

NAU SOUTH CAMPUS TRAFFIC STUDY

Transportation & Systems Engineering

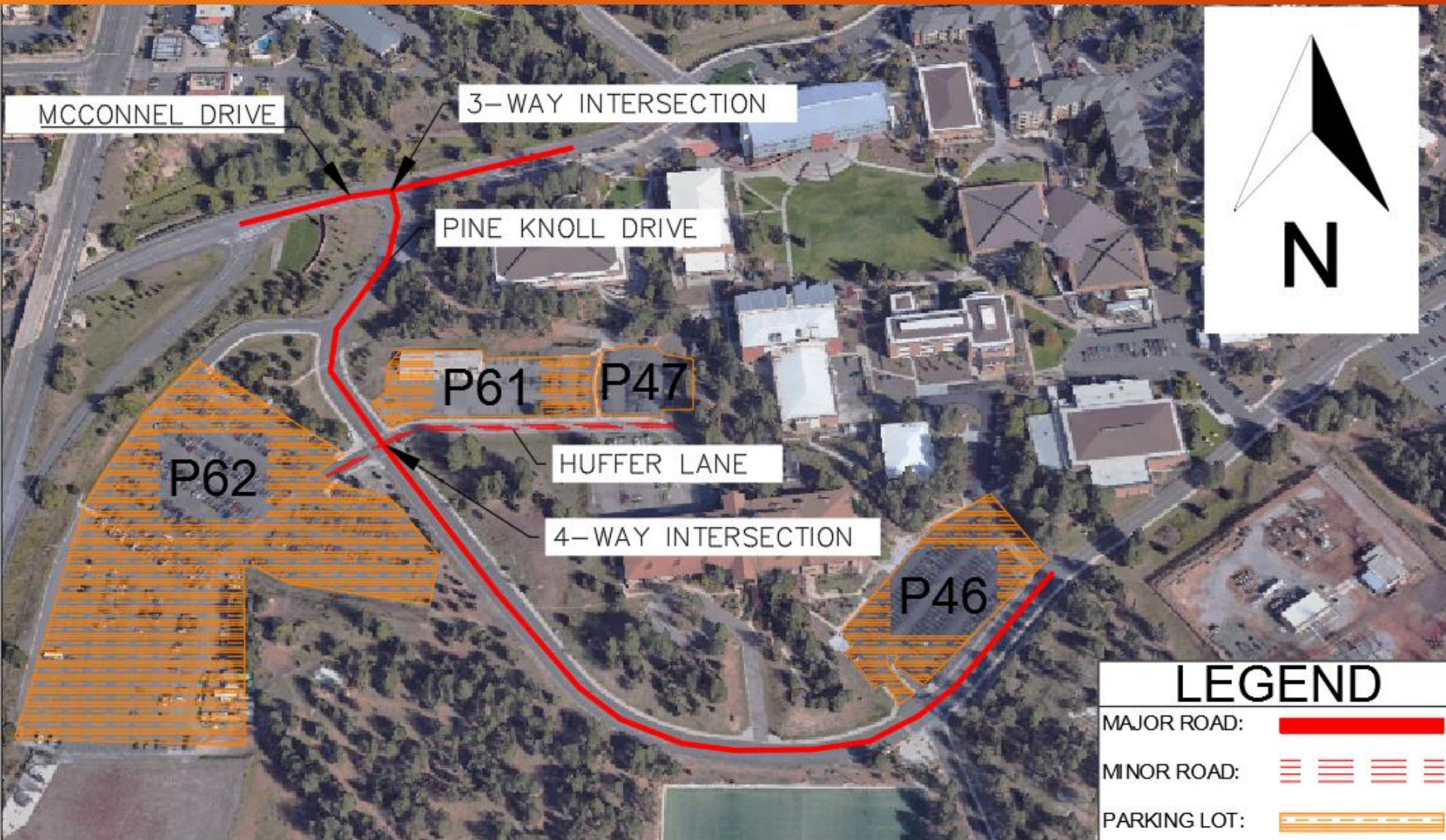


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Location:

- Flagstaff, AZ
- NAU South Campus

Purpose:

- Provide technical recommendations to mitigate traffic.

