

# **Appendix 3**

## **Alternatives Screening Report**

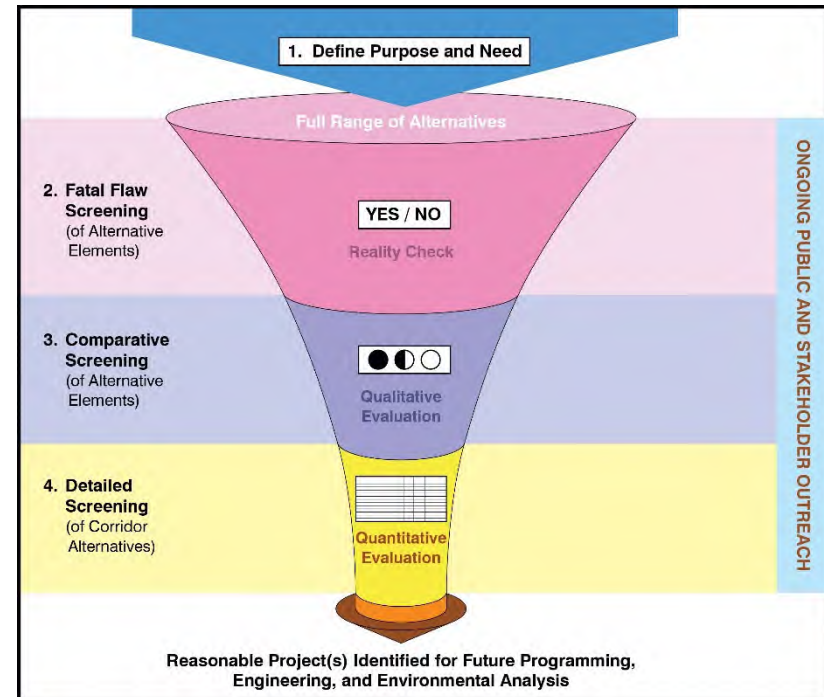
## INTRODUCTION

This Alternatives Screening Report is prepared for the Henderson Interchange Feasibility Study based on the Federal Highway Administration’s (FHWA) guidance for Planning and Environmental Linkages (PEL) to enable use as the basis for subsequent project development under the National Environmental Policy Act (NEPA) and its implementing regulations as contained in 23 Code of Federal Regulations (CFR) and 40 CFR. These regulations require that the NEPA process rigorously explores and objectively evaluates all reasonable alternatives to the proposed action. Reasonable alternatives are those that are practical or feasible from a technical and economic standpoint, achieve the purpose and need for the project, and do not create unacceptable environmental impacts when compared to other alternatives. This document summarizes the full range of ideas for transportation improvements considered for the study and the process used to identify and screen the ideas and to combine them into reasonable alternatives for further consideration.

The first step was to define the purpose and need for the study that established the goals to be met. After definition of the project’s purpose and need, three levels of alternatives development and screening took place during this feasibility study. Level 1 is an evaluation to eliminate ideas and alternatives that have fatal flaws. Level 2 is a comparative screening of ideas and alternatives based primarily on qualitative criteria to identify and rank ideas and alternatives that could satisfy the purpose and need. Level 3 is a detailed screening and refinement of alternatives to ascertain which alternative or alternatives best meet the purpose and need for the project.

This report includes information about the alternatives development and evaluation process. It describes how alternatives were identified and how they were evaluated on their ability to

meet the purpose and need for the project, their environmental impact, and their practicality. It also describes how ideas were combined to create build alternatives recommended for further evaluation in Level 3 screening, and further refinement of alternatives for advancement to the NEPA process.



**Figure 1 – Alternatives Screening Process**

### Study Area and Logical Termini

This feasibility study covers an area as shown in Figure 2 along Interstate 515 (I-515) between Galleria Drive (northern terminus) and Horizon Drive (southern terminus), and along Lake Mead Parkway and Interstate 215 (I-215) between Van Wagenen Street (eastern terminus) and Valle Verde Drive (western terminus).

These logical termini allow for development of a project that can be constructed alone, serving a significant purpose, addressing environmental impacts on a sufficient scale, without requiring implementation of other future projects.

### 1.2 Project Purpose and Need

At the onset of this feasibility study, the transportation needs of the study area were identified and analyzed. From this effort, a purpose and need statement was developed. The purpose and need statement will be refined following this feasibility study as the project is further developed through the NEPA process.

This study developed and calibrated a “subarea” model within the Southern Nevada Aimsun Next model, originally developed by the Nevada Department of Transportation’s (NDOT) Southern Nevada Traffic Study (SNTS). The calibrated subarea model was then used to develop year 2040 traffic forecasts needed for future conditions analyses. NDOT developed the SNTS Aimsun Next traffic model based on socioeconomic and land use assumptions in the Access 2040 Regional Transportation Plan adopted by the Regional Transportation Commission of Southern Nevada (RTC) on February 9, 2017.

The purpose of the proposed project is to:

- Resolve existing roadway deficiencies,
- Provide transportation improvements to serve existing and future growth areas,
- Restore local traffic connectivity, and
- Accommodate regional and local plans.



Figure 2 – Study Area and Logical Termini

**Purpose: Resolve Existing Roadway Deficiencies**

**Need:** The existing system interchange between I-215 and I-515 was constructed in the mid-1990s when the population of the Las Vegas Valley was one million people. The population has since more than doubled and is projected to continue to increase. Traffic volumes at the interchange exceed the original design year forecasts. Additionally, a service interchange was constructed at I-215/Gibson Road close to the system interchange in the early 2000s creating weaving conflicts between vehicles entering at Gibson Road bound for Lake Mead Parkway and vehicles transitioning to the I-515 connector ramps. The westbound Gibson Road off-ramp is closer than desirable to the I-515 ramps entering westbound I-215. AASHTO<sup>1</sup> recommends at least 2,000 feet from one freeway entrance to the following exit between system and service interchanges, and the distance for the westbound approach to Gibson Road is approximately 1,500 feet. The resulting congestion within the I-515 and I-215 corridors create delays for users and is a contributing factor to crashes. Specific areas where deficient traffic operations are observed include:

- The I-215 eastbound to I-515 southbound interchange ramp merges from two lanes to one lane, and then joins the I-515 southbound mainline. The ramp merge results in upstream queues (vehicles waiting in line) on the ramp itself and I-215 eastbound during peak traffic times that can contribute to crashes.
- The weaving movement along I-215 westbound, between the I-515 interchange ramps and Gibson Road off-ramp resulted in congestion and queues prior to recent restriping and placement of barriers to prevent motorists on Lake Mead Parkway/I-215 westbound from exiting to Gibson Road. The recent restriping and placement of barrier

resulted in loss of access for westbound motorists who wish to exit at Gibson Road.

- The weaving movement along eastbound I-215 between the Gibson Road on-ramp and the I-515 interchange ramps results in congestion and queues that can contribute to crashes. This weaving movement impacts the traffic that can reach and be served by the I-515 interchange ramps. Under existing conditions, traffic on eastbound I-215 between Gibson Road and the I-515 system ramps experiences speeds as low as 40 miles per hour (mph) during the PM peak period.
- The I-215 eastbound system ramp merges on to I-515 northbound, followed by the northbound Auto Show Drive on-ramp merging on to the freeway. These ramp merges happen within about 0.25 mile and neither of these ramps include an auxiliary lane or a parallel acceleration lane. These successive merges result in traffic slowdowns (to approximately 50 mph) along the freeway.
- Westbound Lake Mead Parkway drops from two lanes to one lane at the I-515/I-215 interchange. This reduction in the number of lanes results in upstream queues that may extend to the Lake Mead Parkway/Eastgate Road intersection and can contribute to crashes.

**Purpose: Provide Transportation Improvements to Serve Existing and Future Growth Areas.**

**Need:** Existing roadway deficiencies result in congestion that can contribute to crashes and travel delays for motorists. In addition to the existing roadway deficiencies listed in the previous section, by

<sup>1</sup>A Policy on Geometric Design of Highways and Streets, 7<sup>th</sup> Edition, Figure 10-70





the year 2040, the demand for the I-215 eastbound system ramp to I-515 northbound is expected to exceed the available capacity. In the year 2040 PM peak hour, a demand of more than 3,400 vehicles is expected along this existing one-lane ramp. This bottleneck is expected to result in extensive upstream queuing and congestion along I-215 eastbound. With the year 2040 No-Action Alternative, the I-215 eastbound section between Gibson Road and the I-515 system ramps is expected to experience speeds as low as 20 mph in the PM peak period. Similarly, year 2040 traffic demands exceed existing capacity for some of the other ramp movements between the I-215 and I-515 freeways. Capacity improvements to the system interchange are needed to meet the projected year 2040 demand.

**Purpose: Restore Local Traffic Connectivity**

**Need:** Interim safety and capacity improvement projects implemented in 2019 including restriping of I-215 and I-515 resulted in loss of connectivity for some users at adjacent interchanges. Motorists heading west on Lake Mead Parkway towards I-215 are no longer permitted to exit at Gibson Road. Motorists heading south on I-515 from Auto Show Drive are no longer permitted to exit to I-215. Members of the public that attended the March 2019 public meeting commented that the connectivity should be restored.

**Purpose: Accommodate Regional and Local Plans.**

**Need:** Accommodate NDOT's ongoing development of a valley-wide High Occupancy Vehicle (HOV) network through the study area and to not preclude NDOT's siting of an I-11 corridor within the Las Vegas Valley. The I-11 corridor may be selected upon completion of the Tier 1 Environmental Impact Statement anticipated in early 2022.

**Study Process**

The planning horizon year for this feasibility study was established as year 2040 to conform with the Regional Transportation Plan (RTP) current planning horizon.

The process for this study used an approach whereby decision stop points established the basis for tasks leading to the next decision. Decision stop points were reached during development of the screened concepts as well as during the screening process at Technical Advisory Committee (TAC) meeting presentations of potential concepts and screening results. At each stop point, the analysis result and recommendations for proceeding were presented to the project team. Minutes from TAC meetings are included in Appendix 14. Within the framework of the monthly TAC meetings, two specific concept meetings were held, one to present screening results and another to determine alternatives for development. Consensus on the results and direction forward was obtained.

Table 1 shows roles and responsibilities of participants, including interest groups and the public, were defined shortly after project initiation. The alternatives development and screening process used a study team coordination structure that included three groups.

An Alternatives Development Workshop was held in April 2019 following the first public meeting to develop the purpose and need for the project, define decision-making criteria, and identify potential alternative solutions related to the Henderson Interchange study area. Participants included the consultant design team as well as the City of Henderson and NDOT. Attendees at the two-day workshop included:

**TABLE 1 – MAJOR ROLES AND RESPONSIBILITIES OF THE PROJECT TEAM GROUPS**

PROJECT TEAM GROUP	MAJOR ROLES AND RESPONSIBILITIES
Public	Provide input and raise issues
Resource Group (state and federal agencies)	Provide necessary input based on regulatory responsibilities
Technical Advisory Committee (TAC) (Staff from the City, Clark County, RTC, NDOT, FHWA, and consultant)	Execute process, perform technical tasks, evaluation, and develop recommendations

- Tom Davy, City of Henderson
- Scott Jarvis, City of Henderson
- Michael Kidd, City of Henderson
- Maylinn Rosales, City of Henderson
- Christine Klimek, City of Henderson
- Alyssa Rodrigues, City of Henderson
- Al Jankowiak, City of Henderson
- Eric Hawkins, City of Henderson
- Heidi Dexheimer, City of Henderson
- Irene Lam, City of Henderson
- David Bowers, NDOT
- Jeff Lerud, NDOT
- Jesse Smithson, NDOT
- Michelle Castro, NDOT
- Marc Cutler, NDOT
- Jim Caviola, CA Group
- Cad Anson, CA Group
- Jack Sjostrom, CA Group

- Sriram Balasubramanian, CA Group
- Tammy Michels, CA Group
- John Karachepone, Jacobs Engineering Group
- Matt Horrocks, Horrocks Engineers
- Jared Olsen, Horrocks Engineers

Information, including existing conditions in the study area, was presented to workshop attendees. A preliminary utility evaluation was presented, which is further developed and discussed in Section 4.15. Crash data was provided and reviewed to ascertain critical locations that may need special attention. A review of traffic projections excerpted from the *Southern Nevada Traffic Study* was provided to attendees, along with proposed HOV improvements and improvement alternatives within the study area as described in the *Southern Nevada HOV Study*.

Project stakeholders were listed and discussed. The initial listing of stakeholders included:

- City of Henderson
- Clark County
- RTC of Southern Nevada
- NDOT
- FHWA
- Union Pacific Railroad (UPRR)
- Fiesta Henderson Hotel & Casino
- Utility Owners

Participating stakeholders during the study process included City of Henderson, Clark County, NDOT, and FHWA. A summary of existing geometry and study area constraints was presented to workshop attendees. Critical constraints within the corridor were highlighted, including right-of-way, UPRR crossings, and proximity of adjacent

service interchanges. Two attempts were made to contact UPRR, as listed in Appendix 13.

Workshop attendees participated in development of the project evaluation criteria and the ranking scale. It was agreed that at this early level of detail – with the wide array of concepts that would be screened – the ranking would be on a “poor to best” scale with five steps scored from zero to four to establish meaningful differentiation between concepts for each evaluation criterion. The Alternatives Workshop provided the basis for initial concepts screening and kicked off the alternatives development process.

