TEXAS STATE
INGRAM SCHOOL OF ENGINEERING

Group C1.08
I-35 Corridor Traffic Congestion Relief

Bryan Brinkman, Skyler Garrett, Andy Gombac, Mason Holden

PROJECT OVERVIEW

As the population along the I-35 corridor increases and becomes increasingly more car-dependent, the problem of traffic congestion has increased. The goal of this design project is to determine and evaluate two solutions to reducing traffic congestion on interstate 35 between Austin and San Antonio, TX. By evaluating the solutions using **total cost**, **sustainability**, and **feasibility**, our group was able to determine what would help resolve this issue.

BACKGROUND

Traffic congestion has proved to be an ongoing and increasing problem for major urban areas, with the I-35 corridor between Austin and San Antonio, TX being a prime example. As one of the most traveled segments of roadway within the state, the roadway has been plagued by delays caused from traffic congestion. During peak hours, interstate users may sit in traffic for hours trying to arrive at their final destinations.

DESIGN CONSIDERATIONS

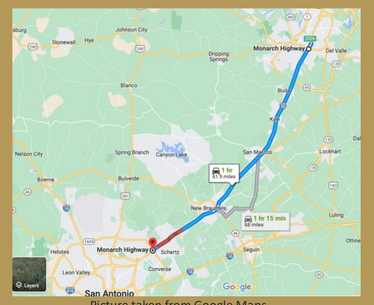
For our design evaluation, we considered the following criteria:

- Cost
- Feasibility
- Time Alleviation
- Usage and Ridership
- Sustainability

By comparing the two design alternatives against each other utilizing these criteria, we feel that we have provided an adequate juxtaposition of each design.

SITE SELECTION

This site, consisting of the interstate corridor between Austin and San Antonio, TX, was chose specifically for its heavy commuter and commercial traffic use, proximity, and congestion. This roadway serves as a major connector for many cities, along with the hundreds of thousands of individuals that use it for travel and the working commute every day. The total distance the project will be confined in is around 62 miles, starting from Austin, Texas to San Antonio, Texas. Each alternative would follow this route, thus totaling around 62 miles.



Picture taken from Google Maps

DESIGN ALTERNATIVES

Alternative One: The expansion of Interstate 35 (I-35) through the addition of a one lane toll lane in both directions. This additional lane would help reduce traffic congestion by providing another lane for travel and offer commuters the opportunity to travel in a faster lane for a fee.

Alternative Two: The construction of a new commuter rail connecting the major cities of Austin and San Antonio, TX with additional stops in Buda, Kyle, San Marcos, and New Braunfels. This commuter rail would help reduce congestion by offering a competitive alternative to vehicle-oriented options of travel.

SUSTAINABILITY EVALUATION

For the sustainability evaluation, we were given the option of using either Envision or LEED. Since LEED is geared more towards new building construction, we found that Envision was more applicable to our project. By using Envision, we rated both alternatives separately. Alternative one Scored 34.7% while Alternative two scored 69.3%. Within the Envision system, a higher score means the project is more sustainable in terms of social, economic, and environmental factors. These two scores were determined by using our best Engineering judgement, therefore, may be slightly skewed.

CAPITAL AND LIFE CYCLE COSTS

For the cost estimate portion, we used a combination of TxDOT provided materials, Lonestar Rail materials, and Capital Metro cost estimates to estimate cost of construction materials for our project. The capital costs for each alternative includes the initial construction cost. Alternative one's capital cost is $286.04 million, and alternative Two's capital cost is $526.55 million.

We were able to estimate the entire life cycle cost by using the LCCA equation. The life cycle cost includes maintenance and major rehabilitations, alongside an estimate of salvage cost at the end of its life cycle, 75 years. We calculated the life cycle cost of alternative one to be $312.64 million, and alternative two to be $779.38 million.

TEAM MEMBER PICTURES

In order from left to right:
Mason Holden, Skyler Garrett,
Bryan Brinkman, and Andy Gombac

SECOND SEMESTER PLAN

We plan to further dive into the designing process by picking our favorite alternative and making a relative model of that design. Additionally, we will apply skills learned in class by designing a civil engineering aspect along side the road or rail. The additional design may include drainage considerations, geotechnical factors, environmental concerns, and structural designs.

ACKNOWLEDGEMENTS

We would like to thank the College of Science and Engineering for giving us the opportunity to create this project, Dr. Feng Hong for leading our senior design class, and our friends and family for encouraging and inspiring us to continue in our pursuit of higher education.

Without them, we would have been unable to accomplish all that we have in our time at Texas State University.