

GDOT OPERATIONAL IMPROVEMENT PROGRAM

PROCEDURE MANUAL

October 2020



**GDOT Operational Improvements
Procedure Manual**

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1 PROGRAM OVERVIEW

The Georgia Department of Transportation's (GDOT) Operational Improvement Program was developed with the purpose of efficiently and economically addressing operational deficiencies on Georgia's roadways. Through the available funding sources and the structure put in place to select and approve a project, the Program has created a streamlined process for the delivery of "quick" projects that provide a major benefit with a relatively low cost.

1.1 FUNDING SOURCES

When the GDOT Operational Improvement Program was initially set up in 2010, the program had a single, Federal, funding source. That allocation was created through the agreement between the Federal Highway Administration (FHWA) and GDOT. With the passage of the 2015 Transportation Funding Act, additional State funds became available and have led to GDOT setting up a separate lump sum fund for operational improvements.

As projects are identified, they are targeted for funding based on several factors including implementation speed and impact to National Highway System (NHS) facilities. Projects that have low construction costs and that are not on an interstate are generally candidates for State funding as the construction timeline can be expedited as they don't require a NEPA document. Projects located on an Interstate require Federal action and therefore require NEPA clearance. Interstate projects are generally always slated for Federal funding.

1.2 OPERATIONAL IMPROVEMENT COMMITTEE

As the means of selecting appropriate operational projects that address the goals of the Program, the Operational Improvement Committee was setup through the agreement with FHWA. The Committee has been designed in such a way that each of the major offices are represented to appropriately identify and address risks related to recommended improvements.

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As of 2020, the Committee is made up of people from the following positions (or their designee):

- Chief Engineer
- Director of Operations
- Director of Engineering
- Director of Program Delivery
- State Transportation Planning Administrator
- State Traffic Engineer

1.3 PROJECT DEVELOPMENT PROCEDURE

The process for getting a project from the beginning stages as an idea through to project delivery takes about six months on average. The project development goes through several steps, as shown in Figure 1.

The following sections describe in more detail each step of the process for GDOT's Operational Improvement Program.

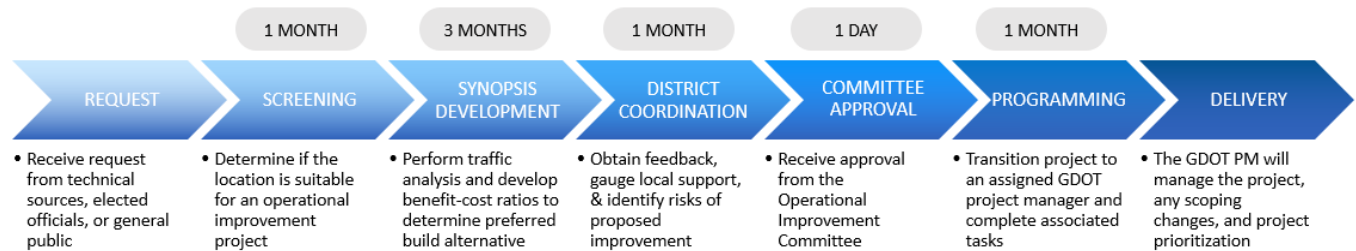


FIGURE 1: GDOT OPERATIONAL IMPROVEMENT PROJECT SUMMARY

2 LOCATION REQUESTS

Locations for roadway segments and intersections to be analyzed for a potential project come from requests from various sources including data driven sources, technical, elected officials, and the general public. The primary source of project identification is congestion data available through the Eastern Transportation Coalition's Regional Integrated Transportation Information System (RITIS). This system provides access to multiple types of transportation congestion data including INRIX and HERE.

Technical sources include GDOT District staff, local agencies, and available congestion data. Technical sources typically provide a high quality of project as the requestors have a better understanding of the underlying issues at the intersection. Additionally, requests come from elected officials and the general public. These requests are often more time sensitive and require the Operational Improvement Team

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(OIT) members to complete a more detailed investigation into the underlying issues as the operational and/or safety concerns at the intersection must be explained in detail whether the location moves forward for an improvement or not.

The Program relies heavily on congestion data as team members are not able to visit all intersections within the state. Sources of congestion data include Regional Integrated Transportation Information System (RITIS) data, Google congestion data, and GDOT Automated Traffic Signal Performance Measures (ATSPM).

3 GOASIS

With multiple sources of project requests and various programs evaluating locations, the OIT relies heavily on GDOT’s online tracking system, Georgia Operational and Safety Information System (GOASIS) to maintain a list of active locations and provide real-time status information to stakeholders. GOASIS is a web-based tracking system that allows users to enter location, track phase status, record important notes about the location, and store key project files.

▲ % Complete	ID	Region	District	County	Mainline	Minor Street	Program Type	Priority	PI #	Current Phase	GDOT PM	Consultant	Notes
40%	19-5010	Ops - 1	5	Chatham	SR 204	Pine Grove Dr	Operations			0 - Screening	1 Perry	Arcadis	
40%	19-6013	Ops - 2	6	Fannin	SR 60	SR 60 Spur	Operations			10 - RSA	1 Perry	Arcadis	
80%	18-038	Ops - 2	4	Tift	SR 7	I-75	Operations			11 - RSA Review	1 Perry	Arcadis	District indicated that a development is proposed near the NB ramps. Project S...
80%	18-3004	Ops - 2	3	Butts	SR 36	Stark Rd	Operations			12 - TE Study	1 Perry	Arcadis	Rail crossing just south of intersection. Not enough available RW for low cost roundabout option.
60%	19-6014	Ops - 2	6	Cherokee	SR 108	SR 140	Operations			13 - Synopsis	1 Perry	Arcadis	New counts need to be taken due to new traffic patterns from a nearby school.
70%	19-1019	Ops - 1	1	Forsyth	SR 20	SR 400 NB to Marketplace/Ronald Reagan Blvd	Operations			20 - Concept Report	1 Perry	Arcadis	
80%	18-001	Ops - 2	3	Henry	SR 155	Campground Rd	Operations			30 - Full Design	1 Perry	Arcadis	TE completed by AECOM in 2015 indicated that the addition of left and right turn...
80%	18-1017	Ops - 1	1	Gwinnett	SR 140	Brook Hollow Pkwy	Operations			40 - Construction	1 Perry	Arcadis	M004756 extended NB left turn lane on SR 140
80%	18-7031	Ops - 2	7	Fulton	I-75	Moore's Mill Rd	Operations			41 - Quick Response	1 Perry	Arcadis	Signal Upgrade Project at Intersection (PI 0013213). Safety project (19-7008) to...
80%	19-1009	Ops - 1	1	Jackson	SR 53	I-95	Operations			50 - Other	Landon Perry	Arcadis	Reinstated for Sue Anna Decker...

FIGURE 2: GOASIS PROJECT TABLE

In addition to tracking current data, GOASIS also stores information about the durations of historic phases which will allow GDOT to review the performance of consultants on future contracts.

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4 SCREENING PROCESS AND DATA DRIVEN IDENTIFICATION

When a request for a potential project is received, the request goes through a screening process to determine if it is suitable for an operational improvement project. In addition to GDOT's Operational Improvement Program, the GDOT Office of Traffic Operations manages the Safety Program. Therefore, the programs work closely to route location requests to the program where the location would have the most potential for success. After a potential improvement location has been identified, the Operational Improvement Team (OIT) conducts a process of screening and vetting the location for applicability to the Program. The screening process includes:

- Reviewing the request to determine if it is operationally or safety based.
- Obtaining crash data for the location to check for fatalities and compare against statewide injury and property damage only (PDO) frequencies.
- Checking the project against programmed projects, on-going safety projects, and local projects. This is completed utilizing a variety of sources including GDOT's online project search tool, Geo PI, and by contacting the District Traffic Engineer (DTE) who is responsible for the region in which the project is located.
- Reviewing congestion data to check for recurring congestion at the intersection.

All decisions are noted in GOASIS so that the decision-making process is documented, and the requester can follow along as the request is furthered through the process.

In addition to submitted project requests, the Office of Traffic Operations also evaluates projects based on their bottleneck ranking based on HERE data. Referred to as RITIS Ranking, this serves as a standard measure for comparing intersection delay across Districts and the state. RITIS data is pulled on an annual basis and the Top 200 intersection bottlenecks statewide are calculated. A detailed methodology for the RITIS process is available in Appendix A.

The RITIS ranking is used as a base but adjusted on a variety of factors, including observed congestion from Google Traffic, anticipated volumes from GDOT's Traffic Analysis and Data Application (TADA), potential for delay improvement, and the cost of the improvement. These factors are used to develop a Modified RITIS score for each location. The locations with the lowest score are considered more likely to

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have a competitive B/C. Locations undergoing the RITIS process are screened using the same procedures as requests submitted by others.

Figure 3 illustrates these steps and the decision-making process.

Mainline Facility Type		PDO	Injury
Urban	Arterial	364	99
	Collector	88	23
	Local	70	18
Rural	Arterial	109	36
	Collector	52	16
	Local	19	3

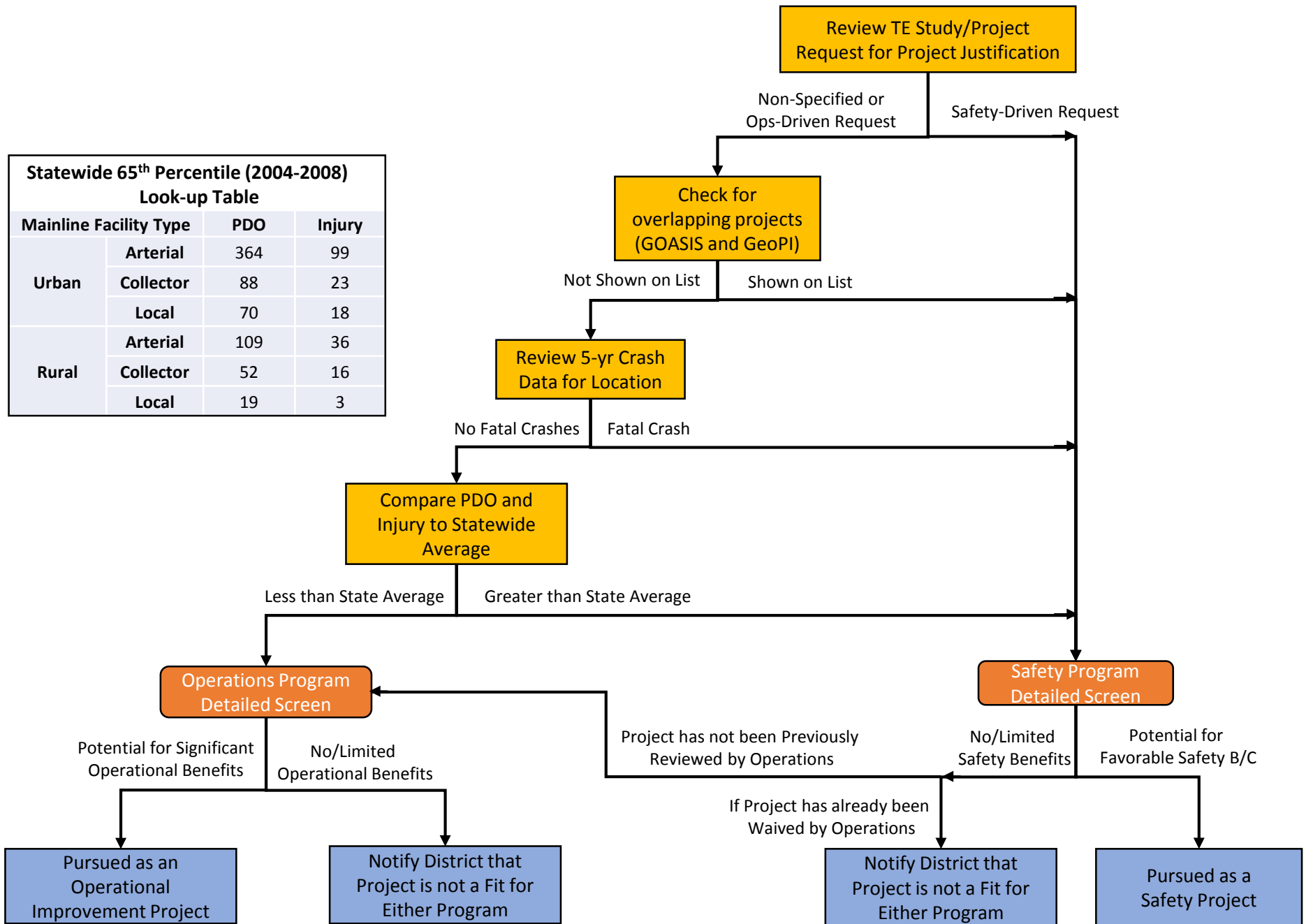


FIGURE 3: GDOT OFFICE OF TRAFFIC OPERATIONS TE/PROJECT REQUEST SCREENING FLOW-CHART

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4 SYNOPSIS DEVELOPMENT

Locations which clear the screening process move forward into the synopsis phase. This stage is where traffic counts are obtained, traffic models are developed, and future conditions are estimated. The synopsis phase is broken into three stages: RITIS B/C Calculation, Existing/No-Build Analysis, and Build Development. The RITIS B/C Calculation is an abbreviated version of the overall analysis which includes development of no-build models, testing a single build option, and estimating costs for the build option. The purpose this exercise is to obtain an approximate B/C to estimate the competitiveness of the location and prioritize further synopsis development. After review of the RITIS B/C locations which remain competitive move to the Existing/No-Build Analysis stage. The purpose of the existing/no-build analysis is to quantify the cost of delay at the location over the next 20-years, verify operational deficiencies, and identify potential constraints to improvement construction. The purpose of the build development is to identify potential build alternatives, select a preferred alternative, and develop a schematic layout for the preferred alternative. The analysis, assumptions, and risks are then summarized in a synopsis package which is submitted to the GDOT Operational Improvement Committee for review and approval. An example synopsis package can be found in Appendix B.

After Committee approval, a formal project transition document is developed. The following sections discuss the specific tasks included in the synopsis phase.

4.1 DATA COLLECTION

Unlike major capacity deficiencies, operational deficiencies can be localized and intricate in nature. Therefore, having a good understanding of the existing conditions and operations is vital to identification of an improvement that addresses the needs of the intersection. A multi-faceted data collection effort is undertaken as an initial step. This includes collecting traffic counts, obtaining signal phasing/timing information, and verifying the roadway geometry in the study area. For more complex locations, such as those with closely spaced intersections or driveways, a field visit is made to get more detailed information such as origin destination and weaving movements. Table 1 lists the types of data to collect and the data source to retrieve the information.

