



March 25, 2024

Mr. Haji Alam
Faizan Corporation
390 E. Gobbi Street
Ukiah, CA 95482

Addendum to the *Transportation Impact Study for a Gas Station at 9621 North State Street*

Dear Mr. Alam;

As recently discussed, the trip generation estimates for the project evaluated in the subject study appear unreasonable for Mendocino County based on your experience with a similarly sized and sited Chevron gas station in Ukiah. As requested, we have reviewed the trip generation and right-turn lane warrant analysis to determine if the information presented in the *Transportation Impact Study for a Gas Station at 9621 North State Street* (TIS) is reasonable considering your local experience. The purpose of this letter is to present the findings of the reevaluation of the project's expected trip generation and the effect a change in the trip generation would have on the finding that a right-turn lane is warranted on US 101 at North State Street.

Trip Generation

The anticipated trip generation for the proposed project as presented in the TIS was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 11th Edition, 2021, for Convenience Store/Gas Station (2-4 ksf) (LU #945). Based on these rates it was estimated that the project would generate 5,302 trips at the driveways per day, including 321 during the morning peak hour, 368 during the evening peak hour and 340 during the Saturday peak hour. It is understood that based on local experience it appears to be highly unlikely that the project would actually generate 5,300 trips daily at its driveways.

As a point of comparison, activity at an existing gas station on North State Street at the interchange with US 101 in the City of Ukiah was considered. This gas station is larger than the planned gas station with a convenience store of more than 5,000 square feet and 22 vehicle fueling positions. While the existing gas station would have a different theoretical trip generation rate than the proposed project due to the larger convenience store, the daily trip rate for sites with stores of both more and less than 5,000 square feet is similar between these land uses (265.12 daily trips per vehicle fueling position for the small store versus 257.13 daily trips per vehicle fueling position a larger one).

The existing gas station's daily transaction history was used to estimate that site's customer trip generation. Transactions for Monday through Friday were reviewed and it was determined that Friday has the highest number of customers. The number of transactions on numerous Fridays in February, August and November were then reviewed and the one day with the highest number of transactions was conservatively used to develop the trip estimate. Further, it was assumed that each purchase of fuel and each purchase at the convenience store created two trips to the site even though it is likely that some of the convenience store purchases were made by someone who also purchased fuel. Based on these assumptions the existing purchases produced 794 daily trips or 36.09 daily trips per fueling position. While this includes only customers and not trips associated with deliveries, employees, vendors, etc., this is less than 14 percent of the ITE theoretical daily trip rate of 257.13 trips per fueling position, indicating that the theoretical rate is not consistent with current activity in Mendocino County.

It is noted that there are some obvious reasons why the theoretical rates, which are based on data collected between the 1980's and the 2010's, may not reflect current conditions. First, over the past twenty to thirty years there have been extensive efforts to improve the efficiency of motor vehicles and reduce their gas consumption. The introduction of hybrid vehicles has had a substantial effect on how often motorists must fill their tanks. More

ATTACHMENT L

Mr. Haji Alam

Page 2

March 25, 2024

recently, the COVID pandemic resulted in significant changes in travel patterns. Many employees now work from home at least part time and many meetings are held virtually rather than in person. Retail has also seen a substantial drop in the number of in-person customers versus on-line sales. These changes in how often people drive have further contributed to a substantial decrease in the frequency of drivers purchasing gas or stopping at a convenience market. Finally, it is noted that the peak hour volume on US 101 at North State Street on the date of the counts was 1,429 through vehicles. For the project to attract 155 customers from this passing traffic (the estimated pass-by volume used in the TIS), more than ten percent of all passing traffic would need to stop for gas or to shop at the convenience market, which seems highly unlikely and quite unrealistic.

Based on the data reviewed as well as in consideration of factors affecting the trip generation for gas stations and convenience markets, it appears that the trip generation as used in the traffic analysis substantially overstated the potential effects of the proposed project.

Right-Turn Lane Warrants

Hourly transactional data was not available so a comparison between the existing gas station's and ITE's peak hour trip generation was not possible; however, it seems reasonable to assume that the existing gas station's trips are distributed across the day in a manner similar to the historical pattern captured in ITE's trip rates. Conservatively assuming that the project would generate one-eighth (rather than one-tenth as indicated by the comparison of transactions) the number of trips projected using standard rates would result in the project as proposed having an expected trip generation of 742 daily trips, 45 a.m. peak hour trips, 52 p.m. peak hour trips, and 48 Saturday peak hour trips on a Friday during August. Note that these trip counts are two-way; half would be inbound. It is understood that this is fairly consistent with your experience.

Using the same methodology as used for the analysis detailed in the TIS and the lower trip generation, the volume at which a right-turn lane from US 101 onto North State Street would be warranted was reevaluated. It was determined that up to 64 right turns could be accommodated under current volumes and 48 under the much higher future volumes before the right-turn lane would be warranted. With a maximum inbound volume of 26, even if all drivers came from US 101 and made the northbound right turn, a right-turn lane would not be warranted. Volumes inbound to the station would need to be double the projected volume, equaling about 20 percent of all traffic passing the site, before a right-turn lane would be needed. While a right-turn taper is warranted, there is an existing right-turn taper on US 101 so no further improvements would be needed. A copy of the updated turn-lane warrant analysis is enclosed.

Finding – A right-turn lane on US 101 to North State Street is not warranted for the highest volumes evaluated using the trip generation based on current experience in Mendocino County. A right-turn taper exists so no further improvements are needed.

