Kimley»Horn

September 7, 2017

To: Veronica Morgan, PE
Mitchell and Morgan

From: Jeff Whitacre, P.E., AICP, PTP
Jonelle Hanson, AICP

RE: ***Future minor collector realignment to Harpers Ferry Road***

Overview

The purpose of this study is to evaluate the realignment of a future minor collector and the impacts the realignment will have on the planned College Station Thoroughfare Plan. The minor collector under evaluation is currently planned to intersect Arrington Road approximately 1,500 feet north of Harpers Ferry Road but is under consideration to be realigned to intersect directly with Harpers Ferry Road. This study looks at the impacts of this realignment on the planned thoroughfare network in the area bounded by the following: Arrington Road, Greens Prairie Road, Nantucket Drive, Harpers Ferry Road, and South Oaks.

Study Approach

This study utilizes a travel demand model (TDM) to estimate traffic projections within the study area limits. A travel demand is a tool that cities use to develop municipal transportation plans. The model utilizes demographic data to generate forecasted trip volumes. These trip volumes are distributed among the roadway network via a gravity-model based on desirable origins and destinations.

This TDM study is independent of the April 2017 Traffic Impact Analysis (TIA) that was prepared for the Margraves tract. A TIA evaluates traffic impacts and mitigation strategies for a development or project. A TIA is a micro-analysis focused on identify improvements while a TDM is a tool utilized to understand how thoroughfare changes impact the overall network.

Volume projections may vary from various methodologies and TDM runs, however the findings are anticipated to remain consistent.

Traffic projections were developed for the study area with the following two (2) options:

- **Existing TDP Model:** Future minor collector connecting to Arrington Road, approximately 1,500 feet north of Harpers Ferry Road
- **Realignment Road Scenario:** Future minor collector aligned to Harpers Ferry Road

Modeling Methodology – Roadway Network and Demographic Adjustments

As part of the 2015 College Station Thoroughfare Development Plan, Kimley-Horn developed a Travel Demand Model (TDM) for College Station. Using this TDM, the roadway network and demographics can be adjusted within the planned development Study Area. For this study, adjustments to the model only occurred within the study area. The roadway network was modified, removing facilities that are not anticipated to be built in a foreseeable future. This included the removal of two collectors connecting to Arrington and the extension of WS Phillips Parkway connecting to Mesa Verde. The roadway facilities were removed from the travel demand model for the purposes of analysis only. With these removals, the traffic volumes were insolated to the future minor collector that was being evaluated. These additional roadways will further redistribute traffic in the future and are not being recommended to be removed from the Thoroughfare Plan.

One of the primary inputs into the TDM is demographics, which includes households and employment data. In the TDM, each Traffic Analysis Zone (TAZ) has the demographics needed to determine how many trips are generated and where the trips are going. As part of the previous Thoroughfare Plan the TAZs in this area were developed with projected households and employment using the Future Land Use Plan. However, for this study recently approved zoning case information gathered from various Traffic Impact Analysis were utilize to refine the TAZ containing the Margraves tract, two apartment complexes and recent commercial development. See **Exhibit 1** for TAZ boundaries.

Exhibit 1 – TAZ boundaries

Once the appropriate adjustments are completed, the Four-Step Modeling Process (trip generation, trip distribution, modal split, and trip assignment) can be completed in TransCAD. This macro model is an excellent tool to compare existing and future traffic volumes on roadways at a regional or sub-regional level.

Model Results

Travel demand model results are commonly presented in volume ranges that correspond closely to the function classification (i.e. collector or arterial) and the anticipated number of travel lanes. The model results between two scenarios are compared to determine if the proposed modification has impacted the Thoroughfare Plan. Below are the volume ranges being utilized for comparison in this study:

- 0-1000 vehicles per day: Local Street
- 0-5,000 vehicles per day: Minor Collector with two lanes
- 5,000 – 10,000 vehicles per day: Minor Collector with turn lanes or Major Collector
- 10,000 – 15,000 vehicles per day: Major Collector
- 15,000 – 25,000 vehicles per day: Minor Arterial

The travel demand model run results are provided in the attached **Exhibits 3 and 4. Table 1** summarizes the traffic projections for each corridor of interest for the realignment scenario and Thoroughfare Plan network.

