Take Five Oil Change

1990 South Havana St
Aurora, CO 80014

Traffic Memo

KE Job #2024-061

Prepared for:

Tait & Associates, Inc.
7320 North Lincoln Ave
Loveland, CO 80537

Prepared by:

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1.0 Introduction

This Traffic Memo is for the proposed Take Five Oil Change project located at 1990 S Havana St, Aurora, CO 80014. See Figure 1: Vicinity Map. The purpose of this Traffic Memo is to identify project traffic generation characteristics and to identify potential traffic related impacts on the adjacent street system.

Kellar Engineering LLC (KE) has prepared the Traffic Memo to document the results of anticipated traffic conditions in accordance with the governing jurisdiction's requirements. The proposed Take Five Oil Change project is anticipated to generate approximately 137 daily weekday trips, 11 AM total peak hour trips, and 17 PM total peak hour trips.

2.0 Existing Conditions and Roadway Network

The project site is located north of E Asbury Ave and east of S Havana St. E Asbury Ave is an east-west local street with a posted speed of 25 mph. S Havana St is a north-south six-lane major arterial roadway with a posted speed of 45 mph. See Figure 2: Site Plan.

Figure 1: Vicinity Map

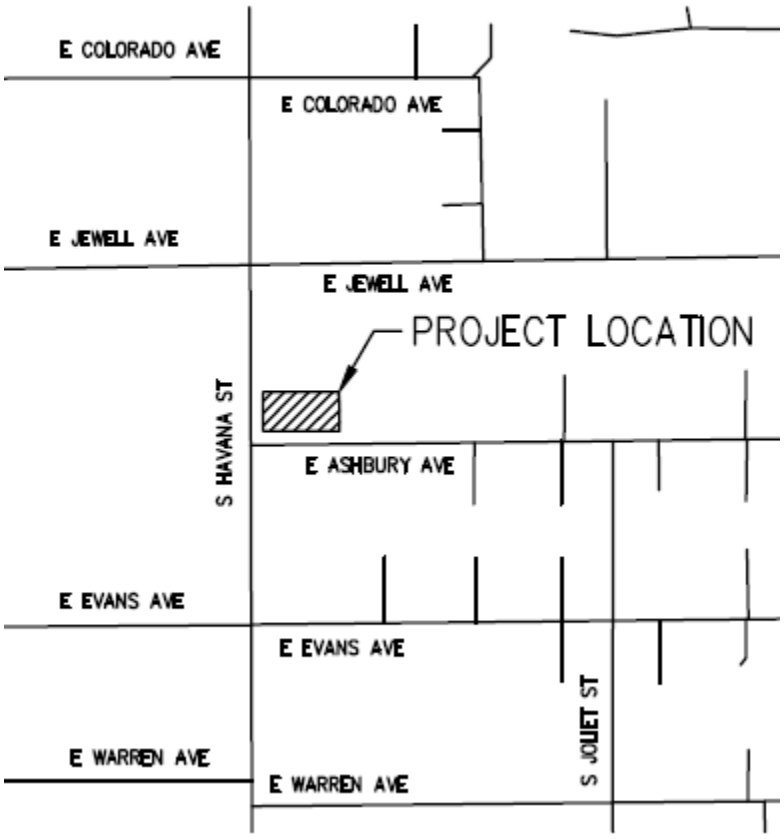
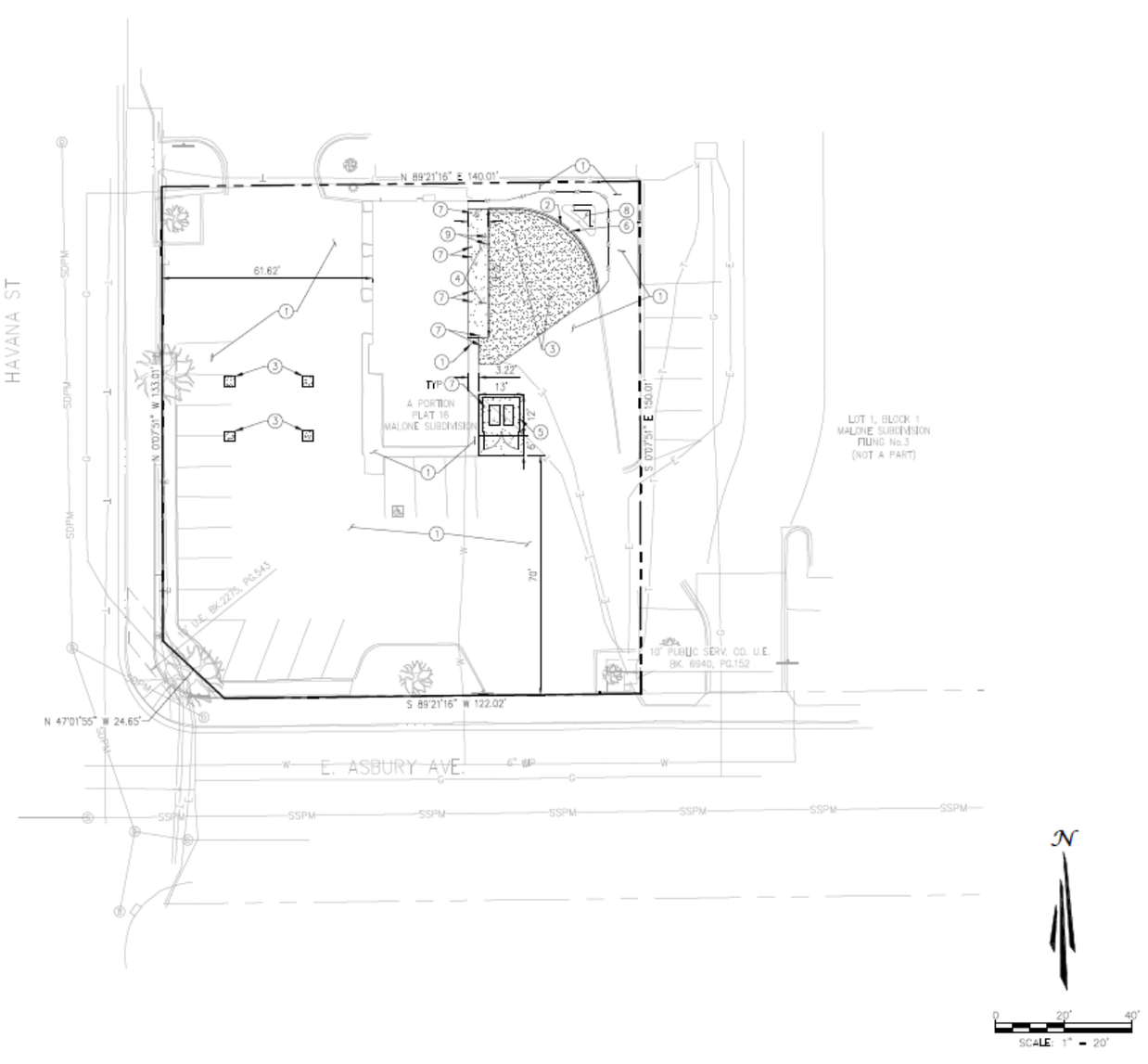


Figure 2: Site Plan (For reference only. Provided by Civil Engineer. See Civil Drawings for more information)



3.0 Proposed Development

The proposed development consists of converting an existing 1,966 SF building associated with used car sales into a quick lubrication vehicle shop. See Table 1 and Figure 2.

3.1 Trip Generation

Site generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Report* published by the Institute of Transportation Engineers (ITE). ITE has established trip generation rates in nationwide studies of similar land uses. For this study, KE used the *ITE 11th Edition Trip Generation Report* average trip rates. The proposed project is anticipated to generate approximately 137 daily weekday trips, 11 AM peak hour total trips, and 17 PM peak hour total trips. Table 1 summarizes the estimated trip generation for the proposed development.