Area of Interest:

- McConnell Drive
- Pine Knoll Drive
- Huffer Lane
- Parking Lots (P62, P61, P47, P46)

POTENTIAL CHALLENGES

TOPOGRAPHY:

- Slope & Curvature Of The Existing Roadway

TIME OF CONGESTION:

- Occurs 20-25 Minute Intervals

MCCONNELL EXIT RAMP (341):

- Located 280ft West Of The Area Of Interest

AREAS OF JURISDICTION:

- Arizona Department Of Transportation
- City Of Flagstaff
- Northern Arizona University



STAKEHOLDERS

Client

- Greg Mace, Engineering & Inspection Associate
Director of Northern Arizona University

Public

- City of Flagstaff Residents
- Establishments Along Vicinity
- NAU Students & Faculty
- Traffic Users Exiting Freeway
- Arizona Department of Transportation (ADOT)



VIEW OF NAU CAMPUS [11]



DR. GREG MACE [2]

SCOPE OF SERVICES

Task 1: Field Evaluation

- Analysis of Existing Data
- Analysis of Existing Traffic Conditions
- 2015 NAU Landscape Master Plan
- NAU Circulation Study
- Signage

Task 2: Mapping & Surveying

- 2.1 Establish Survey Control
- 2.2 Create Topographical Map



PINE KNOLL DRIVE & HUFFER LANE
INTERSECTION [1]

SCOPE OF SERVICES

Task 3: Site Characterization

3.1 Traffic Impact Analysis

3.1.1 Occupancy Data

3.1.2 Volume Analysis

3.1.3 Vehicle Classification Study

3.1.4 Delay Analysis



INTERSECTION OF HUFFER LANE &
PINE KNOLL DRIVE [1]



HEAVY CONGESTION ON PINE
KNOLL DRIVE [1]

SCOPE OF SERVICES

Task 4: Design

- Design Considerations
- Roundabout
- Roadway Extension
- Pedway with Bike Lane
- Pedestrian Footbridge



PEDWAY WITH BIKE LANE [11]



ARIZONA STATE UNIVERSITY PEDESTRIAN BRIDGE [11]

SCOPE OF SERVICES

Task 4: Design

4.2 Economical

- Design Cost
- CMF - Crash Modification Factors
- KABCO Crash Severity Index
- Empirical Bayes Method of Analysis

4.3 Environmental

- Synchro To Estimate Reduction In Vehicular Delay

4.4 Social

- Public Perception Of Design



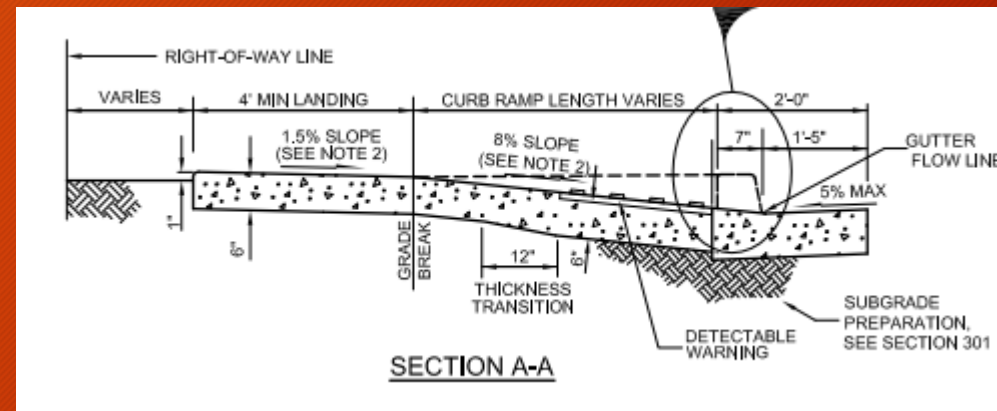
CONGESTION FROM MCCONNELL DRIVE TO
PINE KNOLL DRIVE [1]

LIST OF EXCLUSIONS

- Geotechnical Engineering
- Construction Design Specifications
- Structural Design Specifications
- Hydrologic or Hydraulic Analysis



GEOTECH SAMPLES [11]



CURB DESIGN SPECIFICATION [11]



CULVERT [11]

