

Effingham Parkway and Blue Jay Road

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Prepared by:



Prepared for:



County
Effingham
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Attachments:

- Attachment A – 2014 Concept Report Traffic Flow Diagrams
- Attachment B – Synchro Traffic Analysis Output
- Attachment C – Conceptual Design
- Attachment D – Cost Estimate

Introduction

Effingham County and the Georgia Department of Transportation (GDOT) are constructing Effingham Parkway, a new roadway extending from the intersection of SR 30 and Benton Boulevard in Chatham County northward through southern Effingham County to Blue Jay Road. As part of this effort, a concept report was prepared in 2014 which includes a concept design and projected traffic volumes for the new road and key intersections. In this concept report, it was planned to realign Blue Jay Road so that northbound travelers on Effingham Parkway would continue to Blue Jay Road eastbound, as shown below in **Figure 1**. An additional realignment has been constructed further east to realign Blue Jay Road such that eastbound travelers on Blue Jay Road continue to McCall Road northbound, creating a continuous travel corridor from Effingham Parkway to McCall Road.

Figure 1 GDOT Concept Design for the Intersection of Blue Jay Road and Effingham Parkway



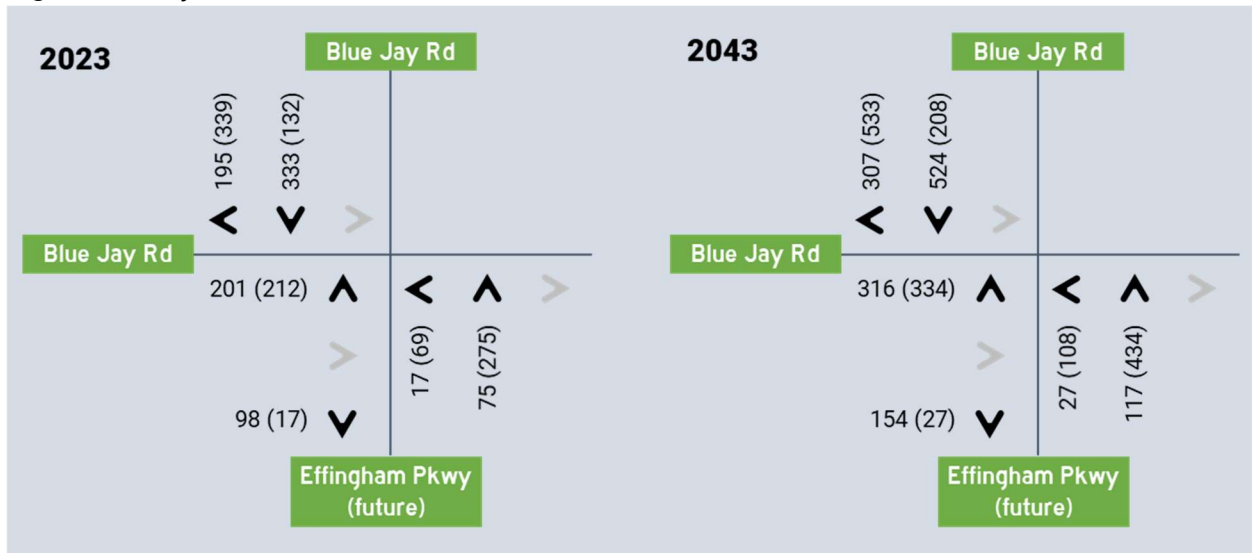
The purpose of this report is to examine intersection configurations and controls at the future intersection of Blue Jay Road and Effingham Parkway based on forecasted traffic from the 2014 concept report and anticipated traffic growth from the Effingham County Transportation Master Plan (TMP) completed in 2021. The report considers the previously proposed configuration as well as other traditional and innovative intersection configurations in order to find the most appropriate intersection control.

Congestion Analysis

Traffic Volumes

Anticipated future traffic volumes were developed based on the traffic volumes included in the 2014 concept report and traffic growth methodology used in the Effingham County TMP. Traffic flow diagrams from this report are included in **Attachment A**. This report anticipated an opening year of 2019 and a design year of 2039. Currently, Effingham Parkway is anticipated to open to traffic in 2023, so analyses were performed with an open year of 2023 and a design year of 2043. Per the TMP, traffic volumes were grown by 3.5% per year through year 2031 and by 1.5% per year from year 2031 through year 2043. These calculated traffic volumes are shown in **Figure 2** below. Truck factors from the concept report were also used.

Figure 2 Analysis Volumes



Analysis Methodology

The intersection was analyzed using Trafficware's Synchro 11 software to understand congestion levels at the intersection under different control configurations. Analysis was performed based on methodologies published in the 6th edition of the Highway Capacity Manual (HCM). HCM methodology determines the average amount of delay an intersection control (signal, stop sign, etc.) causes for each vehicle in the intersection. This is typically expressed in average seconds of delay per vehicle (sec/veh). Intersections (or individual approaches or movements at intersections) are then assigned a Level of Service based on this average delay, based on research about drivers' perceptions of delay. Levels of Service range from A to F, with different threshold for signalized and unsignalized control. Different jurisdictions have different policies, but generally an LOS of A through D is considered acceptable, while LOS of E or F is typically cause for concern.

Alternatives Considered

In order to determine the best intersection control and configuration, the following intersection controls were analyzed:

- Blue Jay Road (west) stop-controlled at Effingham Parkway/Blue Jay Road (east), as included in the GDOT concept,
- A similar intersection, utilizing a High-T configuration,
- A similar intersection, utilizing a Restricted Crossing U-Turn (RCUT) configuration, and
- A single-lane roundabout.

Congestion Analysis Results

Full Synchro reports of the analyses conducted are included in **Attachment B**. A summary of the results of the analyses performed are shown in **Table 1** below. Note that for alternatives except the roundabout, the delay of the stop-controlled approach (Blue Jay Road (west)) is shown. The delay shown for the roundabout is the average delay of the full intersection. Based on these results, a traditional side-street stop-controlled intersection, a High-T intersection, an RCUT configuration are anticipated to experience substantial delays by year 2043, while a roundabout is expected to be able to support future traffic demands with comparatively little congestion.

Table 1 Congestion Analysis Results

Alternative		2023 Opening Year				2043 Design Year			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Minor Street Stop Controlled		B	15	C	22	F	56	F	253
High-T		B	14	C	17	D	29	F	76
RCUT	Main Intersection	C	15	B	11	F	67	B	14
	Downstream U-Turn	A	8	A	9	A	8	B	11
Single-Lane Roundabout*		A	8	A	8	C	17	C	16

**Delays shown for the roundabout are intersection average delays, while others represent the delay anticipated to be experienced by the stop-controlled approach of Blue Jay Road (west)*

Recommendations

Based on the analyses presented in this report, a roundabout could potentially support future traffic levels while other configurations are likely to be unable to support future traffic demands during peak periods without substantial delay. As such, a single-lane roundabout is recommended at this location.

A conceptual design of this roundabout is included in **Attachment C** and is shown in **Figure 3** below. Notably, in this concept Effingham Parkway curves to meet Blue Jay Road, rather than the realignment of Blue Jay Road proposed in the GDOT concept. This was done to keep the roundabout within the proposed right-of-way of the Effingham Parkway project. If the realignment was maintained, part of the roundabout would likely require additional right-of-way acquisition. As part of this concept design, a cost estimate was prepared, and is included in Attachment D. It is estimated that this roundabout could be constructed for between approximately \$1.83 and \$2.08 million .

Figure 3 Conceptual Roundabout Design

