

City of Tiffin – US 6 (Marengo Rd) Operations Analysis for Intersections with Croell Ave and Kimberlite St.

Prepared by: MSA Professional Services, Inc.

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Project Overview

MSA Professional Services completed a **traffic operations review** for two key intersections along **US 6** in the City of Tiffin:

- 1. **US 6 & Croell Avenue**
- 2. **US 6 & Kimberlite Street**

The study evaluated **current and future traffic conditions** and assessed potential intersection improvements needed to accommodate continued city growth and new development north of US 6.

Alternatives Studied

Five intersection improvement options were evaluated as part of this review. Each alternative assumes US 6 will be reconstructed to a **three-lane cross section**—one lane in each direction with a **two-way left-turn lane (TWLTL)**.

Option Croell Avenue		Kimberlite Street
1	Offset right-turn lane	Traffic Signal
2	Restricted access (right-in/right-out only)	Traffic Signal
3	Traffic Signal	Restricted access (right-in/right-out only)
4	Traffic Signal	Traffic Signal
5	Traffic Signal	Single-Lane Roundabout

These alternatives were selected to compare a range of design and operational strategies—from limited-access control to full intersection control—to improve both safety and traffic flow along the US 6 corridor.

Traffic Growth & Future Development

Traffic counts were collected on **August 5, 2025**, during weekday AM and PM peak hours. Growth projections extended to **2045**, incorporating background traffic and traffic generated by nearby planned developments north of US 6, including:

- 44 single-family homes
- 154 duplex/townhome units
- 14 acres of mixed-use commercial development
- 10,000 sq. ft. University of Iowa clinic

A **4.3% annual traffic growth rate** was applied to US 6 based on Iowa DOT historical data—higher than typical growth rates, but representative of recent local trends. Operational analyses were conducted using **Synchro 12** and **HCS software** following **Highway Capacity Manual (HCM 7th Edition)** methodologies.

Key Terminology

- **Level of Service (LOS):** A measure of intersection efficiency based on vehicle delay.
 - **A–D = Acceptable, E–F = Poor/Overcapacity**
 - **95th Percentile Queue:** The queue length expected to occur during the busiest traffic periods.
 - **TWLTL (Two-Way Left-Turn Lane):** A shared center lane that allows vehicles traveling in either direction to make left turns.
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Existing Conditions (2025)

- **Croell Avenue:** Operates acceptably overall (LOS D or better), except for the **southbound left-turn**, which experiences significant delay (LOS F) during the PM peak.
 - Crash data (2019–2024): **12 crashes**, primarily angle-type collisions involving southbound left-turn movements.

- **Kimberlite Street:** Currently operates acceptably under existing volumes with minor delay.
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Future Conditions (2025–2045)

Croell Avenue

- Alternatives that include a **traffic signal** improve operations to acceptable LOS during both peak periods.
- The **southbound left-turn queue** may occasionally exceed existing storage length but remains manageable under most conditions.