Table 1: Trip Generation (ITE Trip Generation, 11th Edition)

ITE Code	Land Use		Average Daily Trips		AM Peak Hour Trips						PM Peak Hour Trips					
		Size	Rate	Total	Rate	% In	In	% Out	Out	Total	Rate	% In	In	% Out	Out	Total
	Existing Land Use															
841	Automobile Sales (Used)	1.97 KSF	27.06	53	2.13	76%	3	24%	1	4	3.75	47%	3	53%	4	7
	Proposed Project															
941	Quick Lubrication Vehicle Shop	1.97 KSF	69.57	137	5.80	75%	9	25%	2	11	8.70	42%	7	58%	10	17
Difference				**84**			**6**		**1**	**7**			**4**		**6**	**10**

KSF = Thousand Square Feet

3.2 Site Access

The proposed access to the project site is from the existing site access points on the property; a full-movement access to E Asbury Ave and a full-movement access to S Havana St. The site access is appropriate and existing roadway system is adequate to handle the project's traffic. See Figure 2: Site Plan.

4.0 Findings

This Traffic Memo for the proposed Take Five Oil Change project verifies that the project's traffic will not create a negative traffic impact upon the public streets adjacent to the project site.

The findings of the Traffic Memo are summarized below:

- The proposed project is anticipated to generate approximately 137 daily weekday trips, 11 AM peak hour total trips, and 17 PM peak hour total trips.
- The proposed project is only anticipated to generate approximately 84 daily weekday new trips, 7 AM peak hour total new trips, and 10 PM peak hour total new trips when compared to the trip generation for the existing land use (used car sales) on the property. See Table 1.
- The project site is appropriate to handle the project's peak hour vehicle queuing (three vehicles). See Appendix for vehicle queue length calculation.
- The proposed project's trip generation is low and the existing roadway network is sufficient to handle the project's traffic.

APPENDIX:

Aerial Image

Vehicle Queue Length Calculation:

Legend:
N = Number of Vehicles During Specified Time Period
T = Specified Time Period for Queue Analysis
r = Time Each Vehicle is Waiting

Formula:
 # Vehicles in Queue ≥ N(r)/T

The highest entering peak hour trips for the ITE land-use Quick Lubrication Vehicle Shop is the AM Peak hour. (ITE 941)

N = 9 Vehicles

T = 60 min

r = 15 min

Vehicles in Queue ≥ N(r)/T = 9(15)/60 = 2.25 Vehicles

⇒ 3 Vehicles in Queue

Queue length (ft) = # Vehicles in Queue × 25 ft = 3(25')

⇒ 75' Queue Length (approx.)

Teknomo, Kardi, Ph.D. Queueing Theory

Land Use: 941
Quick Lubrication Vehicle Shop

Description

A quick lubrication vehicle shop is a business where the primary activity is to perform oil change services for motor vehicles. Other services provided may include preventative maintenance, such as fluid and filter changes. Automobile repair service is generally not provided. Automobile care center (Land Use 942) and automobile parts and service center (Land Use 943) are related uses.

Additional Data

For the purpose of this land use, the independent variable, servicing positions, is defined as the maximum number of vehicles that can be serviced simultaneously.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1990s and the 2010s in California, Texas, Washington, and Wisconsin.

Source Numbers

362, 441, 886, 960

Quick Lubrication Vehicle Shop
(941)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