Identification of the Preferred Alternative will occur during the NEPA phase of the project and the responsibility for this task rests with the affected agencies including the City of Henderson, the Nevada Department of Transportation (NDOT), and the Federal Highway Administration (FHWA). The final authority to select the Preferred Alternative is the responsibility of the FHWA and will occur with the signing of the final NEPA decision document.

### **ALTERNATIVES SCREENING**

A wide range of ideas was initially developed that included feasible highway improvements on both existing and new alignments. The process of developing and screening alternatives considered the following:

- The purpose and need for the project,
- Ability to avoid or minimize environmental impacts,
- The regional planning context,
- The reasonableness of an alternative,
- Stakeholder input,
- Public input, and
- State and federal requirements.

A public meeting was held March 27, 2019 to gather input that could assist the study team in identifying issues and problems needing resolution, developing the purpose and need for the project, and identifying potential solutions.

An Alternative Development Workshop was held April 1 and 2, 2019. Representatives from the City of Henderson, NDOT, and the CA Group consultant team met to generate ideas for improvements to the I-215/I-515 interchange area, and to establish the criteria against which the ideas would be evaluated.

The study team used a four-step alternatives development and screening process to identify and evaluate the candidate alternatives, as shown in Figure 1. The four steps include:

- Step 1 – Develop preliminary alternatives based on purpose and need
- Step 2 – Conduct screening based on fatal flaws (Level 1),
- Step 3 – Conduct screening based on preliminary comparative analysis (Level 2), and
- Step 4 – Conduct detailed screening based on quantitative comparative analysis (Level 3).

The Technical Advisory Committee (TAC) provided input from a range of organizations and agencies representing a variety of goals and interests. The TAC included representatives of the City of Henderson, FHWA, NDOT, RTC, Clark County Public Works, and the consultant team members. Also, the public provided comments on alternatives via the public involvement program. The study team used input from the stakeholders and public to develop screening criteria, develop alternatives, and screen ideas.

### **Decision-Making Process**

The study team used a collaborative decision-making process to develop consensus among the communities and agencies, including NDOT and FHWA, on the elements in the alternatives. A collaborative decision-making process was used because of the need for broad community support and to make the most informed use of limited financial resources available for transportation improvements in the region. Broad community support sets the stage for local agency participation, partnerships, and commitment to implementation through policies, zoning, and adoption of complementary land use and transportation plans. At this point, the collaborative decision-making process is the mechanism for achieving broad community support for alternatives to be further developed and analyzed during the subsequent NEPA phase.

The process guidelines were developed through collaboration with agency stakeholders so that they understood how consensus was to be achieved during this study, recognizing there is a combination of gains and tradeoffs. Throughout the process, stakeholders present were asked to indicate their level of support for the decision. If consensus was not possible, the level of support and dissention was noted, and all deliberations and products of the collaboration were considered by NDOT and FHWA as they made decisions.

The discussion process that led to the alternatives recommended for further analysis, presented in “Step 4 – Alternatives Development”, entailed consideration by the TAC and other stakeholders of the purpose and need of the project, weighed against environmental and other constraints. In support of this effort, the study team provided data describing these constraints to the stakeholders, including traffic demand and environmental

data. The TAC meetings served as a forum for an iterative discussion process involving review and screening of conceptual alternatives based on increasingly detailed design and criteria.

The public outreach activities included an initial public meeting to inform the public of the ongoing study and request their input to the project issues and needs. A subsequent public meeting was held December 5, 2019 to assist the study team in Level 3 evaluations of alternatives. In this way, a wide range of stakeholders and the public have contributed to the development of the alternatives.

### **Screening Criteria**

The goal of this study is to generate alternatives that may be implemented within the area of study, and that are focused on improving traffic movement and correcting problems within the corridor and vicinity streets. This study identifies a range of solutions and their associated costs, with a goal of recommending a course of action to the City of Henderson and NDOT. The anticipated class of NEPA action under which the project would be processed is discussed in this report but is not used as an evaluation criterion to screen ideas.

Workshop participants identified criteria for qualitative evaluation of transportation improvement ideas as:

- Safety, including consideration of whether the idea could meet design criteria without need for design exceptions and improve safety for users. Ideas that meet design criteria would score higher, e.g. free-flow directional movements would be considered superior to a signalized intersection,



- Mobility, including consideration of whether the idea could provide opportunities for users to efficiently move from their origin to their destination and minimize delay. An idea that connects motorists to their destination would score higher than an idea that requires them to travel out of their way,
- Accessibility, including consideration of whether the idea could maintain existing connections or add access points between the local road network and the interstate highway system. For example, an idea that allowed for access from westbound Lake Mead Parkway to Gibson Road would score higher than an idea that did not permit this access,
- Implementability includes consideration of relative construction costs of the idea and whether the idea would likely be accepted by the public. Detailed estimates of construction costs are not available for each of the ideas because they have not been fully developed, but engineering judgement has been applied to compare order of magnitude costs. Higher comparative cost would result in a lower score, but high cost is not considered to be a fatal flaw. Opinions regarding acceptance of ideas by the public are subjectively provided by the project team as guided by feedback provided at Public Meeting No. 1 held in March 2019,
- Environmental impacts considers whether ideas could result in substantial impacts to the environment such as endangered species or encounter existing environmental contamination such as known hazardous materials in the southeast quadrant of the interchange. Based on a review

of previous hazardous material studies as summarized in Appendix 12, site contamination encountered during construction could be mitigated. Ideas that would be expected to encounter hazardous materials are scored lower to reflect the cost of mitigation, but encountering hazardous materials is not considered to be a fatal flaw, and

- Schedule impacts includes consideration of whether ideas would result in need for additional right-of-way or utility relocations that could lead to delays in implementation.

### **Scoring**

As summarized in Table 2, feasible ideas were scored by qualitatively ranking them against each criterion on a scale of 0-4. A low score of zero or one was not considered to be a fatal flaw. Each criterion carried equal weight. The average of the six scores was used to compare one idea to other ideas.

### **Step 1 – Preliminary Alternatives Based on Purpose and Need**

Alternatives workshop participants formed three groups and identified 39 ideas for transportation improvements within the study area, summarized in Table 3. Sketches of ideas are included with this report.

### **Steps 2 and 3 – Level 1 and Level 2 Screening Process**

Four ideas (S-2, S-5, G-2 and G-7) were found not to be geometrically feasible and were therefore eliminated as having fatal flaws. Ideas determined to contain fatal flaws were not scored.

**TABLE 2 – SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS**

CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate acceptance	Low relative cost or high acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

There was no pre-identified cutoff score for determining which ideas are recommended for further consideration. Lower scoring ideas (in whole or in part) could be added back for consideration in subsequent phases of project development if it is determined that other ideas initially thought to be superior are determined by subsequent analysis not to be as effective as anticipated.

**System Interchange Ideas**

Nine ideas that provide for improvements to the system-to-system interchange are shown in Table 4.

**Idea No. S-1 (not recommended for further consideration)**

proposes a diverging diamond configuration for the north-south highway (I-515). While feasible, Idea No. S-1 would necessitate additional right-of-way in several quadrants and scored well below other interchange improvement ideas. Safety is expected to be slightly better than existing conditions, but low-speed loop ramps

are included within the interchange area. Mobility would be better than existing with restoration of access from Lake Mead Parkway to Gibson Road without need for out of direction travel. Accessibility would score high with full access to adjacent intersections. Implementability and schedule impacts score low because this idea results in the need to acquire the Fiesta Casino with resulting loss of numerous local jobs. Environmental impacts are anticipated due to loss of employment at the casino, the need for construction in the southwest quadrant with mitigation for hazardous materials in that area. Idea No. S-1 scored 1.67 out of 4 and is not recommended for further consideration.

**Idea No. S-2 (fatal flaw)** proposes a diverging diamond configuration for the east-west highway (I-215/Lake Mead Parkway) with crossovers positioned at Gibson Road and Eastgate Road. This would result in a three-level structure at Gibson Road and

## TABLE 3 - LIST OF IDEAS

Idea	Group	ID	Idea Description
S-1	1	1	DDI with grade-separated crossovers on I-515 and loop ramps for access from I-515 to LMP. New bridge for NB I-515 to WB I-215. Retain existing bridge for EB I-215 to NB I-515
S-2	1	2	DDI with grade-separated crossovers on I-215. New flyover bridge for Eastbound I-215 to Northbound I-515.
S-3	1	11	Create 3-lane ramp exit from Southbound 515. Split around straddle bent
S-4	Post Workshop		Crossover Interchange
S-5	2	1	Mainline to mainline re-build and maintain access, eliminate Southbound to Gibson access. Exit Lake Mead to the right after Gibson
S-6	2	7	Exit Lake Mead west of system interchange, make 215 fork - build new structures. Use existing bridges for Gibson entrance to I-515 north and LMP movements. (SNTS Alt. 2)
S-7	2	9	SPIU for service movements at LMP and 515. Extend LMP to Gibson as part of a half interchange with ramps to and from the West only. Gibson traffic from 515 exits at LMP. Include space and consideration for HOV connection
S-8	3	10	Use existing bridge. Space for new HOV bridge. Keep Gibson interchange. (SNTS Alt 1)
S-9	2	8	Prioritize system movements, separate LMP to Gibson traffic. Get Lane balance in segment between 515 and Gibson for Westbound movement.
G-1	1	3	Eliminate Gibson ramp access from Lake Mead Parkway on east side - develop Texas Turnaround at Stephanie for westbound motorists to reverse course back to Gibson
G-2	1	4	Construct a ramp using straddle bents over I-215 Westbound lanes to provide access from Westbound Lake Mead Parkway to Gibson Road.
G-3	1	5	EB 215 w/ HOV - 2-lane exit to I-515 - with existing mainline as HOV and Gibson EB. Eliminate WB Gibson exit, provide 2-515 SB lanes, 2-515 NB lanes and 2-LMP WB lanes
G-4	1	6	Use Gibson Eastbound Off ramp to provide Eastbound LMP exit. Use existing bridges to connect 215/515. 1 mile west of Gibson, 2-lane Eastbound exit.
G-5	1	7	Retain Lake Mead Parkway as is - braid both Gibson ramps east side to interior of 215. Eliminates weave.
G-6	1	10	Braid Eastbound Gibson ramp with 215 ramps
G-7	2	6	Lake Mead Westbound realignment North of 215 past RR, through Gibson, then onto Westbound 215; provide a slip ramp to Gibson from Lake Mead Westbound
G-8	3	1	Median opening at Gibson - right in right out to I-215 on the east side only - to allow Northbound Gibson to Lake Mead and Lake Mead Westbound to Northbound Gibson.
G-9	3	2	Swing Northbound I-515 to WB I-215 ramp and stay north of I-215 until after Gibson, merge to Westbound I-215 after Gibson
G-10	3	4	Exit Eastbound I-215 to NB I-515 system movement before Gibson, tie back into flyover bridge. Minimizes weave between Gibson Eastbound on-ramp and system interchange
G-11	3	6	Median opening for Gibson, full median interchange
G-12	3	7	Frontage road between Gibson and LMP outside of mainline on both directions
G-13	3	8	Eastbound Gibson to LMP stay on the south side of I-215, past RR will loop back around to connect to LMP for profile reasons
G-14	3	11	Peel off Lake Mead Eastbound traffic from mainline. Provide a slip ramp from Gibson on-ramp to Lake Mead, which minimizes weaving. Make use of that space for HOV.
E-1	1	8	Create a connection over/under 515 at south UPRR Spur
E-2	1	9	Use Eschelon intersection at Eastgate - Eastbound stays at grade but Westbound gets elevated.
E-3	1	12	Construct a through-turn intersection at Eastgate. Combine with Westbound continuous flow intersection left turn.
E-4	2	2	Grade separate Lake Mead Parkway over Eastgate
E-5	2	4	Provide direct connection from Fiesta Henderson Blvd. - T-intersection, parallel 515 NB and bridge over Lake Mead - this will provide more green time to Lake Mead throughs
E-6	3	5	Provide connection from Fiesta Henderson Blvd. to Northbound I- 515 near the south UPRR spur
E-7	Post Workshop		Retain at-grade intersection configuration and add lanes as needed for traffic projections
N-1	1	13	Braid Northbound Lake Mead Parkway to 515 with Auto Show.
N-2	2	10	Northbound C-D for Auto Show, Sunset and Galleria.
N-3	2	11	Southbound braid at Galleria -move north to give more distance. Consider Southbound C-D if space allows.
N-4	3	9	I-515 Southbound braid between Sunset and Auto Show - also triple exit for I-215 Westbound.
N-5	Post Workshop		Widen I-515 north of the interchange as needed for traffic projections
H-1	2	3	From Horizon to Lake Mead Parkway - extend Northbound auxiliary lane - reconstruct noise walls.
H-2	2	5	Connect Las Palmas Entrada to I-515 Southbound, peel off after RR grade separation
H-3	2	12	Southbound I-515 between 215 and Horizon, provide link to Southbound Horizon ridge via flyover and direct connect. Grade separate Northbound Horizon Ridge
H-4	3	3	Add I-515 Southbound exit to Las Palmas Entrada, braided with Southbound I-515 System ramp movement, may include slip ramp from Southbound I-215/I-515.