Kimberlite Street

- **Traffic Signal Alternatives (Options 1–4):**
 - Maintain acceptable LOS through 2045, though westbound queues increase during the PM peak.
 - **Roundabout Alternative (Option 5):**
 - Operates efficiently in the near term (2025).
 - By 2045, the westbound approach operates at LOS F during the PM peak, though queues remain shorter than the signalized alternative.
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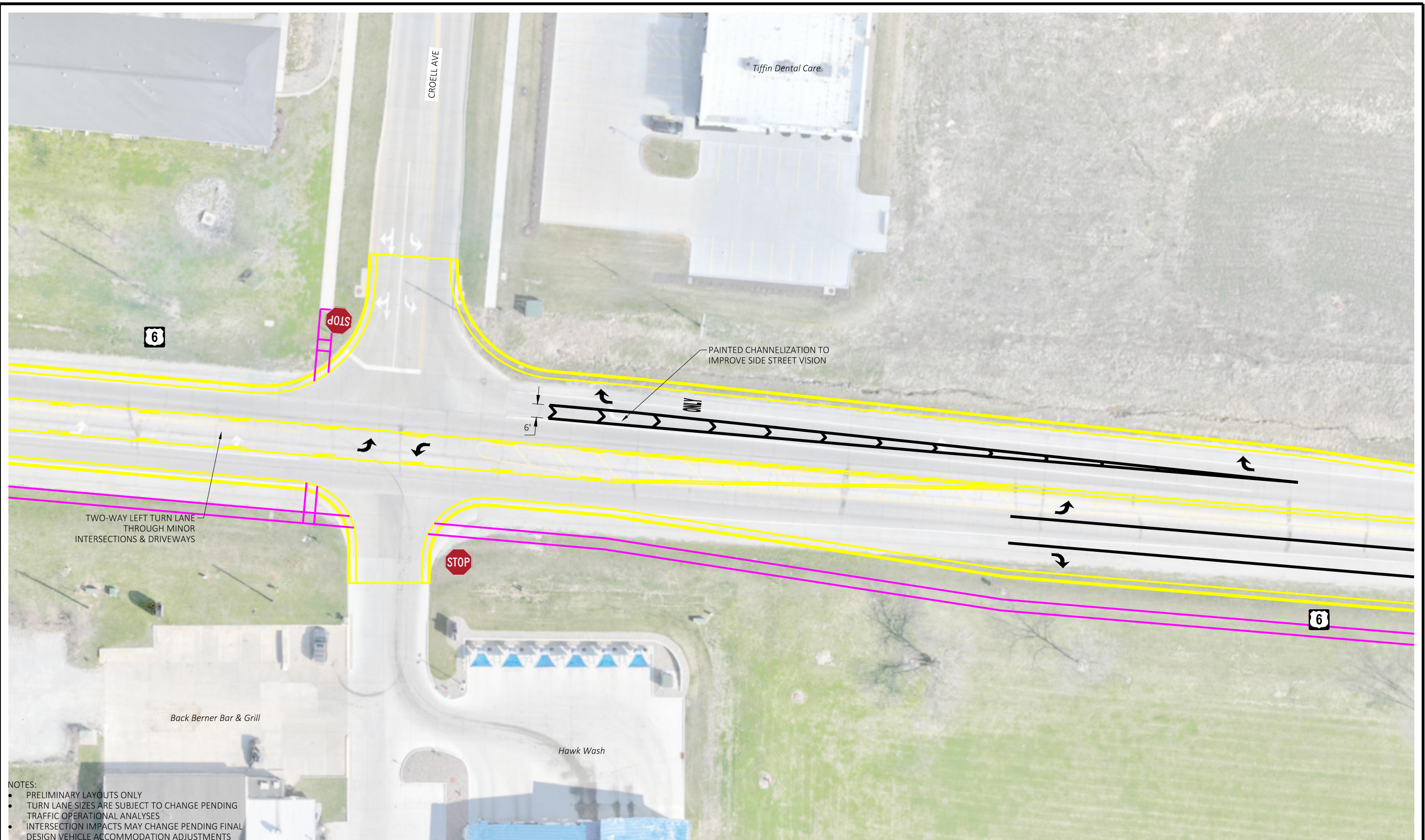
Safety and Design Considerations

