

Memorandum

To: Travis Vencel, Sullivan Development LLC
Andrew Cibor, City of Bloomington

From: Amanda Johnson, EMCS

Date: 04/18/2024

RE: Summit PUD

EMCS Inc. completed a traffic impact analysis for the Summit District PUD. The most recent update was dated 3/18/2024. This memorandum serves as a supplemental document to detail the analysis and results of additional analysis scenarios as requested by the City of Bloomington. All traffic volumes and methodologies described in the original analysis are still relevant except where superseded within the following sections. The topics of discussion included within this memorandum include:

- Potential Hotel in commercial land use
- Weimer Road Analysis
- Deborah Road Analysis
- Weimer Road & Bloomfield Avenue
- Bloomfield Road & Allen Road
- Turn lanes at internal intersections
- Sensitivity analysis for all improvements
- Mode Split comparison

Hotel Land Use

Since the PUD and zoning allows for a potential hotel within the commercial areas of the development, the impact of a hotel was investigated. A potential 100 room hotel was included in the Everest Center section of the PUD. The following table includes the ITE trip generation for a hotel.

ITE Land Use Code	Size	AM Enter	AM Exit	PM Enter	PM Exit
310	100 Rooms	26	20	30	29

For the purpose of this study, internal trip and mode split trip reductions were not applied. It is anticipated that traffic will access the site from both Adams Street and Sudbury Drive (via Weimer Road). The resulting additional traffic is shown in green boxes on the following pages.