**TABLE 4 - SYSTEM INTERCHANGE IDEAS**

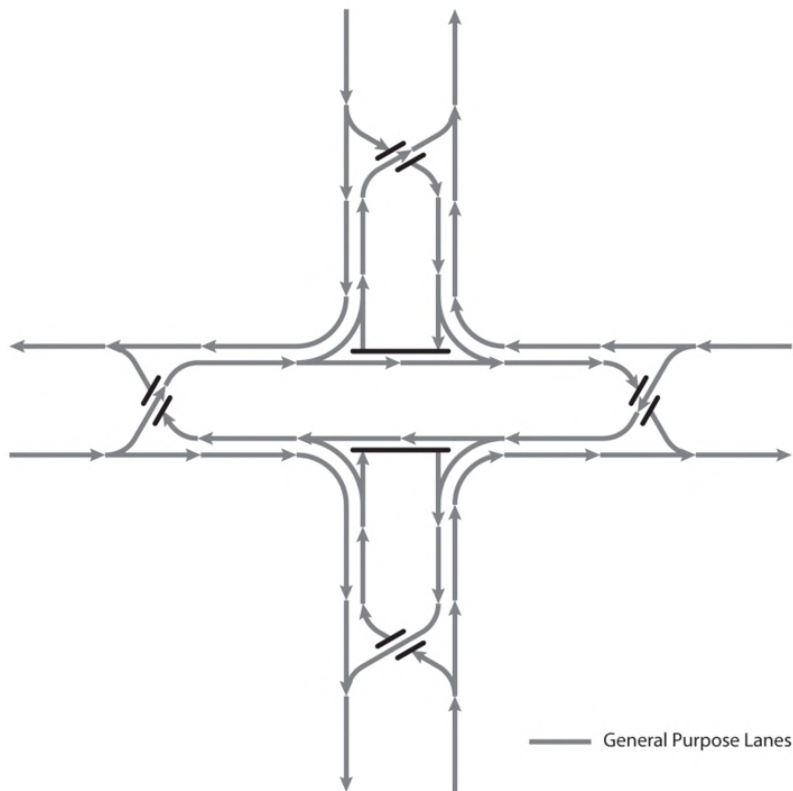
TABLE 4 - SYSTEM INTERCHANGE IDEAS		Comparative Differences Between Ideas							
		Safety	Mobility	Accessibility	Implementability	Environmental Impacts	Schedule Impacts	Overall Performance Average	
									4 = Best
									3 = Better
									2 = Good
									1 = Neutral
0 = Poor									
Idea #	Idea Description								
S-1	DDI with grade separated crossovers on I-515 and loop ramps for access from I-515 to LMP. New bridge for NB I-515 to WB I-215. Retain existing bridge for EB I-215 to NB I-515	2	3	4	0	0	1	1.67	
S-2	DDI with grade separated crossovers on I-215. New flyover bridge for EB I-215 to NB I-515.	Determined to not be geometrically feasible							
S-3	Create 3-lane ramp exit from SB 515. Split around straddle bent	2	2	2	4	4	4	3.00	
S-4	Crossover Interchange	3	4	4	4	2	4	3.50	
S-5	Mainline to mainline rebuild and maintain access, eliminate SB to Gibson access. Exit Lake Mead to the right after Gibson	Determined to not be geometrically feasible							
S-6	Exit Lake Mead west of system interchange, make 215 fork - build new structures. Use existing bridges for Gibson entrance to I-515 north and LMP movements. (SNTS Alt. 2)	0	4	4	2	2	2	2.33	
S-7	SPUI for service movements at LMP and 515. Extend LMP to Gibson as part of a half interchange with ramps to and from the West only. Gibson traffic from 515 exits at LMP. Include space and consideration for HOV connection	2	3	2	4	2	4	2.83	
S-8	Use existing bridge. Space for new HOV bridge. Keep Gibson interchange. (SNTS Alt 1)	3	4	2	4	2	4	3.17	
S-9	Prioritize system movements, separate LMP to Gibson traffic. Get Lane balance in segment between 515 and Gibson for WB movement.	Combined with other ideas, not scored separately							

conflicting movements at the at-grade intersection with Eastgate Road. Traffic entering eastbound I-215 at Gibson Road would turn from a right-hand lane into a left-hand ramp. Conversely, traffic turning onto westbound Lake Mead Parkway at Eastgate Road would turn from a right-hand lane into a left-hand lane. Many motorists could be expected to be confused by this configuration and travel in the wrong direction. Based on these issues, Idea No. S-2 was determined to contain fatal flaws and this idea was therefore not scored.

**Idea No. S-3 (carry forward)** proposes to construct a three-lane fork from southbound I-515 near Auto Show Drive that would accommodate traffic leading to both eastbound Lake Mead Parkway and westbound I-215. If constructed as an interim project, the three-lane exit would split around an existing straddle bent to fit within the existing interchange geometrics. As part of a long-term solution, this idea could be constructed without the need to split around a bridge foundation. This idea presents a partial solution to meeting the needs of projected 2040 traffic volumes and will be



incorporated into the full interchange alternatives. If scored as an interim idea, it would rank low because of safety issues associated with the split around the straddle bent and because the idea does not address overall system interchange issues. Making those issues moot by including this idea with other interchange ideas would result in a higher score. Idea No. S-3 scored 3.00 out of 4 and is recommended for further consideration as a part of full system interchange alternatives.



**Figure 3 – Crossover Interchange Schematic (Idea No. S-4)**

**Idea No. S-4 (carry forward)** proposes construction of a crossover interchange. Advantages include western crossover geometry that accommodates braided ramps at Gibson to eliminate weaving and to avoid the need for three and four level structures. The existing southbound to westbound ramp horizontal geometry would be retained with a curve radius that meets NDOT’s minimum criteria but not desirable criteria. A schematic of a typical crossover interchange is presented in Figure 3.

It is not anticipated that design exceptions would be needed to implement this idea, but several vertical curves in crossover areas would need to be less than NDOT desirable criteria of 1,000 feet in length. Minimum AASHTO Green Book “K” values would be met, and the curves would be longer than three times the design speed. Disadvantages include driver expectancy regarding left-hand entrances and exits. Information from engineers in Maryland and Alabama where similar configurations have been constructed would be used to guide geometric details to mitigate driver expectations regarding the left-hand movements, including:

- Provide clear signing approaching entrances and exits
- Treat left-hand exits as forks
- Treat left-hand entrances as parallel approaches that add a lane and do not force a merge
- Align vertical profiles of left-hand approaches so that motorists can see adjacent traffic

Each of the four crossovers would be constructed as grade separations.

Future HOV lanes in both directions from I-515 north to I-215 west could be accommodated adjacent to the eastbound to northbound ramp. This idea could be configured to avoid hazardous materials in the southwest quadrant owned by NDOT, however, detailed

geometric design could show an advantage for encroachment into this area to improve ramp design speeds and reduce construction cost by eliminating the need for the ramp to be positioned above the eastbound Lake Mead Parkway lanes as currently configured. Advantages of the encroachment would be compared with the costs of necessary remediation or mitigation of hazardous materials to determine whether the encroachment would be beneficial. Safety for this idea is considered to be much better than existing, with no need for design exceptions and substantial reductions in the need for merging. Mobility and accessibility are much better than existing with no out of direction travel and full connectivity to adjacent interchanges. It is anticipated that this interchange could be constructed within existing NDOT right-of-way with NEPA processed as a Categorical Exclusion (CE). Detailed costs have not been developed, but by avoiding the need for three- and four-level structures and by re-using many existing bridges, it is anticipated that this idea could be constructed for lower relative cost compared to other configurations. It is anticipated that public acceptance will be high with full connectivity to adjacent interchanges. Environmental is scored for modest impacts based on potential for mitigating hazardous materials in the southwest quadrant. Idea S-4 scored 3.5 out of 4 and it is recommended to be carried forward.

**Idea No. S-5 (fatal flaw)** proposes mainline to mainline reconstruction with elimination of access from southbound I-515 to Gibson Road. This idea was found on further examination to contain fatal flaws. It proposes several locations where there would be three-level structures and merges/diverges between levels that would be within 300 feet from the crossings. Vertical profile design meeting design criteria for ramps typically requires at least 800 feet from a merge/diverge to a point where the two ramps can cross with minimum vertical clearance. Idea No. S-5 is not geometrically feasible and was therefore not scored.

**Idea No. S-6 (not recommended for further consideration)**

proposes that eastbound traffic headed to Lake Mead Parkway exit from I-215 west of the system interchange, and that the remaining I-215 lanes subsequently fork. Lake Mead Parkway traffic would be carried by an arterial couplet with a service interchange at I-515 as proposed by SNTS Alternative 2. The service interchange would be controlled by four two-phase traffic signals spaced approximately 800 feet apart in the east-west direction and 300-400 feet apart in the north-south direction. The easternmost signal would be approximately one-quarter mile west of the Eastgate Road signal. This idea would require acquisition of right-of-way from the chemical plant in the northwest quadrant (either fee or aerial easement for structure). While right-of-way acquisition is not a fatal flaw, this idea scored lower than other ideas (2.33 out of 4) due to diminished safety by adding traffic signals west of Eastgate Road; high relative cost due to right-of-way acquisition and viaduct over the chemical plant; low public acceptance of the additional signals; potential environmental mitigation or remediation at the chemical plant, and impacts to schedule that result from right-of-way acquisition. Idea No. S-6 is not recommended for further analysis.

**Idea No. S-7 (carry forward)**

proposes a single-point urban interchange (SPUI) for service movements at Lake Mead Parkway and I-515 with other system-to-system movements carried by directional ramps. On further examination, it was found that only the southbound I-515 off-ramp to Lake Mead Parkway and the southbound I-515 on-ramp from Lake Mead Parkway would need to be served by the SPUI, negating the need to reconstruct the I-515 bridges over Lake Mead Parkway to accommodate a single signal. HOV lanes on I-215 and I-515 would be connected through the interchange on a flyover structure. Safety would be slightly better than existing with Lake Mead Parkway traffic being retained in a low-speed arterial configuration until a point west of the interchange. Mobility and accessibility would be better than

existing conditions by making the connections between I-515 and Lake Mead Parkway more intuitive with elimination of the loop ramp. Construction would occur in the southwest quadrant owned by NDOT where hazardous materials are known to exist, and remediation or other mitigation would likely be needed. HOV lanes would be accommodated with a flyover structure connecting the western segment of I-215 to the northern segment of I-515. This idea scored 2.83 out of 4 and it is recommended for further analysis.

**Idea No. S-8 (carry forward)** proposes to keep the existing interchange configuration and to retain existing structures as practical while adding lanes to accommodate projected 2040 traffic volumes and accommodating future HOV connections on a new flyover structure to connect the western segment of I-215 to the northern segment of I-515. This idea is based on Henderson System Interchange Alternative 1 as presented in the SNTS. Roadways, ramps, and shoulders would be widened as needed to avoid the need for design exceptions. The existing southbound to westbound ramp horizontal geometry would be retained with a curve radius that meets NDOT's minimum criteria but not desirable criteria. It is not anticipated that design exceptions would be needed to implement this idea, but several vertical curves would need to be less than NDOT desirable criteria of 1,000 feet in length. Minimum AASHTO Green Book "K" values would be met, and curves would be longer than three times the design speed. Accessibility would be comparable to existing with insufficient weave length to accommodate westbound Lake Mead Parkway exits to Gibson Road. Idea No. S-8 scored 3.17 out of 4 and is recommended for further analysis. Advantages include retaining the existing configuration that matches current driver expectations. Disadvantages include high costs associated with reconstruction of the flyover bridges.

**Idea No. S-9 (combined with other ideas and not scored separately)** proposed prioritizing of system movements and separation of traffic from Lake Mead Parkway to Gibson Road. The eastbound braided ramp at Gibson Road proposed by Idea No. S-9 was incorporated into Idea No. G-5. The reversal of eastbound ramps proposed by Idea No. S-9 from I-215 to I-515 where northbound motorists exit to the right and then cross over southbound motorists was incorporated into Idea No. S-8.

#### **Gibson Road Ideas**

Fourteen ideas that propose modifications intended to improve access to Gibson Road are presented in Table 5.

