guardrail | \$101,800 |
| J. | Traffic Control & Mobilization | \$200,000 |
| K. | Landscaping and Erosion Control | \$249,576 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$5,949,825 |

Engineering & Contingencies; 10% \$594,983

Total Construction Cost **\$6,544,808**

Total Project Costs **\$7,691,608**

Whitfield County

SUMMARY OF PROJECT COSTS

SR 201 Widening

From I-75 to SR 2

Non-Construction Costs

| | | |
|----|------------------------|--------------------|
| A. | Right-of-Way | \$3,594,480 |
| B. | Reimbursable Utilities | \$1,000,000 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$1,102,933 |
| E. | Drainage | \$485,520 |
| F.. | Base and Paving | \$5,173,293 |
| H. | Signing and Striping | \$214,528 |
| I. | Guardrail | \$101,800 |
| J. | Traffic Control & Mobilization | \$400,000 |
| K. | Landscaping and Erosion Control | \$549,188 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$8,072,263 |

Engineering & Contingencies; 10% \$807,226

Total Construction Cost **\$8,879,489**

Total Project Costs **\$13,473,969**

Whitfield County

SUMMARY OF PROJECT COSTS
SR 201 Shoulder Widening & Safety Improvements
From Reed Road to SR 2

Non-Construction Costs

| | | |
|----|------------------------|--------------------|
| A. | Right-of-Way | \$2,056,400 |
| B. | Reimbursable Utilities | \$200,000 |

Construction Costs

| | | |
|-----|----------------------------------|--------------------|
| C. | Major Structures | \$0 |
| D. | Grading and Earthwork | \$396,000 |
| E. | Drainage | \$314,020 |
| F.. | Base and Paving | \$1,467,270 |
| H. | Signing and Striping | \$107,040 |
| I. | Guardrail | \$101,800 |
| J. | Traffic Control & Mobilization | \$200,000 |
| K. | Landscaping and Erosion Control | \$228,035 |
| L. | Miscellaneous Construction Items | \$45,000 |
| | Construction Cost Subtotal | \$2,859,165 |

Engineering & Contingencies; 10% \$285,916

Total Construction Cost **\$3,145,081**

Total Project Costs **\$5,401,481**

Appendix B – Highway Capacity Analysis Worksheets

Phone: Fax:
E-Mail:

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 7/11/11
 Analysis Time Period
 Highway SR 2
 From/To Eastern Leg
 Jurisdiction Whitfield County
 Analysis Year 2009
 Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 656 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.93 | |
| PCE for trucks, ET | 1.9 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.903 | |
| Two-way flow rate, (note-1) vp | 868 | pc/h |
| Highest directional split proportion (note-2) | 521 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 47.1 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 0.94 | |
| PCE for trucks, ET | 1.5 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.943 | |
| Two-way flow rate,(note-1) vp | 822 | pc/h |
| Highest directional split proportion (note-2) | 493 | |
| Base percent time-spent-following, BPTSF | 51.4 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.0 | |
| Percent time-spent-following, PTSF | 51.4 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | C | |
| Volume to capacity ratio, v/c | 0.27 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 1093 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 3936 | veh-mi |
| Peak 15-min total travel time, TT15 | 23.2 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone: Fax:
E-Mail:

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
Agency/Co. Moreland Altobelli
Date Performed 7/11/11
Analysis Time Period
Highway SR 2
From/To Eastern Leg
Jurisdiction Whitfield County
Analysis Year 2035
Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|----------------|---------|----|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |

Two-way hourly volume, V 966 veh/h
Directional split 60 / 40 %

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.99 | |
| PCE for trucks, ET | 1.5 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.943 | |
| Two-way flow rate, (note-1) vp | 1149 | pc/h |
| Highest directional split proportion (note-2) | 689 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 44.9 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 1.00 | |
| PCE for trucks, ET | 1.0 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 1.000 | |
| Two-way flow rate,(note-1) vp | 1073 | pc/h |
| Highest directional split proportion (note-2) | 644 | |
| Base percent time-spent-following, BPTSF | 61.1 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.0 | |
| Percent time-spent-following, PTSF | 61.1 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | D | |
| Volume to capacity ratio, v/c | 0.36 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 1610 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 5796 | veh-mi |
| Peak 15-min total travel time, TT15 | 35.9 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone: _____ Fax: _____
 E-Mail: _____

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 9/10/11
 Analysis Time Period
 Highway SR 2
 From/To Eastern Leg
 Jurisdiction Whitfield County
 Analysis Year 2035 - Build
 Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 8.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 966 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.99 | |
| PCE for trucks, ET | 1.5 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.943 | |
| Two-way flow rate, (note-1) vp | 1149 | pc/h |
| Highest directional split proportion (note-2) | 689 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 0.0 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 58.0 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 49.1 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 1.00 | |
| PCE for trucks, ET | 1.0 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 1.000 | |
| Two-way flow rate, (note-1) vp | 1073 | pc/h |
| Highest directional split proportion (note-2) | 644 | |
| Base percent time-spent-following, BPTSF | 61.1 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.0 | |
| Percent time-spent-following, PTSF | 61.1 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | C | |
| Volume to capacity ratio, v/c | 0.36 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 1610 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 5796 | veh-mi |
| Peak 15-min total travel time, TT15 | 32.8 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone: Fax:
E-Mail:

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
Agency/Co. Moreland Altobelli
Date Performed 7/11/11
Analysis Time Period
Highway SR 2
From/To Middle Leg
Jurisdiction Whitfield County
Analysis Year 2009
Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 379 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.93 | |
| PCE for trucks, ET | 1.9 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.903 | |
| Two-way flow rate, (note-1) vp | 502 | pc/h |
| Highest directional split proportion (note-2) | 301 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 49.9 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 0.77 | |
| PCE for trucks, ET | 1.8 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.912 | |
| Two-way flow rate,(note-1) vp | 599 | pc/h |
| Highest directional split proportion (note-2) | 359 | |
| Base percent time-spent-following, BPTSF | 40.9 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.0 | |
| Percent time-spent-following, PTSF | 40.9 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | C | |
| Volume to capacity ratio, v/c | 0.16 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 632 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 2274 | veh-mi |
| Peak 15-min total travel time, TT15 | 12.7 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone: _____ Fax: _____
 E-Mail: _____

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 7/11/11
 Analysis Time Period
 Highway SR 2
 From/To Middle Leg
 Jurisdiction Whitfield County
 Analysis Year 2035
 Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|----------------|---------|----|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |

Two-way hourly volume, V 558 veh/h
 Directional split 60 / 40 %

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.93 | |
| PCE for trucks, ET | 1.9 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.903 | |
| Two-way flow rate, (note-1) vp | 739 | pc/h |
| Highest directional split proportion (note-2) | 443 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 48.1 | mi/h |