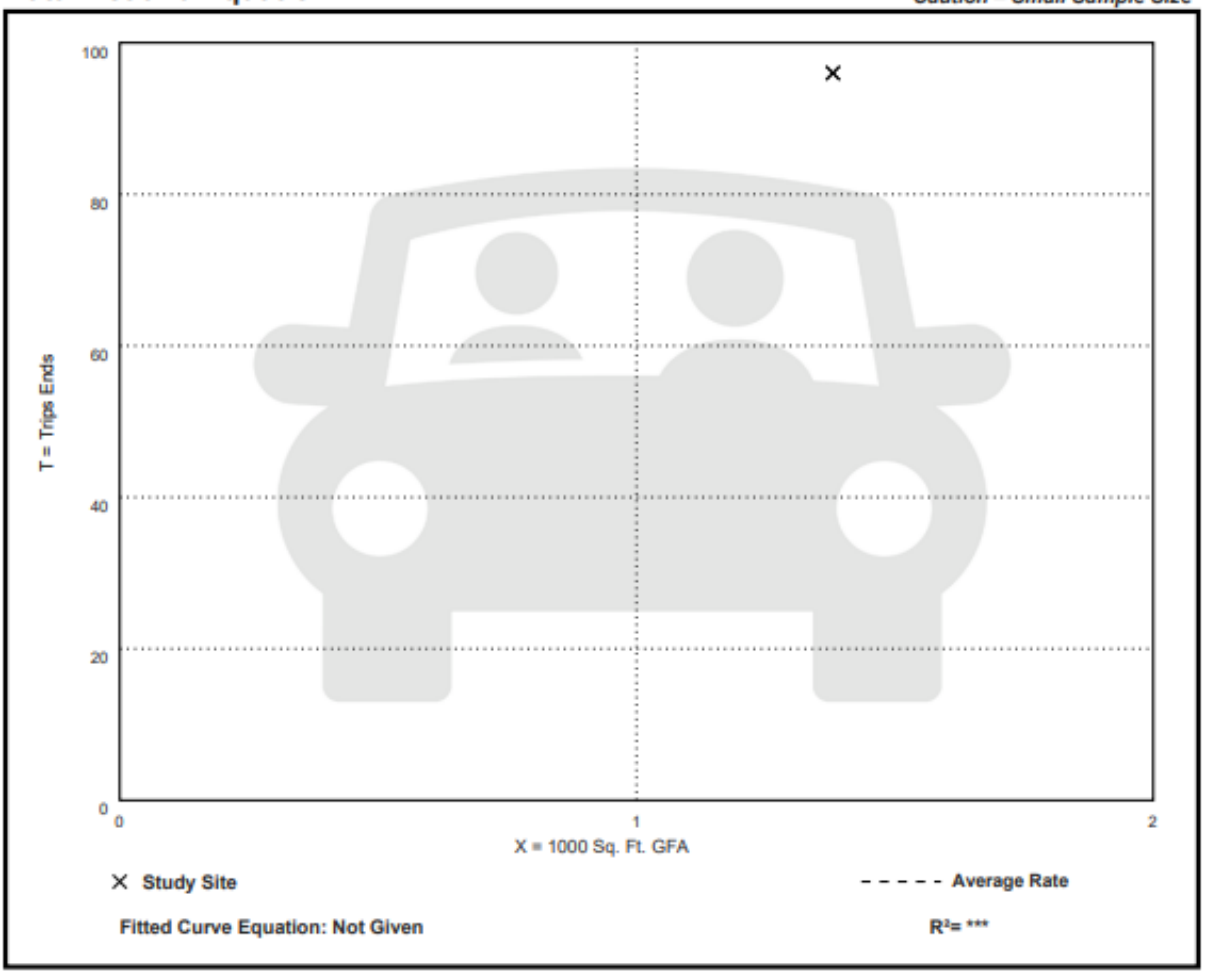
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. 1000 Sq. Ft. GFA: 1
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
69.57	69.57 - 69.57	***

Data Plot and Equation

Caution – Small Sample Size



Quick Lubrication Vehicle Shop
(941)