**Idea No. G-1 (carry forward)** proposes to continue prohibition for westbound traffic to weave to the westbound exit ramp to Gibson Road and to construct a continuous movement turnaround at Stephanie Street. Westbound traffic that is unable to use the existing exit ramp at Gibson Road would be able to turn around at Stephanie Street and return to Gibson Road via the eastbound exit ramp from I-215. While common on Texas freeways to improve frontage road access, this idea has not been implemented to date in Nevada. Clear and concise signing and a robust public information program would be helpful in introducing this concept to motorists prior to implementation in the field. Signing would be warranted for both motorists using the turnaround and eastbound motorists entering from Stephanie Street who would merge with turnaround traffic prior to merging with eastbound I-215 traffic. Safety would be improved by providing for a way to access Gibson Road without need for design exceptions. This idea would require out of direction travel on the order of 2.25 miles, and public acceptance would be diminished by this extra distance and time. Relative cost would be low, and this idea could be constructed within existing

**TABLE 5 - GIBSON ROAD INTERCHANGE IDEAS**

TABLE 5 - GIBSON ROAD INTERCHANGE IDEAS		Comparative Differences Between Ideas							
		Safety	Mobility	Accessibility	Implementability	Environmental Impacts	Schedule Impacts	Overall Performance Average	
									4 = Best
									3 = Better
									2 = Good
									1 = Neutral
0 = Poor									
Idea #	Idea Description								
G-1	Eliminate Gibson ramp access from Lake Mead Parkway on east side - develop Texas Turnaround at Stephanie for westbound motorists to reverse course back to Gibson	4	0	4	3	4	4	3.17	
G-2	Construct a ramp using straddle bents over I-215 WB lanes to provide access from WB Lake Mead Parkway to Gibson Road.	Determined to not be geometrically feasible							
G-3	EB 215 w/ HOV - 2-lane exit to I-515 - with existing mainline as HOV and Gibson EB. Eliminate WB Gibson exit, provide 2-515 SB lanes, 2-515 NB lanes and 2-LMP WB lanes	2	2	0	2	2	1	1.50	
G-4	Use Gibson EB Off ramp to provide EB LMP exit. Use existing bridges to connect 215/515. 1 mile west of Gibson, 2-lane EB exit.	2	2	1	3	2	1	1.83	
G-5	Retain Lake Mead Parkway as is - braid both Gibson ramps east side to interior of 215. Eliminates weave.	4	4	4	3	4	4	3.83	
G-6	Braid EB Gibson ramp with 215 ramps	3	2	3	2	4	4	3.00	
G-7	Lake Mead WB realignment North of 215 past RR, through Gibson, then onto WB 215; provide a slip ramp to Gibson from Lake Mead WB	Determined to not be geometrically feasible							
G-8	Median opening at Gibson - right in right out to I-215 on the east side only - to allow NB Gibson to Lake Mead and Lake Mead WB to NB Gibson.	0	2	2	4	4	4	2.67	
G-9	Swing NB I-515 to WB I-215 ramp and stay north of I-215 until after Gibson, merge to WB I-215 after Gibson	1	1	1	0	4	4	1.83	
G-10	Exit EB I-215 to NB I-515 system movement before Gibson, tie back into flyover bridge. Minimizes weave between Gibson EB on ramp and system interchange	3	2	1	1	4	4	2.50	
G-11	Median opening for Gibson, full median interchange	0	0	3	0	4	4	1.83	
G-12	Frontage road between Gibson and LMP outside of mainline on both directions	4	4	4	2	0	1	2.50	
G-13	EB Gibson to LMP stay on the south side of I-215, past RR will loop back around to connect to LMP for profile reasons	3	2	2	2	2	1	2.00	
G-14	Peel off Lake Mead EB traffic from mainline. Provide a slip ramp from Gibson on ramp to Lake Mead, which minimizes weaving. Make use of that space for HOV.	3	2	2	2	2	1	2.00	



right-of-way. This idea scored 3.17 out of 4 and could be paired with any of the feasible system-to-system interchange ideas. Idea No. G-1 is recommended for further analysis.

**Idea No. G-2 (fatal flaw)** proposes that access from westbound Lake Mead Parkway to Gibson Road would be from a ramp that elevates beginning at the UPRR spur crossing up and over westbound I-215 traffic using straddle bents, and then merges with the westbound I-215 off-ramp to Gibson Road. The length from the UPRR spur to Gibson Road is approximately 2,900 feet. Design criteria would require approximately 2,450 feet to develop the off-ramp from westbound Lake Mead Parkway, approximately 800 feet to elevate or depress the braided ramp, approximately 950 feet to transition the ramp across the mainline general-purpose and HOV lanes, and approximately 800 feet to merge the braided ramp with the mainline off-ramp to Gibson Road. Total required length of approximately 5,000 feet exceeds the available length of approximately 2,900 feet, therefore, this idea is deemed not to be feasible and is not scored.

**Idea No. G-3 (not recommended for further consideration)** proposes to eliminate the westbound exit to Gibson Road for all motorists, and to construct a separate roadway parallel to I-215/Lake Mead Parkway for eastbound traffic traveling from Gibson Road to Eastgate Road. This idea could be combined with any of the system interchange improvement ideas. Safety and mobility would be slightly better than existing with improvements for eastbound Lake Mead Parkway motorists. Accessibility would be worse than existing with no westbound access to Gibson Road. Right-of-way would be needed from a residential area on the south side of I-215 and the resulting costs and low public acceptance result in low scores for implementability. Right-of-way impacts may result NEPA being processed as an Environmental Assessment (EA). This idea

scored low (1.50 out of 4) and is not recommended for further analysis.

**Idea No. G-4 (not recommended for further consideration)**

proposes to use the eastbound off-ramp to Gibson Road to access Lake Mead Parkway, with a separate roadway parallel to I-215/Lake Mead Parkway for eastbound traffic headed to Eastgate Road. This idea is similar to No. G-3 above, except the westbound off-ramp to Gibson Road is retained. Safety and mobility would be slightly better than existing with improvements for eastbound Lake Mead Parkway motorists. Accessibility would be comparable to existing with no westbound access to Gibson Road from Lake Mead Parkway. Right-of-way would be needed from a residential area on the south side of I-215 and the resulting costs and low public acceptance result in low scores for implementability. Right-of-way impacts may result NEPA being processed as an EA. This idea scored low (1.83 out of 4) and is not recommended for further analysis.

**Idea No. G-5 (carry forward)** proposes to construct braided ramps westbound to Gibson Road and eastbound from Gibson Road to connect with central lanes leading to and from Lake Mead Parkway. This idea would improve safety, mobility, and accessibility by restoring full access to Gibson Road. It would be necessary to reconstruct the westbound ramps from I-515 to cross above the Gibson Road exit ramp from Lake Mead Parkway. It is not anticipated that design exceptions would be needed to implement this idea, but several vertical curves would need to be less than NDOT desirable criteria of 1,000 feet in length. Minimum AASHTO Green Book "K" values would be met, and the curves would be longer than three times the design speed. Higher relative construction cost is counterbalanced by expected high public acceptance. This idea scored 3.83 out of 4 and could be paired with

any of the feasible system-to-system interchange ideas. Idea No. G-5 is recommended for further analysis.

**Idea No. G-6 (carry forward)** proposes to develop an exit from eastbound I-215 to both Gibson Road and southbound I-515 west of Gibson Road, with a subsequent fork between Gibson Road and southbound I-515. A collector-distributor (C-D) road would be constructed south of and parallel to I-215 leading to southbound I-515. The eastbound on-ramp from Gibson Road would have the option to enter eastbound I-215 that would lead to northbound I-515 and Lake Mead Parkway, or to enter the C-D road toward southbound I-515. This idea could be paired with any of the feasible system-to-system interchange ideas and is similar to a portion of Idea No. G-5 in that it proposed an eastbound braid but without a similar westbound braid. Safety would be better than existing for eastbound motorists entering from Gibson Road. Mobility would be slightly better with improvements for eastbound motorists, while accessibility would be better than existing for eastbound motorists. Relative cost would be low with no additional right-of-way needed. NEPA would likely be processed as a CE. Idea No. G-6 scored 3.00 out of 4 and is recommended for further analysis in the event that Idea No. G-5 that incorporates this idea along with westbound improvements does not perform as well as anticipated.

**Idea No. G-7 (fatal flaw)** proposes to realign westbound Lake Mead Parkway to be north of and parallel to I-215 from the west side of I-515 through Gibson Road. Westbound Lake Mead Parkway would then continue onto westbound I-215. A slip ramp would be provided to Gibson Road from westbound Lake Mead Parkway. The length from the diverging point to the slip ramp would be approximately 1,900 feet. Design criteria would require approximately 2,450 feet to develop the off-ramp from westbound Lake Mead Parkway, approximately 800 feet to elevate or depress

the braided ramp, approximately 950 feet to transition the ramp across the mainline general-purpose and HOV lanes, and approximately 800 feet to merge the braided ramp with the existing westbound general-purpose off-ramp. Total required length of approximately 5,000 feet exceeds the available length of 1,900 feet, therefore this idea is deemed not to be feasible and is not scored.

**Idea No. G-8 (not recommended for further consideration)** proposes a median opening between eastbound and westbound I-215 at Gibson Road to allow right-in and right-out access to ramps leading to and from Lake Mead Parkway. Left turns from westbound Lake Mead Parkway to southbound Gibson Road would be prohibited, as would left turns from southbound Gibson Road to eastbound Lake Mead Parkway. Median HOV lanes would need to be adjacent to the general-purpose lanes, with the median opening between opposing HOV lanes. Design criteria would require approximately 1,050 feet to develop the median exit or entrance and approximately 800 feet to elevate or depress the ramp. Required length of approximately 1,850 feet can be accommodated by the available length of approximately 1,900 feet. Safety may be worse than existing, with additional intersections constructed midway between existing signalized ramp intersections that are only 400 feet apart. Mobility and accessibility would be better than existing for those motorists traveling to and from Gibson Road who are positioned to turn right. This idea could be paired with any of the feasible system-to-system interchange ideas. Idea No. G-8 scored 2.67 out of 4 and is not recommended for further analysis.

**Idea No. G-9 (not recommended for further consideration)** proposes to accommodate access from westbound Lake Mead Parkway to Gibson Road by reconstructing the northbound I-515 ramp to westbound I-215 so that it merges with I-215 west of Gibson Road. This would result in an inability for northbound I-515

motorists from accessing Gibson Road, thus, solving an access issue for one set of motorists by introducing an access issue to a different set of motorists. Safety, mobility, and accessibility would be comparable to existing conditions. This idea could likely be constructed within existing right-of-way. A new flyover structure would result in higher relative cost for this idea and the loss of accessibility would likely result in public opposition. This idea could be paired with any of the feasible system-to-system interchange ideas and it scored 1.83 out of 4. Idea No. G-9 is not recommended for further analysis.

**Idea No. G-10 (combined into Idea No. G-5)** proposes to develop an exit ramp from eastbound I-215 to northbound I-515 at a point west of the Gibson Road interchange, thus, minimizing the eastbound weave ahead of the system interchange. Advantages include improvements to eastbound weaving but there is no improvement to westbound weaving approaching Gibson Road. This idea could improve safety for eastbound motorists. Mobility would be slightly better than existing conditions and accessibility would be comparable to existing conditions. A new flyover structure would be required, and this idea results in higher relative cost. This idea could be paired with any of the feasible system-to-system interchange ideas. Idea No. G-10 scored 2.50 out of 4 and is not recommended for further analysis. While Idea No. G-10 is not recommended for further analysis, elements of this idea are incorporated into Idea No. G-5 that proposes to braid ramps in both directions.

**Idea No. G-11 (not recommended for further consideration)** proposes a median opening between eastbound and westbound I-215 at Gibson Road with a full intersection with ramps leading to and from Lake Mead Parkway. This idea would eliminate weaving approaching and departing from Gibson Road. Idea No. G-11 could

be paired with any of the feasible system-to-system interchange ideas and would require a new traffic signal midway between the existing signal at existing ramp termini. Signal spacing along Gibson Road would result in a series of three traffic signals spaced at 200 feet.

Design criteria would require approximately 1,050 feet to develop the median exit or entrance and approximately 800 feet to elevate or depress the ramp. Required length of approximately 1,850 feet could be accommodated by the available length of approximately 1,900 feet. Safety would be worse than existing with an additional traffic signal installed midway between existing traffic signals at Gibson Road ramp termini that are only 400 feet apart. Mobility would be improved for motorists on Lake Mead Parkway who wish to access Gibson Road, but preliminary traffic analysis shows that the closely spaced traffic signals on Gibson Road would result in substantial degradation to levels of service on Gibson Road. Accessibility would be improved with full access provided to Gibson Road. Higher relative construction cost and low public acceptance of Gibson Road level of service result in a low score for implementability. Idea No. G-11 could be constructed within existing NDOT right-of-way and NEPA is anticipated to be processed as a CE. This idea scored 1.83 out of 4 and is not recommended for further analysis.

**Idea No. G-12 (not recommended for further consideration)** proposes eastbound and westbound frontage roads parallel to I-215 from Gibson Road to the I-515 underpass to accommodate local traffic on Lake Mead Parkway between Gibson Road and Eastgate Road. Geometric analysis determined that the westbound ramps from I-515 would need to be reconstructed at a higher level to cross over the frontage road that would be constructed to match the approximate grade of existing westbound I-215 at the UPRR spur

crossing. It is not anticipated that design exceptions would be needed to implement this idea, but several vertical curves would need to be less than NDOT desirable criteria of 1,000 feet in length. Minimum AASHTO Green Book “K” values would be met, and the curves would be longer than three times the design speed. Providing vertical separation between the westbound ramps from I-515 and westbound Lake Mead Parkway would result in a wider footprint near the western UPRR spur bridge, and additional right-of-way would likely be needed as an aerial easement to reconstruct the westbound ramp bridges across the chemical plant property. Right-of-way would also likely be required to construct the eastbound frontage road with acquisition of approximately 14 homes and relocation of occupants, impact to the trail on the south side of I-215, and acquisition of a portion of the park on the south side of I-215 west of the UPRR spur. Right-of-way impacts including relocations and park property may result in NEPA being processed as an Environmental Impact Statement (EIS). Higher relative construction cost is counterbalanced by expected high public acceptance. This idea scored 2.50 out of 4. Idea No. G-12 is not recommended for further analysis.