-----Percent Time-Spent-Following-----

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 0.94 | |
| PCE for trucks, ET | 1.5 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.943 | |
| Two-way flow rate,(note-1) vp | 699 | pc/h |
| Highest directional split proportion (note-2) | 419 | |
| Base percent time-spent-following, BPTSF | 45.9 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.0 | |
| Percent time-spent-following, PTSF | 45.9 | % |

-----Level of Service and Other Performance Measures-----

| | | |
|--|------|--------|
| Level of service, LOS | C | |
| Volume to capacity ratio, v/c | 0.23 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 930 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 3348 | veh-mi |
| Peak 15-min total travel time, TT15 | 19.3 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone:
E-mail:

Fax:

OPERATIONAL ANALYSIS

Analyst: William Ruhsam
Agency/Co: Moreland Altobelli
Date: 9/10/11
Analysis Period: PM
Highway: SR 2
From/To: SR 201 to SR 71
Jurisdiction: Whitfield County
Analysis Year: 2035
Project ID: Widening

FREE-FLOW SPEED

| | Direction | 1 | | 2 | |
|-----------------------------------|-----------|-----------|-----|-----------|-----|
| Lane width | | 12.0 | ft | 12.0 | ft |
| Lateral clearance: | | | | | |
| Right edge | | 6.0 | ft | 6.0 | ft |
| Left edge | | 6.0 | ft | 6.0 | ft |
| Total lateral clearance | | 12.0 | ft | 12.0 | ft |
| Access points per mile | | 6 | | 6 | |
| Median type | | Undivided | | Undivided | |
| Free-flow speed: | | Base | | Base | |
| FFS or BFFS | | 60.0 | mph | 60.0 | mph |
| Lane width adjustment, FLW | | 0.0 | mph | 0.0 | mph |
| Lateral clearance adjustment, FLC | | 0.0 | mph | 0.0 | mph |
| Median type adjustment, FM | | 1.6 | mph | 1.6 | mph |
| Access points adjustment, FA | | 1.5 | mph | 1.5 | mph |
| Free-flow speed | | 56.9 | mph | 56.9 | mph |

VOLUME

| | Direction | 1 | | 2 | |
|----------------------------------|-----------|---------|--------|---------|--------|
| Volume, V | | 360 | vph | 240 | vph |
| Peak-hour factor, PHF | | 0.90 | | 0.90 | |
| Peak 15-minute volume, v15 | | 100 | | 67 | |
| Trucks and buses | | 12 | % | 12 | % |
| Recreational vehicles | | 0 | % | 0 | % |
| Terrain type | | Rolling | | Rolling | |
| Grade | | 0.00 | % | 0.00 | % |
| Segment length | | 0.00 | mi | 0.00 | mi |
| Number of lanes | | 2 | | 2 | |
| Driver population adjustment, fP | | 1.00 | | 1.00 | |
| Trucks and buses PCE, ET | | 2.5 | | 2.5 | |
| Recreational vehicles PCE, ER | | 2.0 | | 2.0 | |
| Heavy vehicle adjustment, fHV | | 0.847 | | 0.847 | |
| Flow rate, vp | | 236 | pcphpl | 157 | pcphpl |

RESULTS

| | Direction | 1 | | 2 | |
|------------------------------------|-----------|------|----------|------|----------|
| Flow rate, vp | | 236 | pcphpl | 157 | pcphpl |
| Free-flow speed, FFS | | 56.9 | mph | 56.9 | mph |
| Avg. passenger-car travel speed, S | | 56.9 | mph | 56.9 | mph |
| Level of service, LOS | | A | | A | |
| Density, D | | 4.1 | pc/mi/ln | 2.8 | pc/mi/ln |

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: _____ Fax: _____
 E-Mail: _____

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 7/11/11
 Analysis Time Period
 Highway SR 2
 From/To Western Leg
 Jurisdiction Whitfield County
 Analysis Year 2009
 Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 173 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.71 | |
| PCE for trucks, ET | 2.5 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.847 | |
| Two-way flow rate, (note-1) vp | 319 | pc/h |
| Highest directional split proportion (note-2) | 191 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 51.3 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 0.77 | |
| PCE for trucks, ET | 1.8 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.912 | |
| Two-way flow rate,(note-1) vp | 274 | pc/h |
| Highest directional split proportion (note-2) | 164 | |
| Base percent time-spent-following, BPTSF | 21.4 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 1.2 | |
| Percent time-spent-following, PTSF | 22.6 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | B | |
| Volume to capacity ratio, v/c | 0.10 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 288 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 1038 | veh-mi |
| Peak 15-min total travel time, TT15 | 5.6 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 7/11/11
 Analysis Time Period
 Highway SR 2
 From/To Western Leg
 Jurisdiction Whitfield County
 Analysis Year 2035
 Description North Whitfield County Corridor Study

Input Data

| | | | | | |
|----------------|---------|----|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |

Two-way hourly volume, V 257 veh/h
 Directional split 60 / 40 %

Average Travel Speed

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.71 | |
| PCE for trucks, ET | 2.5 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.847 | |
| Two-way flow rate, (note-1) vp | 475 | pc/h |
| Highest directional split proportion (note-2) | 285 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 50.1 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 0.77 | |
| PCE for trucks, ET | 1.8 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.912 | |
| Two-way flow rate,(note-1) vp | 406 | pc/h |
| Highest directional split proportion (note-2) | 244 | |
| Base percent time-spent-following, BPTSF | 30.0 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.5 | |
| Percent time-spent-following, PTSF | 30.5 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | B | |
| Volume to capacity ratio, v/c | 0.15 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 428 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 1542 | veh-mi |
| Peak 15-min total travel time, TT15 | 8.5 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone: _____ Fax: _____
 E-Mail: _____

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 7/11/11
 Analysis Time Period
 Highway SR 201
 From/To Eastern Leg
 Jurisdiction Whitfield County
 Analysis Year 2009
 Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 487 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.93 | |
| PCE for trucks, ET | 1.9 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.903 | |
| Two-way flow rate, (note-1) vp | 645 | pc/h |
| Highest directional split proportion (note-2) | 387 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 48.8 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 0.94 | |
| PCE for trucks, ET | 1.5 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.943 | |
| Two-way flow rate,(note-1) vp | 610 | pc/h |
| Highest directional split proportion (note-2) | 366 | |
| Base percent time-spent-following, BPTSF | 41.5 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.0 | |
| Percent time-spent-following, PTSF | 41.5 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | C | |
| Volume to capacity ratio, v/c | 0.20 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 812 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 2922 | veh-mi |
| Peak 15-min total travel time, TT15 | 16.6 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 7/11/11
 Analysis Time Period
 Highway SR 201
 From/To Eastern Leg
 Jurisdiction Whitfield County
 Analysis Year 2035
 Description North Whitfield County Corridor Study

Input Data

| | | | | | |
|----------------|---------|----|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |

Two-way hourly volume, V 717 veh/h
 Directional split 60 / 40 %

Average Travel Speed

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.93 | |
| PCE for trucks, ET | 1.9 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.903 | |
| Two-way flow rate, (note-1) vp | 949 | pc/h |
| Highest directional split proportion (note-2) | 569 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 46.4 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 0.94 | |
| PCE for trucks, ET | 1.5 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.943 | |
| Two-way flow rate,(note-1) vp | 898 | pc/h |
| Highest directional split proportion (note-2) | 539 | |
| Base percent time-spent-following, BPTSF | 54.6 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.0 | |
| Percent time-spent-following, PTSF | 54.6 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | C | |
| Volume to capacity ratio, v/c | 0.30 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 1195 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 4302 | veh-mi |
| Peak 15-min total travel time, TT15 | 25.7 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone: Fax:
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 7/11/11
 Analysis Time Period
 Highway SR 201
 From/To Middle Leg
 Jurisdiction Whitfield County
 Analysis Year 2009
 Description North Whitfield County Corridor Study

Input Data

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 806 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

Average Travel Speed

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.93 | |
| PCE for trucks, ET | 1.9 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.903 | |
| Two-way flow rate, (note-1) vp | 1067 | pc/h |
| Highest directional split proportion (note-2) | 640 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 45.5 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 0.94 | |
| PCE for trucks, ET | 1.5 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.943 | |
| Two-way flow rate,(note-1) vp | 1010 | pc/h |
| Highest directional split proportion (note-2) | 606 | |
| Base percent time-spent-following, BPTSF | 58.8 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.0 | |
| Percent time-spent-following, PTSF | 58.8 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | C | |
| Volume to capacity ratio, v/c | 0.33 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 1343 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 4836 | veh-mi |
| Peak 15-min total travel time, TT15 | 29.5 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone: _____ Fax: _____
 E-Mail: _____

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 7/11/11
 Analysis Time Period
 Highway SR 201
 From/To Middle Leg
 Jurisdiction Whitfield County
 Analysis Year 2035
 Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 1188 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.99 | |
| PCE for trucks, ET | 1.5 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.943 | |
| Two-way flow rate, (note-1) vp | 1413 | pc/h |
| Highest directional split proportion (note-2) | 848 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 42.8 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 1.00 | |
| PCE for trucks, ET | 1.0 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 1.000 | |
| Two-way flow rate,(note-1) vp | 1320 | pc/h |
| Highest directional split proportion (note-2) | 792 | |
| Base percent time-spent-following, BPTSF | 68.7 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.0 | |
| Percent time-spent-following, PTSF | 68.7 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | D | |
| Volume to capacity ratio, v/c | 0.44 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 1980 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 7128 | veh-mi |
| Peak 15-min total travel time, TT15 | 46.2 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone:
E-mail:

Fax:

OPERATIONAL ANALYSIS

Analyst: William Ruhsam
 Agency/Co: Moreland Altobelli
 Date: 9/10/11
 Analysis Period:
 Highway: SR 201
 From/To: I-75 to SR 2
 Jurisdiction: Whitfield County
 Analysis Year: 2035 - Build 4 Lanes
 Project ID: North Whitfield County Corridor Study

FREE-FLOW SPEED

| Direction | 1 | | 2 | |
|-----------------------------------|---------|-----|---------|-----|
| Lane width | 12.0 | ft | 12.0 | ft |
| Lateral clearance: | | | | |
| Right edge | 6.0 | ft | 6.0 | ft |
| Left edge | 6.0 | ft | 6.0 | ft |
| Total lateral clearance | 12.0 | ft | 12.0 | ft |
| Access points per mile | 8 | | 8 | |
| Median type | Divided | | Divided | |
| Free-flow speed: | Base | | Base | |
| FFS or BFFS | 55.0 | mph | 55.0 | mph |
| Lane width adjustment, FLW | 0.0 | mph | 0.0 | mph |
| Lateral clearance adjustment, FLC | 0.0 | mph | 0.0 | mph |
| Median type adjustment, FM | 0.0 | mph | 0.0 | mph |
| Access points adjustment, FA | 2.0 | mph | 2.0 | mph |
| Free-flow speed | 53.0 | mph | 53.0 | mph |

VOLUME

| Direction | 1 | | 2 | |
|----------------------------------|---------|--------|---------|--------|
| Volume, V | 715 | vph | 475 | vph |
| Peak-hour factor, PHF | 0.90 | | 0.90 | |
| Peak 15-minute volume, v15 | 199 | | 132 | |
| Trucks and buses | 12 | % | 12 | % |
| Recreational vehicles | 0 | % | 0 | % |
| Terrain type | Rolling | | Rolling | |
| Grade | 0.00 | % | 0.00 | % |
| Segment length | 0.00 | mi | 0.00 | mi |
| Number of lanes | 2 | | 2 | |
| Driver population adjustment, fP | 1.00 | | 1.00 | |
| Trucks and buses PCE, ET | 2.5 | | 2.5 | |
| Recreational vehicles PCE, ER | 2.0 | | 2.0 | |
| Heavy vehicle adjustment, fHV | 0.847 | | 0.847 | |
| Flow rate, vp | 468 | pcphpl | 311 | pcphpl |

RESULTS

| | Direction | 1 | | 2 | |
|------------------------------------|-----------|------|----------|------|----------|
| Flow rate, vp | | 468 | pcphp1 | 311 | pcphp1 |
| Free-flow speed, FFS | | 53.0 | mph | 53.0 | mph |
| Avg. passenger-car travel speed, S | | 53.0 | mph | 53.0 | mph |
| Level of service, LOS | | A | | A | |
| Density, D | | 8.8 | pc/mi/ln | 5.9 | pc/mi/ln |

Overall results are not computed when free-flow speed is less than 45 mph.

Phone:
E-Mail:

Fax:

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 9/10/11
 Analysis Time Period 2035
 Highway SR 71
 From/To Northern Leg
 Jurisdiction Whitfield County
 Analysis Year 2035
 Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 6.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 0.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Level | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 16 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 594 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 1.00 | |
| PCE for trucks, ET | 1.2 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, | 0.977 | |
| Two-way flow rate, (note-1) vp | 676 | pc/h |
| Highest directional split proportion (note-2) | 406 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.0* | mi/h |
| Adj. for access points, fA | 4.0 | mi/h |
| Free-flow speed, FFS | 52.0 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 46.8 | mi/h |

-----Percent Time-Spent-Following-----

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 1.00 | |
| PCE for trucks, ET | 1.1 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.988 | |
| Two-way flow rate, (note-1) vp | 668 | pc/h |
| Highest directional split proportion (note-2) | 401 | |
| Base percent time-spent-following, BPTSF | 44.4 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.0 | |
| Percent time-spent-following, PTSF | 44.4 | % |

-----Level of Service and Other Performance Measures-----

| | | |
|--|------|--------|
| Level of service, LOS | C | |
| Volume to capacity ratio, v/c | 0.21 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 0 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 0 | veh-mi |
| Peak 15-min total travel time, TT15 | 0.0 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