TABLE 1: DATA COLLECTION

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Data Type	Source
Traffic Counts	Vendor
Signal Timing & Phasing	State, County, or Municipal, field visit (if required)
Roadway Geometry	Aerial imagery, field visit (if required)
Origin/Destination	Field visit (if required)
Weaving Movements	Field visit (if required)

4.2 EXISTING MODEL DEVELOPMENT

Using a traffic modeling software platform to analyze the existing conditions based on the data collected is the next step in better understanding the operational deficiencies. Multiple traffic modeling software platforms are available to aid in the analysis of intersections and interchanges. Each modeling platform has different features which leads to different preferences based on specific geometries and operational needs. Generally, Synchro is used for the analysis of signalized and unsignalized intersections. The Synchro platform is widely accepted as an industry standard and does well analyzing isolated intersections and the impacts of phasing modifications on operations. For multiple intersections, Synchro's built-in simulation platform, SimTraffic, is used.

For more complex locations, Vissim is used. Vissim is more customizable than Synchro, allows a user to define specific paths through a network, and allows the modeling of both interrupted and uninterrupted flows. Typical projects which utilize Vissim include interchanges where impacts to freeway segments must be quantified, locations where complex weaving movements must be evaluated, and locations where complex intersection geometry and/or control must be tested.

For scenarios containing roundabouts, multiple modeling platforms are available. The primary platform used is Sidra. Like Synchro for signalized intersections, Sidra is easy to use and widely accepted for the modeling of single and multi-lane roundabouts. For locations where Sidra indicates possible capacity concerns, additional tools such as Arcady and Vissim are often also used to gain a greater confidence in the capacity issues.

Regardless of the platform used, it is important that the model be calibrated to reflect the queuing and other operational issues observed through data and in the field.

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4.3 GROWTH RATE ESTIMATION

After developing a calibrated model, a growth rate is determined to estimate future year volumes. The current [GDOT Design Traffic Forecasting Manual](#) is followed to determine the appropriate growth rate.

4.4 EXISTING/NO-BUILD ANALYSIS

4.4.1 DELAY CALCULATION METHODOLOGY/STANDARDS

A key step in the identification of potential improvement locations is quantification of delay costs for the intersection or study area. This is done utilizing the calibrated models, a standard value of time, and the duration of the congestion. The factors are entered in the GDOT Benefit Cost Calculator spreadsheet tool. The default values for duration of congestion and truck percentage is used unless other data is available. Additionally, the benefit calculation is set to 100% operational as the alternative is selected solely based on the operational benefits.

To calculate the total delay cost, the no-build volumes and delay are entered into the spreadsheet leaving build information blank. The total, 20-year delay is then converted to current year dollars based on the default value of time. Separate value of time equivalents are used for passenger vehicles and trucks.

As a next step, the total delay cost is reviewed for the likelihood of ability to improve it. For example, an intersection with \$15M in delay would be more likely to have an improvement which would yield a competitive benefit cost ratio (B/C) than an intersection that only has \$500k over 20 years.

4.4.2 ICE STAGE 1

In 2017, GDOT implemented an intersection control evaluation (ICE) policy, [Policy 4A-5](#). This policy requires that all projects impacting an intersection consider the control type. If the operational delay costs over 20 years appears to be favorable for future analysis, the next step is to complete the first stage of the Intersection Control Evaluation (ICE). Stage 1 is a high-level review of possible improvements and is completed by answering a series of seven (7) questions which assist in evaluating the feasibility of various potential improvements. Improvements which are found to be reasonable are moved forward to the next stage. An example of the ICE Stage 1 analysis can be found at:

<http://www.dot.ga.gov/PartnerSmart/DesignManuals/IntersectionControlEvaluation/GDOTICEToolExample.zip>.

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4.4.3 EXISTING/NO-BUILD SUMMARY

The final step in the existing/no-build phase is developing a summary document. For locations which will move forward into build analysis, this summary document serves as the tool to lead the discussion for brainstorming potential improvements and the relative size of the improvements. For projects where the existing/no-build analysis indicates that insufficient delay exists, the summary document provides the requestor with the necessary information to explain why the recommended location is not suitable for an operational improvement project. The summary document is uploaded into GOASIS for record keeping and to respond to future requests at the same location. An example existing/no-build document is available in Appendix C.

4.5 BUILD ANALYSIS

4.5.1 ICE STAGE 2 ALTERNATIVES

In the GDOT ICE Policy, Stage 2 is the point where quantitative analysis on the alternatives which were carried forward from the Stage 1 ICE analysis begins. As the alternatives progress, the OIT typically evaluates multiple sub alternatives which evaluate impacts of changes such as alternative signal phasing and various turn lane lengths. All evaluations are completed by modifying the calibrated models created during the existing/no-build phase of the analysis. Individual components are evaluated and B/Cs are calculated to identify the most operationally beneficial components.

An example of the ICE Stage 2 analysis can be found at:

[http://www.dot.ga.gov/PartnerSmart/DesignManuals/Intersection Control Evaluation/GDOT ICE Tool Example.zip](http://www.dot.ga.gov/PartnerSmart/DesignManuals/Intersection%20Control%20Evaluation/GDOT%20ICE%20Tool%20Example.zip).

4.5.2 LOCALLY RECOMMENDED ALTERNATIVE

In addition to the ICE alternatives, any locally recommended improvements are evaluated. Similar to the ICE alternatives, sub alternatives of the locally recommended improvements are evaluated as well in an effort to identify the most beneficial improvement.

4.6 MEASURES OF EFFECTIVENESS (MOEs)

4.6.1 TRAFFIC OPERATIONAL RESULTS

4.6.1.1 DELAY

There are several types of delay measures which are commonly used in traffic analysis. The two most common measures are intersection delay and network delay. Intersection delay provides a good

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measure of performance at a single intersection and is generally used for intersection capacity adding projects with study areas that include only a single intersection. Network delay provides a reliable measure of operations for a series of intersections and for smaller changes such as turn lane extensions. Additionally, network delay accounts for the delay generated through weaving movements, merges, and diverges. Network delay is used for studies where intersection delay is not able to accurately reflect the operational performance of an area.

Intersection delay also correlates with level of service (LOS). While the units of intersection delay and network delay are both reported in seconds per vehicle, network delay should not be correlated with LOS.

4.6.1.2 STATE ROUTE APPROACHES

Since the Program is funded through state and federal funds, it is important to consider the impact of the proposed improvement on the state route system approaches. In addition to reporting the overall intersection or network delay, approach delay can give decision makers a good understanding of the impacts or benefits to the mainline approaches.

4.7 SCHEMATIC DESIGN

4.7.1 LAYOUTS

Limited right of way (ROW) and topo data is available at this stage of project development. Therefore, all layouts developed are based only on aerial images and any available ROW data. In the development of the synopsis, two types of layouts are created: Costing and schematic. Costing layouts are developed for each alternative to provide the teams with a method of developing a high-level cost. Most locations will require numerous costing layouts so these are rough sketches which are often as simple as edge of pavement lines for existing and proposed new lanes. For the preferred alternative, schematic layouts are developed. Schematic layouts have more detail than costing layouts as they are intended to develop more refined costs and to explain the overall improvement concept to the Committee. These layouts include shading, signal locations, pedestrian facilities, and callouts for key elements such as utility impacts and environmentally sensitive areas. Additionally, new pavement verses mill and inlay is called out. Figure 4 shows an example of a schematic layout.

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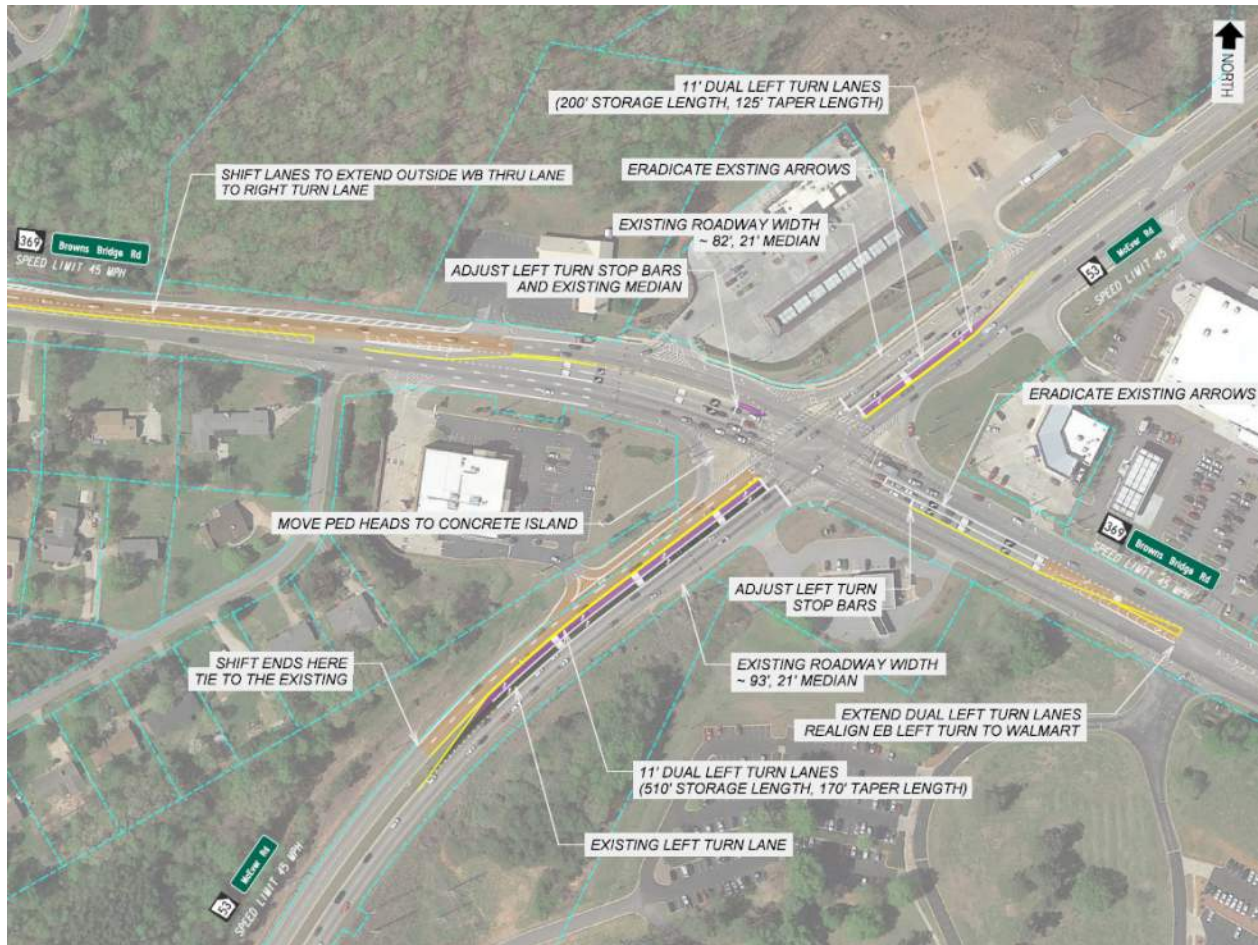


FIGURE 4: EXAMPLE OF A SCHEMATIC LAYOUT

4.7.2 COSTING

Developing an accurate cost is critical for the preferred alternative as it is used to calculate the cost for B/C analysis and for programming, if the improvement is approved by the Operational Improvement Committee. Costs are developed using planning-level quantity estimates. The quantity take-offs for these estimates are conducted from the schematic layout and include items such as the length of widening, overlay, curb and gutter, drainage, signing and marking, median, and the number of signals impacted. Additionally, ROW costs are developed based off the area type, land use, and intensity of the impact to the parcel. The utility cost is typically assumed to be 10 percent of construction costs unless there are known impacts to distribution poles or underground facilities. Preliminary Engineering (PE) costs are based on the project type, complexity, delivery mechanism, and anticipated funding source.

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4.7.2.1 PE PHASE STANDARDS

The cost of the PE phase can vary based on several factors such as delivery mechanism, project complexity, and potential risks. Improvements which are intended to go negotiated bid, as discussed in Section 5.1.1, will have minimal PE costs while improvements which will require full concept reports and/or interchange modification reports will need to have sufficient PE funds to cover the additional design, analysis, and coordination required to develop and gain approval of these key documents.

4.7.2.2 CONTINGENCIES

As previously discussed, construction costs are based on schematic layouts. These schematic layouts are generally based on aerials and GIS-based ROW data. With some items, such as earthwork being somewhat unknown, the contingencies on each proposed improvement needs to be carefully considered based on topography and other known risks. For example, if a project has substantial grade change within the project limit then additional contingency would need to be added for earthwork as the exact amount of fill or borrow would not be known or could it be verified that it could be balanced.

4.7.3 COORDINATION WITH DISTRICT AND LOCAL AGENCIES

Prior to finalizing the synopsis package, the OIT consults with the District Traffic Engineer for the respective district to obtain their feedback on the proposed improvement, gauge local support, and identify any unknown risks to project delivery. Coordination is completed with the DTE but is the responsibility of the District to review the project with local contacts to gain their support for the improvement. Since the Committee approval serves as concept approval, this coordination serves as the Initial Concept Team Meeting (ICTM).

Feedback from this step is used to further refine the layout and make the final determination on whether the proposed improvement should go to the Committee for approval.

4.8 RISKS

4.8.1 ENVIRONMENTAL

Environmental risks must be quantified for costing and delivery reasons. A desktop review of the study area is completed to identify potential environmental resources during the synopsis development. The results of this screening are considered as engineers develop potential improvements and the associated cost of those improvements. Additionally, a more detailed screening is completed prior to finalizing the synopsis package. The results of the additional screening are added to a risk register which

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is reviewed by the GDOT Office of Traffic Operations prior to recommending the delivery method and determining a concept report requirement.

4.8.2 CONSTRUCTABILITY

The constructability of a proposed improvement must also be reviewed prior to finalization. Items such as topography, environmental constraints, and staging can all have an impact on the constructability and cost of construction on a proposed improvement. Improvements that will require complex construction staging or walls to address topographic concerns will be more likely to require a more formal project development process.

4.8.3 PROJECT SUPPORT

While most risks are engineering focused, when dealing with the travelling public, politics is often involved. This is most frequently in the form of political support for the improvement or local concerns about impacts due to the proposed improvement. Projects with political opposition are more likely to require a more formal project development as they will often need public involvement prior to finalizing the plans. Projects with political support, on the other hand, are more likely to be able to advance through an expedited plan process as local opposition is typically at a lower level.

5 COMMITTEE REVIEW

The Operational Improvement Committee generally meets on a quarterly basis. The meeting typically consists of an update of the overall Program and then review of synopsis packages. After each package is reviewed, it is voted on for advancement by a specific delivery method. In addition to in-person meetings, e-mail voting can be used for projects which have low costs, complexities, and/or risks. For e-mail voting, Committee members have the option of voting Yes, No, or Hold For Discussion. If a member requests to Hold For Discussion, then the proposed operational improvement is held until the next meeting, regardless of the number of approving votes.

If a project is approved by the Committee, a Project Scoping Document is then signed by all members in attendance. The document describes the project scope, assigns a delivery mechanism, and describes any conditions to approval. An example project scoping document can be found in Appendix D.

