

**Office of the City Engineer**

**John C. Rooney, P.E.**  
Assistant Commissioner of Public Works/  
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September 28, 2017

**MEMO**

To: John C. Rooney, P.E.

Re: Traffic Study - Intersection Analysis of Columbia St., Clarence and Carmel Avenues

From: Ara P. Molitor, P.E.

Purpose: Determine if there is a warranted change required for the control of the intersection.

Method: Field observation, traffic count, an accident analysis and review of previous study

**ANALYSIS:**

**Existing Conditions**

- All 3 streets beyond the intersection are 36 foot face to face asphalt or concrete streets. They combine to form a unique intersection with a triangular island median in the middle of the intersection. In the intersection the lane/roadway widths vary.
- For analysis purposes; I describe the intersection as a 4-legged intersection, although there is no true north leg to the intersection. Carmel Ave. forms the west and north approaches, Columbia St. makes up the east approach and Clarence Ave. is then the south approach.
- The neighborhood is predominantly residential with one business on the southwest corner forcing the odd geometrics to the intersection.
- The west approach (Carmel) and the south approach (Clarence) are the only legs that are "Stop" controlled.

**Traffic Analysis**

A 3-hour count was conducted on Thursday 9/21/17 from 2 PM to 5 PM. This was used to project a theoretical ADT for the intersection.

- There are multiple factors and variations related to calculating the Average Daily Traffic: (see attached calculations)
  - Range of ADT's calculated (2017) – 650 to 862 vpd
  - Range of ADT's calculated (2008) – 759 to 1145 vpd
  - Intersection ADT – use 800 vpd for the purpose of this study.
- Accident Study Findings
  - 2017 - 2 total accidents reported: 0 Injuries 0 Deaths 1 accident was correctable.\*
  - 2008 - 2 total accidents reported: 0 Injuries 0 Deaths 0 accidents correctable.

\* see Field Observations for explanation

### **Intersection Control Warrants**

- **Two way Stop Sign Control** – warranted if any of the following conditions are met:
  - Safe approach speed (SSSD) < 10mph.
    - Met – Carmel Ave. (w) controlled by Stop Sign.
    - Met – Clarence Ave. (s) controlled by Stop Sign.
  - Accident experience of 3 or more right angle accidents per year.
    - Not Met
  - A total average daily traffic (ADT): 2000<ADT<8000 (intersection ADT)
    - Not Met

### **Field Observations**

- 29% of the traffic traveling through this intersection is coming from Carmel Ave. (w) which is stop-controlled.
- 26% of the traffic traveling through this intersection is coming from Clarence Ave. (s) which is stop-controlled.
- 33% of the traffic traveling through this intersection is coming from Columbia St. (e) which is **NOT** stop-controlled.
- Only 12% of the traffic traveling through this intersection is coming from Carmel Ave. (n) which is also **NOT** stop-controlled.
- The one correctable accident could have been prevented if the traffic coming up the hill from Columbia St. needed to stop before entering the unique intersection. Most of the traveling public that utilizes this intersection is familiar with the layout and where the traffic can be approaching from, but it is not a standard intersection and someone that is not familiar with its layout is at a disadvantage.
- Geometrics of the intersection would not warrant the installation of a Stop Sign on Carmel Ave. coming from the north. They have a clear view of the whole intersection before they would have any conflict. This direction also has extremely low volumes.

### **CONCLUSIONS:**

- Do to the unique geometrics of this intersection it is my opinion to add two “Stop” signs on the existing traffic island.
  - The first would be for southbound traffic on Clarence mounted above the diagonal marking sign. (a new pole would be required to achieve proper height)
  - The second “Stop” sign would be in a similar location for southbound traffic on Carmel. The sign however would need to be located in a non-conventional location on the island because a driveway and tree eliminate the possibility of conventional installation.
- In addition to these Stop signs and also added to the two existing Stop Signs add 2 each of: W04-04aLP (24”X12”) “Traffic From Left Does Not Stop” – new Stop locations and W04-04aRP (24”X12”) “Traffic From Right Does Not Stop” – existing Stop locations. (See Attached)

**Recommendation: more speed enforcement and monitoring.**

**TRAFFIC FROM LEFT  
DOES NOT STOP**

**TRAFFIC FROM RIGHT**

**DOES NOT STOP**