* These items have been entered or edited to override calculated value

Phone: _____ Fax: _____
 E-Mail: _____

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 7/11/11
 Analysis Time Period
 Highway SR 201
 From/To Western Leg
 Jurisdiction Whitfield County
 Analysis Year 2009
 Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 274 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.71 | |
| PCE for trucks, ET | 2.5 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.847 | |
| Two-way flow rate, (note-1) vp | 506 | pc/h |
| Highest directional split proportion (note-2) | 304 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 49.9 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 0.77 | |
| PCE for trucks, ET | 1.8 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.912 | |
| Two-way flow rate,(note-1) vp | 433 | pc/h |
| Highest directional split proportion (note-2) | 260 | |
| Base percent time-spent-following, BPTSF | 31.7 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.4 | |
| Percent time-spent-following, PTSF | 32.1 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | C | |
| Volume to capacity ratio, v/c | 0.16 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 457 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 1644 | veh-mi |
| Peak 15-min total travel time, TT15 | 9.2 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone: _____ Fax: _____
 E-Mail: _____

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 9/10/11
 Analysis Time Period
 Highway SR 201
 From/To Western Leg
 Jurisdiction Whitfield County
 Analysis Year 2009
 Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 10.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 2 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 274 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.71 | |
| PCE for trucks, ET | 2.5 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.847 | |
| Two-way flow rate, (note-1) vp | 506 | pc/h |
| Highest directional split proportion (note-2) | 304 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 0.0 | mi/h |
| Adj. for access points, fA | 0.5 | mi/h |
| Free-flow speed, FFS | 59.5 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 55.6 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 0.77 | |
| PCE for trucks, ET | 1.8 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.912 | |
| Two-way flow rate, (note-1) vp | 433 | pc/h |
| Highest directional split proportion (note-2) | 260 | |
| Base percent time-spent-following, BPTSF | 31.7 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.4 | |
| Percent time-spent-following, PTSF | 32.1 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | A | |
| Volume to capacity ratio, v/c | 0.16 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 457 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 1644 | veh-mi |
| Peak 15-min total travel time, TT15 | 8.2 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone: Fax:
E-Mail:

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
Agency/Co. Moreland Altobelli
Date Performed 7/11/11
Analysis Time Period
Highway SR 201
From/To Western Leg
Jurisdiction Whitfield County
Analysis Year 2035
Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 6.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 404 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.93 | |
| PCE for trucks, ET | 1.9 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.903 | |
| Two-way flow rate, (note-1) vp | 535 | pc/h |
| Highest directional split proportion (note-2) | 321 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 49.6 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 0.94 | |
| PCE for trucks, ET | 1.5 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.943 | |
| Two-way flow rate,(note-1) vp | 506 | pc/h |
| Highest directional split proportion (note-2) | 304 | |
| Base percent time-spent-following, BPTSF | 35.9 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.2 | |
| Percent time-spent-following, PTSF | 36.1 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | C | |
| Volume to capacity ratio, v/c | 0.17 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 673 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 2424 | veh-mi |
| Peak 15-min total travel time, TT15 | 13.6 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

HCS+: Two-Lane Highways Release 5.2

Phone:
E-Mail:

Fax:

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 9/10/11
 Analysis Time Period 2035
 Highway SR 71
 From/To Northern Leg
 Jurisdiction Whitfield County
 Analysis Year 2035
 Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 6.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 12 | % |
| Segment length | 0.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Level | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 16 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 594 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 1.00 | |
| PCE for trucks, ET | 1.2 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, | 0.977 | |
| Two-way flow rate, (note-1) vp | 676 | pc/h |
| Highest directional split proportion (note-2) | 406 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.0* | mi/h |
| Adj. for access points, fA | 4.0 | mi/h |
| Free-flow speed, FFS | 52.0 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 46.8 | mi/h |

-----Percent Time-Spent-Following-----

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 1.00 | |
| PCE for trucks, ET | 1.1 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.988 | |
| Two-way flow rate, (note-1) vp | 668 | pc/h |
| Highest directional split proportion (note-2) | 401 | |
| Base percent time-spent-following, BPTSF | 44.4 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.0 | |
| Percent time-spent-following, PTSF | 44.4 | % |

-----Level of Service and Other Performance Measures-----

| | | |
|--|------|--------|
| Level of service, LOS | C | |
| Volume to capacity ratio, v/c | 0.21 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 0 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 0 | veh-mi |
| Peak 15-min total travel time, TT15 | 0.0 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-mail:

-----PLANNING ANALYSIS-----

Analyst: William Ruhsam
 Agency/Co: Moreland Altobelli
 Date: 7/11/11
 Analysis Period: 2009
 Highway: SR 71
 From/To: Northern Leg
 Jurisdiction: Whitfield County
 Analysis Year: 2009
 Project ID: North Whitfield County Corridor Study

-----INPUT DATA-----

| | | |
|--|---------|-----|
| Total AADT volume, AADT | 4040 | vpd |
| Proportion AADT during peak hour, K | 0.09 | |
| Percent peak-hour traffic in heaviest direction, D | 60 | % |
| Trucks | 12 | % |
| Terrain type | Rolling | |
| Base free-flow speed, BFFS | 60.0 | mph |

-----ANALYSIS-----

DDHV = AADT x D x K
 DDHV = 4040 x 0.60 x 0.09 = 218

| | | | |
|----------------------|-------------------|-------|-----|
| Volume for : | | | LOS |
| 4-lane highway = 218 | vph/2 lanes = 109 | vphpl | A |
| 6-lane highway = 218 | vph/3 lanes = 72 | vphpl | A |

-----LEVEL OF SERVICE-----

| | | Free-Flow Speed = 60 mph | | | | | Free-Flow Speed = 50 mph | | | | |
|---------------|-----|--------------------------|------|------|------|------|--------------------------|------|------|------|------|
| | | Percent Trucks | | | | | Percent Trucks | | | | |
| | LOS | 0 | 5 | 10 | 15 | 20 | 0 | 5 | 10 | 15 | 20 |
| Terrain Level | A | 560 | 550 | 530 | 520 | 510 | 440 | 430 | 420 | 410 | 400 |
| | B | 920 | 900 | 870 | 850 | 840 | 710 | 700 | 680 | 660 | 650 |
| | C | 1310 | 1280 | 1250 | 1220 | 1190 | 1030 | 1000 | 980 | 960 | 940 |
| | D | 1680 | 1640 | 1600 | 1570 | 1530 | 1350 | 1320 | 1290 | 1260 | 1230 |
| | E | 1870 | 1820 | 1780 | 1740 | 1700 | 1610 | 1570 | 1530 | 1500 | 1460 |
| Rolling | A | 560 | 520 | 490 | 460 | 430 | 440 | 410 | 380 | 360 | 340 |
| | B | 920 | 850 | 800 | 750 | 710 | 710 | 660 | 620 | 580 | 550 |
| | C | 1310 | 1220 | 1140 | 1070 | 1010 | 1030 | 960 | 900 | 840 | 790 |
| | D | 1680 | 1570 | 1470 | 1380 | 1300 | 1350 | 1260 | 1180 | 1100 | 1040 |
| | E | 1870 | 1740 | 1620 | 1520 | 1440 | 1610 | 1500 | 1400 | 1310 | 1240 |
| Mountain | A | 560 | 480 | 420 | 370 | 330 | 440 | 370 | 320 | 290 | 260 |

| | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|-----|
| B | 920 | 780 | 680 | 600 | 540 | 710 | 610 | 530 | 470 | 420 |
| C | 1310 | 1120 | 970 | 860 | 770 | 1030 | 880 | 760 | 680 | 610 |
| D | 1680 | 1430 | 1250 | 1100 | 990 | 1350 | 1150 | 1000 | 890 | 800 |
| E | 1870 | 1590 | 1380 | 1220 | 1100 | 1610 | 1370 | 1190 | 1050 | 950 |

Assumptions: highway with 60 mi/h FFS has 8 access points/mi; highway with 50 mi/h FFS has 25 access points/mi; lane width = 12 ft; shoulder width > 6 ft; divided highway; PHF = 0.88; all heavy vehicles are trucks and regular commuters

Phone: Fax:
E-mail:

-----PLANNING ANALYSIS-----

Analyst: William Ruhsam
Agency/Co: Moreland Altobelli
Date: 7/11/11
Analysis Period: 2035
Highway: SR 71
From/To: Northern Leg
Jurisdiction: Whitfield County
Analysis Year: 2035
Project ID: North Whitfield County Corridor Study

-----INPUT DATA-----

| | | |
|--|---------|-----|
| Total AADT volume, AADT | 6600 | vpd |
| Proportion AADT during peak hour, K | 0.09 | |
| Percent peak-hour traffic in heaviest direction, D | 60 | % |
| Trucks | 12 | % |
| Terrain type | Rolling | |
| Base free-flow speed, BFFS | 60.0 | mph |

-----ANALYSIS-----

DDHV = AADT x D x K
DDHV = 6600 x 0.60 x 0.09 = 356

| | | | |
|----------------------|-------------------|-------|-----|
| Volume for : | | | LOS |
| 4-lane highway = 356 | vph/2 lanes = 178 | vphpl | A |
| 6-lane highway = 356 | vph/3 lanes = 118 | vphpl | A |

-----LEVEL OF SERVICE-----

| | | Free-Flow Speed = 60 mph | | | | | Free-Flow Speed = 50 mph | | | | |
|---------------|-----|--------------------------|------|------|------|------|--------------------------|------|------|------|------|
| | | Percent Trucks | | | | | Percent Trucks | | | | |
| | LOS | 0 | 5 | 10 | 15 | 20 | 0 | 5 | 10 | 15 | 20 |
| Terrain Level | A | 560 | 550 | 530 | 520 | 510 | 440 | 430 | 420 | 410 | 400 |
| | B | 920 | 900 | 870 | 850 | 840 | 710 | 700 | 680 | 660 | 650 |
| | C | 1310 | 1280 | 1250 | 1220 | 1190 | 1030 | 1000 | 980 | 960 | 940 |
| | D | 1680 | 1640 | 1600 | 1570 | 1530 | 1350 | 1320 | 1290 | 1260 | 1230 |
| | E | 1870 | 1820 | 1780 | 1740 | 1700 | 1610 | 1570 | 1530 | 1500 | 1460 |
| Rolling | A | 560 | 520 | 490 | 460 | 430 | 440 | 410 | 380 | 360 | 340 |
| | B | 920 | 850 | 800 | 750 | 710 | 710 | 660 | 620 | 580 | 550 |
| | C | 1310 | 1220 | 1140 | 1070 | 1010 | 1030 | 960 | 900 | 840 | 790 |
| | D | 1680 | 1570 | 1470 | 1380 | 1300 | 1350 | 1260 | 1180 | 1100 | 1040 |
| | E | 1870 | 1740 | 1620 | 1520 | 1440 | 1610 | 1500 | 1400 | 1310 | 1240 |
| Mountain | A | 560 | 480 | 420 | 370 | 330 | 440 | 370 | 320 | 290 | 260 |

| | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|-----|
| B | 920 | 780 | 680 | 600 | 540 | 710 | 610 | 530 | 470 | 420 |
| C | 1310 | 1120 | 970 | 860 | 770 | 1030 | 880 | 760 | 680 | 610 |
| D | 1680 | 1430 | 1250 | 1100 | 990 | 1350 | 1150 | 1000 | 890 | 800 |
| E | 1870 | 1590 | 1380 | 1220 | 1100 | 1610 | 1370 | 1190 | 1050 | 950 |

Assumptions: highway with 60 mi/h FFS has 8 access points/mi; highway with 50 mi/h FFS has 25 access points/mi; lane width = 12 ft; shoulder width > 6 ft; divided highway; PHF = 0.88; all heavy vehicles are trucks and regular commuters

Phone: Fax:
E-mail:

-----PLANNING ANALYSIS-----

Analyst: William Ruhsam
 Agency/Co: Moreland Altobelli
 Date: 7/11/11
 Analysis Period: 2009
 Highway: SR 71
 From/To: Southern Leg
 Jurisdiction: Whitfield County
 Analysis Year: 2009
 Project ID: North Whitfield County Corridor Study

-----INPUT DATA-----

| | | |
|--|---------|-----|
| Total AADT volume, AADT | 9440 | vpd |
| Proportion AADT during peak hour, K | 0.09 | |
| Percent peak-hour traffic in heaviest direction, D | 60 | % |
| Trucks | 12 | % |
| Terrain type | Rolling | |
| Base free-flow speed, BFFS | 60.0 | mph |

-----ANALYSIS-----

DDHV = AADT x D x K
 DDHV = 9440 x 0.60 x 0.09 = 510

| | | | |
|----------------------|-------------------|-------|-----|
| Volume for : | | | LOS |
| 4-lane highway = 510 | vph/2 lanes = 255 | vphpl | A |
| 6-lane highway = 510 | vph/3 lanes = 170 | vphpl | A |