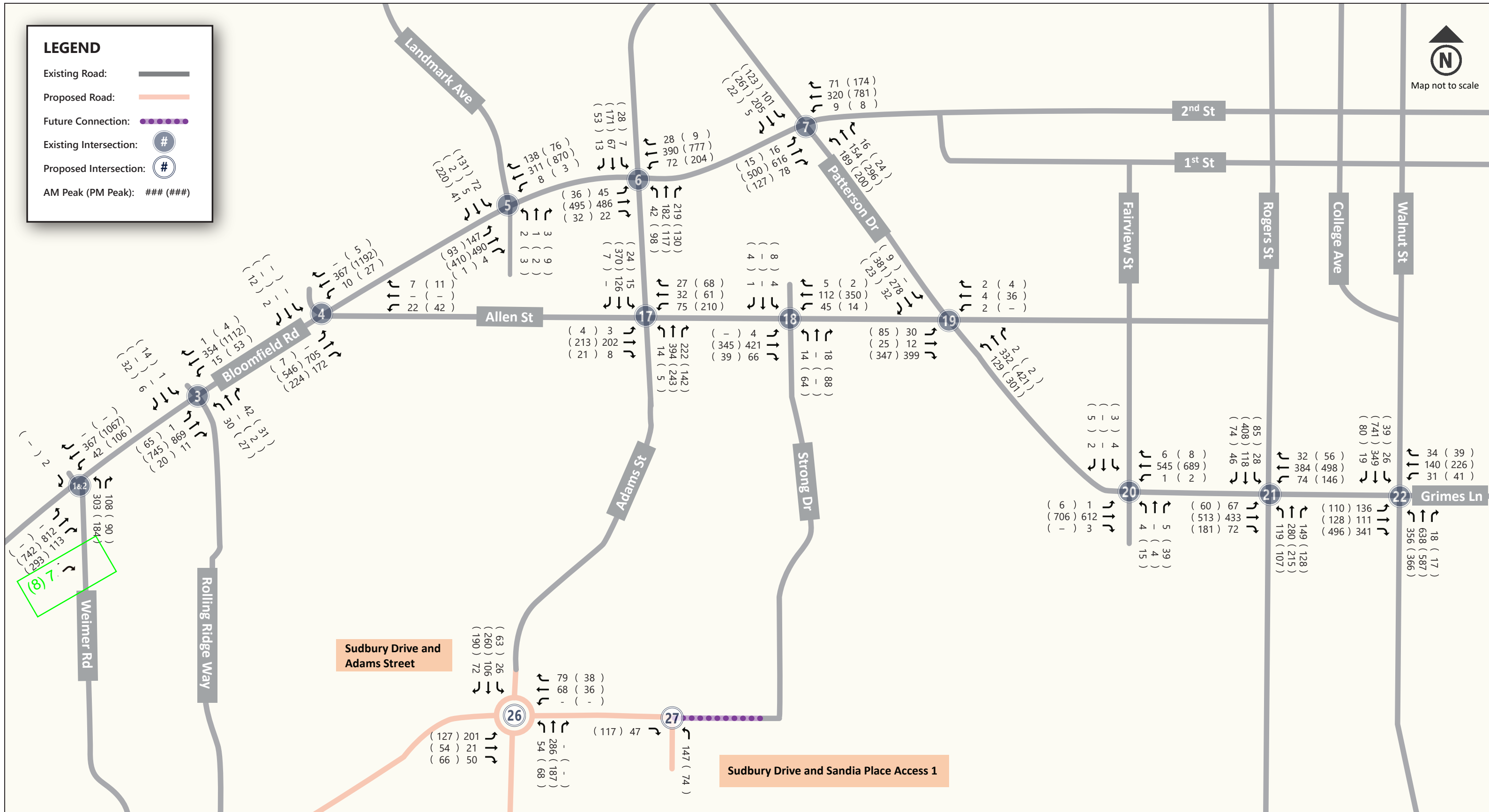


Figure 15: Turning Movements Scenario 4: Bloomfield Road / 2nd Street, Allen Street, and Patterson Street

Disclaimer: Refer to Appendix A for the detailed internal network. The internal network is proposed to be a grid-like network. For the purposes of this study, the internal network was simplified down to 6 key internal intersections (Intersections 24-29). Traffic was not assigned to "Future Connections."