Existing TDP Scenario Findings:

- Projected volumes on the future minor collector between Greens Prairie Road and Arrington Road are appropriate for a minor collector (2,300-7,000 vehicles per day) with intersection improvements at Greens Prairie Road.
- Projected Volumes on Harpers Ferry Road are forecasted to 1,900 vehicles per day

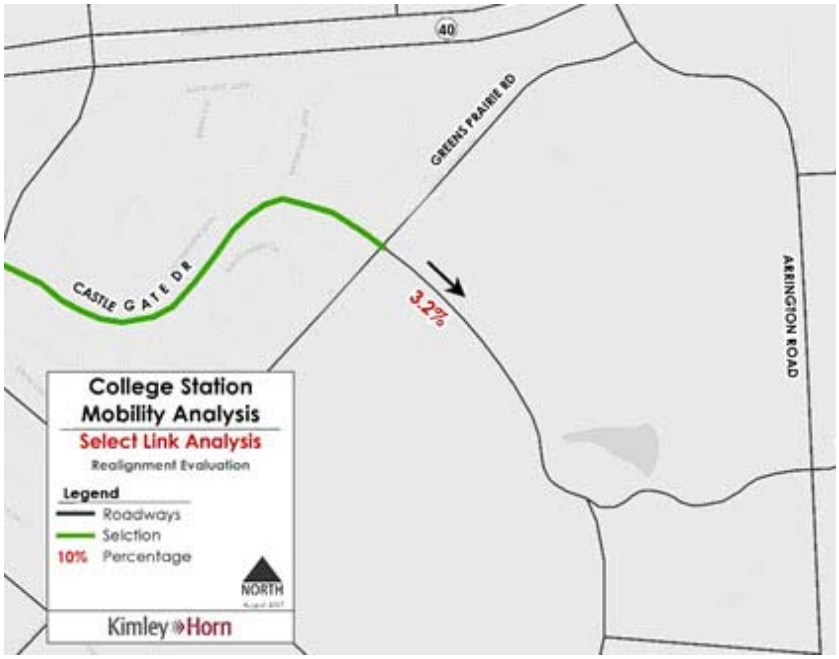
Realignment Scenario Findings:

- Projected volumes on the future minor collector are slightly lower on the segment near Greens Prairie and slightly higher on the segment near Arrington Road. The realignment provides a increased dispersion of traffic between Greens Prairie Road and Arrington Road.
- Trips are sufficiently distributed onto area collectors/arterials with a minor increase in projected volume on Harpers Ferry Road and Arrington Road.
- The realignment of the future minor collector to Harpers Ferry Road is not anticipated impact the Level of Service.
- A realignment of the future minor collector to Harpers Ferry Road is not anticipated to have significant impact to the projected volumes along the thoroughfares in the study area.

Select Link Analysis

A select link analysis was run on Castlegate Drive to understand the trip patterns of users on the selected roadway link with the primary purpose to understand the amount of traffic that will travel from Castlegate Drive to Harpers Ferry Road. **Exhibit 2** shows this to be 1.9% (100 vehicles per day) under the current Thoroughfare Plan and 3.2% (170 vehicles per day) with the realignment.

Current Thoroughfare Plan



Realignment Scenario

Exhibit 2 – Select Link Analysis

Preliminary Recommendation

Realignment Scenario Evaluation

The results of the travel demand model analysis demonstrate that there is little or no impact to surrounding thoroughfares if the future minor collector is realigned to Harpers Ferry Road. The future minor collector serves primarily as a collector for the residential neighborhood, and access is provided by Greens Prairie Road and Arrington Road. An alignment of the future minor collector to Harpers Ferry Road improves overall intersection safety by not allowing overlapping left turns. In addition, aligning the future minor collector will prevent future difficulties the offset intersections can create and also allows for the potential that the intersection of Arrington Road and Harper Ferry could be stopped controlled, if warranted. Therefore, it is recommended that this section could be realigned in the thoroughfare plan.

