

Scope of Services

McConnell Dr. and Pine Knoll Dr. Roundabout Design

BETR Engineering

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Introduction

- Background
 - Focus on intersection and effects on I-17 ramp
- Purpose
 - Alleviate congestion at Pine Knoll Dr. and McConnell Dr.
- Client
 - Nate Reisner, ADOT
 - Stakeholders
 - NAU
 - NAIPTA
 - City of Flagstaff



Northern Arizona Intergovernmental Public Transportation Authority, *NAIPTA Logo*. 2017.



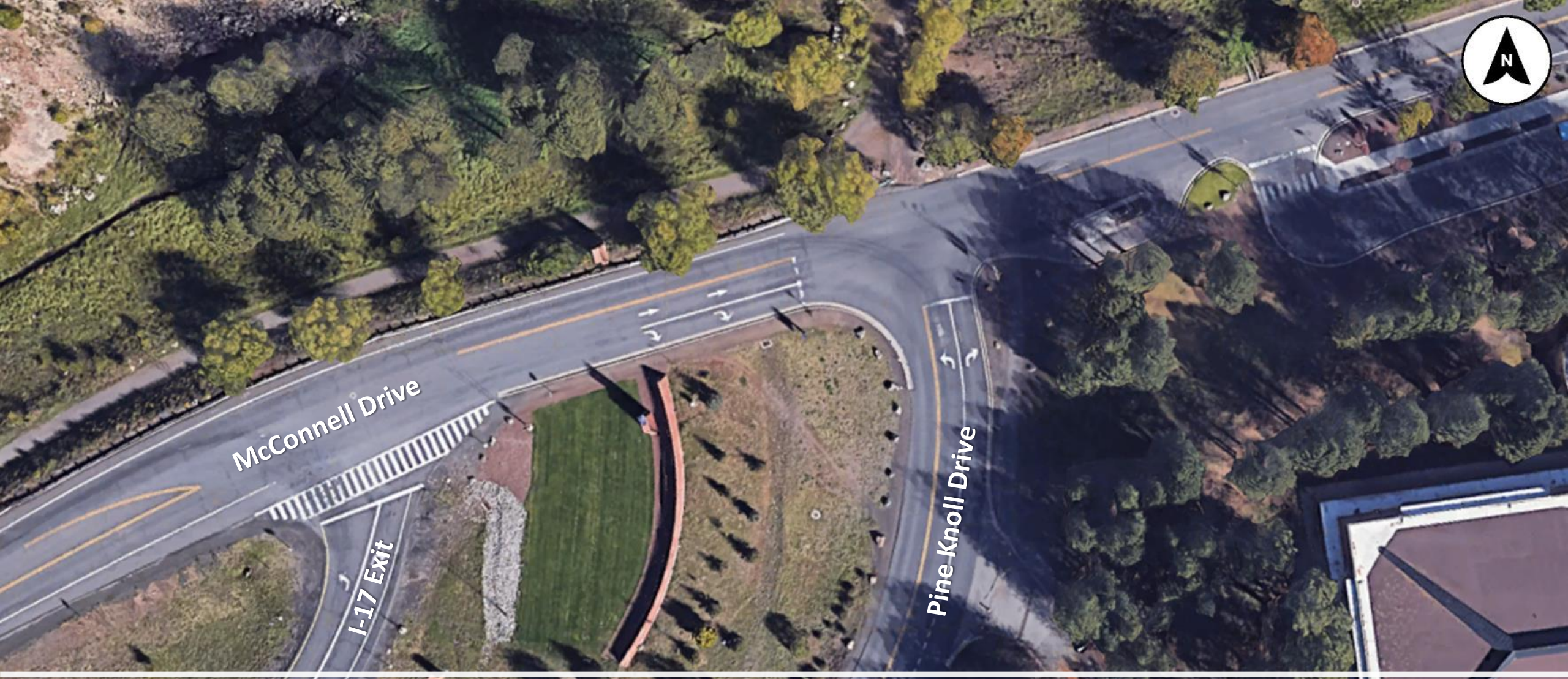
City of Flagstaff, *City of Flagstaff Crest*. 2020.