**Idea No. G-13 (not recommended for further consideration)** proposes an eastbound frontage road parallel to I-215 from Gibson Road to the I-515 underpass to accommodate eastbound local traffic on Lake Mead Parkway between Gibson Road and Eastgate Road. The frontage road would pass over the UPRR spur. Distance from the rail spur to the nearest I-515 underpass structure is approximately 600 feet and may be insufficient to accommodate the necessary vertical profile shift. Providing a 360-degree loop ramp with a radius of at least 250 feet could be used to accommodate the vertical profile shift. Safety would be better than existing by reducing eastbound weaving conflicts for motorists

remaining on Lake Mead Parkway. Mobility and accessibility would be slightly better than existing conditions with existing eastbound movements maintained on separate roadways. Right-of-way would likely be required to construct the frontage road with acquisition of approximately 14 homes and relocation of occupants, impact to the trail on the south side of I-215, and acquisition of a portion of the park on the south side of I-215 west of the UPRR spur. Right-of-way impacts including relocations and park property may result in NEPA being processed as an EIS. Higher relative construction cost is counterbalanced by expected high public acceptance. Construction of a loop ramp in the southwest quadrant may encounter hazardous materials with resulting need for mitigation or remediation. This idea could be paired with any of the feasible system-to-system interchange ideas and it scored 2.00 out of 4. Idea No. G-13 is not recommended for further analysis.

**Idea No. G-14 (not recommended for further consideration)** proposes that eastbound traffic on I-215 destined for Lake Mead Parkway exit from the freeway prior to Gibson Road, with the new road braided over or under the eastbound on-ramp from Gibson Road and positioned parallel to and south of I-215. The space formerly occupied by the eastbound lanes could be used for future HOV lanes. Safety would be better than existing by reducing eastbound weaving conflicts for motorists remaining on Lake Mead Parkway. Mobility and accessibility would be slightly better than existing conditions with existing eastbound movements maintained on separate roadways. Right-of-way would likely be required to construct the frontage road with acquisition of approximately 14 homes and relocation of occupants, impact to the trail on the south side of I-215, and acquisition of a portion of the park on the south side of I-215 west of the UPRR spur. Right-of-way impacts including relocations and park property may result in NEPA being processed



as an EIS. Higher relative construction cost is counterbalanced by expected high public acceptance. This idea could be paired with any of the feasible system-to-system interchange ideas and it scored 2.00 out of 4. Idea No. G-14 is not recommended for further analysis.

### Eastgate Road/Fiesta Henderson Ideas

Seven ideas that propose modifications intended to improve access at Eastgate Road/Fiesta Henderson Boulevard are presented in Table 6. The north leg of the intersection is known as Eastgate Road while the southern leg is known as Fiesta Henderson Boulevard.

<b>TABLE 6 - EASTGATE ROAD/FIESTA HENDERSON BLVD. INTERSECTION IDEAS</b>		Comparative Differences Between Ideas								
		4 = Best	Safety	Mobility	Accessibility	Implementability	Environmental Impacts	Schedule Impacts	Overall Performance Average	
										3 = Better
										2 = Good
										1 = Neutral
										0 = Poor
Idea #	Idea Description									
E-1	Create a connection over/under 515 at south UPRR Spur	4	4	4	3	2	1	3.00		
E-2	Use Eschelon intersection at Eastgate - EB stays at grade but WB gets elevated.	4	4	4	2	2	2	3.00		
E-3	Construct a through-turn intersection at Eastgate. Combine with WB continuous flow intersection left turn.	3	3	3	4	4	2	3.17		
E-4	Grade separate Lake Mead Parkway over Eastgate	4	4	3	2	4	1	3.00		
E-5	Provide direct connection from Fiesta Henderson Blvd. - T-intersection, parallel 515 NB and bridge over Lake Mead - this will provide more green time to Lake Mead throughs	1	3	3	2	4	2	2.50		
E-6	Provide connection from Fiesta Henderson Blvd. to NB I- 515 near the south UPRR spur	1	3	3	2	4	2	2.50		
E-7	Retain at-grade intersection configuration and add lanes as needed for traffic projections	3	3	3	4	4	4	3.50		

**Idea No. E-1 (carry forward)** proposes a local road connection between Fiesta Henderson Boulevard and Las Palmas Entrada Parkway crossing over or under I-515 near the UPRR spur. The existing I-515 bridge over the UPRR spur is not sufficiently long to accommodate the existing rail, existing trail, existing rail maintenance access road, plus a proposed local street. The distance from Fiesta Henderson Boulevard to I-515 is only 450 feet, much less than the approximately 1,600 feet that would be needed for a local street to cross over I-515. It would be feasible to extend existing Waterwheel Falls Drive to the west by acquisition of two

single family homes and with construction of a new underpass structure beneath I-515.

The intent of this idea is to provide an alternate route for motorists on opposite sides of I-515 to reach the other side, thus removing a portion of local traffic from the Eastgate Road intersection with Lake Mead Parkway.

Safety could be improved because this connection could draw traffic away from currently congested intersections. Mobility and accessibility could be much better than existing by creating a

connection that does not currently exist and by reducing out of direction travel for local traffic that wishes to travel from one side of I-515 to the other. Traffic would cross the rail spur using the existing Fiesta Henderson at-grade crossing and no new at-grade crossing would be needed. Schedule would be impacted by the need to acquire two residences resulting in relocation of the occupants. This idea could be paired with any of the feasible system-to-system interchange ideas and scored 3.00 out of 4. Idea No. E-1 is recommended for further analysis.

**Idea No. E-2 (carry forward)** proposes an echelon intersection between Eastgate Road/Fiesta Henderson Boulevard and Lake Mead Parkway with the westbound lanes elevated. The intent of this idea is to reduce travel delays associated with the traffic signal at Lake Mead Parkway and Eastgate Road/Fiesta Henderson Boulevard. Westbound traffic on Lake Mead Parkway would be unimpeded by a signal and traffic on Eastgate Road turning to go westbound on Lake Mead Parkway would also be unimpeded by a signal. A three-phase traffic signal would control traffic on the lower level of the intersection with signal time divided between eastbound through/left, northbound through, and southbound through/left movements. All pedestrian movements and crossings would be accommodated at the lower level using the traffic signal.

If the echelon intersection is constructed with a typical configuration with northbound to westbound motorists turning left onto Lake Mead Parkway near the center of the overpass structure, those motorists would likely be unable to merge across three lanes of uncontrolled traffic within the available length of approximately 600 feet to gain access to the ramp leading to northbound I-515. This idea therefore proposes to include an elevated U-turn viaduct constructed east of Eastgate Road/Fiesta Henderson Boulevard. Motorists who wish to turn left from northbound Fiesta Henderson

Boulevard would turn right onto a dedicated roadway that leads them up and over Lake Mead Parkway on a U-turn viaduct, delivering them back to the north side of the elevated echelon intersection where they would be in position to either enter the ramp leading to northbound I-515 or to merge one lane to the left so that they could continue on Lake Mead Parkway or to southbound I-515.

Safety and mobility would be much better than existing by allowing uncontrolled westbound traffic flow. Accessibility would be better than existing with more traffic signal time available to those remaining movements in the area controlled by a traffic signal. Although the elevated U-turn involves out of direction travel, the movement would be an uncontrolled continuous movement that would provide a net travel time savings to motorists. Higher relative construction cost in the order of \$10M would be balanced by anticipated high levels of public acceptance. It is anticipated that right-of-way would need to be acquired along Lake Mead Boulevard with resulting environmental and schedule impacts. Portions of the grade separation structure could likely be retained if a future project upgraded Lake Mead Parkway to a limited access facility with grade separations and interchanges. This idea could be paired with any of the feasible system interchange ideas recommended for further analysis. Idea No. E-2 scored 3.00 out of 4 and is recommended for further analysis.

**Idea No. E-3 (carry forward)** proposes to reconstruct the Eastgate Road/Fiesta Henderson Boulevard intersection with Lake Mead Parkway as a through-turn continuous flow intersection to improve the intersection capacity for left turn movements. This idea would reduce left-turn conflicts at Eastgate Road/Fiesta Henderson Boulevard with resulting improvements to safety. Mobility would be better than existing with out of direction travel offset by shorter

travel time. Accessibility would be better than existing for eastbound and westbound motorists on Lake Mead Parkway with anticipated reductions in travel time due to less traffic signal time devoted to the anticipated heavy peak hour left turn movement. This alternative would involve moderate relative construction cost and high public acceptance. Environmental impacts are anticipated to be minimal. Schedule would be impacted by acquisition of right-of-way, but it is likely that access to adjacent properties could be modified in a way to avoid the need for relocations. This idea would likely not be compatible with future upgrades of Lake Mead Parkway to a controlled access facility. This idea could be paired with any of the feasible system-to-system interchange ideas. Idea No. E-3 scored 3.17 out of 4 and is recommended for further analysis.

**Idea No. E-4 (carry forward)** proposes construction of a grade-separated interchange between Eastgate Road/Fiesta Henderson Boulevard and Lake Mead Parkway, with Lake Mead Parkway treated as the main line. This idea could be combined with any of the feasible system interchange ideas. If this idea is combined with the crossover system interchange Idea No. S-4, the Eastgate Road/Fiesta Henderson Boulevard interchange would need to be constructed as a three-level interchange to accommodate the grade separation of the eastern crossover structure.

Normal distance between service interchanges is at least one mile, and this distance is normally increased when one is a system interchange. Eastgate Road/Fiesta Henderson Boulevard is only one-third of a mile east of I-515, and ramp braiding would be required to accommodate this proximity. Safety would be much better than existing with uncontrolled through movement of traffic. Mobility would be much better than existing conditions with reductions in travel time through the interchange areas.

Accessibility for motorists would be better than existing, except for those who wish to access businesses located at the four quadrants of the Eastgate Road/Fiesta Henderson Boulevard intersection. Implementability and schedule are impacted by the need to acquire right-of-way from all four quadrants of the intersection and because of related degradation of access to the adjacent businesses. These impacts are anticipated to require the acquisition of the business in the northeast quadrant. This idea scored 3.00 out of 4. Although this score is marginal, Idea No. E-4 is recommended for further analysis because it would be compatible with a potential future project to reconstruct Lake Mead Parkway as a limited access facility with frontage roads.

**Idea No. E-5 (not recommended for further consideration)**

proposes a direct connection from Fiesta Henderson Boulevard around the perimeter of the casino parking lot and across Lake Mead Parkway to merge with the westbound Lake Mead Parkway to northbound I-515 ramp in the northeast quadrant of the system interchange. This idea would improve travel only for motorists originating within the southeast quadrant of the system interchange who wish to travel north on I-515. Improvements to safety by removing some traffic volume from the Fiesta Henderson Boulevard intersection with Lake Mead Parkway would be offset by introducing an additional merge point onto the I-515 system. Mobility and accessibility would be better than existing with a new connection that is anticipated to reduce travel time for northbound motorists. This idea would impact the Fiesta Casino parking field and would require FHWA concurrence with an additional access point to the interstate highway system. Higher relative cost to implement this idea is anticipated to be countered by a positive reaction from the public. Environmental impacts are anticipated to be minimal. Schedule would be impacted by acquisition of right-of-

way and by the need to obtain FHWA concurrence with a change of access to the freeway system. This idea could be combined with system interchange Idea Nos. S-7 or S-8 but would not be compatible with system interchange Idea No. S-4. Idea No. E-5 scored 2.50 out of 4 and is not recommended for further analysis.

**Idea No. E-6 (not recommended for further consideration)**

proposes a direct connection from Fiesta Henderson Boulevard from a point south of the casino parking lot to northbound I-515. The new entrance ramp would be braided over the northbound I-515 exits to Lake Mead Parkway and this idea would improve travel only for motorists originating within the southeast quadrant of the system interchange who wish to travel north on I-515. This idea would be similar in concept to Idea No. E-5 above, accomplishing the same result with slightly different origin and destination points. Improvements to safety by removing some traffic volume from the Fiesta Henderson Boulevard intersection with Lake Mead Parkway would be offset by introducing an additional merge point onto the I-515 system. Mobility and accessibility would be better than existing with a new connection that is anticipated to reduce travel time for northbound motorists. This idea would impact the Fiesta Casino parking field and would require FHWA concurrence with an additional access point to the interstate highway system. Higher relative cost to implement this idea is anticipated to be countered by a positive reaction from the public. Environmental impacts are anticipated to be minimal. Schedule would be impacted by acquisition of right-of-way and by the need to obtain FHWA concurrence with a change of access to the freeway system. This idea could be combined with system interchange Idea Nos. S-7 or S-8 but would not be compatible with system interchange Idea No. S-4. Idea No. E-6 scored 2.50 out of 4 and is not recommended for further analysis.

**Idea No. E-7 (carry forward)** proposes retaining the existing at-grade intersection configuration with lanes added as warranted by traffic projections. Safety, mobility, and accessibility would be better than existing with less congestion and reduced travel time. Implementability would rank high due to low relative construction cost and anticipated high public acceptance. Right-of-way would not be needed for this idea and there would be minimal to no environmental or schedule impacts. Idea No. E-7 scored 3.5 out of 4 and is recommended for further analysis.

**Northern Interchange Ideas**

Four ideas that propose modifications intended to improve access at northern interchanges including Auto Show Drive, Sunset Road, and Galleria Drive are presented in Table 7.