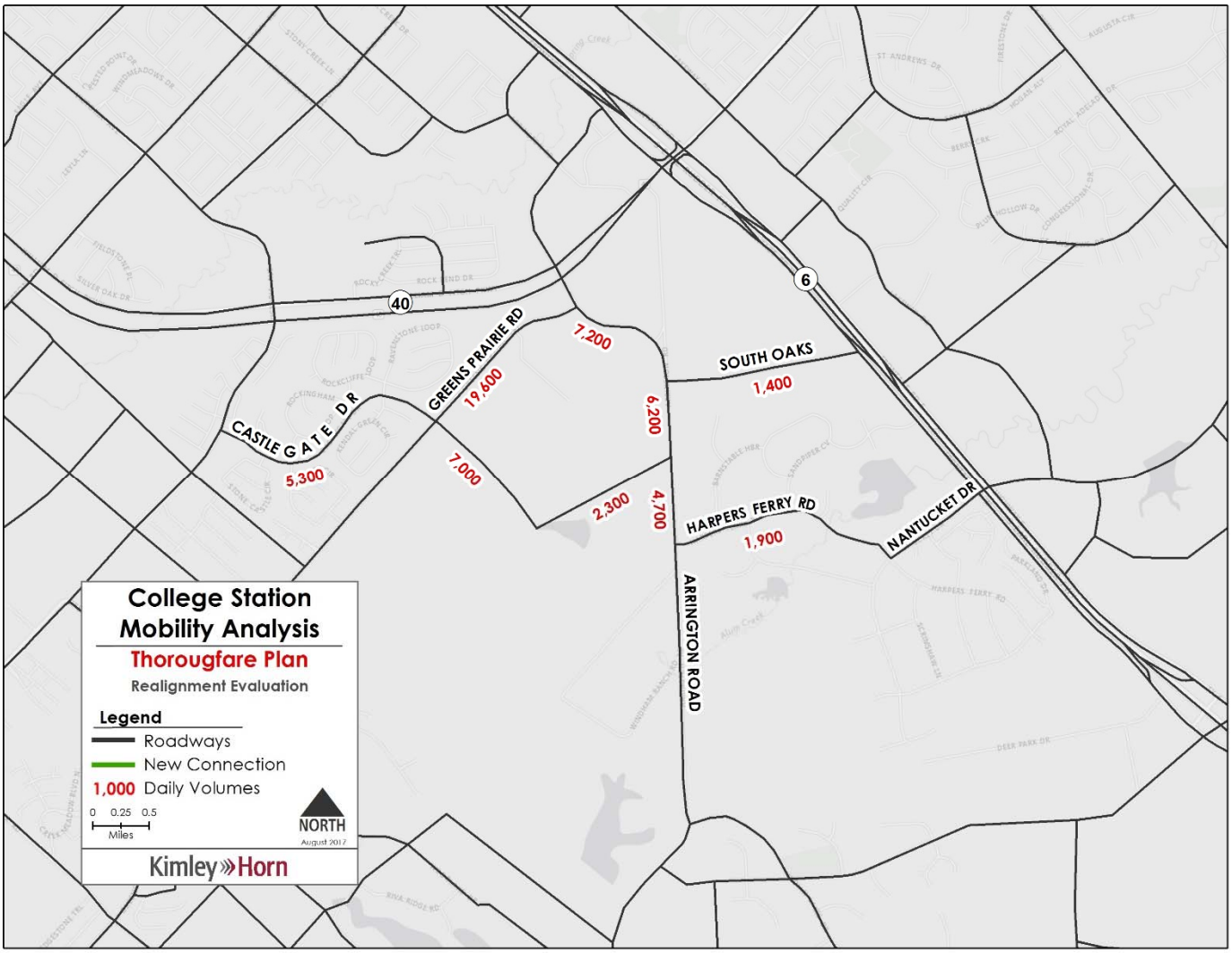


Exhibit 3 – Current Thoroughfare Plan

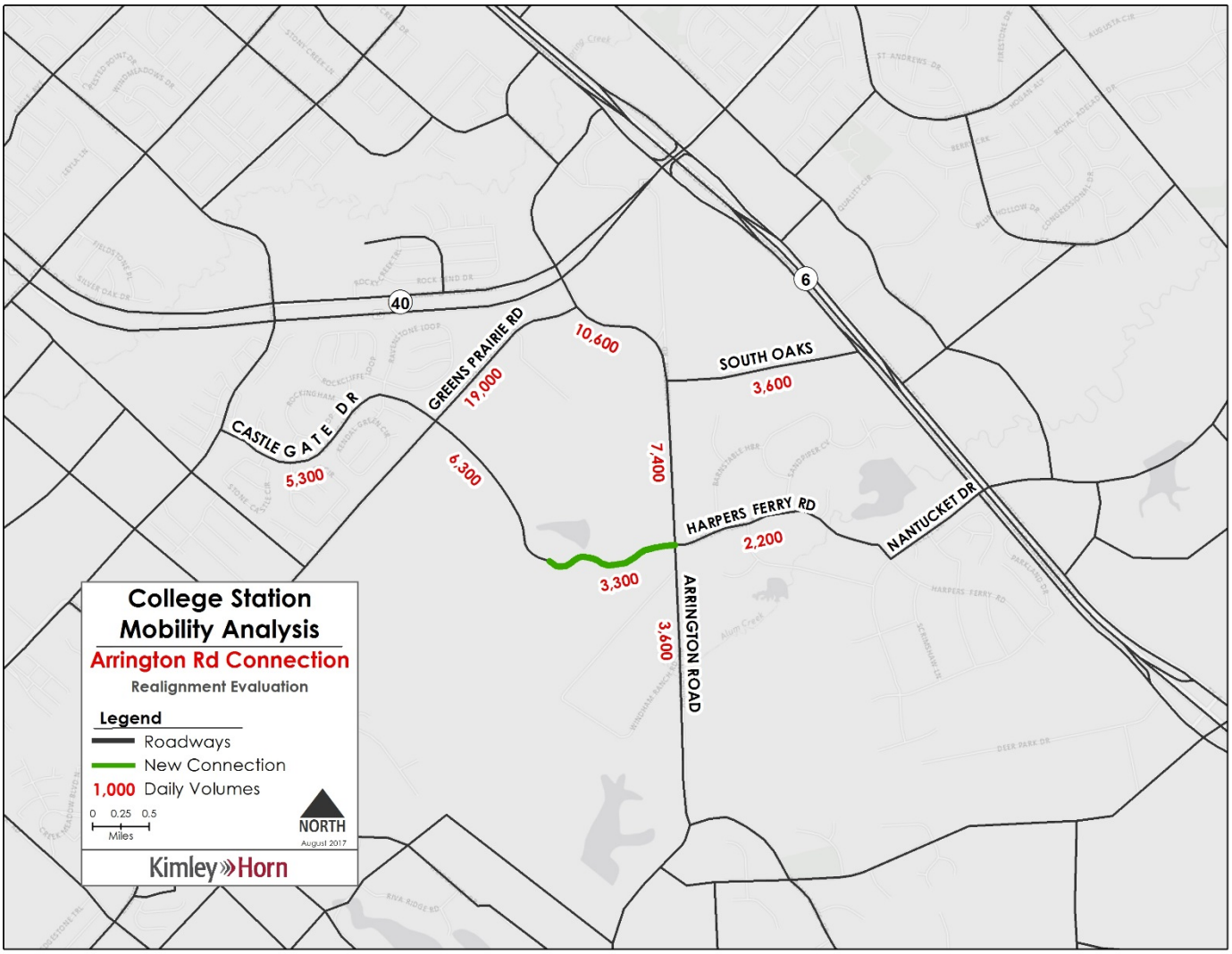


Exhibit 4- Proposed Realignment

Table 1. Study Area Daily Volume Summary				
STREET	Limits		Current Thoroughfare Plan	Realignment Scenario
Greens Prairie Road	Arrington Road	Castlegate Drive	19,600	19,000
Arrington Road	Greens Prairie Road	South Oaks	7,200	10,600
Arrington Road	South Oaks	Future Minor Collector	6,200	NA
Arrington Road	Future Minor Collector	Harpers Ferry Road	4,700	NA
Arrington Road	South Oaks	Harpers Ferry Road	NA	7,400
Harpers Ferry Road	Arrington Road	Nantucket Drive	1,900	2,200
Castlegate Drive	Victoria Ave	Greens Prairie Road	5,300	5,300
Future Minor Collector	Greens Prairie Road	East Segment	7,000	6,300
Future Minor Collector	West Segment	Arrington Road	2,300	3,300
South Oaks	Arrington Road	SH 6	1,400	3,600