I-40/COUNTRY CLUB DRIVE ON-RAMP PROPOSAL

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Project Location

The On-Ramp is located on N Country Club Drive adjacent to Interstate 40 in Flagstaff, AZ (shown in red)



Figure 1: State of Arizona Project Location (1" = 80 miles) [1]



Figure 2: City of Flagstaff Project Location (NTS) [2]

Project Purpose

- One Southbound entrance onto I-40 westbound
- Existing detention basin on north side
- Adding an additional right turn lane to the on-ramp to increase capacity
- Expand existing on ramp from 1 to 2 lanes to reduce congestion



Figure 3: Zoomed in Project Location (NTS) [2]

Stakeholders

Arizona Department of Transportation

- Nate Reisner, P.E., Development Engineer
- City of Flagstaff
 - Daily users of this facility



Task 1: Analyze/Review Existing Studies

1.1 Site Visit

- 1.2 Process Survey Data from GIS
- 1.3 Analyze Existing Drainage Studies/Obtain As-Built Information
- 1.4 Existing Runoff Calculations
- 1.5 Obtain and Analyze Geotechnical Data from ADOT
- 1.6 Input and Process Existing Geometry into Civil 3D
- 1.7 Create Existing Cross Sections
- 1.8 Create Roadway Alignments/Base Files

Task 2: Design

- 2.1 Design/Create Proposed Cross-Sections
- 2.2 Initial Design
 - 2.2.1 Intersection Design
 - 2.2.2 On-Ramp Design
- 2.3 Final Design Geometry/Cross-Sections
- 2.4 Final Drainage Design
- 2.5 Stormwater Pollution Prevention Control Plan
- 2.6 Construction Plan Set
- 2.7 Synchro Analysis and Traffic Analysis Recommendation

Task 3: Deliverables

Task 4: Impacts

- 3.1 30% Submittal (Includes Task 1)
- 3.2 60% Submittal (Includes Task 1 & 2)
- 3.3 90% Submittal (Includes Task 1, 2 & 4) 4.3 Social Impacts
- 3.4 Final Design Concept Report Submittal (Includes Task 1, 2 & 4)
- 3.5 Website

- 4.1 Economic Impacts
- 4.2 Environmental Impacts

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Task 5: Project Management

- 5.1 Grading Instructor Meetings
- 5.2 Client Meetings
- 5.3 Technical Advisor Meetings
- 5.4 Team Meetings
- 5.5 Schedule Management
- 5.6 Cost/Resource Management

Exclusions

- Full Survey
- Geotechnical Analysis
- Collection of Traffic Data
- Traffic Signal Planning
- Environmental Permits/Mitigation Measures
- Bridge Design
- New Drainage Infrastructure Design