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5.1 DELIVERY METHODS

One of the unique benefits of the Operational Improvement Program is the various project delivery methods available. The delivery method is selected based on project size, complexity, and risks. As shown in Figure 5, a negotiated bid delivery method has the least risk and complexity while the full Plan Development Process (PDP) is identified to have the most risks and complexity.



FIGURE 5: PROJECT DELIVERY METHODS

The three delivery methods are discussed below:

5.1.1 NEGOTIATED BID

Georgia law allows GDOT to let projects under \$200,000 using a process known as direct negotiated bidding. That process requires the Department to provide a standard package to three contractors and then award the contract to the contractor with the lowest total price. Projects which undergo this process must be wholly within the ROW and having no/very limited utility impacts. While GDOT has an overall program that funds these types of projects called the Quick Response Program, the OIP can utilize state funding to deliver projects that meet the aforementioned stipulations. Projects which would qualify for Negotiated Bid delivery can be voted on via e-mail or in-person.

5.1.2 MENU OF SERVICE DESIGN (MOSD)

As of 2019, the GDOT Operational Improvement Program operates with two on-call consultants. In addition to supporting the Program with project identification and development, the consultants complete preliminary and final design for projects. A menu of service task order is used to expedite the

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design process. This task order uses negotiated pricing for fixed menu items to allow GDOT to quickly authorize work on standard tasks without needing to negotiate individual task orders.

Projects which have limited ROW and construction costs under \$1,000,000 are generally considered for design using MOSD. The Committee must approve projects for MOSD since it does not include specialized tasks such as public involvement or special environmental permitting. These approvals occur only through in-person voting.

5.1.3 FULL PLAN DEVELOPMENT PROCESS (PDP)

Projects with construction costs over \$1M, ROW impacts, or areas of moderate to high risks are considered for full Plan Development Process (PDP) delivery. While these projects will generally skip the Concept Report phase, they will still go through task order negotiations for specific design scopes. As these projects are full PDP, they can be designed by Operational on-call consultants, Office of Program Delivery on-call consultants, or let as batch design contracts for GDOT qualified consultants. Full PDP projects are voted on at in-person meetings.

6 PROJECT PROGRAMMING

After Committee approval, the project will be programmed and assigned a GDOT Project Manager. To assist in that transition, several tasks are completed including notification of the District, obtaining an official ROW estimate, completing traffic forecasts, and developing a Project Transition Document (PTD). The following sections discuss each task in sequential detail.

6.1 DISTRICT NOTIFICATION

The District Traffic Engineer should be notified of the Committee decision. District staff should notify appropriate local agencies as the project will soon be programmed and show up in GDOT's online project mapping system.

6.2 ROW ESTIMATE

GDOT typically requires a concept-level ROW estimate to be prepared during the concept report phase of project development. Since Operational Improvement Projects are not required to go through a concept report phase, a standalone ROW estimate must be developed. This estimate must be developed by a GDOT-approved ROW vendor and included in the PTD.

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6.3 VOLUME APPROVAL

From traffic operational analysis to environmental approval, traffic forecasting impacts various aspects of project development. To maintain consistency with the traffic analysis completed in the synopsis development, the OIT will develop and obtain approvals for operational improvement projects. Office of Traffic Operations has been given authority to approve traffic forecasts for lump sum programs, such as the Operational Improvement Program, and they have a specific process developed for conducting traffic forecasting. The GDOT Operational Traffic Volume Forecasting Manual is included as Appendix E. The approved traffic volumes and approval memo should be included in the PTD.

6.4 LETTER OF LOCAL SUPPORT

GDOT requires a letter of local support and a lighting agreement to be signed by the local jurisdiction for all roundabout projects. For projects which propose a roundabout, a verbal agreement should be obtained before presenting the proposed improvement to the Operational Improvement Committee and a written agreement obtained before transitioning the project to a GDOT Project Manager. Generally, OTO will work with the District Traffic Engineer to obtain the local letter of support. If a local letter of support cannot be obtained prior to transitioning, it should be noted in the PTD and discussed at the project transitioning meeting.

6.5 PROJECT TRANSITION DOCUMENT

The final stage in the project transition is the development of the PTD. The intent of the PTD is to clearly describe the scope of the project, discuss any factors or key decisions made in project development, outline known risks, and provide key data that was developed through the synopsis process.

7 PROJECT DELIVERY

After transition a GDOT PM will handle all day to day duties on a project. This includes keeping a project on schedule and budget along with monitoring the design team to insure they stay within the scope of the project. Changes may be required to a project as it progresses through the project development process. Reasons for this could include the identification of unknown environmental risks or utilities, public engagement, or topographic concerns identified through the field survey. Additionally, as the number of projects exceeds the program budget, prioritization must occur throughout the project development process. The following sections discuss how each of these areas are handled.

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7.1 MANAGING SCOPE CHANGES

As previously discussed, the Operational Improvement Program is a B/C driven program. This means that projects are designed such that they provide the highest return on investment or B/C. As the project progresses, changes to the design which impact the project cost must be reviewed by OTO. No approval is necessary for reductions to phase costs but requests to increase project costs will be reviewed by OTO staff prior to approval.

The following approval process should be followed for price increases:

- OTO Staff Approval: Total project cost increases less than 30 percent and project B/Cs is greater than 7.0
- Director of Operations Approval: Total project cost increases less than 30 and project B/C is less than 7.0
- Operational Improvement Committee: Total project costs increases by more than 30 percent

Additionally, Office of Program Delivery (OPD) staff must notify OTO of any potential changes in the required phases of the project. This notification serves two purposes, additional phases such as ROW or utility might result in the Operational Improvement Committee requesting a different delivery method, such as changing from streamlined PDP to full-PDP. Secondly, the additional phases often result in project cost changes which will likely impact the project B/C.

7.2 PROJECT PRIORITIZATION

The Operational Improvement Program regularly completes a process of B/C evaluation and project prioritization. As such, a project with a marginal B/C might be approved by Committee, designed, and ultimately placed on the shelf for delivery in future year due to projects with higher B/Cs being ready for project funding. Alternatively, a fully designed project might have a Let Date shift in order to fund a higher B/C project. In addition to the operational B/C, consideration is given to the amount of time a project has spent on the shelf and other factors that impact deliverability when completing project prioritization.

APPENDIX A

RITIS Bottleneck Identification Process

To:

Landon Perry, P.E.
Georgia Department of Transportation
Traffic Operations

Copies:

Scott Zehngraff, GDOT
Doug Tilt, Arcadis
Jody Peace, Arcadis
Han Zheng, Arcadis

Arcadis U.S., Inc.
2839 Paces Ferry Road, Suite 900
Atlanta
Georgia 30339
Tel 770 431 8666
Fax 770 435 2666

From:

Luis Velasquez, PE

Date:

October 19, 2020

Subject:

Data Driven Screening – Process Memorandum – Version 2

The purpose of this document is to provide a detailed explanation of the process completed to develop a data driven approach to screening for the GDOT Operational Improvement Program (Ops Program).

Executive Summary

Operational improvement projects are typically identified by public notification, GDOT personnel, or other municipality notifying the Department that an intersection or approach is not operating at efficient level of service. The intersection could then be screened by the Ops Program to determine if a solution can be implemented. This method would be considered a reactive approach to traffic congestion and public complaints. GDOT Traffic Ops would like to create a proactive approach using traffic data available to GDOT.

The Regional Integration Transportation Information System (RITIS) Probe Data Analytics (PDA) suite has been utilized to develop a data driven approach to prioritizing intersections that can be screened by the Ops Program. This process memorandum provides details on the process completed to generate the prioritized list of intersections.

Regional Integration Transportation Information System, Probe Data Analytics Suit

Currently, the Regional Traffic Operations Program (RTOP) utilizes RITIS and HERE speed data as a way to review historical and real time speed data to be responsive to incidents and accidents that may affect traffic operations on an RTOP corridor. This data use agreement was completed via the I-95 Corridor Coalition allowing GDOT access to the HERE speed data and Probe Data Analytics (PDA) Suite.

The PDA Suite allows GDOT to support operations, planning, analysis, research, and performance measures generation using probe data and other agency transportation data using a variety of data visualization and data retrieval tools. These tools allow users to create and download reports, visualize data on maps or in other interactive graphics, and even download raw data for off-line analysis. Based on discussion with current GDOT users of the RITIS PDA suite and trials completed by the Ops Program, the most effective tool for purposes of intersection prioritization is currently the Bottleneck Ranking tool.

RITIS Registration

Users that would like to access the RITIS platform and PDA suite are required to obtain log in access. To register for a RITIS account please to the following website: <https://www.ritis.org/register/>

Bottleneck Ranking Tool

The Bottleneck Ranking tool allows users to generate reports and discover which bottleneck have the greatest impact. The tool allows user flexibility of the region being analyzed. Regions can be filtered to include certain states, counties, road class or user defined regions of interest.

The Bottleneck ranking tool was used to determine the top 100 intersections for each of the 7 Districts across the State of Georgia. The following details the inputs and outputs from that analysis.

Bottleneck Inputs

Region:

Each GDOT District is comprised of a variety of counties. Each district and appropriate counties were input to the RITIS region tool. Each District and set of appropriate counties were input separately to all for a more granular bottleneck metrics that could be exported from RITIS. Meaning, all the counties for District 1 were selected for one analysis, then counties for District 2 were selected after the analysis was complete for District 1. A map of the GDOT Districts can be found in Appendix A.

Road Class:

Inclusive of all roadway class types: Interstate, US Route, State Route, Parkway, Turnpike, Expressway, Frontage, Interchange, Other. The final results were filtered outside of the PDA suite to not be inclusive of Interstate (limited access facilitates). Details regarding the roadway filtering process is outline later in this memo.

Time Period:

Two months of data was utilized for this initial intersection prioritization: February 2019 and March 2019.

Figure 1, below, shows the bottleneck ranking region selection available to RITIS users.

Figure 1. Bottleneck Ranking Region Input

Data Source:

HERE historical speed data was utilized. This dataset is the most current dataset purchased by GDOT. HERE speed data was chosen by GDOT based on a literature review from resources provided by the I-95 Corridor Coalition, which conducts regular probe data validations on HERE, INRIX, and Tom Tom probe data. The most recent study’s results, which was completed on US-50 in Virginia, are provided in the Table 2 below.

Table 1. Validation Results (US-50, Virginia)

Metric	HERE	INRIX	Tom Tom
Average Absolute Speed Error (mph)	1.9	2.7	2.7
Speed Error Bias (mph)	0.5	1.0	1.4
Slowdown - fully captured (%)	72.14%	32.86%	59.29%
Slowdown - partially captured (%)	19.29%	55.71%	30.00%
Slowdown - not captured (%)	8.57%	11.43%	10.71%

After all inputs are complete, the analysis is completed by selecting submit.

Bottleneck Outputs

The overall ranking completed by RITIS is based on the *Base Impact* which is calculated as the sum of the que lengths over the duration of the bottleneck. Additional information provided for each bottleneck location includes details provided by RITIS:

- Bottleneck Profile:
 - Average Max Length: Calculated average que length for that node/intersection based on congestion (60% of free flow speed).
 - Average Daily Duration: Average time per day speed is observed at 60% of free flow (Congestion).
 - Total Duration: Total congestion time calculated over entire analysis period.
 - Base Impact: aggregation of the que length over the analysis period.

arcadis.com

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- $\text{Que Length} \times \text{Duration of Congestion} = \text{Base Impact}$.
- Base Impact is summed for each corridor over entire analysis period.
- Speed Differential: difference between free flow speed and observed speed, weighed by que lengths.
- Congestion: determined when percent of measured speed (measured speed/free flow speed) falls below 60% (or 0.6 ratio used from performance metric), weight by calculated que lengths.
- Total Delay: base impact weighted by difference in between free-flow speed and observed speed multiplied by AADT.
 - $\text{Base Impact} \times \text{Speed Differential} \times \text{Volume} = \text{Total Delay}$

In the output of PDA Bottleneck Ranking Suite, the default bottleneck ranking is based on Base Impact, but it also provides other measurements might be used for ranking. The Base Impact (BI) and Base Impact weighted by Total Delay (TD) have been used to complete the bottleneck ranking for this project. In order to perform analysis an intersection level, the bottleneck ranking parameters have been aggregated based on the segment aggregation result discuss in later sections of this memo. Currently, RITIS does not have a complete volume data for all the TMC segments. The TMC segments without a volume estimate will have a total delay of zero (0). Therefore, the ranking used in this process has ranked the intersection Base Impact weighted by total delay if the intersection has a total delay value greater than 0. If the intersection has a total delay value of zero (0), because all the segments associated with the intersections don't have a reported volume data, the intersection has been ranked using the base impact metric. In the result of ranking based on February 2019, and March 2019, 3457 intersections are ranked based on total delay followed by 1402 intersections with no volume estimate ranked based on base impact.

Each set of metrics from the resulting input query was exported from RITIS for offline processing.

Offline Processing

The processing and data clean up that was completed outside of RITIS completed two necessary functions: 1) A filtering of the roadway segments so only intersections that are located along State Routes were included in the final list and 2) an aggregation/buffering of the segments so results would be finalized at the intersection/node level instead of at the approach/segment level.

HERE Roadway Segments

The Probe Data Analytics Suite uses the traffic message channel (TMC) standard to uniquely identify each road segment. Under this standard, each road segment is referred to as a TMC, and TMCs are identified by a unique 9-digit TMC code. First 3 digits of TMC code is a state identification number. The state code of Georgia is 101. Therefore, all Georgia's segments start with 101. The fourth character of a TMC code signifies whether it is an "internal" or "external" segment. Internal segments represent a stretch of road within an interchange (e.g. between an exit ramp and an entrance ramp). External segments represent a stretch of road between interchanges. In the statewide intersection ranking, only the delay on internal paths have been considered. In the HERE dataset, external segments contain "+" or "-" representing Eastbound and Westbound respectively. Internal path contains "N" and "P" representing Eastbound and Westbound respectively.

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The TMC segment is a type of object with a length and starting and ending points. The bottleneck ranking tool use the head of the TMC segment (which is typically at an intersection) as identification of bottleneck because head of the segment is usually where traffic blockage starts. The original HERE TMC dictionary provides the TMC code (served as a primary key), head location description (location of downstream edge of TMC segment), and the coordinates of TMC starting and ending points.

Internal Path & External Path

In computational network analysis, the roadway network is broken into links at the network junction, which is usually intersection. In HERE data, TMC segments don't usually start or end at the intersections. The TMC segments are usually cut at the border of the "Intersection/Interchange influence buffer" as shown in Figure 1. The small piece (highlighted in Figure 1) of the segments inside the intersection buffers are categorized as the Internal Path with letter "N" or "P" in TMC codes. The internal paths of an intersection usually run over the intersection, which makes it hard to identify the where the intersection is based on the coordinate of TMC head location. The longer segments outside the buffers are categorized as External Path with character "+" or "-" in TMC codes.