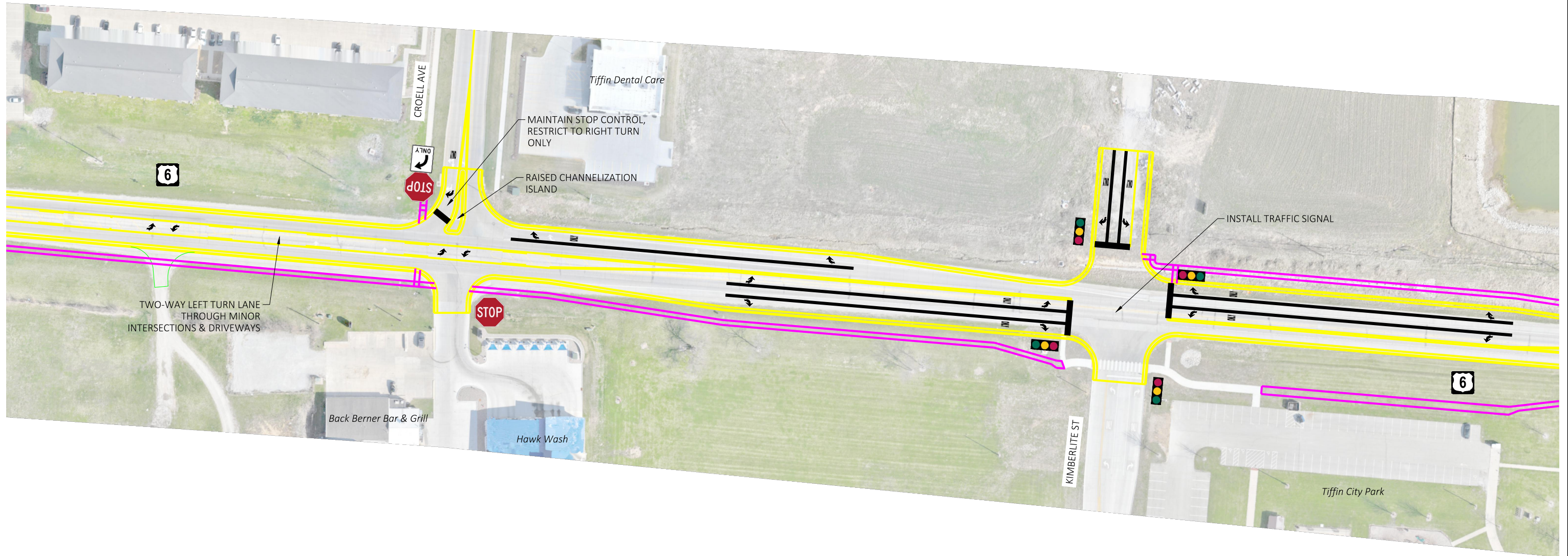
- **Croell Avenue:**
 - Topography and embankment slopes limit roundabout feasibility.
 - Offset right-turn lane and/or traffic signal control can improve visibility and reduce high-angle crash potential.
- **Kimberlite Street:**
 - Both traffic signal and roundabout configurations are feasible.
 - A roundabout offers lower crash severity potential and smoother operations during off-peak hours.

- Coordinated traffic signals (Option 4) improve mainline progression along US 6 but may increase side-street delay.

Conclusions & Recommendations

- All alternatives provide operational and safety improvements compared to existing conditions.
- Under the projected 4.3% annual growth rate, the roundabout is expected to maintain acceptable operations for roughly **14 years** before additional capacity (such as dual westbound lanes) may be needed.
- Options 3-5 provide level of service improvement over existing conditions.





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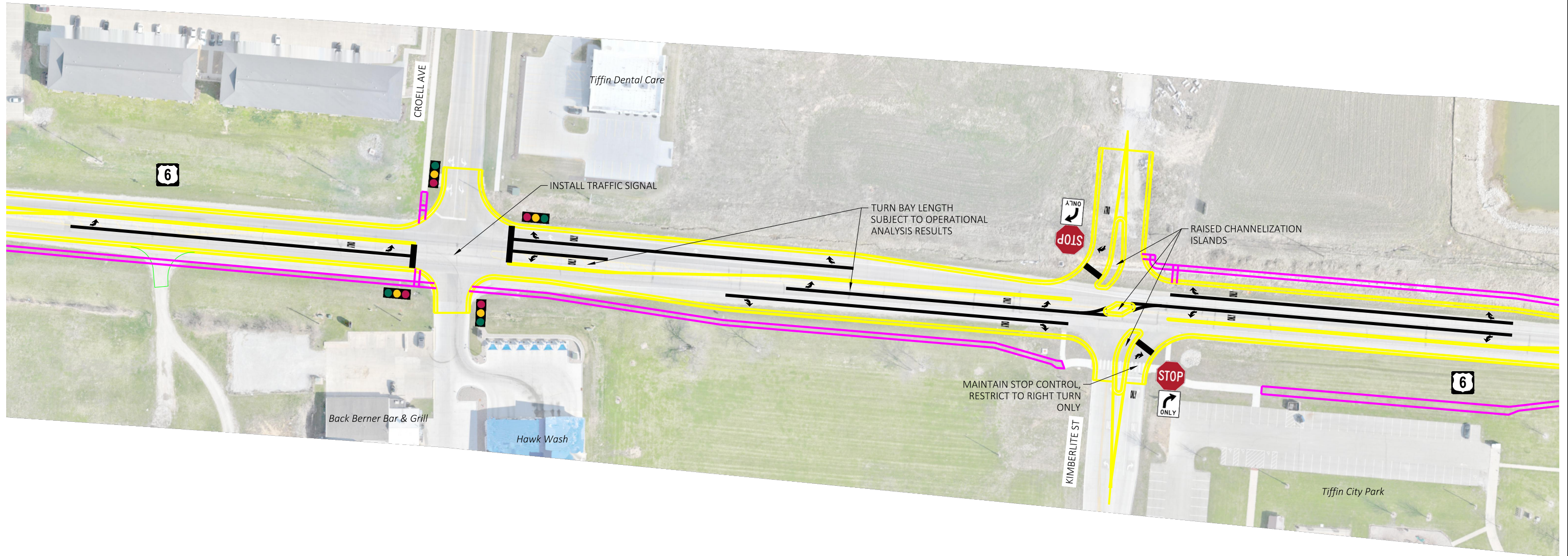
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- TURN LANE SIZES ARE SUBJECT TO CHANGE PENDING TRAFFIC OPERATIONAL ANALYSES
- INTERSECTION IMPACTS MAY CHANGE PENDING FINAL DESIGN VEHICLE ACCOMMODATION ADJUSTMENTS