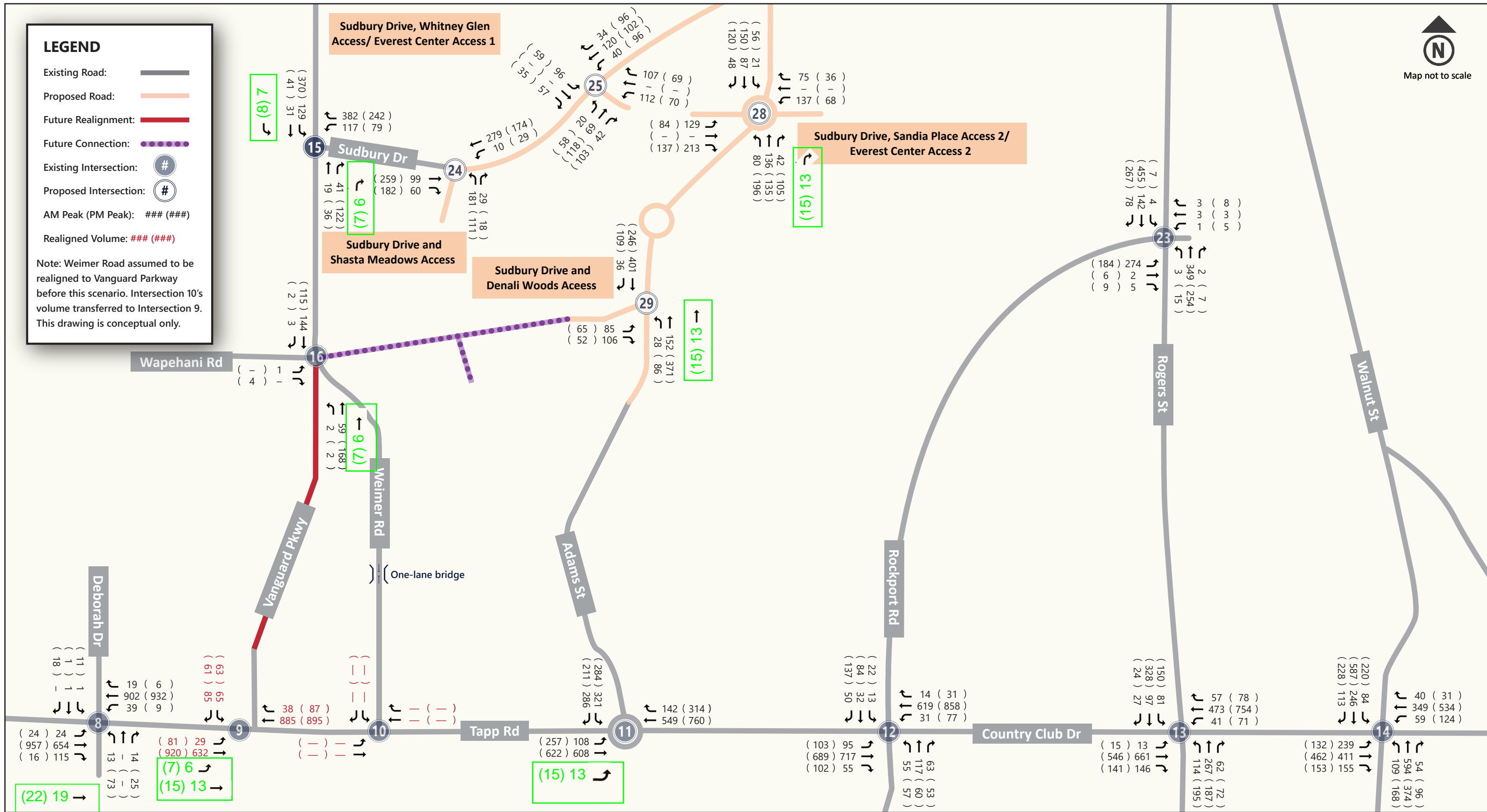


Figure 16: Turning Movements Scenario 4: Tapp Road / Country Club Drive / Winslow Road, Weimer Road, Rockport Road, Rogers Street, and Walnut Street

Disclaimer: Refer to Appendix A for the detailed internal network. The internal network is proposed to be a grid-like network. For the purposes of this study, the internal network was simplified down to 6 key internal intersections (Intersections 24-29). Traffic was not assigned to "Future Connections."

Weimer Road Analysis

The current alignment of Weimer Road includes two low speed horizontal curves and a single lane bridge near the southern terminus of the project. The Bloomington Transportation Plan shows this roadway ultimately being aligned with Vanguard Pkwy. Although the timing of this improvement is still unknown, it was assumed that in the full build scenario, this realignment would have been constructed. As a part of this memorandum, further consideration was given to Weimer Road in it's current configuration.