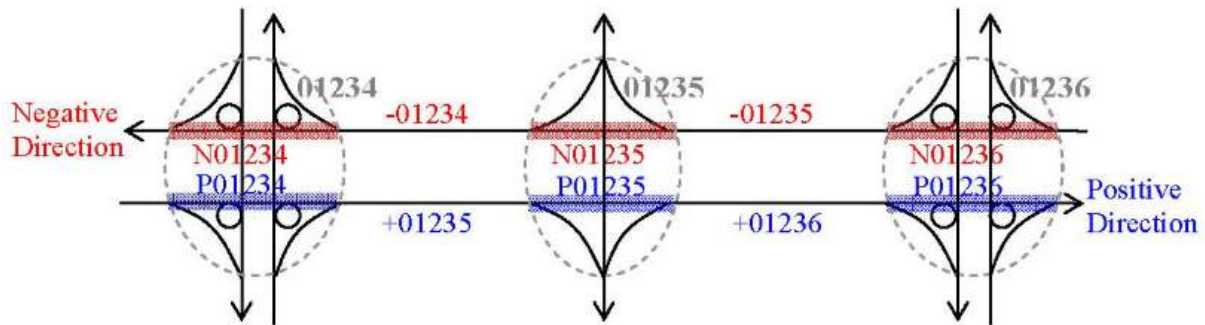


Figure 1. TMC Codes Example

Ideally, for an intersection like 01234 shown in Figure 1, the analysis should take both internal paths (N01234 & P01234) and external paths (-01234 & +01234) into account. However, the radius of the intersections varies across the state. Some of the intersections have very large influence buffers and the external path starts far away from the intersection which makes it hard to find a proper buffer radius to accurately join the external path to its intersection.

TMC Segment Filtering

The process only considered the head locations that are intersections with a state route or US highway, excluding the following:

- arterial intersections without state route or US highway involved, or
- the merge or diverge points of freeway mainline and ramps.

The filtering process is summarized in the table shown in Figure 1. The in-scope head location is identified based on its head location description. The control intersections between freeway off-ramps and arterial were included only if at least one approach of the intersections is state route or US highway.

Table 2 . Roadway Data Filtering Matrix

Segment Head Location Type		In Scope?	
Arterial Intersection	Arterial @ Arterial	Yes	
	Arterial @ US/GA Highway	No	
	US/GA Highway @ US/GA Highway	Yes	
Freeway Interchange (Arterial Level)	Freeway @ Freeway	No	
	Freeway @ Arterial or Arterial @ Freeway	No	
	Freeway @ US/GA Highway	On Ramp	No
		System-to-System Ramp	No
		Off Ramp	Yes
		US/GA Highway	Yes
Freeway Mainline		No	
Head Location is not an intersection		No	

* TMC Segments always break at state or county line. The link head to non-intersection location as such were excluded.

The above filtering process leaves approx. 19,000 TMC segments in scope for further processing. Because RITIS' bottleneck ranking tool ranking ranks bottleneck by approach, the intersection overall delay has been used as the total delay of all approaches going toward the intersection. An aggregation was done based on the spatial location of TMC codes, and TMC head (starting point) locations. TMC segments with matching codes and locations (+/-0.0002) were then grouped into intersections across the state.

The original ~19,000 TMC segments were aggregated to 4859 intersections.

TMC Total Delay Summation

After the TMC filtering and aggregation of the TMC heads was completed, the total delay metric calculated by RITIS was summed for each of the 4859 intersections . The bottleneck parameter of an intersection is the sum of the bottleneck parameters of all TMC segments associated with this intersection. This summation of total delay for each approach was then used to rank the intersections across the state and district. This total delay metric is not available for all segments inside the PDA suite because there are TMC segments that do not have a volume component dataset available. Of the 4859 intersections 3457 have been ranked used the total delay metric. The remaining 1402 intersections have been ranked using the base impact metric.

Additional Attributes

Other attributes were assigned to each of the 4859 intersections to provide for future filtering of the statewide dataset. These attributes included:

- County (based on ARC counties_Georgia shape file)
- GDOT District (related to county)
- Municipality (based on ARC cities_Georgia shape file)

Assumptions & Limitations

Volume Estimate

Currently, RITIS doesn't have complete volume dataset for all the TMC segments located in Georgia. However, 3457 of the 4859 have a volume estimate. As future volume datasets are collected and validated, the number of intersections containing a total delay metric will be expanded. Intersections that do not have a total delay metric as a result of no traffic volume, have been ranked using the base impact metric.

TMC Segment Definition

The metrics and calculations exported from the RITIS PDA Suite are based on the mapping and TMC segment definition that has been developed by RITIS. The metrics and calculations may be adjusted if the mapping and segment data is altered by RITIS.

Segmentation not standard across exports. Should update the base map.

Speed Data

The metrics and calculations exported from the RITIS PDA Suite are based on the historical speed data collected by HERE. The metrics and calculations may be adjusted if a different speed data vendor is used/selected by the Department.

APPENDIX B

Example Synopsis Package

Potential Operational Improvement Project

SR 369 / Browns Bridge Rd at SR 53/McEver Rd		Date Completed: April 2019	Requested By: District 1
Ops ID: 19-1008	GDOT District: District 1	County: Hall	City: Gainesville
	Project Type: Intersection Improvement		

Description of the Problem:

High delays for SR 53 / McEver Rd NB left turns during AM and PM peak hour. Additionally, high delays and long queues for SR 369 WB with left turns backing up to adjacent through lane during PM peak hour. The lane drop west of the intersection creates bottleneck for SR 369 WB.

Location: (Attach Map, Image or Sketch):



Traffic Volume	Year	DHV
Build Year	2024	See Attached Sheets
Future Year	2044	See Attached Sheets
Pedestrian Activity?	Yes	

Proposed Improvement Description:

Provide dual left turns along SR 53/McEver Rd
 Extend SR 369 WB left turn lanes
 Shift lanes to extend the outside through lane of SR 369 WB

Improvement Sketch:



Anticipated Benefits Table: (LOS, Delay Reduction, Modeling output, etc.)

Intersection Delay (sec/veh)

SR 369 at SR 53/McEver Rd	AM Peak Hour				PM Peak Hour			
	No-Build (2024)	Build (2024)	No-Build (2044)	Build (2044)	No-Build (2024)	Build (2024)	No-Build (2044)	Build (2044)
Intersection Delay	46.0	45.3	122.1	56.8	95.1	55.5	433.9	158.1
% Improvement	1%		53%		42%		64%	

Approach Delay (sec/veh)

Approaches with major improvements	AM Peak Hour				PM Peak Hour			
	No-Build (2024)	Build (2024)	No-Build (2044)	Build (2044)	No-Build (2024)	Build (2024)	No-Build (2044)	Build (2044)
SR 369 WB	39.2	35.2	140.3	46.8	200.0	53.2	778.7	271.0
SR 53 NB	34.7	38.5	121.4	45.6	51.0	44.7	296.5	112.4

Initial Project Cost Estimate (\$):

PE:	\$ 575,000	ROW:	\$ 0	Utility:	\$ 30,926	CST:	\$ 773,145	Total:	\$ 1,379,071
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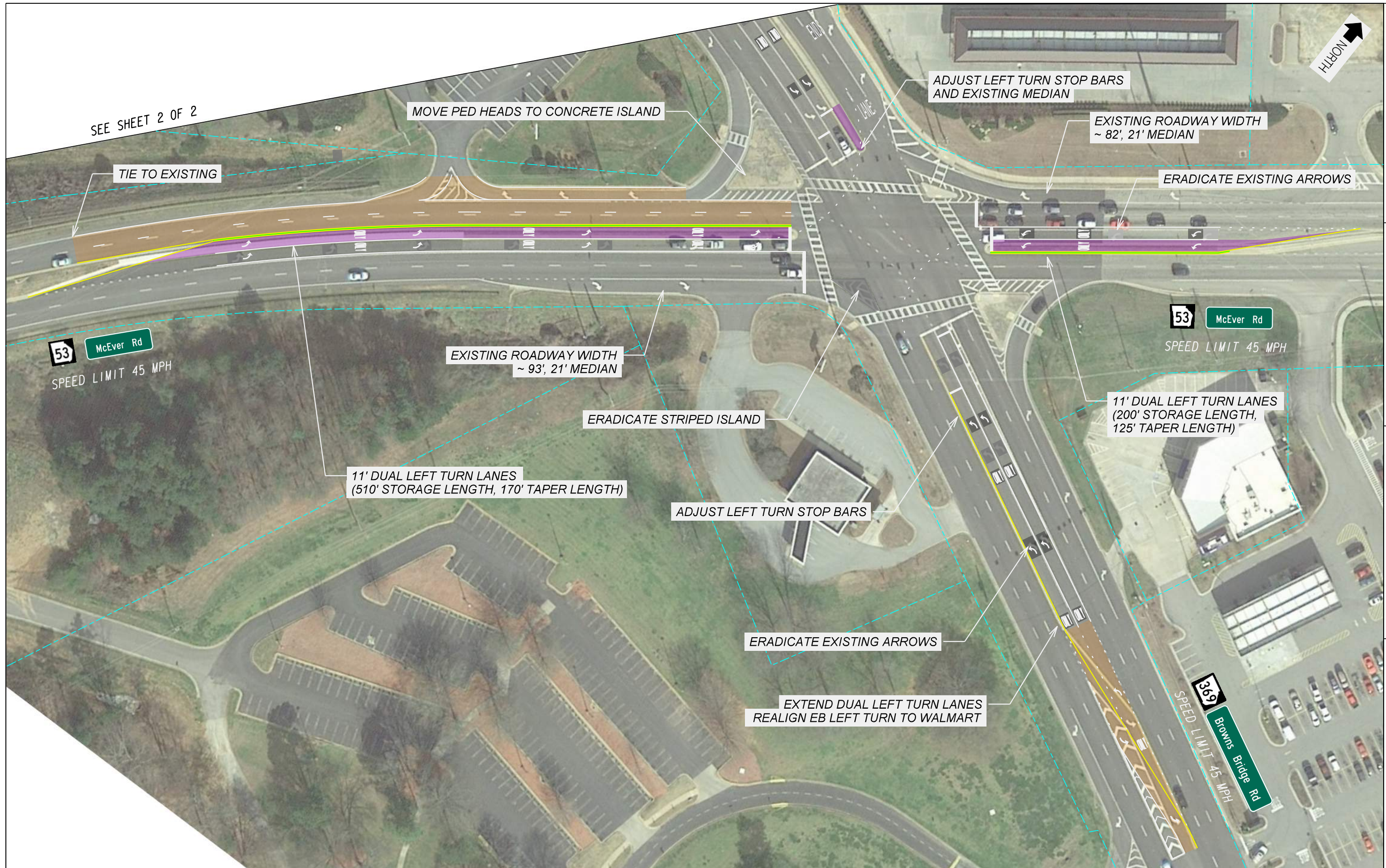


PROPOSED RAISED CONCRETE ISLAND/MEDIAN
 PAVEMENT WIDENING
 PAVEMENT OVERLAY



STATE OF GEORGIA
 DEPARTMENT OF TRANSPORTATION
 SR 369 AT MCEVER RD
 WA 16.39





SEE SHEET 2 OF 2

TIE TO EXISTING

MOVE PED HEADS TO CONCRETE ISLAND

ADJUST LEFT TURN STOP BARS AND EXISTING MEDIAN

EXISTING ROADWAY WIDTH ~ 82', 21' MEDIAN

ERADICATE EXISTING ARROWS

53 McEver Rd
SPEED LIMIT 45 MPH

EXISTING ROADWAY WIDTH ~ 93', 21' MEDIAN

ERADICATE STRIPED ISLAND

53 McEver Rd
SPEED LIMIT 45 MPH

11' DUAL LEFT TURN LANES (200' STORAGE LENGTH, 125' TAPER LENGTH)

11' DUAL LEFT TURN LANES (510' STORAGE LENGTH, 170' TAPER LENGTH)

ADJUST LEFT TURN STOP BARS

ERADICATE EXISTING ARROWS

EXTEND DUAL LEFT TURN LANES REALIGN EB LEFT TURN TO WALMART

369 Browns Bridge Rd
SPEED LIMIT 45 MPH



STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
SR 369 AT MCEVER RD
SHEET 1 OF 2



ARCADIS
Design & Consultancy
for natural and
built assets

Georgia
Department
of transportation
GDOT

PROPOSED RAISED CONCRETE ISLAND/MEDIAN
PAVEMENT WIDENING
PAVEMENT OVERLAY

WA 16.39






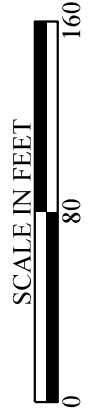
SHIFT LANES TO EXTEND OUTSIDE WB THRU LANE TO RIGHT TURN LANE

369 Browns Bridge Rd
SPEED LIMIT 45 MPH

369 Browns Bridge Rd
SPEED LIMIT 45 MPH

SEE SHEET 1 OF 2

-  PROPOSED RAISED CONCRETE ISLAND/MEDIAN
-  PAVEMENT WIDENING
-  PAVEMENT OVERLAY



GDOT Benefit-Cost Calculator

Project Information

ID [Redacted]
 Description SR 369 at SR 53/McEver Rd _Alt4_ Dual left turns for SR 53 and extend SR 369 WB through [Redacted]

Cost Estimate

Date of estimate	4/16/2019
Preliminary Engineering	\$ 575,000
Reimbursable Utility	\$ 30,926
Right-of-Way	\$ -
Construction	\$ 773,145
Total	\$ 1,379,071

Source of traffic data

Design traffic provided by EIT consultant; Analysis in Synchro 10; Network analysis of 2 hour peak AM and 2 hour peak PM periods

Without project	Open Year				Design Year			
	2024				2044			
	AM		PM		AM		PM	
	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)
Vehicle Served*	3,643	46.0	4,494	95.1	5,265	122.1	4,970	425.6
Vehicle Denied**							1,619	459.4
Total Delay (hr)	46.5		118.7		178.6		794.2	

With project	Open Year				Design Year			
	2024				2044			
	AM		PM		AM		PM	
	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)
Vehicle Served*	2,561	45.3	4,483	55.5	5,172	56.8	6,490	158.1
Vehicle Denied**								
Total Delay (hr)	32.2		69.1		81.6		285.0	

*Vehicle Served: Number of vehicles in the network + Number of vehicles that have arrived; **Vehicle Denied: Number of vehicles not allowed to enter the network
 F: Annual number of collisions involving fatalities during study period
 I: Average annual number of collisions involving injured people for the period of the study
 P: Average annual number of collisions involving only property damage for the period of the study
 R: Reduction of fatal and injury collisions by type (from Table A - Appendix E)
 r: Crash modification factor for fatal and injury collisions
 Rp: Reduction of property damage only collisions by type (from Table A - Appendix E)
 rp: Crash modification factor for property damage only collisions
 Pc: Average cost, in thousands of \$, per property damage only collision
 Q: Weighted cost, in thousands of \$, of fatal and injury collisions
 Ic: Average cost per injury in thousands of \$
 Fc: Average cost per fatality in thousands of \$
 Ek: Capital recovery factor based on countermeasure life (from Table B - Appendix E)
 Ci: Estimated initial cost of the countermeasure (cost of the improvement including r/w) in thousands of \$
 Cm: Estimated annual maintenance and operating cost of the countermeasure in thousands of \$

