North Lehi Interchange

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INTRODUCTION

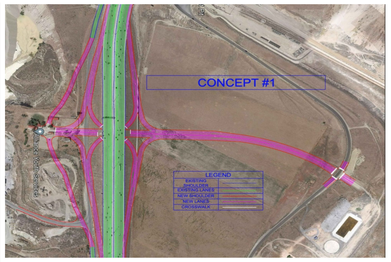
- SR-92 in Lehi sees a lot of traffic and can get very backed up onto the freeway at peak traffic times
- A new interchange north of SR-92 could help relive this congestion
- The design of this interchange would:
    - Provide access to neighborhoods in north Traverse area
    - Relive traffic from SR-92
    - Connect to existing transportation systems (e.g. slip ramps currently running from SR-92 & 2100)

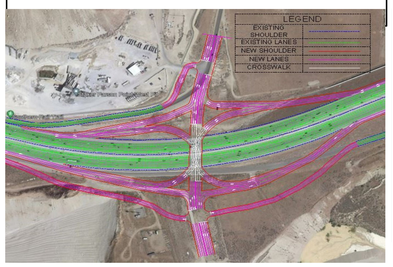
METHODS

- Brainstorm multiple concepts, pick three to focus on.
- Draw each concept in Auto CAD.
- Analyze the impacts of each concept as well as the costs.
- The best concept will move forward to the design stage and have a more detailed plan set provided.

CONCEPTS

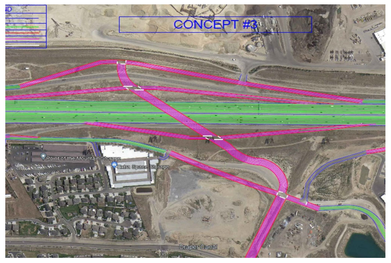
Concept 1
- Closest to SR-92
- Requires a tunnel under I-15
- Roughly 2.73 miles shorter than going through SR-92





Concept 2
- Bridge over I-15
- Roughly 2.91 miles shorter than SR-92 route

Concept 3
- Bridge over I-15
- 2.97 miles shorter than taking SR-92 exit



ANALYSIS

Public Health
EPA says the average car emits 411 grams of CO_2 paricles per mile driven (Greenhouse Gas Emissions from a Typical Passenger Vehicle, 2014). Concept 3 saved the most CO_2 at 1.22 kg with Concept 2 saving 1.20 and Concept 1 1.12 kg.

Public Safety
Related to how far away the new interchange is to the homes. This would mean a shorter commute time and less possibility to accidents.

Public Welfare
This can be improved as there is more time saved going to and from the homes and business in this location.

Economic Impact
The impact to the large field was considered as it could be the location of future businesses. Easy of access was also considered for the current businesses both for commuters and customers.

Global Impact
The current shortages in the market could slow the progress of the project. It is hard to get most products due to lack of labor, shipping issues, and shortages in parts of the product.

Cultural Impact
A herd of elk is in this area. Some local residence will not like the fact that this project could interfere with them and their grazing.

Social Impact
Some residence could reject the project because it will be diverting more traffic to some off these secondary roads, like digital drive. These secondary roads are closer to the residential areas.

Environmental
This was scored the same as public health, the more CO_2 that can be saved, the better air quality will be.

Table 1 – Scoring Table showing how each design ranked in the described categories. Lower number is best.

	Design 1	Design 2	Design 3
Public Health	3	2	1
Public Safety	1	2	3
Public Welfare	1	2	3
Global Impact	1	1	1
Cultural Impact	1	1	1
Social Impact	1	1	1
Environmental Impact	3	2	1
Economic Impact	2	1	3
TOTAL	**13**	**12**	**14**

CONCLUSIONS

Concept 2 was chosen as the best design.
This design was taken further by creating the following plans:
- Typical Sections
- Roadway
- Striping
- Drainage
- Signing

Some of the design standards used for this project were:
- AASHTO's Green Book
- UDOT Drainage Manual of Instruction
- UDOT Roadway Design Manual
- UDOT Standard Drawing Book
- Manual of Uniform Traffic Control Devices

REFERENCES

Greenhouse Gas Emissions from a Typical Passenger Vehicle. (2014, May). Retrieved from United States Environmental Protection Agency:

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