PROJECT SCHEDULE GANTT CHART

August 13, 2017

September 12, 2017

October 12, 2017

November 11, 2017

December 11, 2017

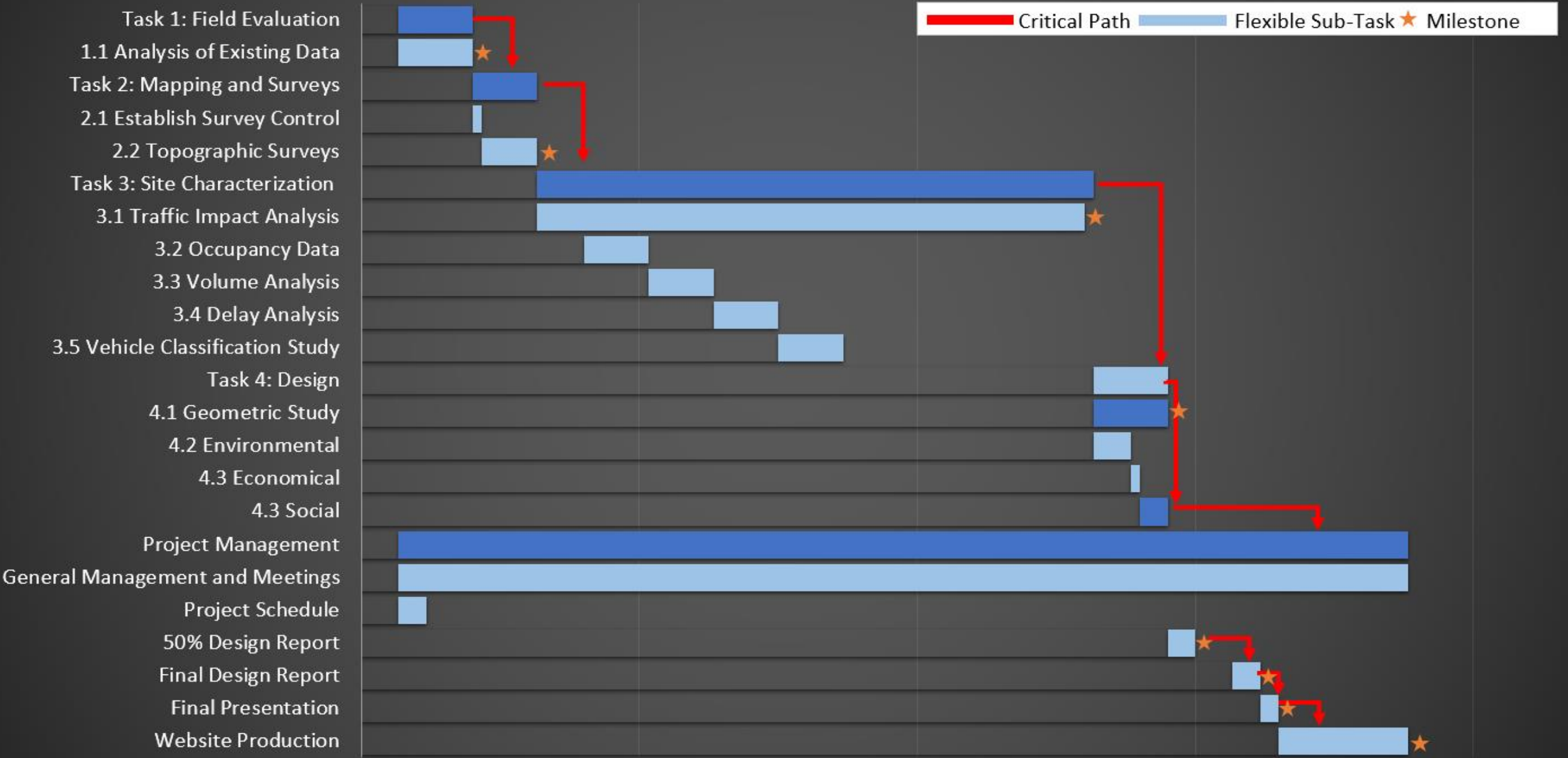


TABLE 1. PERSONNEL HOURS PUT INTO PROJECT.

Hours					
Task	Senior Engineer	Project Engineer	Engineer in Training	Intern	Total Hours
Task 1: Field Evaluation					
1.1 Analysis of Existing Data	10	20	35	35	100
Task 2: Mapping and Surveys					
2.1 Establish Survey Control	2	8	8	8	
2.2 Topographic Surveys	2	8	32	32	100
Task 3: Site Characterization					
3.1 Traffic Impact Analysis	Total Sum:	28	66	131	
3.1.1 Occupancy Data	3	8	25	35	
3.1.2 Volume Analysis	3	8	16	35	
3.1.3 Delay Analysis	2	8	15	35	
3.1.4 Vehicle Classification Study	1	4	10	26	234
Task 4: Design					
4.1 Geometric Study	3	5	20	20	
4.2 Environmental	2	8	15	16	
4.3 Social	2	6	15	16	
4.4 Economical	2	8	20	8	166
				Total	600

COST OF ENGINEERING SERVICES

Positions	Qualifications
Senior Engineer	Transportation Specialty
Project Engineer	Traffic & Systems Specialty
Engineer In Training (E.I.T)	Traffic Systems Specialty
Intern	Traffic Data Collector Specialty

Personnel	Classification	Hours	Base Pay Rate (\$/Hour)	Benefits of Base Pay Rate (%)	Actual Pay (\$/Hour)	Billing Rate (\$/Hour)	Cost
	Senior Engineer	32	\$120.00	50%	\$185.00	\$220.00	\$ 7,040.00
	Project Engineer	91	\$100.00	20.00%	\$133.00	\$160.00	\$14,560.00
	Engineer In Training (E.I.T)	211	\$ 50.00	25.00%	\$ 95.00	\$140.00	\$29,540.00
	Intern	266	\$ 25.00	30.00%	\$ 83.00	\$110.00	\$29,260.00
Rental	Survey Equipment	100				\$ 5.00	\$ 500.00
Total:							\$80,900.00

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