Parameters	Default	Override	Used	
Open year	2018	2024	2024	====> Operational Design Life = 20 Years
Design year	2038	2044	2044	
Discount rate	7%		7%	
AM peak period (hr)	2	2	2	
PM peak period (hr)	3	2	2	
Value of auto travel (\$/hr)	13.75		13.75	
Value of truck travel (\$/hr)	72.65		72.65	
Percent trucks	12%	3.0%	3.0%	
Fatality Cost (Fc)	\$9,100,000		\$9,100,000	
Injury Cost (Ic)	\$955,500		\$955,500	
Property Damage Cost (Pc)	\$27,300		\$27,300	
Annual Maintenance/Operating Cost (Cm)	\$20,000		\$20,000	
Operational Benefit Factor	100%		100%	====> Safety Benefit Factor = 0%

Operational Benefits	
Costs	\$ 1,379,071
Open Year (2024) Auto Delay Costs	
Nobuild	\$ 1,102,117
Build	\$ 675,803
Auto delay savings	\$ 426,314
Open Year (2024) Truck Delay Costs	
Nobuild	\$ 180,099
Build	\$ 110,434
Truck delay savings	\$ 69,665
Open Year (2024) Benefits	\$ 495,978
Design Year (2044) Auto Delay Costs	
Nobuild	\$ 6,486,947
Build	\$ 2,444,909
Auto delay savings	\$ 4,042,038
Design Year (2044) Truck Delay Costs	
Nobuild	\$ 1,060,041
Build	\$ 399,526
Truck delay savings	\$ 660,515
Design Year (2044) Benefits	\$ 4,702,553
Design Life Benefits	\$ 51,985,314
Design Life Benefit-Cost Ratio	37.70

Safety Benefits					
Type of Safety Counter-measure	Ek	R	r	Rp	rp

Description	Symbol	Value
Reduction Factor (F, I)	R	0
Reduction Factor (PDO)	Rp	0
Capital Recovery Factor	Ek	0
Initial Improvement Cost	Ci	\$ 1,379,071

Accident Data	Symbol	Value
PDO	P	
Fatalities	F	
Injuries	I	

Weighted cost of fatal and injury collisions
 Q = \$ -

Annual Benefit: \$ -
Annual Cost: \$ -
Annual B/C Ratio: N/A

Design Life Benefit
 B = \$ -

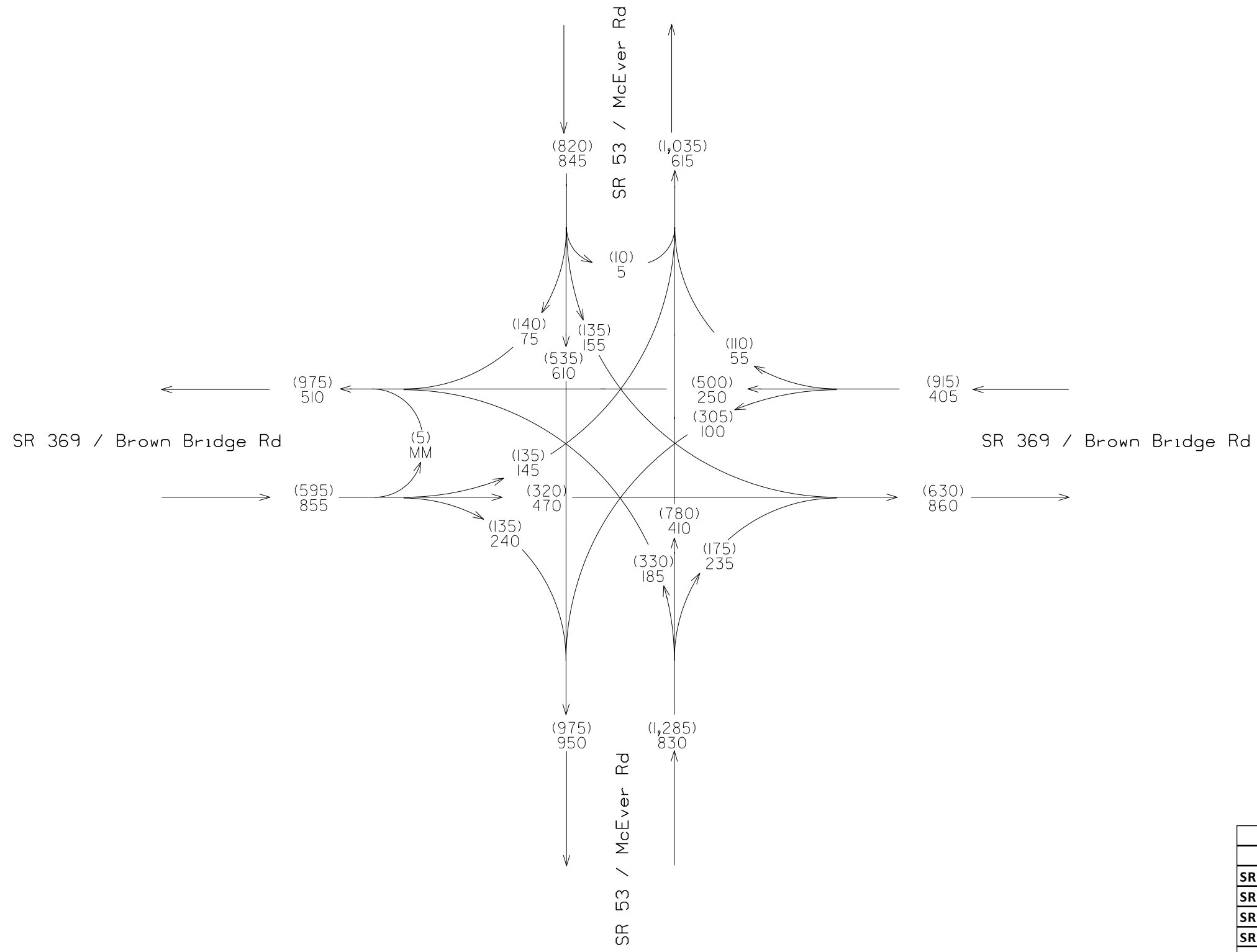
Design Life Cost
 C = \$ -

Design Life Benefit/Cost Ratio
 B/C = N/A

Total Project Benefit			
Design Life Operational Benefit	\$51,985,314	Weight=	100%
Design Life Safety Benefit	\$0	Weight=	0%
Total Weighted Benefit	\$51,985,314		
Design Life Operational Cost	\$1,379,071	Weight=	100%
Design Life Safety Cost	\$0	Weight=	0%
Total Weighted Cost	\$1,379,071		
Project Benefit-Cost Ratio	37.70		

COUNTY	STATE	SHEET NO.	TOTAL SHEETS
HALL	GA	1	3

DHV TRAFFIC VOLUMES
 EXISTING YEAR (2019)
 PM PEAK HOUR = (XXX)
 AM PEAK HOUR = XXX



Truck Percentage		
	AM	PM
SR 369 EB	4.0%	5.8%
SR 369 WB	7.0%	1.2%
SR 53 NB	4.1%	1.2%
SR 53 SB	1.9%	3.3%
Intersection	3.8%	2.4%

STATEWIDE OPERATIONAL IMPROVEMENTS
 SR 369 AT McEver Rd



NO-BUILD

STATE OF GEORGIA
 DEPARTMENT OF TRANSPORTATION

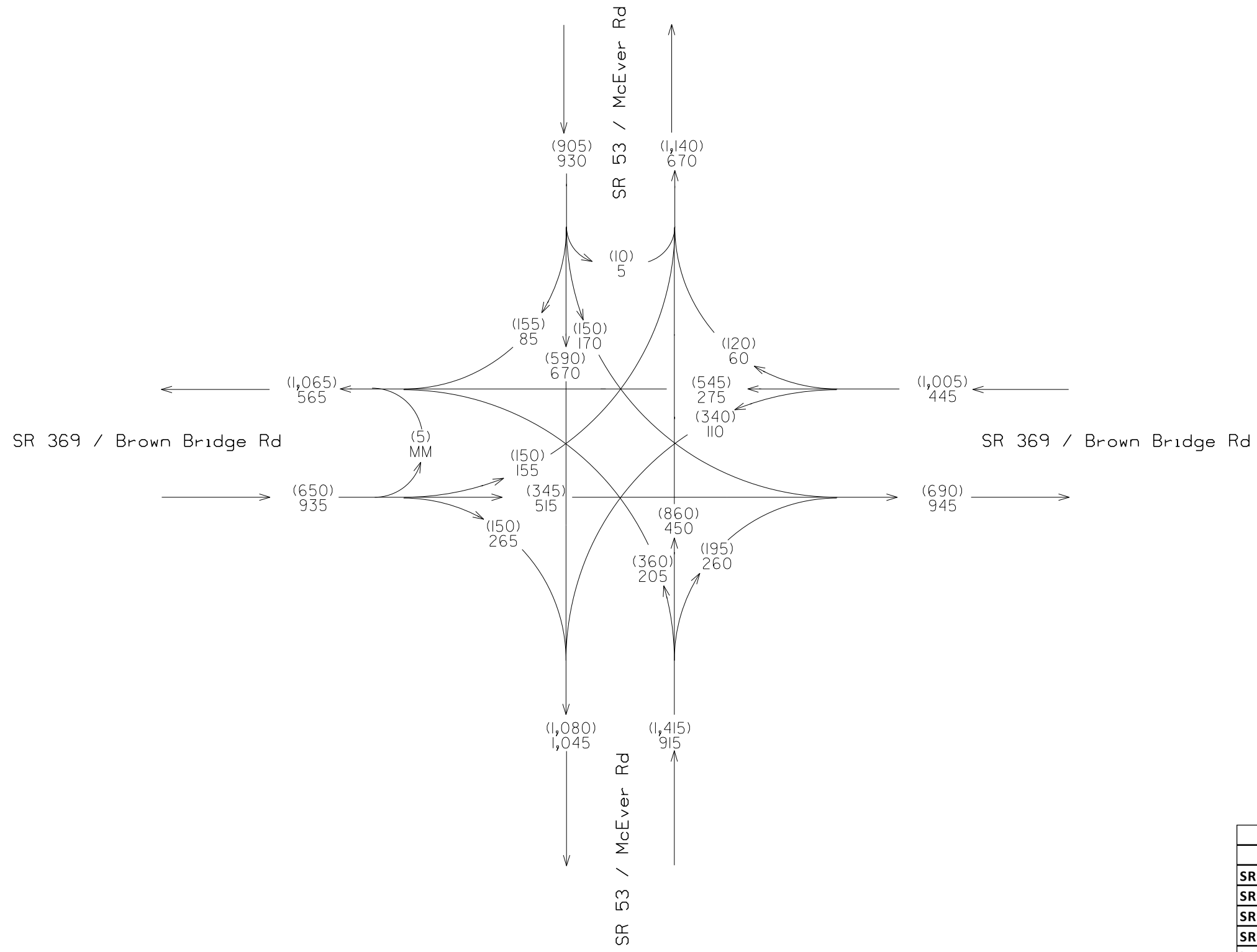
TRAFFIC DIAGRAM

YEAR 2019 DHV

DRAWING No.
 00-0001

COUNTY	STATE	SHEET NO.	TOTAL SHEETS
HALL	GA	1	3

DHV TRAFFIC VOLUMES
 EXISTING YEAR (2024)
 PM PEAK HOUR = (XXX)
 AM PEAK HOUR = XXX



Truck Percentage		
	AM	PM
SR 369 EB	4.0%	5.8%
SR 369 WB	7.0%	1.2%
SR 53 NB	4.1%	1.2%
SR 53 SB	1.9%	3.3%
Intersection	3.8%	2.4%

STATEWIDE OPERATIONAL IMPROVEMENTS
 SR 369 AT McEver Rd



NO-BUILD

STATE OF GEORGIA
 DEPARTMENT OF TRANSPORTATION

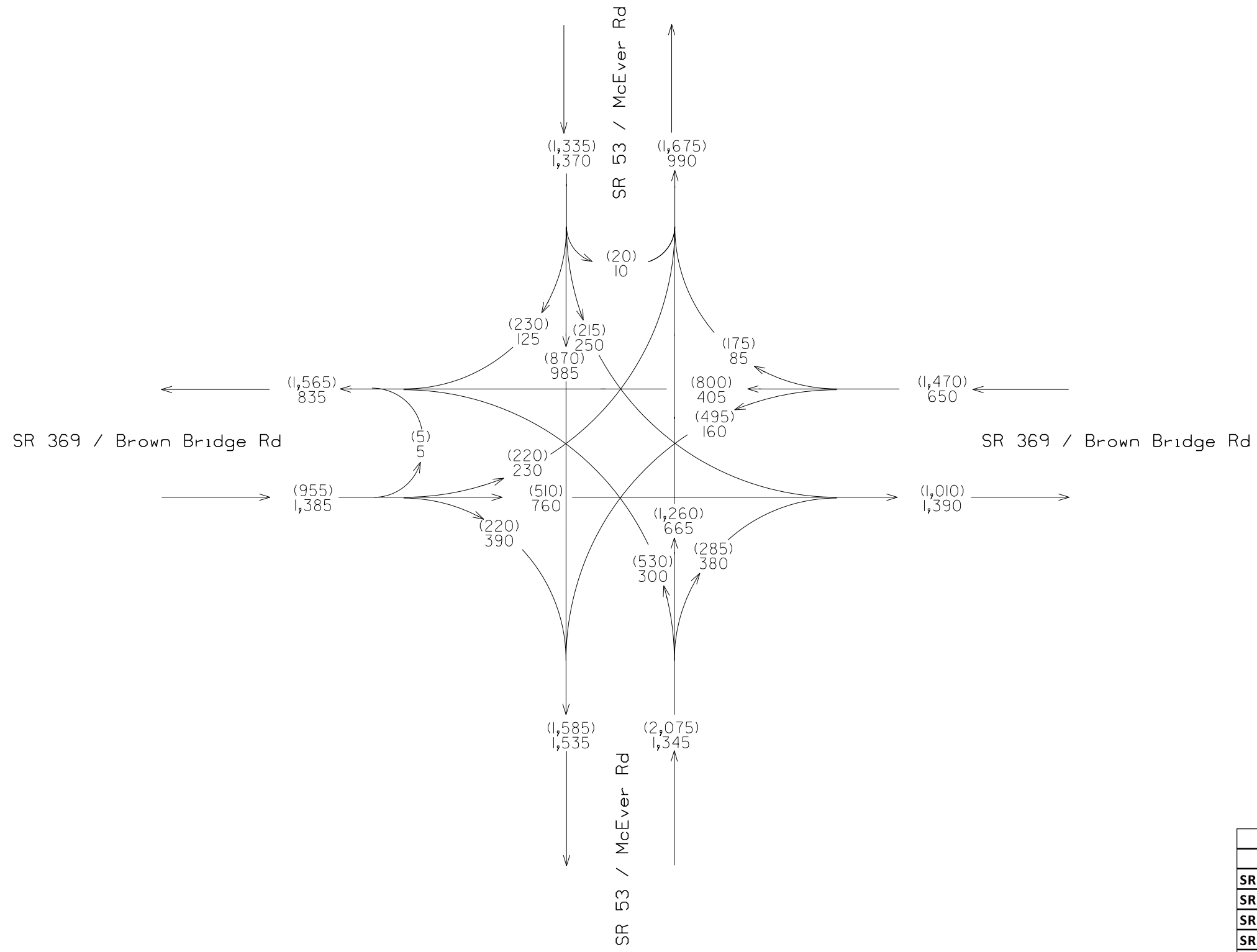
TRAFFIC DIAGRAM

YEAR 2024 DHV

DRAWING No.
 00-0002

COUNTY	STATE	SHEET NO.	TOTAL SHEETS
HALL	GA	1	3

DHV TRAFFIC VOLUMES
 EXISTING YEAR (2044)
 PM PEAK HOUR = (XXX)
 AM PEAK HOUR = XXX



Truck Percentage		
	AM	PM
SR 369 EB	4.0%	5.8%
SR 369 WB	7.0%	1.2%
SR 53 NB	4.1%	1.2%
SR 53 SB	1.9%	3.3%
Intersection	3.8%	2.4%