Conclusions and Recommendations

- The trip generation as applied in the TIS was based on standard theoretical rates and does not appear to be reasonable when compared to current local conditions. The project's trip generation is likely to be approximately one-seventh of the number estimated based on these standard rates.
- Using the lower and more realistic trip generation detailed above, a right-turn lane would not be warranted on US 101 even under much-higher future volumes. A right-turn taper is warranted on US 101 and is satisfied with the existing geometrics.

ATTACHMENT L

Mr. Haji Alam

Page 3

March 25, 2024

Thank you for giving W-Trans the opportunity to provide these services. Please call if you have any questions.

Sincerely,

William Andrews

William Andrews, EIT
Assistant Engineer

Dalene J. Whitlock

Dalene J. Whitlock, PE (Civil, Traffic), PTOE
Senior Principal



DJW/wia/MEX124.L2

Enclosures: Turn-lane Warrants

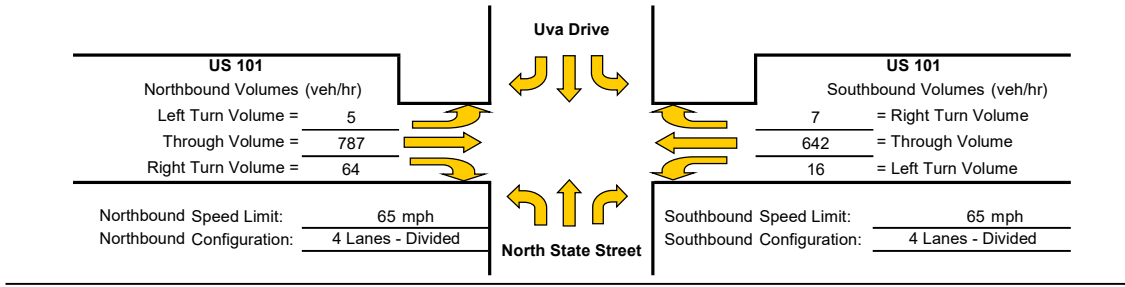
ATTACHMENT L

Turn Lane Warrant Analysis - 4 Legged Intersections

Study Intersection: US 101/Uva Drive-North State Street

Study Scenario: PM Existing plus Project without Closure

Direction of Analysis Street: North/South



Northbound Right Turn Lane Warrants

1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold: AV =	863.9
Advancing Volume Va =	856
If AV < Va then warrant is met	No

Right Turn Lane Warranted: NO

Northbound Right Turn Taper Warrants

(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper

Advancing Volume Threshold AV =	-800
Advancing Volume Va =	856
If AV < Va then warrant is met	Yes

Right Turn Taper Warranted: YES

Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold: AV =	-
Advancing Volume Va =	665
If AV < Va then warrant is met	No

Right Turn Lane Warranted: NO

Southbound Right Turn Taper Warrants

(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper

Advancing Volume Threshold AV =	1100
Advancing Volume Va =	665
If AV < Va then warrant is met	No

Right Turn Taper Warranted: NO

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements*, Jan. 1997. The right turn lane and taper analysis is based on work conducted by Cottrell in 1981. The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.

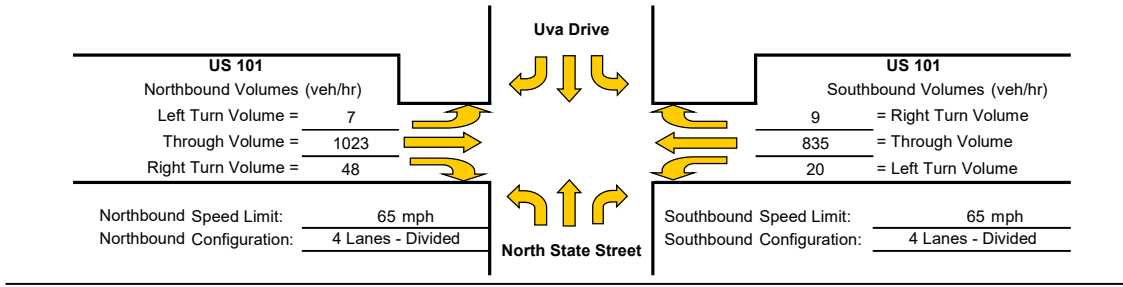
ATTACHMENT L

Turn Lane Warrant Analysis - 4 Legged Intersections

Study Intersection: US 101/Uva Drive-North State Street

Study Scenario: PM Future plus Project without Closure

Direction of Analysis Street: North/South



Northbound Right Turn Lane Warrants

1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold: AV =	1088
Advancing Volume Va =	1078
If AV < Va then warrant is met	No

Right Turn Lane Warranted: **NO**

Northbound Right Turn Taper Warrants (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper

Advancing Volume Threshold AV =	-266.7
Advancing Volume Va =	1078
If AV < Va then warrant is met	Yes

Right Turn Taper Warranted: **YES**

Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED - Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold: AV =	-
Advancing Volume Va =	864
If AV < Va then warrant is met	No

Right Turn Lane Warranted: **NO**

Southbound Right Turn Taper Warrants (evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper

Advancing Volume Threshold AV =	1033.3
Advancing Volume Va =	864
If AV < Va then warrant is met	No

Right Turn Taper Warranted: **NO**

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements*, Jan. 1997. The right turn lane and taper analysis is based on work conducted by Cottrell in 1981. The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.