**Idea No. N-1 (carry forward)** proposes to construct a braided ramp leading from westbound Lake Mead Parkway to northbound I-515, entering I-515 north of the exit from I-515 to Auto Show Drive. The intent of this idea is to remove the northbound weave that currently exists between traffic entering I-515 from Lake Mead Parkway and existing I-515 to Auto Show Drive. The design year peak hour traffic entering northbound I-515 is forecast to be approximately 1400 vehicles per hour, merging with approximately 3,300 vehicles per hour on the northbound I-515. By relocating the merge point to be north of the Auto Show Drive exit, the mainline traffic would be reduced to approximately 3,000 vehicles per hour. This idea would not be compatible with alternatives that retain the existing northbound ramp from I-215 that is braided with the Auto Show off-ramp. Mobility would be better than existing with reduction in weaving conflicts, while accessibility would be comparable to existing. This idea is scored as if accessibility is comparable to existing conditions based on the assertion that this

**TABLE 7 - NORTHERN INTERCHANGE IDEAS**

TABLE 7 - NORTHERN INTERCHANGE IDEAS		Comparative Differences Between Ideas							
		4 = Best	Safety	Mobility	Accessibility	Implementability	Environmental Impacts	Schedule Impacts	Overall Performance Average
		3 = Better							
		2 = Good							
		1 = Neutral							
		0 = Poor							
Idea #	Idea Description								
N-1	Braid NB Lake Mead Parkway to 515 with Auto Show.	3	1	3	4	4	4	3.17	
N-2	NB CD for Auto Show, Sunset and Galleria.	4	3	3	3	4	4	3.50	
N-3	SB braid at Galleria -move north to give more distance. Consider SB CD if space allows.	3	3	1	2	4	4	2.83	
N-4	I-515 SB braid between Sunset and Auto Show - also triple exit for I-215 WB.	4	3	3	3	4	4	3.50	
N-5	Widen I-515 north of the interchange as needed for traffic projections	3	3	3	4	4	4	3.50	

ramp should not be used by motorists to travel from Lake Mead Parkway to Auto Show Drive and that motorists should instead use Eastgate Road for this movement. Implementability is scored high because it would occupy the space currently used for the braid from eastbound I-215. This idea could be paired with feasible system-to-system interchange ideas that do not include a braided ramp from I-215 and scored 3.17 out of 4. Idea No. N-1 is recommended for further analysis.

**Idea No. N-2 (carry forward)** proposes a northbound collector-distributor road that would serve Auto Show Drive, Sunset Road and Galleria Drive. The C-D road would begin with the existing northbound exit to Auto Show Drive. The intent of this idea is to reduce weaving on northbound mainline I-515 by requiring motorists who wish to access Auto Show Drive, Sunset Road or Galleria Drive to exit northbound I-515 south of Auto Show Drive. Safety would be much better than existing by reducing weaving conflicts. Mobility and accessibility would be better than existing by maintaining existing connections and reducing congestion. Relative

high construction cost would be countered by high public acceptance of an idea that is anticipated to reduce travel time. Environmental and schedule impacts are anticipated to be minimal. This idea could be paired with any of the feasible system-to-system interchange ideas and scored 3.50 out of 4. Idea No. N-2 is recommended for further analysis.

**Idea No. N-3 (carry forward)** proposes a southbound braided ramp to connect the existing C-D road to southbound I-515 just north of Sunset Road. Safety is generally improved with use of braided ramps and C-D roads. Mobility would be improved by reducing weaving conflicts and reducing travel time. Accessibility would be comparable to existing conditions. Implementability would be impacted by high costs associated with braided ramps and C-D roads. This idea could be implemented within existing right-of-way with minimal environmental and schedule impacts. This idea could be paired with any of the feasible system-to-system interchange ideas. Idea No. N-3 scored 2.83 out of 4 and is recommended for further analysis.



**Idea No. N-4 (carry forward)** proposes a braided ramp from southbound I-515 near Sunset Road to exit at Auto Show Drive. The intent of this idea is to reduce weaving conflicts between southbound motorists headed to Auto Show Drive and I-215/Lake Mead Parkway. Safety would be much better than existing by reducing weaving conflicts. Mobility and accessibility would be better than existing by maintaining existing connections and reducing congestion. Relative high construction cost would be countered by high public acceptance of an idea that is anticipated to reduce travel time. Environmental and schedule impacts are anticipated to be minimal. This idea could be paired with any of the feasible system-to-system interchange ideas and scored 3.50 out of 4 and is recommended for further analysis.

**Idea No. N-5 (carry forward)** proposes widening of I-515 in both directions between the system interchange area and the northern study limit at Galleria Drive, as warranted by traffic projections.

Safety, mobility, and accessibility would be better than existing with less congestion and reduced travel time. Implementability would rank high due to low relative construction cost and anticipated high public acceptance. Right-of-way would not be needed for this idea and there would be minimal to no environmental or schedule impacts. This could be paired with any of the feasible system-to-system interchange ideas and scored 3.5 out of 4. Idea No. N-5 is recommended for further analysis.

### **Horizon Drive Ideas**

Four ideas that propose modifications intended to improve access at Horizon Drive are presented in Table 8.

**Idea No. H-1 (carry forward)** proposes to construct a northbound I-515 auxiliary lane between Horizon Drive and Lake Mead Parkway.

The intent of this idea is to reduce traffic congestion on northbound I-515 approaching the exit to I-215/Lake Mead Parkway, thereby, reducing impacts from that congestion to northbound traffic entering I-515 from Horizon Drive. A retaining wall approximately 1,500 feet long by six feet tall would be needed to accommodate widening. Safety would be better than existing by reducing congestion for northbound motorists. Mobility and accessibility would be slightly better than existing conditions by the reduction in travel time resulting from less congestion. This idea would have low relative cost and high public acceptance, minimal to no environmental impacts, and no impact to right-of-way, rail operations, or utilities. This idea could be paired with any of the feasible system-to-system interchange ideas and scored 3.17 out of 4. Idea No. H-1 is recommended for further analysis.

### **Idea No. H-2 (not recommended for further consideration)**

proposes a new off-ramp from southbound I-515 to Las Palmas Entrada Way. The intent of this idea was to reduce congestion at the southbound exit to Horizon Drive by providing an alternate way for motorists to gain access to homes in the southwest quadrant of the system interchange. This idea would require a grade separation between the new off-ramp and the existing eastbound I-215 ramp to southbound I-515 and would be grade-separated from the UPRR spur with a bridge adjacent to the I-515 bridge over the rail spur. This alignment results in a low-speed curve ( $R = 150$  feet,  $V_d = 25$  mph) on the south side of the rail bridge that would require a design exception. An idea with a larger radius curve that results in the need for an at-grade rail crossing is presented below as Idea No. H-4. Safety would be worse than existing because of the low-speed curve downstream of the high-speed ramp exit. Mobility and accessibility would be improved for those motorists who wish to access this neighborhood from southbound I-515. Based on the

TABLE 8 - HORIZON DRIVE INTERCHANGE IDEAS		Comparative Differences Between Ideas							
		Safety	Mobility	Accessibility	Implementability	Environmental Impacts	Schedule Impacts	Overall Performance Average	
									4 = Best
									3 = Better
									2 = Good
									1 = Neutral
0 = Poor									
Idea #	Idea Description								
H-1	From Horizon to Lake Mead Parkway - extend NB auxiliary lane - reconstruct noise walls.	3	2	2	4	4	4	3.17	
H-2	Connect Las Palmas Entrada to I-515 SB, peel off after RR grade separation	0	2	2	1	4	2	1.83	
H-3	SB I-515 between 215 and Horizon, provide link to SB Horizon ridge via flyover and direct connect. Grade separate NB Horizon Ridge	3	4	4	3	4	2	3.33	
H-4	Add I-515 SB exit to Las Palmas Entrada, braided with SB I-515 System ramp movement, may include slip ramp from SB I-215/I-515.	0	2	2	1	2	2	1.50	

Aimsun traffic model, approximately 80 vehicles would make use of this connection during the morning peak hour, and approximately 50 vehicles would make use of this connection during the evening peak hour. This idea is anticipated to have low public acceptance because the high relative cost resulting from a flyover structure and new bridge over the UPRR spur would only benefit a small number of motorists and would not result in a noticeable reduction in traffic at Horizon Drive. It would be necessary to mitigate impacts to the regional flood control basin in the southwest quadrant. Environmental impacts are anticipated to be minimal. Schedule would be impacted by the need to acquire additional right-of-way, but no relocations would be needed. Schedule could also be impacted by the need to obtain FHWA concurrence with the change of access for I-515. This idea could be combined with system interchange Idea Nos. S-7 or S-8 but would not be compatible with system interchange Idea No. S-4. Idea No. H-2 scored low (1.83 out of 4) and is not recommended for further analysis.

**Idea No. H-3 (carry forward)** proposes a new off-ramp from southbound I-515 to Horizon Ridge Parkway. The intent of this idea is to reduce congestion at the southbound exit to Horizon Drive by providing an alternate way for motorists to gain access to homes in the southwest quadrant of the system interchange. This idea could be combined with any of the system interchange ideas recommended for further consideration. Year 2040 southbound traffic existing at Horizon Drive during the peak hours and turning right is anticipated to be 710 vehicles in the morning and 860 vehicles in the evening. Approximately two-thirds of those vehicles would be expected to turn north or south onto Horizon Ridge Parkway. Safety, mobility, and accessibility would be better than existing by allowing these vehicles to reach their destination more directly and with fewer traffic signals. High relative construction cost resulting from the flyover structure carrying northbound Horizon Ridge Parkway over the southbound ramp would be offset by high public acceptance of an idea that reduces travel time and congestion. Environmental impacts are anticipated to be minimal.

Schedule would be impacted by the need to acquire additional right-of-way and the need to obtain concurrence from FHWA for a change in access to I-515. Idea No. H-3 scored 3.33 out of 4 and is recommended for further analysis.

**Idea No. H-4 (not recommended for further consideration)**

proposes a new off-ramp from southbound I-515 to Las Palmas Entrada Way, similar to Idea No. H-2. Idea No. H-4 differs from Idea No. H-2 in that it proposes an at-grade rail crossing with the UPRR spur in order to accommodate ramp geometry that could be constructed without the need for design exceptions. The intent of this idea was to reduce congestion at the southbound exit to Horizon Drive by providing an alternate way for motorists to gain access to homes in the southwest quadrant of the system interchange. This idea would necessitate a grade separation between the new off-ramp and the existing eastbound I-215 ramp to southbound I-515. Safety would be worse than existing because of a new at-grade rail crossing where none currently exists. Mobility and accessibility would be improved for those motorists who wish to access this neighborhood from southbound I-515. Based on the Aimsun traffic model, approximately 80 vehicles would make use of this connection during the morning peak hour, and approximately 50 vehicles would make use of this connection during the evening peak hour. This idea is anticipated to have low public acceptance because the high relative cost resulting from a flyover structure and new bridge over the UPRR spur would only benefit a small number of motorists and would not result in a noticeable reduction in traffic at Horizon Drive. It would be necessary to mitigate impacts to the regional flood control basin in the southwest quadrant. Environmental impacts are anticipated to be modest with the potential to mitigate or remediate hazardous materials known to exist in the southwest quadrant of the

interchange. Schedule would be impacted by the need to acquire additional right-of-way, but no relocations would be needed. Schedule could also be impacted by the need to obtain FHWA concurrence with the change of access for I-515. This idea could be combined with system interchange Idea Nos. S-7 or S-8 but would not be compatible with system interchange Idea No. S-4. Idea No. H-4 scored low (1.50 out of 4) and is not recommended for further analysis.

**Ideas Generated by the General Public**

Numerous ideas were provided by the general public at and following the March 2019 Public Meeting. Many of the comments pertained to public transit, the current highway configuration, current signing, and a recent restriping project. Ideas pertaining to interchange improvements are summarized below, with a description of how the ideas are addressed by this report in *italics*:

- Since you are talking about doubling traffic by 2040, I would think you should now be looking at adding lanes. *Each of the alternatives that will be developed will include additional lanes as warranted by the 2040 traffic projections.*
- Provide a two-lane ramp from northbound I-515 to westbound I-215. *Each of the alternatives that will be developed will include the number of lanes as warranted by the 2040 traffic projections. For this ramp movement, it will be at least two lanes.*
- Connect Las Palmas Entrada Avenue under the railroad bridge to the local streets on the east side of I-215. *This suggestion is included with Idea E-1.*
- Rather than complicated flyovers and underpasses from re-routing, why not do something like this (showing a sketch of

forked roadways on I-215). *Forked ramp connections are included with Idea S-4.*

- Provide more ramp braiding. *Ramp braiding is incorporated into Ideas G-5, G-6, N-1, N-2, N-3 and N-4.*
- Can I suggest that we look into creating an exchange that makes sense to the lowest level of the population? If north is to the left, turn left to go north. If south is to the right, turn right to go south. If east is directly in front of you, then the center lanes go forward and go east. *Idea S-4 incorporates the goals requested by this comment.*

- Consider protecting or enhancing the Vegas view from the interchange. *Visual impacts and visual opportunities would be considered in the subsequent NEPA phase.*

**Ideas Not Recommended for Further Consideration**

Fourteen feasible ideas summarized in Table 9 were ranked 2.67 out of 4 or lower and were not recommended for further consideration. These ideas remained available to the study team in the event that higher scoring ideas did not provide the anticipated benefits to meeting the purpose and need for the project.