STATEWIDE OPERATIONAL IMPROVEMENTS
 SR 369 AT McEver Rd



NO-BUILD

STATE OF GEORGIA
 DEPARTMENT OF TRANSPORTATION

TRAFFIC DIAGRAM

YEAR 2044 DHV

DRAWING No.
 00-0003

					Subtotal	\$7,200
Individual Components	Unit Cost	Length (ft)	Width (ft)	Ht (ft)	Cost	
Retaining Walls - Gravity 0 - 5' (LF)	\$60					\$0
Retaining Walls-Gravity 5'-max (LF)	\$120					\$0
Retaining Walls-Special Design(SF)	\$60					\$0
Bridges - widen (SF)	\$100					\$0
Bridges - widen (SF)	\$100					\$0
Bridges - replace (SF)	\$120					\$0
Bridges - replace (SF)	\$120					\$0
Bridges - detour (SF)	\$60					\$0
Bridge Removal (SF)	\$25					\$0
Cofferdams (ea)	\$20,000					\$0
Box Culverts (SF)	\$95					\$0
Box Culverts (SF)	\$95					\$0
Large cross drains (LF)	\$80					\$0
Replace cross drains (LF)	\$120					\$0
Sediment/ detention ponds (ea)	\$30,000					\$0
Pavement patching (Sq yd)	\$30					\$0
New Lighting	\$10,000					\$0
Traffic Signalization / Upgrade (ea)	\$125,000	0.5				\$62,500
					Subtotal	\$62,500
					Total Construction Cost	\$560,250

52%

Right-of-Way Costs

Area Type	Unit Cost (acre	Miles	Width (ft)	Acres	Cost	
Urban Residential	\$800,000				\$0	
Easement Residential	\$240,000			0.000	\$0	
Urban Commercial	\$2,306,992			0.000	\$0	
Easement Commercial	\$175,000			0.000	\$0	
Suburban/Rural Residential	\$100,000			0.000	\$0	
Easement rural Residential	\$180,000			0.000	\$0	
Suburban/Rural Commercial	\$800,000			0.000	\$0	
Easement rural Commercial	\$240,000			0.000	\$0	
Displacements		Number	factor			
Residential	\$250,000	0	0.00		\$0	
Commercial	\$1,000,000	0	0		\$0	
Damages	\$0	0	0.00		\$0	
				ROW multiplier	2	
					Total Right-of-Way Cost	\$0

0%

Reimbursable Utility Costs

	0
4%	\$ 22,410
Total Reimbursable Utility Cost	\$22,410

2.07%

Preliminary Engineering Costs

PE %	46%	Total Preliminary Engineering Cost	\$500,000
------	-----	---	------------------

46.18%

Contingency Costs

Contingency %	20%	Total Contingency Cost	\$216,532.00
		Total (PE+Util.+ROW+CST)	\$1,082,660
		Grand Total	\$1,299,192

GDOT PI #	0015935	<p>Note: Up to 5 alternatives may be selected and evaluated; Use this ICE Stage 1 to screen 5 or fewer alternatives to evaluate in Stage 2</p> <p style="font-size: small; text-align: center;"> 1. Does alternative address the project need in a balanced manner and in scale with the project? 2. Does alternative improve safety performance in terms of reducing severe crashes? 3. Does alternative incorporate safety performance in operations for pedestrians and/or bicyclists? 4. Does alternative improve (or preserve) traffic characteristics, delay, reliability, etc.? 5. Does alternative appear feasible given the site respect to other project factors? 6. Does alternative appear feasible with respect to other project factors? 7. Overall feasible alternative (select alternative for further evaluation in Stage 2)? </p>							
Project Location:	SR 369 @ McEver Rd								
Prepared by:	Arcadis								
Analyst:	Shuqi								
Date:	3/4/2019								
<p><i>Answer "Yes" or "No" to each policy question for each control type to identify which alternatives should be evaluated in the Stage 2 Decision Record; enter justification in the rightmost column</i></p> <p>Intersection Alternative (see "Intersections" tab for detailed description of intersection/interchange type)</p>		Screening Decision Justification:							
Unsignalized Intersections	Conventional (Minor Stop)	No	No	No	No	No	No	No	Existing is signalized
	Conventional (All-Way Stop)	No	No	No	No	No	No	No	Existing is signalized
	Mini Roundabout	No	No	No	No	No	No	No	Existing is two-lane approach
	Single Lane Roundabout	No	No	No	No	No	No	No	Existing is two-lane approach
	Multilane Roundabout	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Potential alternative to evaluate
	RCUT (stop control)	No	No	No	No	No	No	No	Existing is signalized
	RIRO w/down stream U-Turn	No	No	No	No	No	No	No	High left turn volume
	High-T (unsignalized)	No	No	No	No	No	No	No	Not an T-intersection
	Offset-T Intersections	No	No	No	No	No	No	No	Not an T-intersection
	Diamond Interch (Stop Control)	No	No	No	No	No	No	No	Not an interchange
	Diamond Interch (RAB Control)	No	No	No	No	No	No	No	Not an interchange
	No LT Lane Improvements	No	No	No	No	No	No	No	N/A
	No RT Lane Improvements	No	No	No	No	No	No	No	N/A
Other unsignalized (provide description):	No	No	No	No	No	No	No	N/A	
Signalized Intersections	Traffic Signal	No	No	No	No	No	No	No	Existing Condition
	Median U-Turn (Indirect Left)	No	No	No	No	No	No	No	High left turn volume for all approaches
	RCUT (signalized)	No	No	No	No	No	No	No	High left turn volume for all approaches
	Displaced Left Turn (CFI)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Potential alternative to evaluate (Half)
	Continuous Green-T	No	No	No	No	No	No	No	Not an T-intersection
	Jughandle	No	No	No	No	No	No	No	No existing roadway available
	Quadrant Roadway	No	No	No	No	No	No	No	No existing roadway available
	Diamond Interch (Signal Control)	No	No	No	No	No	No	No	Not an interchange
	Diverging Diamond	No	No	No	No	No	No	No	Not an interchange
	Single Point Interchange	No	No	No	No	No	No	No	Not an interchange
	Add LT Lanes on McEver Rd	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Potential alternative to evaluate
	No RT Lane Improvements	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Potential alternative to evaluate
Alt3+extend SR 369 WB left turn lanes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Potential alternative to evaluate	

☐ = Intersection type selected for more detailed analysis in Stage 2 Alternative Selection Decision Record



GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD

ICE Version 2.14 | Revised 08/03/2018

GDOT PI # (or N/A) 0015935

GDOT District: 1 - Gainesville

Date: 3/4/2019

County: Hall

Area Type: Urban

Agency/Firm: Arcadis

Project Location: SR 369 @ McEver Rd

Analyst: Shuqi

Existing Intersection Control: Signal (turn lanes on mainline)

Type of Analysis: **Conventional Non-Safety Funded Project**

Opening / Design Year Traffic Operations

Intersection meets signal/AWS warrants?	Meets Signal Warrants	
Traffic Analysis Measure of Effectiveness	Intersection Delay	
Traffic Analysis Software Used	Synchro 10	
Analysis Time Period	AM Peak Hr	PM Peak Hr
2024 Opening Yr No-Build Peak Hr Intersection Delay	37.6 sec	76.7 sec
2024 Opening Yr No-Build Peak Hr Intersection V/C ratio	0.79	0.89
2044 Design Yr No-Build Peak Hr Intersection Delay	80.3 sec	430.8 sec
2044 Design Yr No-Build Peak Hr Intersection V/C ratio	0.95	1.11

Complete Streets Warrants Met?

- PEDESTRIANS
- BICYCLES
- TRANSIT

Crash Data: Enter 5 most recent years of intersection crash data	Crash Severity			
	PDO	Injury Crash*	Fatal Crash*	
Angle	78	33	0	31%
Head-On	3	4	0	2%
Rear End	155	35	0	53%
Sideswipe - same	29	4	0	9%
Sideswipe - opposite	4	0	0	1%
Not Collision w/Motor Veh	10	2	0	3%
TOTALS:	279	78	0	357

* Number of crashes resulting in injuries / fatalities, not number of persons

Alternatives Analysis:

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Proposed Control Type/Improvement:	Multilane Roundabout	Displaced Left Turn (CFI)	Add Left Turn Lanes	Alt3+extend SR 369 WB left turn lanes	N/A
Project Cost: (From CostEst Worksheet)	<i>Additional description here</i>	<i>Additional description here</i>	<i>Additional description here</i>	<i>Additional description here</i>	
Construction Cost	\$1,554,000	\$2,617,000	\$209,000	\$220,000	
ROW Cost	\$1,176,000	\$1,470,000	\$294,000	\$294,000	
Environmental Cost	\$0	\$0	\$0	\$0	
Reimbursable Utility Cost	\$46,000	\$93,000	\$7,000	\$7,000	
Design & Contingency Cost	\$745,000	\$1,121,000	\$89,000	\$94,000	
Cost Adjustment (justification req'd)	0%	0%	0%	0%	
Total Cost	\$3,521,000	\$5,301,000	\$599,000	\$615,000	

Traffic Operations:

	SIDRA 7		Synchro 10		Synchro 10		Synchro 10	
Traffic Analysis Software Used	AM Peak Hr	PM Peak Hr	AM Peak Hr	PM Peak Hr	AM Peak Hr	PM Peak Hr	AM Peak Hr	PM Peak Hr
Analysis Period								
2044 Design Yr Build Intersection Delay	117.7 sec	252.9 sec	40.1 sec	90.0 sec	71.9 sec	233.4 sec	55.2 sec	154.1 sec
2044 Design Yr Build Intersection V/C	1.41	1.82	0.70	0.85	0.89	0.95	0.89	0.95

Safety Analysis:

Predefined CRF: PDO	26%	33%	0%	0%
Predefined CRF: Fatal/Inj	71%	50%	0%	0%
Predefined CRF Source:	FHWA Clearinghouse #s 4196 / 4195	FHWA-HRT-09-055	N/A	N/A
User Defined CRF: PDO			26%	26%
User Defined CRF: Fatal/Inj			29%	29%
User Defined CRF Source (write in if applicable):			https://safety.mwa.gdot.gov/intersection/conventional/signalized/fhwass1	https://safety.mwa.gdot.gov/intersection/conventional/signalized/fhwass1

Environmental Impacts:¹

Historic District/Property	None	None	None	None
Archaeology Resources	None	None	None	None
Graveyard	None	None	None	None
Stream	None	None	None	None
Underground Tank/Hazmat	None	None	None	None
Park Land	None	None	None	None
EJ Community	None	None	None	None
Wooded Area	None	None	None	None
Wetland	None	None	None	None

Note: If environmental impact is significant (**RED**), provide justification impact won't jeopardize project delivery using "Env" worksheet

¹ Environmental impacts are only preliminary estimates; detailed environmental impact documentation will be included with project concept report

Stakeholder Posture:

Local Community Support	Neutral	Neutral	Neutral	Neutral
GDOT Support	Neutral	Neutral	Neutral	Neutral

Final ICE Stage 2 Score:	1.9	3.6	3.7	4.2
Rank of Control Type Alternatives:	4	3	2	1

Note: Stage 2 score is not given (shown as "-") if signal or AWS is selected as control type but respective warrants are not met

Provide additional comments and/or explain any unique analysis inputs, or results (as necessary):

3: McEver Rd & SR 369 Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	0.8	1.5	0.9	0.8
Total Del/Veh (s)	31.0	39.2	34.7	51.0	39.0
Vehicles Entered	1038	515	1040	1047	3640
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	1	0	0	1

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	46.0
Vehicles Entered	3643
Denied Entry Before	0
Denied Entry After	1

3: McEver Rd & SR 369 Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	1.0	1.2	1.0	0.9
Total Del/Veh (s)	40.9	200.2	51.0	49.5	88.0
Vehicles Entered	765	1163	1599	960	4487
Denied Entry Before	0	0	0	1	1
Denied Entry After	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	95.1
Vehicles Entered	4494
Denied Entry Before	1
Denied Entry After	0

3: McEver Rd & SR 369 Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	0.2	1.6	1.0	0.8
Total Del/Veh (s)	68.2	140.3	121.4	126.3	110.8
Vehicles Entered	1481	779	1463	1545	5268
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	1	1

Total Network Performance

Denied Del/Veh (s)	1.5
Total Del/Veh (s)	122.1
Vehicles Entered	5265
Denied Entry Before	0
Denied Entry After	1

3: McEver Rd & SR 369 Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	491.9	643.6	413.7	458.9
Total Del/Veh (s)	149.2	912.5	161.5	399.4	415.5
Vehicles Entered	959	1151	1689	1120	4919
Denied Entry Before	0	1	98	31	130
Denied Entry After	0	538	755	361	1654

Total Network Performance

Denied Del/Veh (s)	459.4
Total Del/Veh (s)	425.6
Vehicles Entered	4970
Denied Entry Before	130
Denied Entry After	1749

3: McEver Rd & SR 369 Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	0.7	1.5	0.8	0.8
Total Del/Veh (s)	28.7	35.2	38.5	49.7	38.3
Vehicles Entered	1037	542	993	991	3563
Denied Entry Before	0	0	0	1	1
Denied Entry After	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	45.3
Vehicles Entered	3561
Denied Entry Before	2
Denied Entry After	1

3: McEver Rd & SR 369 Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	0.8	1.3	1.0	0.9
Total Del/Veh (s)	41.8	53.2	44.7	43.6	46.3
Vehicles Entered	752	1202	1567	964	4485
Denied Entry Before	0	0	1	0	1
Denied Entry After	0	0	1	0	1