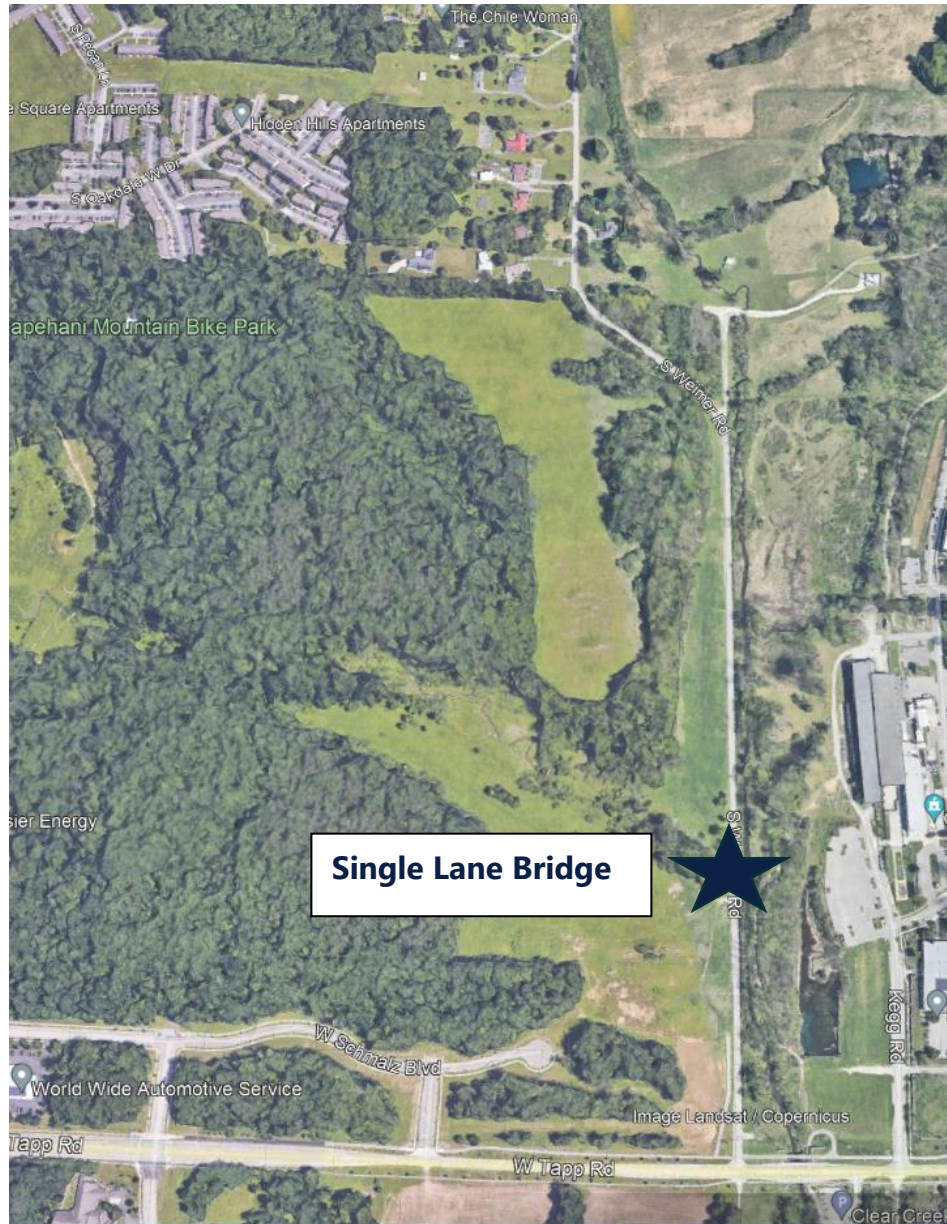


Figure 1 Weimer Road

Although not much guidance is available for two-lane, one-way operations, an outdated FHWA publication cites rural one-lane two-way facilities should not be used on roadways with higher

than 1,500 vpd. Under existing conditions, the ADT is ~1,400 per day. **By the time any development is constructed along Weimer Road, this volume threshold will be exceeded.** In addition, EMCS prepared a traffic simulation using SimTraffic to simulate the one-lane bridge. Although not an exact model, the simulation did show some queueing vehicles. Ultimately, the one-lane two-way operation is less of a capacity issue and more of a safety concern. While still in operation, at a minimum, signage announcing the one-lane bridge should be posted. Consideration should be given to widening the bridge or installing a traffic signal on either end to control the bridge.



Figure 2 Example of Signal Controlled Single Lane Bridge

Finally, the intersection of Wemer Road & Tapp Road experiences heavy delay during the PM peak hour with existing traffic volumes and conditions, specifically along the southbound approach. As vehicles wait longer for gaps, they begin to accept smaller gaps, leading to potential crashes. This intersection is in need of improvements **under existing conditions** and the need will only grow as traffic is added to Weimer Road.

Deborah Drive

There is an existing traffic signal at Debora Drive & Tapp Road serving development to the north and south of Tapp Road. If Weimer Road is realigned with Vanguard Pkwy, consideration

should be given to uninstalling a traffic signal at Deborah Drive. A traffic signal or roundabout could be installed at Vanguard Pkwy. Vanguard Pkwy is the ideal location for a controlled intersection since it will connect to Weimer Road in the north, and the City of Bloomington Transportation Plan indicates a future connection to the south.

If the traffic signal at Deborah Drive is removed, exiting left-turning traffic should be restricted. This configuration lends itself well to a left-in/right-in/right-out access at Deborah Drive and a roundabout at Vanguard Pkwy. A roundabout would provide access for any left-turning traffic and would not be in conflict (as a traffic signal might) with other roundabouts along Tapp Road. A single lane roundabout operates at or above acceptable levels of service for scenarios at Vanguard Pkwy & Tapp Road.