**TABLE 9 - DISPOSITION OF IDEAS NOT RECOMMENDED FOR FURTHER CONSIDERATION**

Idea #	Idea Description	Score	Disposition
S-1	DDI with grade-separated crossovers on I-515 and loop ramps for access from I-515 to LMP. New bridge for Northbound I-515 to Westbound I-215. Retain existing bridge for Eastbound I-215 to Northbound I-515	1.67	Feasible but lower scoring than other ideas. These ideas remain available for use in alternatives if higher scoring ideas do not provide the anticipated benefits.
S-6	Exit Lake Mead west of system interchange, make 215 fork - build new structures. Use existing bridges for Gibson entrance to I-515 north and LMP movements. (SNTS Alt. 2)	2.33	
G-3	Eastbound 215 w/ HOV - 2-lane exit to I-515 - with existing mainline as HOV and Gibson Eastbound. Eliminate Westbound Gibson exit, provide 2-515 Southbound lanes, 2-515 Northbound lanes and 2-LMP Westbound lanes	1.50	
G-4	Use Gibson Eastbound Off ramp to provide Eastbound LMP exit. Use existing bridges to connect 215/515. 1 mile west of Gibson, 2-lane Eastbound exit.	1.83	
G-8	Median opening at Gibson - right in right out to I-215 on the east side only - to allow Northbound Gibson to Lake Mead and Lake Mead Westbound to Northbound Gibson.	2.67	
G-9	Swing NB I-515 to WB I-215 ramp and stay north of I-215 until after Gibson, merge to WB I-215 after Gibson	1.83	
G-11	Median opening for Gibson, full median interchange	1.83	
G-12	Frontage road between Gibson and LMP outside of mainline on both directions	2.50	
G-13	EB Gibson to LMP stay on the south side of I-215, past RR will loop back around to connect to LMP for profile reasons	2.00	
G-14	Peel off Lake Mead Eastbound traffic from mainline. Provide a slip ramp from Gibson on-ramp to Lake Mead, which minimizes weaving. Make use of that space for HOV.	2.00	
E-5	Provide direct connection from Fiesta Henderson Blvd. - T-intersection, parallel 515 Northbound and bridge over Lake Mead - this will provide more green time to Lake Mead throughs	2.50	
E-6	Provide connection from Fiesta Henderson Blvd. to Northbound I- 515 near the south UPRR spur	2.50	
H-2	Connect Las Palmas Entrada to I-515 Southbound, peel off after RR grade separation	1.83	
H-4	Add I-515 Southbound exit to Las Palmas Entrada, braided with Southbound I-515 System ramp movement, may include slip ramp from Southbound I-215/I-515.	1.50	

**Step 4 – Alternatives Development**

Alternatives for further development and consideration were developed by combining ideas previously listed that were recommended for further consideration. The alternatives were further developed from the sketches included in Appendix 3 and are based on project mapping and NDOT design criteria listed in Table 10. Conceptual plans for alternatives advanced for further consideration are included in Appendix 6. All of the feasible ideas remained available to the project team as they worked to develop alternatives that meet the needs of this project.

Traffic modeling for this project is based on the Aimsun model developed for the SNTS, as calibrated for the study limits of this project. Lane configurations are in accordance with traffic demands predicted by the calibrated Aimsun traffic model for this project.

<b>TABLE 10 – MAJOR ELEMENTS OF DESIGN CRITERIA</b>	
Freeway Design Speed	65 mph
Ramp Design Speeds	50/35 mph (preferred/minimum)
Freeway and Ramp Lane Width	12 feet
Freeway Shoulder Widths	12/10 feet left and right (preferred/minimum)
Ramp Shoulder Widths	4 feet left, 8 feet right
Superelevation Rates (except crossovers)	$e_{max} = 8$ percent
Superelevation Rates (freeway crossovers)	$e_{max} = 4$ percent
Roadway Vertical Clearance	16 feet 6 inches
Rail Vertical Clearance	23 feet 4 inches

Alternatives were developed based on NDOT Design Criteria as summarized in Table 10. Aimsun modeling was performed for three combinations of ideas, Build Alternatives 1, 2 and 3, as listed below.

Combinations of ideas were chosen to include ideas recommended for further consideration so that effectiveness could be measured, and planning level construction costs could be estimated.

**Build Alternative 1** – Retain the existing system interchange configuration while widening mainline and ramps as warranted by traffic analysis as proposed by Idea No. S-8 combined with:

- Braided ramps east of Gibson Road for both eastbound and westbound motorists as proposed by Idea No. G-5,
- Eastgate Road/Fiesta Henderson Boulevard retained as an at-grade intersection in the current configuration with lanes added as indicated by traffic modeling as proposed by Idea No. E-7,
- Northbound I-515 auxiliary lane between Horizon Drive and Lake Mead Parkway as proposed by Idea No. H-1,
- Northbound I-515 C-D road north of the system interchange as proposed by Idea No. N-2,
- Southbound I-515 C-D and ramp braids north of the system interchange as proposed by Ideas No. N-3 and N-4,
- Southbound I-515 three-lane fork to I-215/Lake Mead Parkway as proposed by Idea No. S-3,
- Exit from southbound I-515 to Horizon Ridge Parkway as proposed by Idea No. H-3,
- Accommodate (leave space for) future single-lane HOV connections in each direction from the median of I-515 north of the system interchange to the median of I-515 west of the system interchange.



Build Alternative 1 is intended to address each of the project needs including resolving existing roadway deficiencies, providing transportation improvements to serve existing and future growth areas, restore local traffic connectivity, and to respond to regional and local plans.

**Build Alternative 2** – Construct a modified SPUI interchange for Lake Mead Parkway within the existing system interchange configuration while widening mainline and ramps as warranted by traffic analysis as proposed by Idea No. S-7 combined with:

- Braided ramps east of Gibson Road for both eastbound and westbound motorists as proposed by Idea No. G-5,
- Eastgate Road/Fiesta Henderson Boulevard reconstructed as a through-turn continuous flow intersection as proposed by Idea No. E-3,
- I-515 interchanges with Auto Show Drive, Sunset Road, and Galleria Drive retained in the existing configurations with lanes added as indicated by traffic modeling as proposed by Idea No. N-5,
- Southbound I-515 three-lane fork to I-215/Lake Mead Parkway as proposed by Idea No. S-3,
- Northbound I-515 auxiliary lane between Horizon Drive and Lake Mead Parkway as proposed by Idea No. H-1,
- Accommodate (leave space for) future single-lane HOV connections in each direction from the median of I-515 north of the system interchange to the median of I-515 west of the system interchange.

Build Alternative 2 is intended to address each of the project needs including resolving existing roadway deficiencies, providing transportation improvements to serve existing and future growth

areas, restore local traffic connectivity, and to respond to regional and local plans.

Evaluation of Build Alternatives 1 and 2 allowed the study team to ascertain the effectiveness of northern C-D roads and ramp braiding in Build Alternative 1 versus retaining the existing northern configuration in Build Alternative 2. Similarly, the effectiveness of constructing a southbound I-515 off-ramp to Horizon Ridge Parkway in Build Alternative 1 can be compared to the modeling results without that exit for Build Alternative 2; and performance of a widened at-grade Eastgate Road/Fiesta Henderson Boulevard intersection in Build Alternative 1 was compared to the performance of the through-turn continuous flow intersection in Build Alternative 2.

**Build Alternative 3** – Crossover system interchange as depicted in Idea No. S-4 combined with:

- Braided ramps leading to and from Gibson Road as proposed by Idea No. G-5,
- Eastgate Road/Fiesta Henderson Boulevard retained as an at-grade intersection in the current configuration with lanes added as indicated by traffic modeling as proposed by Idea No. E-7,
- Northbound I-515 entrance ramp from Lake Mead Parkway braided with the northbound Auto Show exit ramp as proposed by Idea No. N-1,
- I-515 interchanges with Auto Show Drive, Sunset Road, and Galleria Drive retained in the existing configurations with lanes added as indicated by traffic modeling as proposed by Idea No. N-5,

- Northbound I-515 auxiliary lane between Horizon Drive and Lake Mead Parkway as proposed by Idea No. H-1,
- Exit from southbound I-515 to Horizon Ridge Parkway as proposed by Idea No. H-3,
- Accommodate (leave space for) future single-lane HOV connections in each direction from the median of I-515 north of the system interchange to the median of I-515 west of the system interchange.

Build Alternative 3 is intended to address each of the project needs including resolving existing roadway deficiencies, providing transportation improvements to serve existing and future growth areas, restore local traffic connectivity, and to respond to regional and local plans.

Braided ramps to and from the Gibson Road interchange would be integral with the crossover configuration. Omitting braided ramps

and C-D roads for the northern interchanges as proposed by Idea Nos. N-2 and N-4 will allow the study team to ascertain if the additional weave length for I-515 that is provided by the crossover configuration would be sufficient to meet the needs of I-515 traffic north of the system interchange without the expense of constructing the braided ramps.

**Recommended Ideas Not Included in Alternatives**

Five ideas recommended to be carried forward were not included in either of the three alternatives. As summarized in Table 11, these ideas were either lower scoring or more expensive than other ideas included in the alternatives, and they remained available to the study team for inclusion in an alternative if other ideas did not provide the anticipated benefits for meeting the purpose and need for the project.

**TABLE 11 - DISPOSITION OF IDEAS RECOMMENDED FOR FURTHER CONSIDERATION BUT NOT USED IN AN ALTERNATIVE**

Idea #	Idea Description	Score	Disposition
G-1	Eliminate Gibson ramp access from Lake Mead Parkway on east side - develop turnaround at Stephanie	3.17	Recommended for further consideration but lower scoring than Idea No. G-5. This idea remains available for use in alternatives if Idea No. G-5 does not provide the anticipated benefit.
G-6	Braid Eastbound Gibson ramp with 215 ramps	3.00	Recommended for further consideration but lower scoring than Idea No. G-5. This idea remains available for use in alternatives if Idea No. G-5 does not provide the anticipated benefit.
E-1	Create a connection over/under 515 at south UPRR Spur	3.00	Recommended for further consideration but lower scoring and more expensive than Idea Nos. E-3 and E-7. This idea remains available for use in alternatives if Idea Nos. E-3 or E-7 do not provide the anticipated benefits. This idea could also move forward as a local public agency project to connect neighborhoods east and west of I-515.
E-2	Use Eschelon intersection at Eastgate - Eastbound stays at grade but Westbound gets elevated.	3.00	Recommended for further consideration but lower scoring and more expensive than Idea Nos. E-3 and E-7. This idea remains available for use in alternatives if Idea Nos. E-3 or E-7 do not provide the anticipated benefits.
E-4	Grade separate Lake Mead Parkway over Eastgate	3.00	

**Refinement of Build Alternatives**

**Elimination of Idea No. H-3**

The exit from southbound I-515 to Horizon Ridge Parkway as proposed by Idea No. H-3 would be located approximately 2,800’ from the eastbound I-215 to Southbound I-515 system-to-system painted ramp gore. The goal of this idea is to relieve some of the congestion that was observed at the existing service interchange between I-515 and Horizon Drive. In addition, it was anticipated by the alternatives development team that some of the Gibson Road traffic could also use this ramp as an alternate route instead of traversing the system interchange and encountering multiple traffic signals, especially if their destination would be near Gibson Road and Horizon Ridge Parkway.

In order to evaluate the traffic operations performance of Idea No. H-3, a screening analysis using HCS software was performed following current HCM methodology (6<sup>th</sup> edition). A weaving analysis was performed to determine the Level of Service (LOS) for the weaving segment between the eastbound I-215 to southbound I-515 system-to-system painted ramp gore and the proposed exit to Horizon Ridge Parkway as depicted in Figure 6. As the precise traffic volume that would use this proposed ramp is unknown, certain assumptions were made for the HCS weaving analysis:

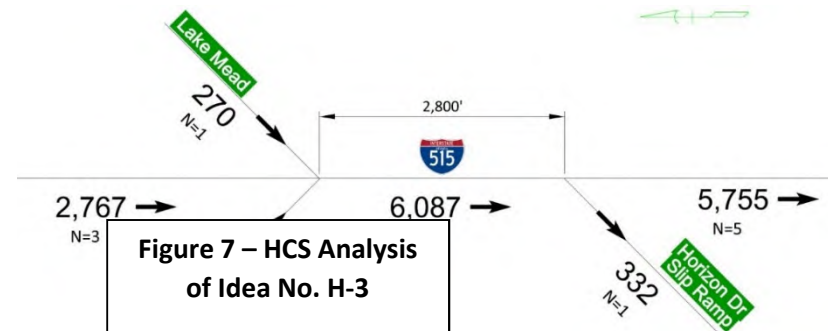
- Approximately 10% of the year 2040 no-build Horizon Drive exit traffic is assumed to instead exit at the proposed exit ramp to Horizon Ridge Parkway, with the origin of the traffic

split equally from Southbound I-515 and the Eastbound I-215 to Southbound I-515 system-to-system ramp,

- Approximately 10% of the Westbound I-215 to Gibson Road exit traffic is assumed to instead exit at the proposed exit ramp to Horizon Ridge Parkway.