Total Network Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	55.5
Vehicles Entered	4483
Denied Entry Before	1
Denied Entry After	1

3: McEver Rd & SR 369 Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	0.2	1.5	0.8	0.7
Total Del/Veh (s)	41.1	46.8	45.6	47.9	45.2
Vehicles Entered	1423	798	1470	1478	5169
Denied Entry Before	0	0	2	0	2
Denied Entry After	0	0	0	1	1

Total Network Performance

Denied Del/Veh (s)	1.5
Total Del/Veh (s)	56.8
Vehicles Entered	5172
Denied Entry Before	2
Denied Entry After	4

3: McEver Rd & SR 369 Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	0.3	5.2	1.0	2.1
Total Del/Veh (s)	110.9	271.0	112.4	57.8	141.6
Vehicles Entered	1090	1651	2290	1459	6490
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	2	0	0	2

Total Network Performance

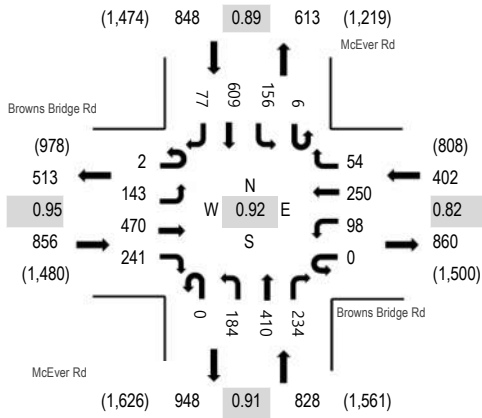
Denied Del/Veh (s)	2.3
Total Del/Veh (s)	158.1
Vehicles Entered	6490
Denied Entry Before	0
Denied Entry After	2



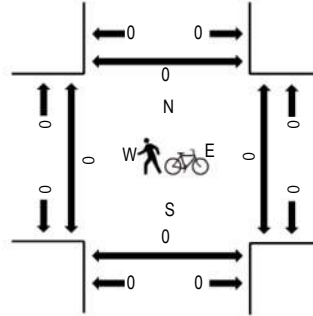
(303) 216-2439
www.alltrafficdata.net

Location: #1 McEver Rd & Browns Bridge Rd AM
Date and Start Time: Tuesday, February 19, 2019
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Browns Bridge Rd Eastbound				Browns Bridge Rd Westbound				McEver Rd Northbound			McEver Rd Southbound				Total	Rolling Hour	Pedestrian Crossings				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru			Right	West	East	South	North
7:00 AM	0	21	73	46	0	12	70	8	0	45	56	36	5	24	113	18	527	2,787	0	0	0	0
7:15 AM	1	28	110	63	0	29	81	15	0	43	84	50	2	30	137	14	687	2,934	0	0	0	0
7:30 AM	0	38	116	62	0	30	61	13	0	39	106	70	3	39	183	14	774	2,934	0	0	0	0
7:45 AM	0	42	128	58	0	24	57	12	0	62	118	61	1	47	165	24	799	2,736	0	0	0	0
8:00 AM	1	35	116	58	0	15	51	14	0	40	102	53	0	40	124	25	674	2,536	0	0	0	0
8:15 AM	6	59	106	42	0	22	55	21	0	46	125	59	1	30	94	21	687		0	0	0	0
8:30 AM	0	24	60	39	0	25	56	18	1	32	86	64	3	43	107	18	576		0	0	0	0
8:45 AM	0	25	76	47	0	32	52	35	0	30	111	42	8	27	98	16	599		0	0	0	0

Peak Rolling Hour Flow Rates

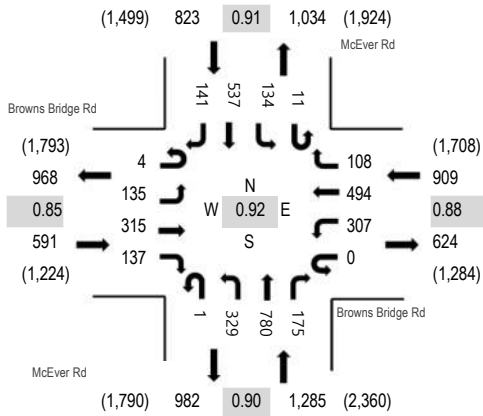
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	8	4	0	1	9	2	0	2	7	3	0	1	2	1	40
Lights	2	138	452	230	0	92	234	48	0	177	392	225	6	151	602	73	2,822
Mediums	0	5	10	7	0	5	7	4	0	5	11	6	0	4	5	3	72
Total	2	143	470	241	0	98	250	54	0	184	410	234	6	156	609	77	2,934



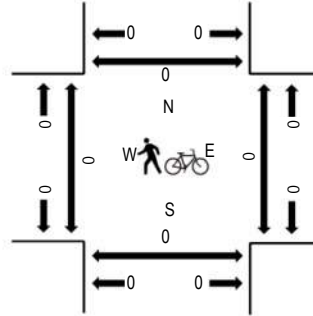
(303) 216-2439
www.alltrafficdata.net

Location: #1 McEver Rd & Browns Bridge Rd PM
Date and Start Time: Tuesday, February 19, 2019
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Browns Bridge Rd Eastbound				Browns Bridge Rd Westbound				McEver Rd Northbound				McEver Rd Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	2	40	97	27	0	55	87	26	0	64	162	65	3	33	73	37	771	3,206	0	0	0	0
4:15 PM	2	33	79	42	0	66	121	35	0	58	144	43	2	31	122	36	814	3,361	0	0	0	0
4:30 PM	1	38	80	30	0	60	119	31	0	71	157	51	6	22	109	24	799	3,529	0	0	0	0
4:45 PM	1	31	71	35	0	58	98	24	0	77	193	53	6	35	111	29	822	3,608	0	0	0	0
5:00 PM	0	43	105	38	0	83	124	30	0	90	168	42	1	46	122	34	926	3,585	0	0	0	0
5:15 PM	2	34	72	41	0	97	139	29	0	70	239	47	3	22	152	35	982		0	0	0	0
5:30 PM	1	27	67	23	0	69	133	25	1	92	180	33	1	31	152	43	878		0	0	0	0
5:45 PM	2	36	94	30	0	70	98	31	1	70	142	47	4	18	123	33	799		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	11	5	0	0	4	2	0	4	0	3	0	0	7	2	38
Lights	4	133	289	131	0	306	487	105	1	323	775	170	11	124	523	138	3,520
Mediums	0	2	15	1	0	1	3	1	0	2	5	2	0	10	7	1	50
Total	4	135	315	137	0	307	494	108	1	329	780	175	11	134	537	141	3,608

WA 16.39 - SR 369/Browns Bridge Rd at SR 53/McEver Rd

Hall County

Location:

- Hall County, Gainesville, GA
- GDOT District 1

No Build Analysis Results:

- AM Peak Hour
 - High delay for SR 53/McEver Rd SB through
 - High delay for SR 53/McEver Rd NB left
- PM Peak Hour
 - High delays and long queues for SR 369 WB with left turns backing up to adjacent through lane
 - Lane drop west of the intersection creates bottleneck for SR 369 WB
 - High delay and long queue for SR 53/McEver Rd NB left turn

Build Alternative:

- Provide dual left turns along SR 53/McEver Rd
- Extend SR 369 WB left turn lanes
- Shift lanes to extend the outside through lane of SR 369 WB to the channelized right turn

SimTraffic Build Analysis Intersection Delay Results (s/veh):

SR 369 at SR 53/McEver Rd	AM Peak Hour				PM Peak Hour			
	No-Build (2024)	Build (2024)	No-Build (2044)	Build (2044)	No-Build (2024)	Build (2024)	No-Build (2044)	Build (2044)
Intersection Delay	46.0	45.3	122.1	56.8	95.1	55.5	433.9	158.1
% Improvement	1%		53%		42%		64%	

SimTraffic Build Analysis Approach Delay Results (s/veh):

Approach Delay (sec/veh)	AM Peak Hour				PM Peak Hour			
	No-Build (2024)	Build (2024)	No-Build (2044)	Build (2044)	No-Build (2024)	Build (2024)	No-Build (2044)	Build (2044)
SR 369 EB	31.0	28.7	68.2	41.1	40.9	41.8	149.2	110.9
SR 369 WB	39.2	35.2	140.3	46.8	200.0	53.2	778.7	271.0
SR 53 NB	34.7	38.5	121.4	45.6	51.0	44.7	296.5	112.4
SR 53 SB	51.0	49.7	126.3	47.9	49.5	43.6	402.7	57.8

SimTraffic Build Analysis 95th Percentile Queue Length comparison (ft):

SR 53 / McEver Rd NB Left turn	AM Peak Hour		AM Peak Hour	
	No-Build (2024)	Build (2024)	No-Build (2024)	Build (2024)
95 th Queue Length	279	197	510	316
% Improvement	29 %		38%	

Projects Within Study Area:

- S014998: Quick Response Project for extending left turn lane on SR 53 NB (Completed)
- 122010-: Long Range Project for widening along SR 369 from Forsyth county line to SR 53
- 0016118: Safety Project for constructing raised median along SR 369 from SR 53 to SR 53 Conn

Speed Limits:

- SR 369/Browns Bridge Rd: 45 mph
- SR 53/McEver Rd: 45 mph

20-Year Intersection Benefit-Cost Ratio: 37.70

APPENDIX C

Example No-Build Summary

WA 16.39 - SR 369/Brown Bridge Rd at SR 53/McEver Rd

Hall County



Location:

- Hall County, West of Gainesville, GA
- GDOT District 1

No Build Analysis Results:

- AM Peak Hour
 - High delay for SR 53/McEver Rd SB through
 - High delay for SR 53/McEver Rd NB left
- PM Peak Hour
 - High delays and long queues for SR 369 WB with left turns backing up to adjacent through lane
 - Lane drop west of the intersection creates bottleneck for SR 369 WB
 - High delay and long queue for SR 53/McEver Rd NB left turn

ICE Stage 1 Alternatives:

- Provide Dual left turns along SR 53/McEver Rd NB
Extend the outside through lane of SR 369 WB, connecting to the channelized right turn
- Displaced Left Turn (CFI) for SR 53
- Multilane Roundabout

Synchro/SimTraffic Analysis Delay Results (s/veh):

Intersection Delay (sec/veh) SR 369 @ McEver Rd	2019	2024	2044
	No-Build	No-Build	No-Build
AM	36.7	37.6	133.8
PM	45.9	76.7	430.8

Crash Data:

Crashes	# of Incidents
PDO	279
Injury	78
Fatality	0

20-Year Intersection Delay Cost: \$86,828,710

Projects Within Study Area:

- S014998: Quick Response Project for extending left turn lane on SR 53 NB
- 122010-: Long Range Project for widening along SR 369 from Forsyth county line to SR 53
- 0016118: Safety Project for constructing raised median along SR 369 from SR 53 to SR 53 Conn



369 Brown Bridge Rd
SPEED LIMIT 45 MPH

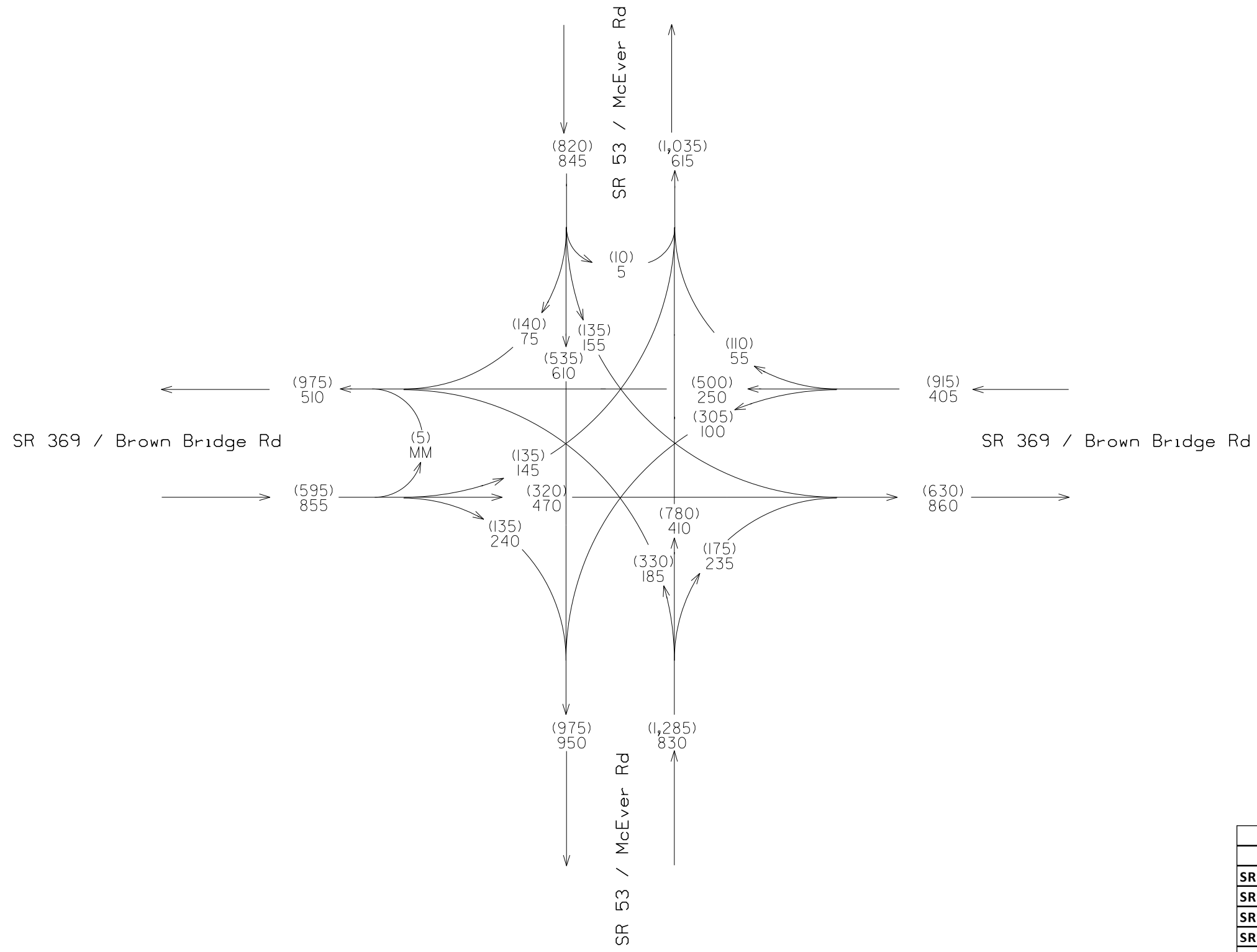
53 McEver Rd
SPEED LIMIT 45 MPH

53 McEver Rd
SPEED LIMIT 45 MPH

369 Brown Bridge Rd
SPEED LIMIT 45 MPH

COUNTY	STATE	SHEET NO.	TOTAL SHEETS
HALL	GA	1	3

DHV TRAFFIC VOLUMES
 EXISTING YEAR (2019)
 PM PEAK HOUR = (XXX)
 AM PEAK HOUR = XXX



Truck Percentage		
	AM	PM
SR 369 EB	4.0%	5.8%
SR 369 WB	7.0%	1.2%
SR 53 NB	4.1%	1.2%
SR 53 SB	1.9%	3.3%
Intersection	3.8%	2.4%