EXHIBIT
02

Croell Ave Restricted Access, Kimberlite St Traffic Signal
US 6 INTERSECTION ALTERNATIVES
TIFFIN, IOWA

CONCEPTUAL DRAWINGS ONLY
SUBJECT TO MODIFICATION



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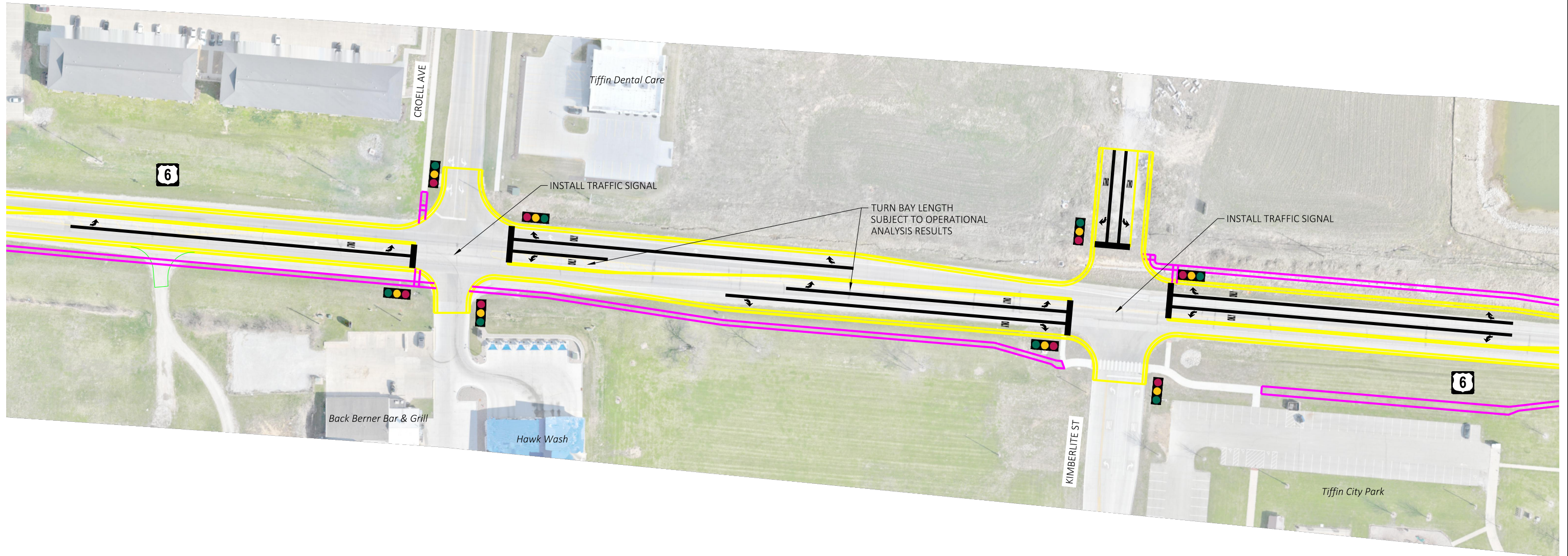
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EXHIBIT
03

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