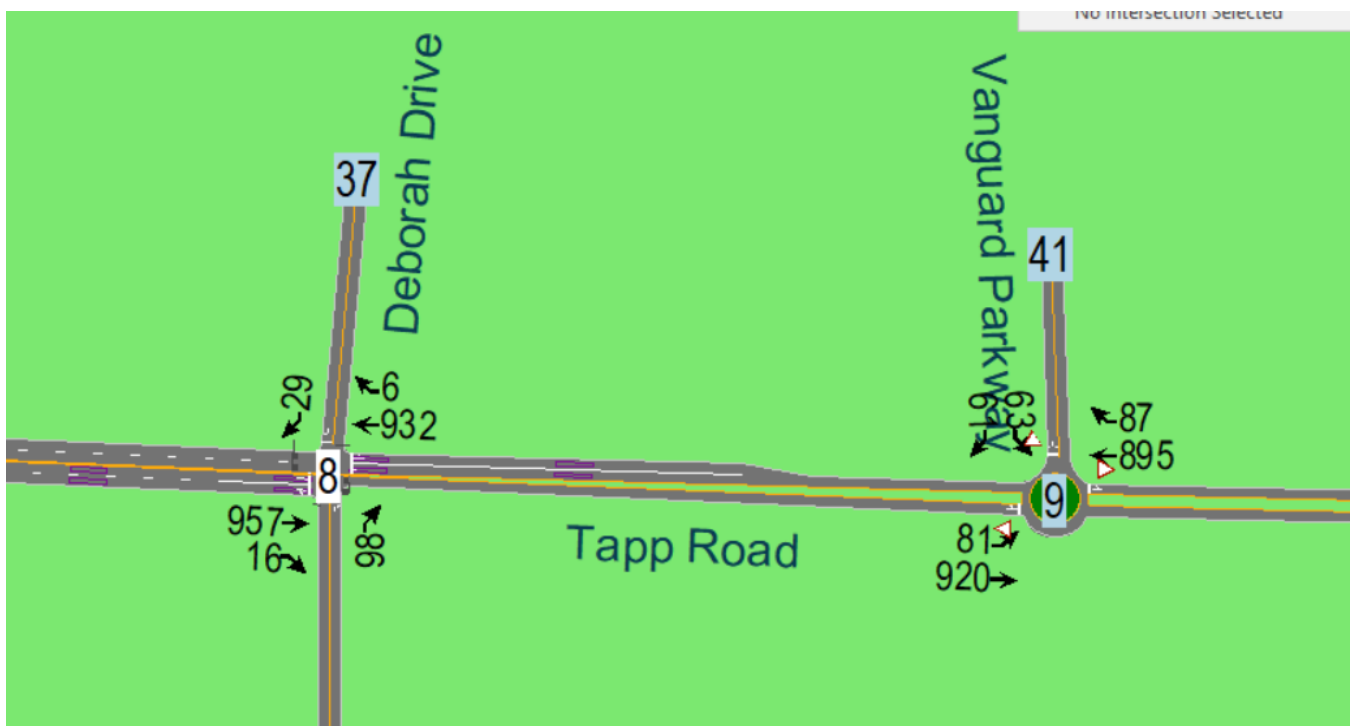


Figure 3 Potential Deborah Drive RIRO and Vanguard Pkwy Roundabout

Weimer Road & Bloomfield Avenue

The intersection of Weimer Road & Bloomfield Avenue is currently a two-way stop-controlled intersection. The north leg leads to a parking lot for the Twin Lakes Sports Park and Recreation Center. Ideally, these two approaches should be aligned. In addition, a second entrance to Twin Lakes Sports Park/Roling Ridge Way & Bloomfield Avenue currently exists as a traffic signal. Weimer Road is listed as a Primary Connector in the Transportation Plan, while Rolling Ridge Way does not appear in the Transportation Plan. The existing traffic signal is less than 400 feet from Weimer Road which causes concern with any new traffic signal or roundabout controlled intersection at Weimer Road & Bloomfield Avenue while maintaining a traffic signal at Rolling Ridge Way.

If the traffic signal was removed and the Twin Lakes Sports Park access realigned, a traffic signal or a roundabout would operate at or above acceptable levels of service at the intersection of Weimer Road & Bloomfield Avenue. Existing traffic along Rolling Ridge Way would also be able to use a proposed controlled access at Weimer Road & Bloomfield Avenue through the connection of Rolling Ridge Way to Weimer Road. Finally, any existing cut-through traffic from Weimer Road, through the apartment complex, to the traffic signal at Rolling Ridge Way would be eliminated.