Arizona Department of Transportation, *ADOT Logo*. 2017.



Northern Arizona University, *NAU Logo*. 2020.



Location





Assessment of Existing Conditions

Task 1: Review Existing Data

Task 1.1: Traffic Data

- Determines number of lanes, and crossing

Task 1.2: Survey Data

- For creation of topographic map

Task 1.3: Right-of-ways

- To determine location and ownership

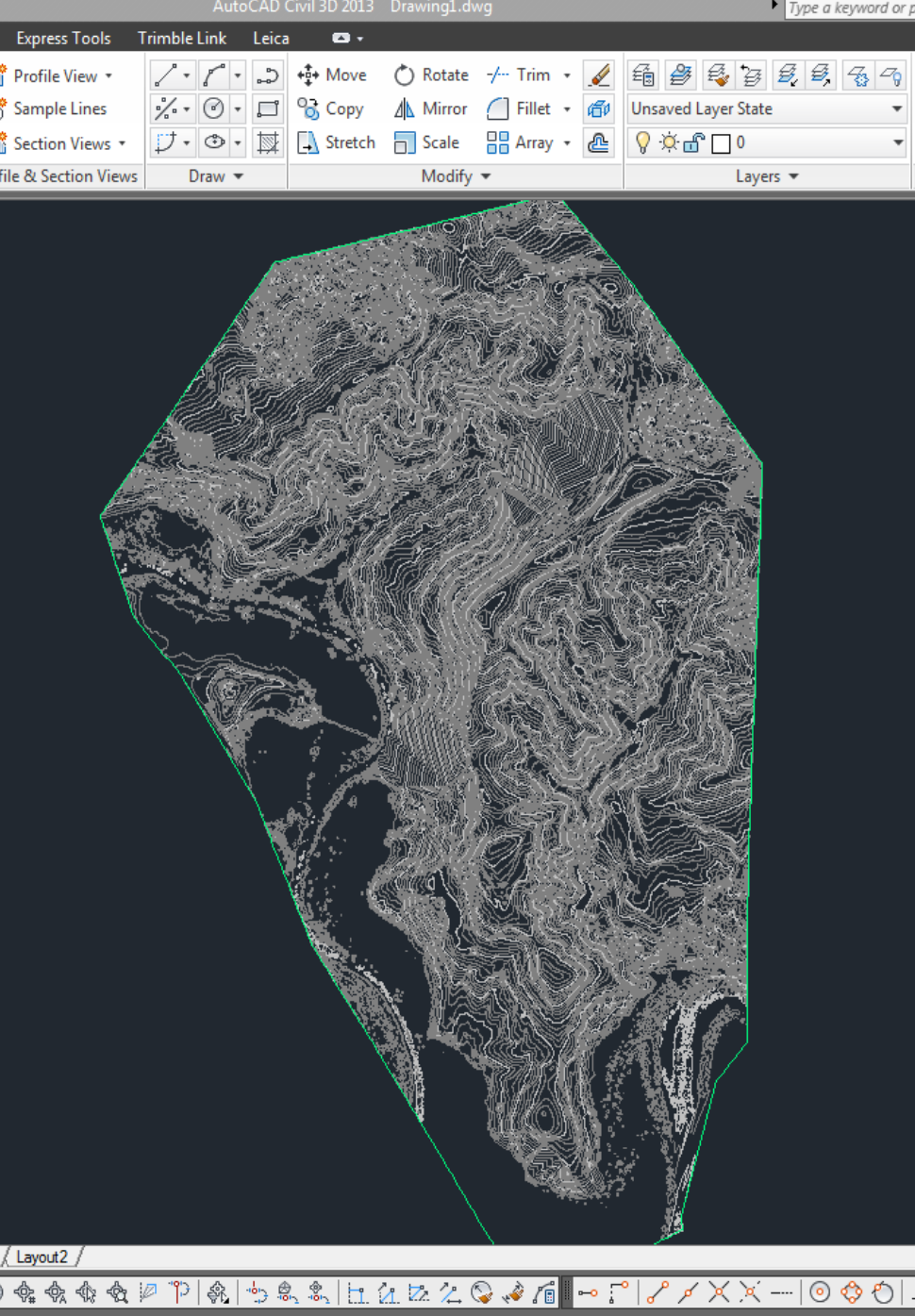
Task 2: Site Investigation

Task 2.1: Surveying

- If not provided, for the creation of a topographic map

Task 2.2: Field Notes

- To further inform the design



Assessment of Existing Conditions

Task 3: Existing Site Conditions

Task 3.1: Existing Topographic Map, Structures, and Environmental Features

- To determine the position of the design and the extents of removal

Task 3.2: Existing Roadway Alignments

- To tie design into existing roadways



Design

Task 4: Roundabout Design and Check

Task 4.1: Preliminary Roundabout Geometry

Task 4.1.1: Evaluation of Design Alternatives

- To consider all design options

Task 4.1.2: Radius of the Inscribed Circle

- To determine general footprint of design

Task 4.1.3: Assessment of Lanes

- To determine general footprint of design

Task 4.2: Grading to Roundabout Requirements

- To determine extents of project area



Stormwater Management

Task 4.3: Hydrology Assessment

Task 4.3.1: Contributing Area and Runoff Coefficient

- To determine extents and characteristics of drainage area

Task 4.3.2: Duration and Intensity

- To determine the behavior of the drainage area

Task 4.3.3: Design and Check Storm Volumes

- To determine the volume of water for design of roadways and drainage structures



Stormwater Management

Task 4.4: Hydraulic Assessment

Task 4.4.1: Assess Flow Criteria

- To ensure code and safety requirements are not exceeded

Task 4.4.2: Hydraulic Structures

- To transport stormwater out of roadway and into channel

Task 4.4.3: Channel Analysis

- To determine if the channel is adequate for post-development



Finalization of Design

Task 4.5: Finalize Roundabout Geometry

Task 4.5.1: Roadway Alignments

- To display necessary design information

Task 4.5.2: Splitter Islands

- To separate traffic and provide a refuge for pedestrians

Task 4.5.3: Crosswalk Locations

- To provide safe crossing locations for pedestrians

Task 4.5.4: Safety and Code Checks

- To ensure adherence to city codes and the safety of all potential users

