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New Mexico Institute of Mining & Technology Student Government Association

## **Research Presentation Grant**

**Proposing Individual(s) Information:** 

### To the proposing Individual(s):

Please attach the travel plans for your trip as well as the abstract for the research that you are presenting at the conference. Include names of ALL individuals planning on attending the conference, starting with the team lead. However, only the team lead's phone number, email, and signature are required in the "information" section.

Name(s):					
Phone: Email:					
Signature:					
Information Regarding Researc	MEXICO TEC				
Title of Research:Collaborative Fram	nework to Create a Culvert Asset Management System for NMDOT				
Location & Date of Conference:					
Club/Dept. Proposing:	VOIT XTX				
Amount Requested*:	Date Submitted:				
	NMIE - L				
Signature of SGA Vice President	Date				
Approvals:					
Amount Approved:					
Index Number:	Covernme Account Code:				
Signature of CFO	 Date				
Signature of SGA President	Date				
*If the requested amount exceeds \$	1000, approval through Budget Analysis is required.				
Signature of Budget Analysis	 Date				

#### **Austin Starnes ICTD Cover Letter**

Over the summer of 2021, New Mexico Tech participated in implementation of a Culvert Asset Management Program (CAMP) for the New Mexico Department of Transportation (NMDOT). A comprehensive survey of 8,502 culverts was completed by five pairs of student interns yielding valuable information on the state of culverts in New Mexico. I am the primary author for "Collaborative Framework to Create a Culvert Asset Management System for NMDOT", a paper that presents the methodology, findings, and implications of the first phase of the project. The paper has been accepted by the American Society of Civil Engineers (ASCE) for inclusion in the 2022 International Conference on Transportation and Development (ICTD) and will be published in the conference proceedings. The conference is in Seattle, Washington this May 31<sup>st</sup>-June 3<sup>rd</sup>. The purpose of this proposed research grant is to request funding for registration, travel, and lodging to represent NMT at this conference and present our research to an international audience.

In the interest of conservation of funds, I have reserved an Airbnb at the cheapest rate available near the location, a total of \$313.28 for a 3-night stay near downtown Seattle (the discounted rate for the conference hotel was \$220/night plus taxes and fees). The research and poster will be presented at the SRS and will be printed cost-free through attendance of SRS workshops. The conference registration costs \$390, and the flight is expected to cost \$400-500. Uber will also be necessary to and from the airport, with an estimated cost of \$50 each way as shown in the attached documents. The Civil and Environmental Engineering (CEE) department at Tech has some funds available and is able to contribute \$500 towards my attendance of the conference. I am financially able to contribute \$500, which will partially go towards meals and other uncovered costs (estimated around \$200) and cover \$300 towards lodging and transportation. This leaves a difference of \$613, which I am requesting through the SGA.

Funding from the SGA will make this trip possible and allow me to represent New Mexico Tech at the ICTD. Participation in this conference will award recognition of NMT and the CEE department and may result in establishing relationships, furthering our research, and collaboration with other entities such as state DOTs, researchers, and educational institutions. I will be honored to represent NMT at this conference and will continue to commit to excellence throughout this research and presentation.

Thank you for your consideration,

**Austin Starnes** 

# Collaborative Framework to Create a Culvert Asset Management System for NMDOT

Austin L. Starnes<sup>1</sup>, Isabel Morris, Ph.D., A.M. ASCE<sup>2</sup>, Claudia Mara D. Wilson, Ph.D., A.M. ASCE<sup>3</sup>, Wesley Cook, Ph.D.<sup>4</sup>, P.E., Clinton P. Richardson, Ph.D., PE, BCEE<sup>5</sup>, David Trujillo, Jr., P.E., M. ASCE<sup>6</sup>, Todd Howell, BS<sup>7</sup>, Douglas D. Cortes, Ph.D.<sup>8</sup>, Daniel Dugas, Ph.D.<sup>9</sup>, David Jauregui, Ph.D.<sup>10</sup>