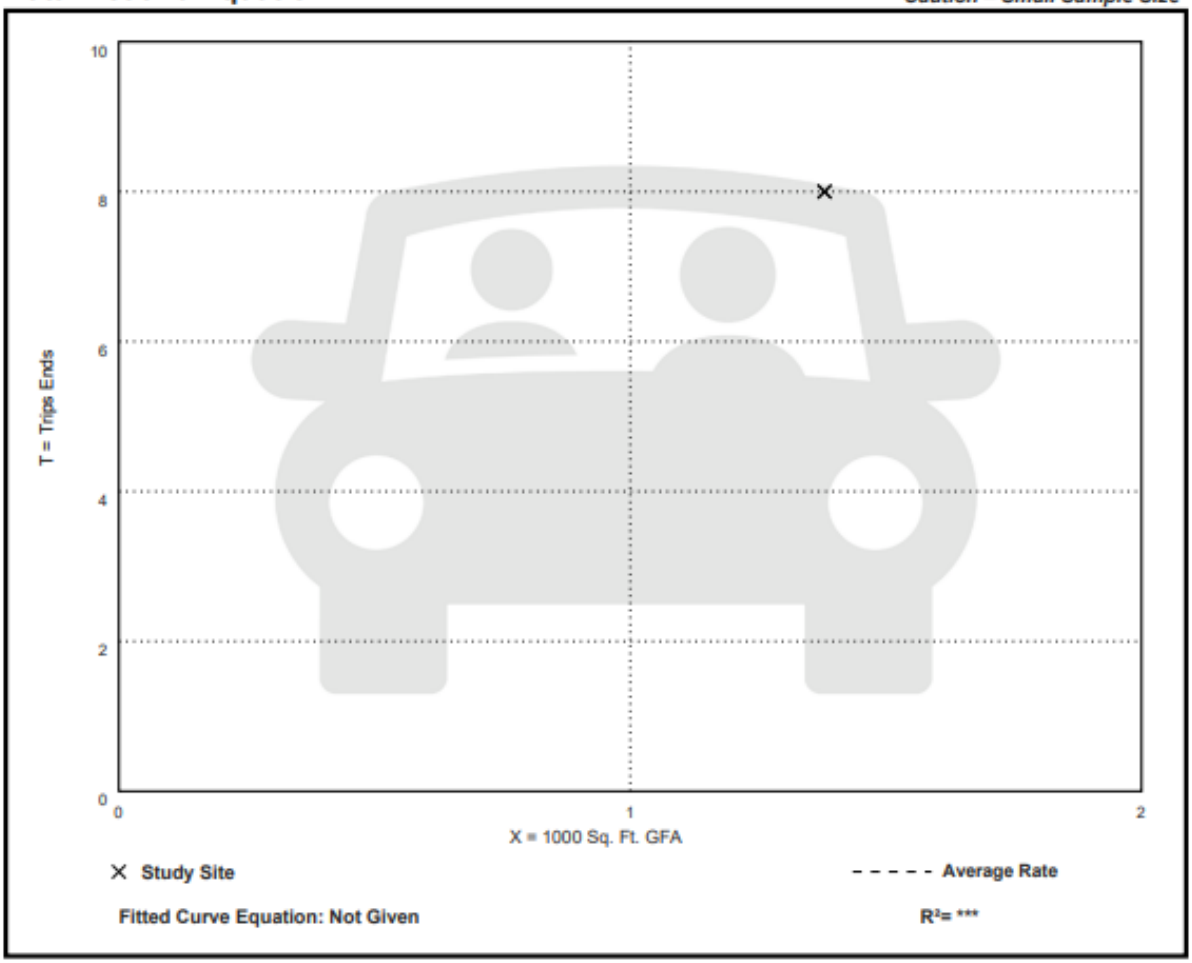
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. 1000 Sq. Ft. GFA: 1
Directional Distribution: 75% entering, 25% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
5.80	5.80 - 5.80	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

Quick Lubrication Vehicle Shop
(941)