-----LEVEL OF SERVICE-----

| | | Free-Flow Speed = 60 mph | | | | | Free-Flow Speed = 50 mph | | | | |
|------------------|-----|--------------------------|------|------|------|------|--------------------------|------|------|------|------|
| | | Percent Trucks | | | | | Percent Trucks | | | | |
| | LOS | 0 | 5 | 10 | 15 | 20 | 0 | 5 | 10 | 15 | 20 |
| Terrain Level | A | 560 | 550 | 530 | 520 | 510 | 440 | 430 | 420 | 410 | 400 |
| | B | 920 | 900 | 870 | 850 | 840 | 710 | 700 | 680 | 660 | 650 |
| | C | 1310 | 1280 | 1250 | 1220 | 1190 | 1030 | 1000 | 980 | 960 | 940 |
| | D | 1680 | 1640 | 1600 | 1570 | 1530 | 1350 | 1320 | 1290 | 1260 | 1230 |
| | E | 1870 | 1820 | 1780 | 1740 | 1700 | 1610 | 1570 | 1530 | 1500 | 1460 |
| Rolling | A | 560 | 520 | 490 | 460 | 430 | 440 | 410 | 380 | 360 | 340 |
| | B | 920 | 850 | 800 | 750 | 710 | 710 | 660 | 620 | 580 | 550 |
| | C | 1310 | 1220 | 1140 | 1070 | 1010 | 1030 | 960 | 900 | 840 | 790 |
| | D | 1680 | 1570 | 1470 | 1380 | 1300 | 1350 | 1260 | 1180 | 1100 | 1040 |
| | E | 1870 | 1740 | 1620 | 1520 | 1440 | 1610 | 1500 | 1400 | 1310 | 1240 |
| Mountain | A | 560 | 480 | 420 | 370 | 330 | 440 | 370 | 320 | 290 | 260 |

| | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|-----|
| B | 920 | 780 | 680 | 600 | 540 | 710 | 610 | 530 | 470 | 420 |
| C | 1310 | 1120 | 970 | 860 | 770 | 1030 | 880 | 760 | 680 | 610 |
| D | 1680 | 1430 | 1250 | 1100 | 990 | 1350 | 1150 | 1000 | 890 | 800 |
| E | 1870 | 1590 | 1380 | 1220 | 1100 | 1610 | 1370 | 1190 | 1050 | 950 |

Assumptions: highway with 60 mi/h FFS has 8 access points/mi; highway with 50 mi/h FFS has 25 access points/mi; lane width = 12 ft; shoulder width > 6 ft; divided highway; PHF = 0.88; all heavy vehicles are trucks and regular commuters

HCS+: Multilane Highways Release 5.2

Phone:
E-mail:

Fax:

PLANNING ANALYSIS

Analyst: William Ruhsam
 Agency/Co: Moreland Altobelli
 Date: 7/11/11
 Analysis Period: 2035
 Highway: SR 71
 From/To: Southern Leg
 Jurisdiction: Whitfield County
 Analysis Year: 2035
 Project ID: North Whitfield County Corridor Study

INPUT DATA

| | | |
|--|---------|-----|
| Total AADT volume, AADT | 13900 | vpd |
| Proportion AADT during peak hour, K | 0.09 | |
| Percent peak-hour traffic in heaviest direction, D | 60 | % |
| Trucks | 12 | % |
| Terrain type | Rolling | |
| Base free-flow speed, BFFS | 60.0 | mph |

ANALYSIS

DDHV = AADT x D x K
 DDHV = 13900 x 0.60 x 0.09 = 751

| | | | |
|----------------------|-------------------|-------|-----|
| Volume for : | | | LOS |
| 4-lane highway = 751 | vph/2 lanes = 375 | vphpl | A |
| 6-lane highway = 751 | vph/3 lanes = 250 | vphpl | A |

LEVEL OF SERVICE

| | | Free-Flow Speed = 60 mph | | | | | Free-Flow Speed = 50 mph | | | | |
|---------------|-----|--------------------------|------|------|------|------|--------------------------|------|------|------|------|
| | | Percent Trucks | | | | | Percent Trucks | | | | |
| | LOS | 0 | 5 | 10 | 15 | 20 | 0 | 5 | 10 | 15 | 20 |
| Terrain Level | A | 560 | 550 | 530 | 520 | 510 | 440 | 430 | 420 | 410 | 400 |
| | B | 920 | 900 | 870 | 850 | 840 | 710 | 700 | 680 | 660 | 650 |
| | C | 1310 | 1280 | 1250 | 1220 | 1190 | 1030 | 1000 | 980 | 960 | 940 |
| | D | 1680 | 1640 | 1600 | 1570 | 1530 | 1350 | 1320 | 1290 | 1260 | 1230 |
| | E | 1870 | 1820 | 1780 | 1740 | 1700 | 1610 | 1570 | 1530 | 1500 | 1460 |
| Rolling | A | 560 | 520 | 490 | 460 | 430 | 440 | 410 | 380 | 360 | 340 |
| | B | 920 | 850 | 800 | 750 | 710 | 710 | 660 | 620 | 580 | 550 |
| | C | 1310 | 1220 | 1140 | 1070 | 1010 | 1030 | 960 | 900 | 840 | 790 |
| | D | 1680 | 1570 | 1470 | 1380 | 1300 | 1350 | 1260 | 1180 | 1100 | 1040 |
| | E | 1870 | 1740 | 1620 | 1520 | 1440 | 1610 | 1500 | 1400 | 1310 | 1240 |
| Mountain | A | 560 | 480 | 420 | 370 | 330 | 440 | 370 | 320 | 290 | 260 |

| | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|-----|
| B | 920 | 780 | 680 | 600 | 540 | 710 | 610 | 530 | 470 | 420 |
| C | 1310 | 1120 | 970 | 860 | 770 | 1030 | 880 | 760 | 680 | 610 |
| D | 1680 | 1430 | 1250 | 1100 | 990 | 1350 | 1150 | 1000 | 890 | 800 |
| E | 1870 | 1590 | 1380 | 1220 | 1100 | 1610 | 1370 | 1190 | 1050 | 950 |

Assumptions: highway with 60 mi/h FFS has 8 access points/mi; highway with 50 mi/h FFS has 25 access points/mi; lane width = 12 ft; shoulder width > 6 ft; divided highway; PHF = 0.88; all heavy vehicles are trucks and regular commuters

Phone: Fax:
E-Mail:

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
 Agency/Co. Moreland Altobelli
 Date Performed 7/11/11
 Analysis Time Period
 Highway US 41
 From/To Northern Leg
 Jurisdiction Whitfield County
 Analysis Year 2009
 Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 9 | % |
| Segment length | 1.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 404 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.93 | |
| PCE for trucks, ET | 1.9 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.925 | |
| Two-way flow rate, (note-1) vp | 522 | pc/h |
| Highest directional split proportion (note-2) | 313 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 49.7 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 0.94 | |
| PCE for trucks, ET | 1.5 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.957 | |
| Two-way flow rate,(note-1) vp | 499 | pc/h |
| Highest directional split proportion (note-2) | 299 | |
| Base percent time-spent-following, BPTSF | 35.5 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.3 | |
| Percent time-spent-following, PTSF | 35.8 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | C | |
| Volume to capacity ratio, v/c | 0.16 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 112 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 404 | veh-mi |
| Peak 15-min total travel time, TT15 | 2.3 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone: Fax:
E-Mail:

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst William Ruhsam
Agency/Co. Moreland Altobelli
Date Performed 7/11/11
Analysis Time Period
Highway US 41
From/To Northern Leg
Jurisdiction Whitfield County
Analysis Year 2035
Description North Whitfield County Corridor Study

-----Input Data-----

| | | | | | |
|--------------------------|---------|-------|-------------------------|------|-----|
| Highway class | Class 1 | | | | |
| Shoulder width | 1.0 | ft | Peak-hour factor, PHF | 0.90 | |
| Lane width | 12.0 | ft | % Trucks and buses | 9 | % |
| Segment length | 1.0 | mi | % Recreational vehicles | 0 | % |
| Terrain type | Rolling | | % No-passing zones | 0 | % |
| Grade: Length | | mi | Access points/mi | 8 | /mi |
| Up/down | | % | | | |
| Two-way hourly volume, V | 594 | veh/h | | | |
| Directional split | 60 / 40 | % | | | |

-----Average Travel Speed-----

| | | |
|---|-------|-------|
| Grade adjustment factor, fG | 0.93 | |
| PCE for trucks, ET | 1.9 | |
| PCE for RVs, ER | 1.1 | |
| Heavy-vehicle adjustment factor, | 0.925 | |
| Two-way flow rate, (note-1) vp | 767 | pc/h |
| Highest directional split proportion (note-2) | 460 | pc/h |
| Free-Flow Speed from Field Measurement: | | |
| Field measured speed, SFM | - | mi/h |
| Observed volume, Vf | - | veh/h |
| Estimated Free-Flow Speed: | | |
| Base free-flow speed, BFFS | 60.0 | mi/h |
| Adj. for lane and shoulder width, fLS | 4.2 | mi/h |
| Adj. for access points, fA | 2.0 | mi/h |
| Free-flow speed, FFS | 53.8 | mi/h |
| Adjustment for no-passing zones, fnp | 0.0 | mi/h |
| Average travel speed, ATS | 47.8 | mi/h |

Percent Time-Spent-Following

| | | |
|--|-------|------|
| Grade adjustment factor, fG | 0.94 | |
| PCE for trucks, ET | 1.5 | |
| PCE for RVs, ER | 1.0 | |
| Heavy-vehicle adjustment factor, fHV | 0.957 | |
| Two-way flow rate,(note-1) vp | 734 | pc/h |
| Highest directional split proportion (note-2) | 440 | |
| Base percent time-spent-following, BPTSF | 47.5 | % |
| Adj.for directional distribution and no-passing zones, fd/np | 0.0 | |
| Percent time-spent-following, PTSF | 47.5 | % |

Level of Service and Other Performance Measures

| | | |
|--|------|--------|
| Level of service, LOS | C | |
| Volume to capacity ratio, v/c | 0.24 | |
| Peak 15-min vehicle-miles of travel, VMT15 | 165 | veh-mi |
| Peak-hour vehicle-miles of travel, VMT60 | 594 | veh-mi |
| Peak 15-min total travel time, TT15 | 3.4 | veh-h |

Notes:

1. If $vp \geq 3200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $vp \geq 1700$ pc/h, terminate analysis-the LOS is F.

Phone:
E-mail:

Fax:

OPERATIONAL ANALYSIS

Analyst: William Ruhsam
Agency/Co: Moreland Altobelli
Date: 9/10/11
Analysis Period:
Highway: US 41
From/To: Northern Leg
Jurisdiction: Whitfield County
Analysis Year: 2035
Project ID: North Whitfield County Corridor Study

FREE-FLOW SPEED

| | Direction | 1 | | 2 | |
|-----------------------------------|-----------|-----------|-----|-----------|-----|
| Lane width | | 12.0 | ft | 12.0 | ft |
| Lateral clearance: | | | | | |
| Right edge | | 6.0 | ft | 6.0 | ft |
| Left edge | | 6.0 | ft | 6.0 | ft |
| Total lateral clearance | | 12.0 | ft | 12.0 | ft |
| Access points per mile | | 0 | | 0 | |
| Median type | | Undivided | | Undivided | |
| Free-flow speed: | | Base | | Base | |
| FFS or BFFS | | 55.0 | mph | 55.0 | mph |
| Lane width adjustment, FLW | | 0.0 | mph | 0.0 | mph |
| Lateral clearance adjustment, FLC | | 0.0 | mph | 0.0 | mph |
| Median type adjustment, FM | | 1.6 | mph | 1.6 | mph |
| Access points adjustment, FA | | 0.0 | mph | 0.0 | mph |
| Free-flow speed | | 53.4 | mph | 53.4 | mph |

VOLUME

| | Direction | 1 | | 2 | |
|----------------------------------|-----------|---------|--------|---------|--------|
| Volume, V | | 356 | vph | 238 | vph |
| Peak-hour factor, PHF | | 0.90 | | 0.90 | |
| Peak 15-minute volume, v15 | | 99 | | 66 | |
| Trucks and buses | | 9 | % | 9 | % |
| Recreational vehicles | | 0 | % | 0 | % |
| Terrain type | | Rolling | | Rolling | |
| Grade | | 0.00 | % | 0.00 | % |
| Segment length | | 0.00 | mi | 0.00 | mi |
| Number of lanes | | 2 | | 2 | |
| Driver population adjustment, fP | | 1.00 | | 1.00 | |
| Trucks and buses PCE, ET | | 2.5 | | 2.5 | |
| Recreational vehicles PCE, ER | | 2.0 | | 2.0 | |
| Heavy vehicle adjustment, fHV | | 0.881 | | 0.881 | |
| Flow rate, vp | | 224 | pcphpl | 150 | pcphpl |

RESULTS

| | Direction | 1 | | 2 | |
|------------------------------------|-----------|------|----------|------|----------|
| Flow rate, vp | | 224 | pcphpl | 150 | pcphpl |
| Free-flow speed, FFS | | 53.4 | mph | 53.4 | mph |
| Avg. passenger-car travel speed, S | | 53.4 | mph | 53.4 | mph |
| Level of service, LOS | | A | | A | |
| Density, D | | 4.2 | pc/mi/ln | 2.8 | pc/mi/ln |

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

----- PLANNING ANALYSIS -----

Analyst: William Ruhsam
 Agency/Co: Moreland Altobelli
 Date: 7/11/11
 Analysis Period: 2009
 Highway: US 41
 From/To: I-75 to Tunnell Hill
 Jurisdiction: Whitfield County
 Analysis Year: 2009
 Project ID: North Whitfield County Corridor Study

----- INPUT DATA -----

| | | |
|--|---------|-----|
| Total AADT volume, AADT | 21720 | vpd |
| Proportion AADT during peak hour, K | 0.09 | |
| Percent peak-hour traffic in heaviest direction, D | 60 | % |
| Trucks | 9 | % |
| Terrain type | Rolling | |
| Base free-flow speed, BFFS | 60.0 | mph |