ID	Task Name	Duration	Start	Finish	February 2020 March 202 13 16 19 22 25 28 31 3 6 9 12 15 18 21 24 27 1 4 7	0 April 2020 10 13 16 19 22 25 28 31 3 6 9 12 15 18 21 24
1	Task 1: Existing Studies	16 days	Mon 1/13/20) Mon 2/3/20		
2	1.1: Site Visit	1 day	Mon 1/13/20) Mon 1/13/20	1	
3	1.2: Process Survey Data from GIS	7 days	Tue 1/14/20	Wed 1/22/20		
4	1.3: Studying/Analyzing Existing Drainage Studies/As-Built Information	3 days	Tue 1/14/20	Thu 1/16/20	Critical Path show	n in Red (70 Days)
5	1.4: Runoff Calculations	4 days	Tue 1/14/20	Fri 1/17/20		
6	1.5: Analyze Existing Geotechnical Information	3 days	Tue 1/14/20	Thu 1/16/20		
7	1.6: Input and Process Existing Geometry into Civil3D	5 days	Thu 1/23/20	Wed 1/29/20		
8	1.7: Create Existing Cross-Sections	3 days	Thu 1/23/20	Mon 1/27/20	(** **)	
9	1.8: Create Roadway Alignments/Base Files	3 days	Thu 1/30/20	Mon 2/3/20	*	
10	Task 2: Design	56 days	Tue 1/28/20	Mon 4/20/20	•	1
11	2.1: Create Proposed Cross-Sections	4 days	Tue 1/28/20	Fri 1/31/20	* −¬	
12	2.2: Initial Design	27 days	Mon 2/3/20	Tue 3/10/20		-
13	2.2.1: Intersection Design	27 days	Mon 2/3/20	Tue 3/10/20		-
14	2.2.1: On-Ramp Design	27 days	Mon 2/3/20	Tue 3/10/20	• • • • • • • • • • • • • • • • • • •	
15	2.3: Final Design Geometry/Cross-Sections	12 days	Thu 3/12/20	Thu 4/2/20		
16	2.4: Final Drainage Design	12 days	Fri 4/3/20	Mon 4/20/20		
17	2.5: Stormwater Pollution Prevention Control Plan	4 days	Fri 4/3/20	Wed 4/8/20		• • • • • • • • • • • • • • • • • • •
18	2.6: Construction Plan Set	50 days	Mon 2/3/20	Thu 4/16/20	l	
19	2.7 Synchro Analysis and Traffic Analysis Recommendation	2 days	Wed 3/11/20) Thu 3/12/20		*
20	Task 3: Deliverables	47 days	Fri 2/14/20	Fri 4/24/20		
21	3.1: 30% Submittal	1 day	Fri 2/14/20	Fri 2/14/20		1
22	3.2: 60% Submittal	1 day	Tue 3/10/20	Tue 3/10/20		۲ <u>ــــــــــــــــــــــــــــــــــــ</u>
23	3.3: 90% Submittal	1 day	Tue 4/21/20	Tue 4/21/20		*
24	3.4: Final Design Report	1 day	Fri 4/24/20	Fri 4/24/20		1
25	Task 4: Impacts	2 days	Fri 4/3/20	Mon 4/6/20		
26	4.1: Social Impacts Assessment	2 days	Fri 4/3/20	Mon 4/6/20		
27	4.2: Economic Impacts Assessment	2 days	Fri 4/3/20	Mon 4/6/20		— ———
28	4.3: Environmental Impacts Assessment	2 days	Fri 4/3/20	Mon 4/6/20		
29	Task 5 Project Management	68 days	Mon 1/13/20) Tue 4/21/20		1

Table 1: Staffing Summary

Staffing

- 612 Total estimated hours for this project
- PE will lead Design Work
- PM will review work and ensure QA/QC

Tasks	РМ	PE	EIT	TECH	Total
Task 1: Existing Studies	6	18	40	52	116
Task 2: Design	17	38	98	74	227
Task 3: Deliverables	9	16	42	30	97
Task 4: Impacts	3	3	6	0	12
Task 5: Project Management	42	42	38	38	160
Total	77	117	224	194	612

Table 2: Cost Summary

Cost Estimate

- Total Estimated Cost of Engineering Services is
 \$72,369
- Travel Cost is Minimal, but was Included for Accuracy

1.0 Team Members	0 Team Members Billing Rate per Hour		Cost
PM	\$195.00	77	\$15,015
PE	\$155.00	117	\$18,135
EIT	\$110.00	224	\$24,640
TECH	\$75.00	194	\$14,550
	\$72,340		
8 Meetings	@ 4 mi/meeting	\$0.58 mi/meeting	\$19
5 Meetings @	5 Meetings @ 2.5 mi/meeting \$0.58 r		\$10
	\$29		
Total	\$72,369		

References

- [1] "Coconino County Map" (2016). [Image] Available at: https://www.mapsoftheworld.com [Accessed 4 Dec. 2019].
- "Google Maps", Google Maps, 2019. [2019]. Available: https://www.google.com/maps/@35.2171255.5857948.17z
 [Accessed 05- Dec- 2019].
- "Arizona Department of Transportation", En.wikipedia.org. 2019.
 [Online]. Available:https://en.wikipedia.org/wiki/Arizona_Department_of_ Transportation [Accessed 05-Dec-2019]
- [4] "AASHTO-Roadside-Design-Guidelines," American Association of State Highway and Transportation Officials, vol. 4th, 2011
- [5] "ADOT Roadway Design Guidelines," Arizona Department of Transportation, May 2012

Questions?