

APPENDIX E

Traffic Analysis

TECHNICAL MEMORANDUM

Date: March 3, 2016

To: Mr. Paul Tran, P.E., – City of Orange, Public Works/Design Engineering

From: Min Zhou, P.E., Vice President – KOA Corporation

Subject: Traffic Study for the Tustin & Meats Intersection Right-Turn Lane Improvements Project

This technical memorandum provides a summary of the traffic study conducted to determine the adequacy of the northbound right-turn pocket length design at the intersection of Tustin Street and Meats Avenue in the City of Orange.

Data Collection

KOA collected AM/PM peak hour turning movement volumes for the Tustin/Meats intersection. The PM peak hour turning movement volumes for the northbound right-turn movement are lower than the AM peak hour. AM/PM peak hour volumes from the City’s 2009 General Plan traffic analysis were also collected. The table below summarizes these findings.

Table I – Tustin/Meats Northbound Right-Turn Volumes

Source	Northbound Right-Turn Traffic Volumes	
	AM Peak Hour	PM Peak Hour
2009 General Plan Traffic Analysis	78	282
2015 Count Data	111	263

Traffic Analysis

KOA conducted a Synchro analysis to determine the Level of Service (LOS) for the intersection of Tustin/Meats and a queuing analysis to determine the recommended storage length for the proposed northbound right-turn pocket. The analysis was conducted for the following conditions:

- Existing AM/PM
- Existing AM/PM with Project

The tables below summarize the intersection level of service and the queue analysis results for the proposed northbound right-turn pocket for the intersection of Tustin/Meats, during the Existing and Existing with Project conditions.

Table 2 – Intersection Level of Service (LOS) Analysis

Scenario	Level of Service (LOS)	
	AM Peak Hour (Average Delay/LOS)	PM Peak Hour (Average Delay/LOS)
Existing	40.1/D	52.1/D
Existing with Project	39.8/D	48.2/D

Table 3 – Northbound right-Turn Pocket Queue Analysis – Existing with Project

Existing With Project Northbound Right-Turn Pocket	PM Peak Hour
Queue Length 50 th Percentile	85 feet
Queue Length 95 th Percentile	164 feet

Based on the improvement exhibit provided by the City, the available pocket length (from the Villa Park Motel southern property line to the proposed curb return including taper) is approximately 180 feet. Considering the taper length of 60 feet (per Caltrans Highway Design Manual Chapter 400, the bay taper in urban area should be 60 to 90 feet), the available pocket length is approximately 120 feet.

The 120 feet pocket length availability provides better than 50th percentile queuing length requirements (85 feet) but does not quite meet the 95th percentile queue length (164 feet), based on the above Synchro analysis results. KOA considers the 120 feet of pocket length to be adequate based on the available right-of-way. Based on the Synchro analysis, the proposed improvement of the northbound right-turn lane conditions provides better level of services and queuing conditions than the existing conditions.

This analysis and design did not consider the General Plan long range condition. The General Plan contemplates a future interchange on the SR-55 freeway at Meats Avenue, east of Tustin Street. The northbound right-turn movement volumes and the overall intersection volumes would increase dramatically if that interchange is constructed.

KOA also evaluated the improvement exhibit for the proposed improvement segment along Meats Avenue. Below are the comments regarding the bus bay and taper requirement along Meats Avenue.

Based on the OCTA requirements, the minimum length for the bus bay is 80 feet and the farside taper should be 60 feet. Therefore the proposed improvements should include a 60 foot taper after the proposed bus bay along Meats Avenue.

Conclusion

Based on the level of service, queueing, and taper length analysis for the proposed northbound right-turn pocket at the intersection of Tustin Street and Meats Avenue, the proposed nearside taper should be 60 feet in length beginning at the Villa Park Motel southern property line. The pocket length would then be approximately 120 feet from the end of the 60 foot taper to the proposed edge of curb return at Meats Avenue. The farside taper along Meats Avenue, after the 80 foot bus bay, should be 60 feet to meet OCTA standards.

Figure 1 shows the proposed bus bay and nearside and farside taper lengths needed to properly accommodate the right-turn pocket.

The proposed improvements will result in an improved level of service for the Tustin/Meats intersection over existing conditions.

Sincerely,



Min Zhou, PE
Vice President