----- ANALYSIS -----

DDHV = AADT x D x K
 DDHV = 21720 x 0.60 x 0.09 = 1173

| | | | |
|-----------------------|-------------------|-------|-----|
| Volume for : | | | LOS |
| 4-lane highway = 1173 | vph/2 lanes = 586 | vphpl | B |
| 6-lane highway = 1173 | vph/3 lanes = 391 | vphpl | A |

----- LEVEL OF SERVICE -----

| | | Free-Flow Speed = 60 mph | | | | | Free-Flow Speed = 50 mph | | | | |
|---------------|-----|--------------------------|------|------|------|------|--------------------------|------|------|------|------|
| | | Percent Trucks | | | | | Percent Trucks | | | | |
| | LOS | 0 | 5 | 10 | 15 | 20 | 0 | 5 | 10 | 15 | 20 |
| Terrain Level | A | 560 | 550 | 530 | 520 | 510 | 440 | 430 | 420 | 410 | 400 |
| | B | 920 | 900 | 870 | 850 | 840 | 710 | 700 | 680 | 660 | 650 |
| | C | 1310 | 1280 | 1250 | 1220 | 1190 | 1030 | 1000 | 980 | 960 | 940 |
| | D | 1680 | 1640 | 1600 | 1570 | 1530 | 1350 | 1320 | 1290 | 1260 | 1230 |
| | E | 1870 | 1820 | 1780 | 1740 | 1700 | 1610 | 1570 | 1530 | 1500 | 1460 |
| Rolling | A | 560 | 520 | 490 | 460 | 430 | 440 | 410 | 380 | 360 | 340 |
| | B | 920 | 850 | 800 | 750 | 710 | 710 | 660 | 620 | 580 | 550 |
| | C | 1310 | 1220 | 1140 | 1070 | 1010 | 1030 | 960 | 900 | 840 | 790 |
| | D | 1680 | 1570 | 1470 | 1380 | 1300 | 1350 | 1260 | 1180 | 1100 | 1040 |
| | E | 1870 | 1740 | 1620 | 1520 | 1440 | 1610 | 1500 | 1400 | 1310 | 1240 |
| Mountain | A | 560 | 480 | 420 | 370 | 330 | 440 | 370 | 320 | 290 | 260 |

| | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|-----|
| B | 920 | 780 | 680 | 600 | 540 | 710 | 610 | 530 | 470 | 420 |
| C | 1310 | 1120 | 970 | 860 | 770 | 1030 | 880 | 760 | 680 | 610 |
| D | 1680 | 1430 | 1250 | 1100 | 990 | 1350 | 1150 | 1000 | 890 | 800 |
| E | 1870 | 1590 | 1380 | 1220 | 1100 | 1610 | 1370 | 1190 | 1050 | 950 |

Assumptions: highway with 60 mi/h FFS has 8 access points/mi; highway with 50 mi/h FFS has 25 access points/mi; lane width = 12 ft; shoulder width > 6 ft; divided highway; PHF = 0.88; all heavy vehicles are trucks and regular commuters

Phone: Fax:
E-mail:

-----PLANNING ANALYSIS-----

Analyst: William Ruhsam
 Agency/Co: Moreland Altobelli
 Date: 7/11/11
 Analysis Period: 2009
 Highway: US 41
 From/To: I-75 to Tunnell Hill
 Jurisdiction: Whitfield County
 Analysis Year: 2009
 Project ID: North Whitfield County Corridor Study

-----INPUT DATA-----

| | | |
|--|---------|-----|
| Total AADT volume, AADT | 31990 | vpd |
| Proportion AADT during peak hour, K | 0.09 | |
| Percent peak-hour traffic in heaviest direction, D | 60 | % |
| Trucks | 9 | % |
| Terrain type | Rolling | |
| Base free-flow speed, BFFS | 60.0 | mph |

-----ANALYSIS-----

DDHV = AADT x D x K
 DDHV = 31990 x 0.60 x 0.09 = 1727

| | | | |
|-----------------------|-------------------|-------|-----|
| Volume for : | | | LOS |
| 4-lane highway = 1727 | vph/2 lanes = 863 | vphpl | C |
| 6-lane highway = 1727 | vph/3 lanes = 575 | vphpl | B |

-----LEVEL OF SERVICE-----

| | | Free-Flow Speed = 60 mph | | | | | Free-Flow Speed = 50 mph | | | | |
|------------------|-----|--------------------------|------|------|------|------|--------------------------|------|------|------|------|
| | | Percent Trucks | | | | | Percent Trucks | | | | |
| | LOS | 0 | 5 | 10 | 15 | 20 | 0 | 5 | 10 | 15 | 20 |
| Terrain Level | A | 560 | 550 | 530 | 520 | 510 | 440 | 430 | 420 | 410 | 400 |
| | B | 920 | 900 | 870 | 850 | 840 | 710 | 700 | 680 | 660 | 650 |
| | C | 1310 | 1280 | 1250 | 1220 | 1190 | 1030 | 1000 | 980 | 960 | 940 |
| | D | 1680 | 1640 | 1600 | 1570 | 1530 | 1350 | 1320 | 1290 | 1260 | 1230 |
| | E | 1870 | 1820 | 1780 | 1740 | 1700 | 1610 | 1570 | 1530 | 1500 | 1460 |
| Rolling | A | 560 | 520 | 490 | 460 | 430 | 440 | 410 | 380 | 360 | 340 |
| | B | 920 | 850 | 800 | 750 | 710 | 710 | 660 | 620 | 580 | 550 |
| | C | 1310 | 1220 | 1140 | 1070 | 1010 | 1030 | 960 | 900 | 840 | 790 |
| | D | 1680 | 1570 | 1470 | 1380 | 1300 | 1350 | 1260 | 1180 | 1100 | 1040 |
| | E | 1870 | 1740 | 1620 | 1520 | 1440 | 1610 | 1500 | 1400 | 1310 | 1240 |
| Mountain | A | 560 | 480 | 420 | 370 | 330 | 440 | 370 | 320 | 290 | 260 |

| | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|-----|
| B | 920 | 780 | 680 | 600 | 540 | 710 | 610 | 530 | 470 | 420 |
| C | 1310 | 1120 | 970 | 860 | 770 | 1030 | 880 | 760 | 680 | 610 |
| D | 1680 | 1430 | 1250 | 1100 | 990 | 1350 | 1150 | 1000 | 890 | 800 |
| E | 1870 | 1590 | 1380 | 1220 | 1100 | 1610 | 1370 | 1190 | 1050 | 950 |

Assumptions: highway with 60 mi/h FFS has 8 access points/mi; highway with 50 mi/h FFS has 25 access points/mi; lane width = 12 ft; shoulder width > 6 ft; divided highway; PHF = 0.88; all heavy vehicles are trucks and regular commuters