Task 4.5.5: Redesign As Needed

- To ensure that roadway elements function well together and the needs of all users are met

Task 5: Signage and Striping

- To guide users safely through the intersection

Submittal Package



Task 6: Temporary Traffic Control

The plan to be implemented for directing traffic during the construction process



Task 7: Plan Set Production

To detail all layers of work to be done to implement the design



Task 8: Drainage Report

To detail how the drainage infrastructure will properly manage stormwater flows



Task 9: Traffic Report

To detail how traffic control measures how will safely and adequately direct traffic flow

Project Impacts

Task 10: Project Impacts

Task 10.1: Social Impacts

- Intersection closure
- General discomfort with roundabouts
- Improve travel time and safety
- Aesthetic appeal

Task 10.2: Economic Impacts

- Cost to design
- Cost to construct (\$4-\$8 million)
- Reduction of crashes

Task 10.3: Environmental Impacts

- Effects to Sinclair Wash
- Reduction in vehicle emissions
- Increased green space

CENE 486

Deliverables

Task 11: Project Milestones

Task 11.1: 30% Submittal

- To showcase via a report and presentation the existing data, site investigation, creation of topographic map and initial traffic report

Task 11.2: 60% Submittal

- To showcase via a report and presentation the iterative roundabout design processes, safety checks, and corresponding drawings

Task 11.3: 90% Submittal

- To showcase via a report and presentation all drawings and the final plan set, including signing and striping, and completing the traffic control plan and traffic and drainage reports

Task 11.4: Final Report

- A compilation and description of all work completed toward completion of the project

Task 11.5: Website

- A website will act as the team's online portfolio and description of the project

Task 11.6: Presentation

- A slideshow that the team will narrate to their audience at the completion of the project work

Project Management

Task 12: Project Management

Task 12.1: Meetings

- To ensure that the team stays on schedule and understands each element of the design process

Task 12.2: Schedule Management

- To ensure that project deadlines are met, and milestones are completed on time

Task 12.3: Budget Management

- To ensure that the project is completed within the allowable range of resources



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