Bloomfield Avenue & Allen Road

The intersection of Bloomfield Avenue & Allen Road is currently a two-way stop-controlled intersection. Allen Road has sight distance constraints with trees and roadway curvature. The proposed Summit District PUD will connect with Allen Street via Adams Road. While the capacity analysis does not indicate improvements are required until Scenario 4 (full build out of Summit District), consideration should be given to tree clearing at a minimum, and realignment of Allen Street to intersect at a perpendicular angle.

The capacity analysis has shown that improvements are needed in the full build scenario, however, if other improvements are installed at Weimer Road & Bloomfield Avenue, less traffic might be attracted to this intersection, lessening the need for additional improvements.

Turn Lanes at Internal Intersections

A turn lane warrant analysis based on methodology set forth in INDOT driveway permit manual was completed at each internal intersection. The capacity analysis showed that no turn lanes were required at any internal intersections. Based on the turn lane warrant analysis, the following turn lanes should be included:

	Intersection	Right-Turn Warranted?	Left-Turn Warranted?
26	Sudbury & Adams	Southbound	Eastbound
24	Sudbury & Shasta	Eastbound	No
25	Sudbury & Everest Center 1	No	No
28	Sudbury & Sandia/Everest	Northbound, Southbound. Eastbound	No
29	Adams & Denali	Southbound	Northbound

Mode Split Sensitivity

The Traffic Impact Analysis and associated Appendices detail the decision making in determining a 5% mode split reduction. While this assumption was made with guidance from ITE Trip Generation Manual, a sensitivity analysis was conducted to simulate what might

happen if no bus, carpool, or walking/biking modes were utilized within the development and if additional improvements would be required at study intersections if the anticipated mode split was not realized.

In the PM peak, a total of 241 trips (out of 2,467 – less than 10%) were removed due to mode split and internal capture calculations. If these reductions were not included, the maximum impact would be at Weimer Road & Bloomfield Avenue – along with internal intersections.

Summary

The addition of a **hotel land use** within the Everest Center development area would increase peak hour traffic volumes by less than 60 trips each. Once these trips are distributed to the study area roadways, the impact to operations and level of service is negligible.

The **Weimer Road Realignment** is included in the Bloomington Transportation Plan, but there is not currently a timeline for this project. This analysis shows that the existing conditions are not favorable and that as soon as any development is constructed with Summit District (or other developments), the operations along Weimer Road will deteriorate causing additional delay and safety concerns. An improvement to Weimer Road should be made in conjunction with development of the Sudbury District – ideally a realignment, but at a minimum expansion to a two-lane bridge.

The intersection of **Weimer Road & Bloomfield Avenue** should be converted to either a traffic signal or a roundabout in conjunction with construction of the Summit District development. Both options would operate well at this location, but a traffic signal may be desired due to grade differences through the intersection which would lead to a costly roundabout. The existing traffic signal at Rolling Ridge Way would need to be decommissioned. This would also require a traffic signal warrant to ensure both the new signal is warranted and that the existing signal would not be warranted, assuming some diversion of existing traffic to an improved Weimer Road & Bloomfield Avenue intersection.

The intersection of **Bloomfield Avenue & Allen Road** operates well from a capacity analysis standpoint until the full build out scenario of Summit District. However, there are existing sight distance concerns at the intersection. Aligning Allen Road to perpendicularly connect with Bloomfield Avenue and tree clearing would improve sight distance at the intersection and should be considered for existing conditions. Although the full build scenario shows increased delay on Allen Road during the peak hours, it is anticipated that it will dissipate quickly. Additionally, a traffic signal or roundabout at Weimer Road & Bloomfield Avenue would provide a controlled option for exiting traffic.

An analysis of **turn lane warrants** at internal intersections was completed and shows that additional turn lanes should be included at Sudbury & Adams, Sudbury & Shasta, Sudbury & Sandia/Everest, and Adams & Denali.

Finally, a **mode split sensitivity** analysis was completed assuming all vehicular trips will access the site. While a 0% mode split is not anticipated for this site, this analysis was prepared to demonstrate a worst case scenario to confirm no additional improvements are needed. The sensitivity analysis shows that all intersections operate above acceptable levels of service with a 10% volume increase at each intersection with the proposed conditions – with the exception of Allen & Adams which continues to operate below acceptable levels of service during the PM peak hour as described in the full report.