### **ABSTRACT**

The New Mexico Department of Transportation (NMDOT) is in the process of developing an asset management program for small culverts, which are not required to be included in biennial bridge inspections and can lead to catastrophic road failures if unmaintained. Aside from a partial statewide inventory in 2004, culverts in New Mexico have not been comprehensively inspected or had their condition assessed. The NMDOT initiated a Culvert Asset Management Program (CAMP) in 2021 to create an inventory of the state's projected 70,000 culverts, which will be regularly updated and used statewide to prioritize and plan maintenance and improve road safety. Student interns from New Mexico Tech (NMT) and New Mexico State University (NMSU) completed the first of six seasons of CAMP inspections in the Summer of 2021. This paper will review the data collected by NMT and make suggestions for future work. Researchers used Trimble devices with Terraflex GIS software to compile GPS points and photos for each culvert, along with entries for size, material, and condition. The condition was recorded by visual inspection, describing corrosion, concrete spalling and cracking, other structural damage, and blockage of flow by silting or other means. Researchers examined data for completeness and accuracy by comparing photos with reported data and holding team discussions to improve uniformity at weekly QA/QC Meetings. Five teams from NMT surveyed 8,502 culverts, averaging 53 culverts per team per day. A total of 1,480 (17%) may warrant immediate intervention (e.g., severe corrosion, spalling, or silting). This paper summarizes the contributions of CAMP from NMT, makes suggestions for improved survey efficiency, and assesses the program's utility in future applications. This research proposes a methodology that can be utilized by other entities for culvert asset management and produces a database useful in other analyses.

2/28/22, 9:40 PM 4 / 7

## **BILLING ADDRESS:**

Austin Starnes, S.M.ASCE 505 Western Ave Socorro, NM 87801-4447

## **SUMMARY:**

## **REFERENCE NUMBER: 1045271405**

International Conference on Transporta  5/31/2022 - 6/3/2022  Add to Calendar	ation and Development	Quantity	Unit Price	Total
test 2		1	\$390.00	\$390.00
QUESTIONS/ANSWER	RS			
The Oversite than Lyrands for in			SubTotal:	\$390.00
The Organization I work for is: Education			Tax:	\$0.00
Education		0	rder Total:	\$390.00
My Position is:	Paid on 02/28	3/22 with Visa er	nding in 4352 f	for \$390.00
Student			Balance:	\$0.00
How many previous ASCE conferences have you attended, including this one?			Amount Due:	\$0.00
My Age Group is: 25-34				
Gender:				
Male				
Please specify your ethnicity White				
I have reviewed ASCE's COVID-19	9 policy and			

providing proof of vaccination or a recent negative

COVID-19 test:

YES



 $\leftarrow$  To Itinerary

## Your payment details

### Seattle

### 3 nights in Seattle

Tue, May 31, 2022  $\rightarrow$  Fri, Jun 3, 2022

Entire home/apt · 1 bed · 1 guest

Confirmation code: HMH8E3RYDR



## **Payments**

Payment 1 of 2 \$62.66

Feb 28, 2022 · 10:40PM CST VISA .... 4352

Get receipt

Amount paid (USD) \$62.66

## **Scheduled Payments**

Payment 2 of 2 \$250.62

Scheduled for May 18, 2022 VISA ···· 4352

Update payment details

Balance due (USD) \$250.62



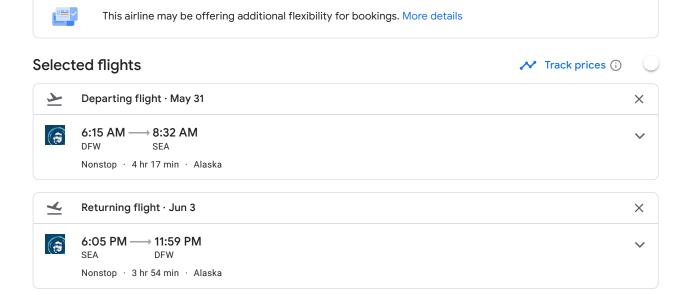




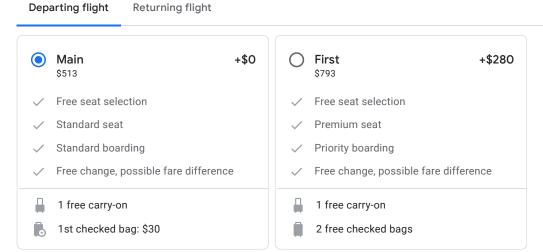
\$513

Share

Total price from

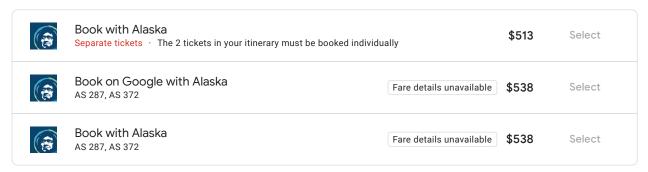


### Fare options



Alaska bag policy

### Booking options (i)



### **Screenshot of Uber Estimate from Airport**