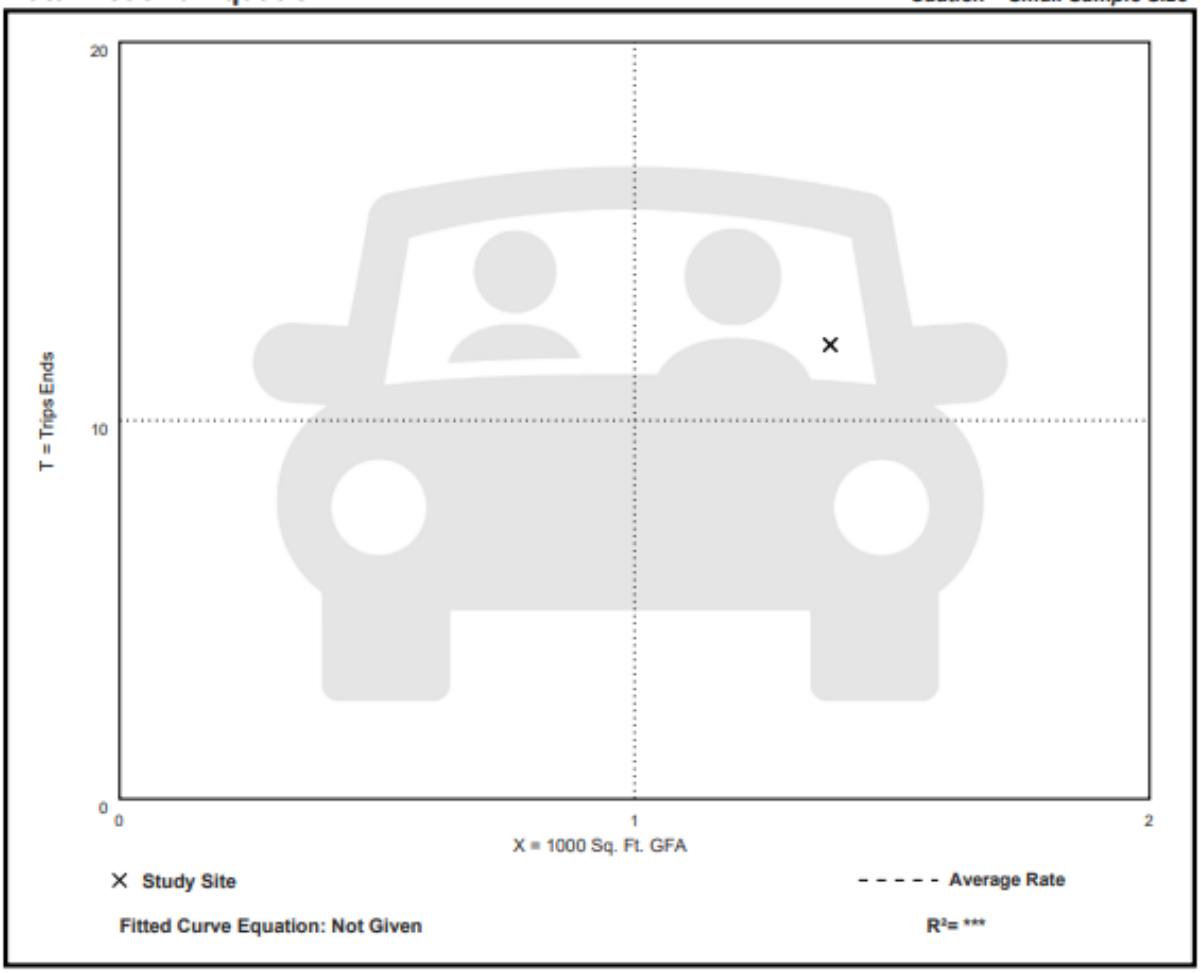
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. 1000 Sq. Ft. GFA: 1
Directional Distribution: 42% entering, 58% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
8.70	8.70 - 8.70	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

KELLAR ENGINEERING

Sean Kellar, PE, PTOE

Principal Engineer

Education
B.S., Civil Engineering, Arizona State University – Tempe, AZ

Registration
Colorado, Professional Engineer (PE)
Wyoming, Professional Engineer (PE)
Idaho, Professional Engineer (PE)
Arizona, Professional Engineer (PE)
Kansas, Professional Engineer (PE)
Missouri, Professional Engineer (PE)
Professional Traffic Operations Engineer (PTOE)

Professional Memberships
Institute of Transportation Engineers (ITE)

Industry Tenure
25 Years

Sean's wide range of expertise includes: transportation planning, traffic modeling roadway design, bike and pedestrian facilities, traffic impact studies, traffic signal warrant analysis, parking studies, corridor planning and access management. Sean's experience in both the private and public sectors; passion for safety and excellence; and strong communication and collaboration skills can bring great value to any project. Prior to starting Kellar Engineering, Sean was employed at the Missouri Department of Transportation (MoDOT) as the District Traffic Engineer for the Kansas City District. Sean also worked for the City of Loveland, CO for over 10 years as a Senior Civil Engineer supervising a division of transportation/traffic engineers. While at the City of Loveland, Sean managed several capital improvement projects, presented several projects to the City Council and Planning Commission in public hearings, and managed the revisions to the City's Street Standards. Sean is also proficient in Highway Capacity Software, Synchro, PT Vissim, Rodel, GIS, and AutoCAD.

WORK EXPERIENCE:

Kellar Engineering, Principal Engineer/President – January 2016 – Present

Missouri Department of Transportation, District Traffic Engineer, Kansas City District – June 2015 – January 2016

City of Loveland, Colorado, Senior Civil Engineer, Public Works Department – February 2005 – June 2015

Kirkham Michael Consulting Engineers, Project Manager - February 2004 – February 2005

Dibble and Associates Consulting Engineers, Project Engineer – August 1999 – February 2004