STATEWIDE OPERATIONAL IMPROVEMENTS
 SR 369 AT McEver Rd



NO-BUILD

STATE OF GEORGIA
 DEPARTMENT OF TRANSPORTATION

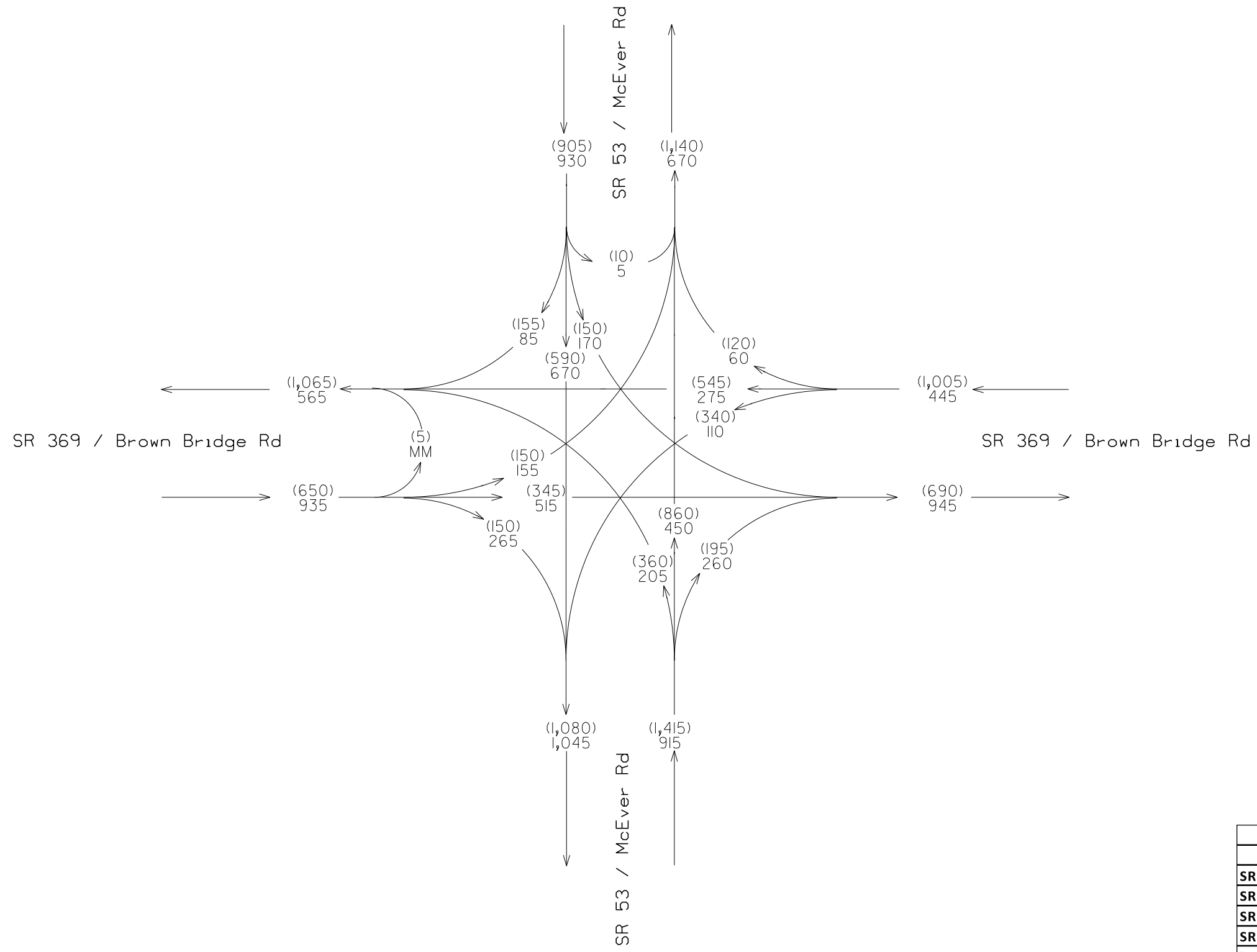
TRAFFIC DIAGRAM

YEAR 2019 DHV

DRAWING No.
 00-0001

COUNTY	STATE	SHEET NO.	TOTAL SHEETS
HALL	GA	1	3

DHV TRAFFIC VOLUMES
 EXISTING YEAR (2024)
 PM PEAK HOUR = (XXX)
 AM PEAK HOUR = XXX



Truck Percentage		
	AM	PM
SR 369 EB	4.0%	5.8%
SR 369 WB	7.0%	1.2%
SR 53 NB	4.1%	1.2%
SR 53 SB	1.9%	3.3%
Intersection	3.8%	2.4%

STATEWIDE OPERATIONAL IMPROVEMENTS
 SR 369 AT McEver Rd



NO-BUILD

STATE OF GEORGIA
 DEPARTMENT OF TRANSPORTATION

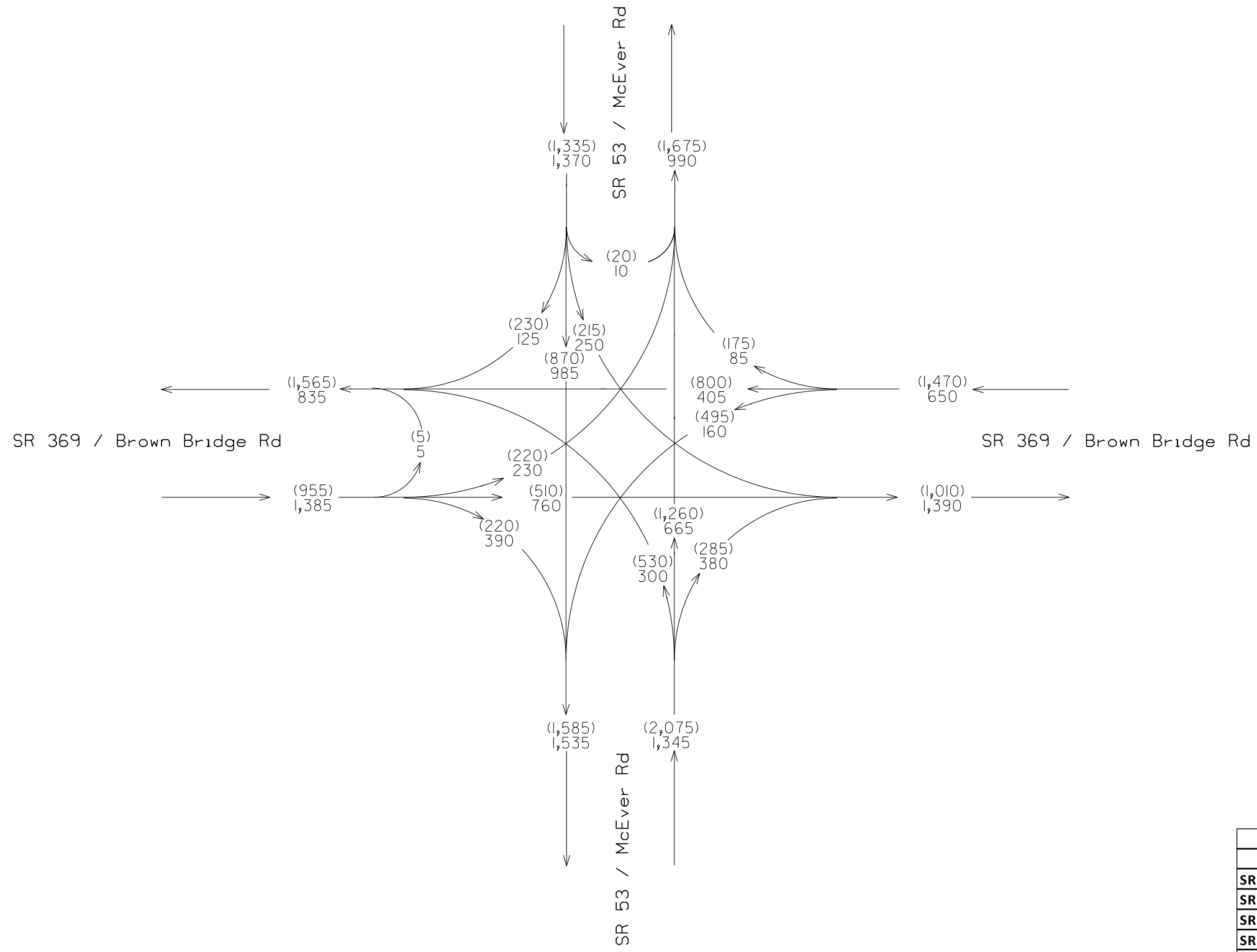
TRAFFIC DIAGRAM

YEAR 2024 DHV

DRAWING No.
 00-0002

COUNTY	STATE	SHEET NO.	TOTAL SHEETS
HALL	GA	1	3

DHV TRAFFIC VOLUMES
 EXISTING YEAR (2044)
 PM PEAK HOUR = (XXX)
 AM PEAK HOUR = XXX



Truck Percentage		
	AM	PM
SR 369 EB	4.0%	5.8%
SR 369 WB	7.0%	1.2%
SR 53 NB	4.1%	1.2%
SR 53 SB	1.9%	3.3%
Intersection	3.8%	2.4%

STATEWIDE OPERATIONAL IMPROVEMENTS
 SR 369 AT McEver Rd



NO-BUILD

STATE OF GEORGIA
 DEPARTMENT OF TRANSPORTATION

TRAFFIC DIAGRAM

YEAR 2044 DHV

DRAWING No.
 00-0003

GDOT PI #	0015935	Note: Up to 5 alternatives may be selected and evaluated; Use this ICE Stage 1 to screen 5 or fewer alternatives to evaluate in Stage 2 1. Does alternative address the project need in a balanced manner and in scale with the project? 2. Does alternative improve safety performance in terms of reducing severe crashes? 3. Does alternative incorporate safety performance in operations for pedestrians and/or bicyclists? 4. Does alternative improve (or preserve) traffic characteristics (congestion, delay, reliability, etc.)? 5. Does alternative appear feasible given the site respect to other project factors? 6. Does alternative appear feasible with respect to other project factors? 7. Overall feasible alternative (select alternative for further evaluation in Stage 2)?							
Project Location:	SR 369 @ McEver Rd								
Prepared by:	Arcadis								
Analyst:	Shuqi								
Date:	3/4/2019	Answer "Yes" or "No" to each policy question for each control type to identify which alternatives should be evaluated in the Stage 2 Decision Record; enter justification in the rightmost column							
Intersection Alternative (see "Intersections" tab for detailed description of intersection/interchange type)		Screening Decision Justification:							
Unsignalized Intersections	Conventional (Minor Stop)	No	No	No	No	No	No	No	Existing is signalized
	Conventional (All-Way Stop)	No	No	No	No	No	No	No	Existing is signalized
	Mini Roundabout	No	No	No	No	No	No	No	Existing is two-lane approach
	Single Lane Roundabout	No	No	No	No	No	No	No	Existing is two-lane approach
	Multilane Roundabout	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Potential alternative to evaluate
	RCUT (stop control)	No	No	No	No	No	No	No	Existing is signalized
	RIRO w/down stream U-Turn	No	No	No	No	No	No	No	High left turn volume
	High-T (unsignalized)	No	No	No	No	No	No	No	Not an T-intersection
	Offset-T Intersections	No	No	No	No	No	No	No	Not an T-intersection
	Diamond Interch (Stop Control)	No	No	No	No	No	No	No	Not an interchange
	Diamond Interch (RAB Control)	No	No	No	No	No	No	No	Not an interchange
	No LT Lane Improvements	No	No	No	No	No	No	No	N/A
	No RT Lane Improvements	No	No	No	No	No	No	No	N/A
Other unsignalized (provide description):	No	No	No	No	No	No	No	N/A	
Signalized Intersections	Traffic Signal	No	No	No	No	No	No	No	Existing Condition
	Median U-Turn (Indirect Left)	No	No	No	No	No	No	No	High left turn volume for all approaches
	RCUT (signalized)	No	No	No	No	No	No	No	High left turn volume for all approaches
	Displaced Left Turn (CFI)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Potential alternative to evaluate (Half)
	Continuous Green-T	No	No	No	No	No	No	No	Not an T-intersection
	Jughandle	No	No	No	No	No	No	No	No existing roadway available
	Quadrant Roadway	No	No	No	No	No	No	No	No existing roadway available
	Diamond Interch (Signal Control)	No	No	No	No	No	No	No	Not an interchange
	Diverging Diamond	No	No	No	No	No	No	No	Not an interchange
	Single Point Interchange	No	No	No	No	No	No	No	Not an interchange
	Add LT Lanes on McEver Rd	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Potential alternative to evaluate
	No RT Lane Improvements	No	No	No	No	No	No	No	N/A
Other Signalized (provide description):	No	No	No	No	No	No	No	N/A	

= Intersection type selected for more detailed analysis in Stage 2 Alternative Selection Decision Record

APPENDIX D

Example Project Scoping Document



Interoffice Memo

DATE: 6/3/2019

FROM: Landon Perry, GDOT Office of Traffic Operations

TO: GDOT Operational Improvement Committee

SUBJECT: GDOT Statewide Operational Improvement Program Project Scoping Document – SR 369/Browns Bridge Rd at SR 53/McEver Road

Project Description:

The proposed project would provide northbound and southbound dual left turn lanes on SR 53/McEver Road with storage lengths of 510' northbound and 200' southbound. The project also includes extending the SR 369/Browns Bridge Rd westbound left turn lanes by approximately 100' and extending the SR 369/Browns Bridge Rd eastbound outside through lane to allow for more storage prior to merging into 1 EB lane.

Delivery Mechanism:

Menu of Service Design: X
Full PDP with concept report: or
Full PDP without concept report: X

Project Approval:

For a project to be partially or fully funded by Operational Improvement Program funds, it must be reviewed and approved by a majority of the Operational Improvement Committee. That Committee is made up of the Chief Engineer, Director of Operations, Director of Engineering, Director of Program Delivery, State Traffic Engineer, and State Transportation Planning Administrator. This project scope was reviewed and approved by the Committee on 6/3/2019. The initials of the Committee member or their designee is below:

mgp Chief Engineer

 Director of Operations

HP Director of Engineering

AVS Director of Program Delivery

S. Forst State Traffic Engineer

 State Transportation Planning Administrator

Project Revisions:

Deviations from the project scope will require approval from the Chairman of the Operational Improvement Committee or their designee. Requests for changes in scope should be submitted to the Office of Traffic Operations Program Manager.

APPENDIX E

The GDOT Operational Traffic Volume Forecasting Manual