HCS weaving analysis revealed that the LOS for the weaving segment would operate at LOS F (failure) as the volume-to-capacity ratio is greater than 1 ( $v/c > 1$ ). The proposed Southbound I-515 exit to Horizon Ridge Parkway was therefore deleted from Build Alternative 1 for further evaluation of traffic operations and project cost development.

Traffic modeling for Build Alternative 1 without Idea No. H-3 showed that this alternative would provide improvement over the no-build scenario and further, that traffic operations performance for Build Alternative 1 would resolve existing roadway deficiencies.



**Figure 7 – HCS Analysis of Idea No. H-3**

### **Elimination of Idea No. E-3**

Idea No. E-3 proposed construction of a through-turn continuous flow intersection at Eastgate Road/Fiesta Henderson Boulevard. Initial traffic modeling using Aimsun Next for Build Alternative 1 showed that an improved at-grade intersection would provide satisfactory traffic operations performance at this location. Further analysis using Synchro showed that LOS E would be achieved using an at-grade intersection in the absence of frequent pedestrian crossings. The study team therefore eliminated Idea No. E-3 from consideration and substituted the less expensive Idea No. E-7 in its place for each of the alternatives.

While LOS E is considered to represent satisfactory traffic operations performance, it is on the margin between satisfactory and unsatisfactory. In the event that delay in implementation of improvements to the Henderson Interchange results in use of traffic projections for a design year later than 2040, it is possible that higher future traffic volumes for 2045 or later might show a need for Idea E-3 or some other idea to provide satisfactory traffic operations performance. This idea may therefore be reevaluated and brought back in a subsequent development phase for this project.

### **4.7 Evaluation Against the Purpose and Need**

**Purpose and Need: Resolve Existing Roadway Deficiencies** – Build Alternatives 1, 2, and 3 resolve existing roadway deficiencies. Braided ramps to and from Gibson Road allow sufficient distance between I-515 traffic entering westbound I-215 and the off-ramp to Gibson Road, as well as minimizing weaving between Lake Mead Parkway traffic and I-515 traffic. Ramp merges and tapers meet or exceed current geometric design criteria. Each of the alternatives

would add auxiliary lanes between Horizon Drive and I-215/Lake Mead Parkway.

**Purpose and Need: Provide Transportation Improvements to Serve Existing and Future Growth Areas** – Build Alternatives 1, 2, and 3 provide satisfactory traffic operations performance for year 2040 traffic projections that are based on population growth projections by RTC. Based on modeling using Aimsun Next, each of the alternatives meet the needs of the total traffic demand for year 2040 with satisfactory traffic operations performance.

**Purpose and Need: Restore Local Connectivity** – Build Alternatives 1 and 2 would restore local connectivity to Gibson Road, but would retain the existing disconnection between Auto Show Drive and I-215. Build Alternative 3 would restore local connectivity to Gibson Road and to Auto Show Drive to and from I-215.

**Purpose and Need: Accommodate Regional and Local Plans:** Build Alternatives 1, 2, and 3 were configured to accommodate future construction of HOV lanes to the north and west of the interchange.

At the time this feasibility study was completed, a route for I-11 had not been chosen through the Las Vegas Valley area and it was not possible to ascertain the potential impact of that facility being sited within the study area of the Henderson Interchange Feasibility Study. I-11 would connect the metropolitan areas of Phoenix, Arizona and Las Vegas, Nevada, and to points beyond to Mexico and Canada.

The study team observed operation of I-15 that connects the metropolitan areas of Los Angeles, California and Las Vegas, Nevada, and to points beyond to Mexico and Canada. Observations made during peak hour travel for both morning and evening showed that traffic volumes in I-15 south of St. Rose Parkway and north of Speedway Boulevard were sparse, even as traffic volume

on I-15 within the Las Vegas metropolitan area was very heavy. Recognizing that the Los Angeles metropolitan area population of approximately 18.7 million people is nearly four times the Phoenix metropolitan area population, the study team concluded that designation of the Henderson Interchange study area as I-11 would not result in meaningful increases to design year traffic volumes in the peak morning and afternoon hours beyond that which results from locally-generated traffic sources. Therefore, Build Alternatives 1, 2, and 3 would accommodate future siting of I-11 within the Henderson Interchange study area.

#### **4.8 Build Alternative Ranking**

As summarized in Table 1 and similar to the Level 2 screening, alternatives are evaluated and scored by subjectively and qualitatively ranking them against each criterion on a scale of 0-4. A low score of zero or one is not considered to be a fatal flaw. Each criterion carries equal weight. The average of the six scores is used to compare one alternative to others.

Each alternative is scored in Table 12 based on criteria listed in Table 1.

**Safety** – Each of the alternatives as modified to include simple widening of I-515 between Auto Show Drive and Galleria Drive provide satisfactory traffic operations performance and are expected to improve safety as compared to the No-Build Alternative. Build Alternatives 1 and 3 are expected to provide superior safety performance and are scored as 4 out of 4, while Build Alternative 2 is downgraded one point to 3 out of 4 because an additional traffic signal on Lake Mead Parkway west of I-515 results in lower traffic operations performance than for Build Alternatives 1 or 3.

**Mobility** – Each of the alternatives provide better mobility than the No-Build Alternative. Build Alternatives 1 and 3 are scored 4 out of 4 because travel time through the interchange area will be much better than existing, while Build Alternative 2 is downgraded one point to 3 out of 4 because the traffic signal on Lake Mead Parkway west of I-515 would result in increased average travel time versus Build Alternatives 1 and 3.

**Accessibility** – Each of the alternatives provide better mobility than the No-Build Alternative. Build Alternative 3 restores connectivity between I-215 and Auto Show Drive and between Lake Mead Parkway and Gibson Road and is scored as 4 out of 4. Build Alternatives 1 and 2 are downgraded one point to 3 out of 4 because they restore connectivity between Lake Mead Parkway and Gibson Road, but not between I-215 and Auto Show Drive.

**Implementability** – Each of the alternatives improves traffic operations performance as compared with the No-Build Alternative and would be expected to meet with acceptance by the public. Estimated project costs are estimated to be highest for Build Alternative 2, followed by Build Alternative 1, and then by the least expensive Build Alternative 3. Scoring for implementability is therefore 2 out of 4 for Build Alternative 2, 3 out of 4 for Build Alternative 1, and 4 out of 4 for Build Alternative 3.

**Environmental Impacts** – Each of the alternatives is anticipated to have minimal to no environmental impacts, and each alternative is therefore scored 4 out of 4.

**Schedule** – Each of the alternatives is anticipated to be constructed within the existing right-of-way footprint, and schedule impacts are anticipated to be minimal. Build Alternative 3 would impact four high-pressure gas lines in the southwest interchange quadrant and is therefore downgraded one point to 3 out of 4 from the scores of 4 out of 4 for Build Alternatives 1 and 2.



**TABLE 12 – RANKING OF ALTERNATIVES**

CRITERIA	ALTERNATIVE		
	1	2	3
Safety	4	3	4
Mobility	4	3	4
Accessibility	3	3	4
Implementability	3	2	4
Environmental Impacts	4	4	4
Schedule	4	4	3
Total	22	19	23
Average Score	3.67	3.17	3.83

**Elimination of Build Alternative 2**

Summary scores shown in Table 12 for Build Alternatives 1 and 3 are very close, while the score for Build Alternative 2 is well behind the grouping of Build Alternatives 1 and 3. Build Alternatives 1 and 2 are very similar, with the difference being that two free-flowing ramp movements for Build Alternative 1 are replaced by signal-controlled ramp intersections for Build Alternative 2. As determined by the traffic analysis, it is not possible for Build Alternative 2 to have better traffic operations performance than Build Alternative 1. As determined by the cost estimate, it is not possible for Build Alternative 2 to have lower project cost than Build Alternative 1. Build Alternative 2 was therefore eliminated from further consideration by the study team.

**Renaming of Build Alternatives**

With elimination of Build Alternative 2, Build Alternative 1 was renamed as Build Option 1 and Build Alternative 3 was renamed Build Option 2. Only Build Options 1 and 2 were evaluated at the Cost-Risk Workshop held November 18, 2019 and presented to the public at the second public meeting on December 5, 2019.



**Idea No. S-1 (not recommended for further consideration)**

Diverging diamond configuration for the north-south highway (I-515).

**Screening Evaluation**

Safety	2
Mobility	3
Accessibility	4
Implementability	0
Environmental Impacts	0
Schedule Impacts	1
Overall Performance Average	1.67

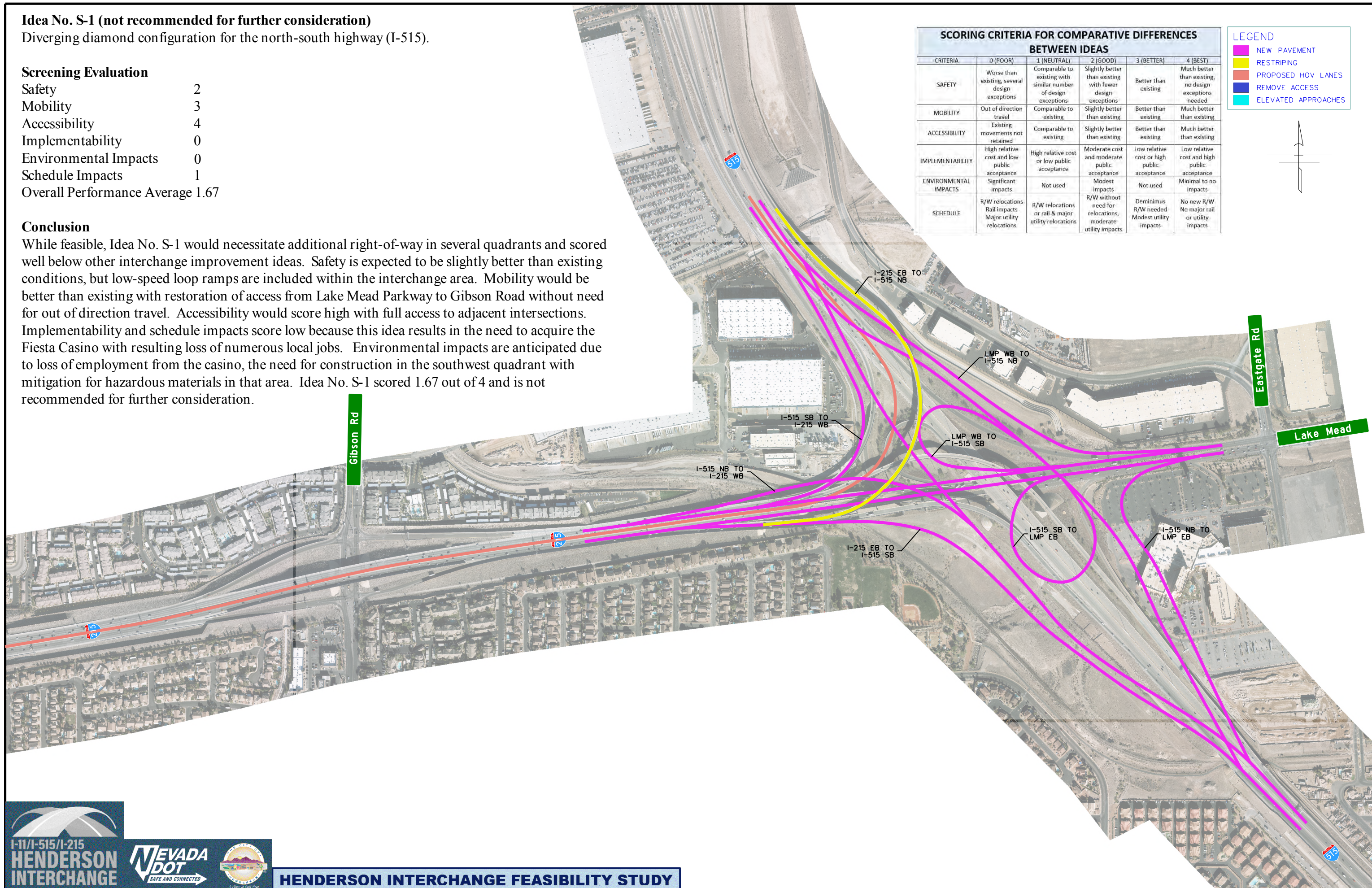
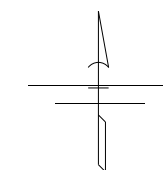
**Conclusion**

While feasible, Idea No. S-1 would necessitate additional right-of-way in several quadrants and scored well below other interchange improvement ideas. Safety is expected to be slightly better than existing conditions, but low-speed loop ramps are included within the interchange area. Mobility would be better than existing with restoration of access from Lake Mead Parkway to Gibson Road without need for out of direction travel. Accessibility would score high with full access to adjacent intersections. Implementability and schedule impacts score low because this idea results in the need to acquire the Fiesta Casino with resulting loss of numerous local jobs. Environmental impacts are anticipated due to loss of employment from the casino, the need for construction in the southwest quadrant with mitigation for hazardous materials in that area. Idea No. S-1 scored 1.67 out of 4 and is not recommended for further consideration.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations, Rail impacts, Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed, Modest utility impacts	No new R/W, No major rail or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES





**Idea No. S-2 (fatal flaw)**

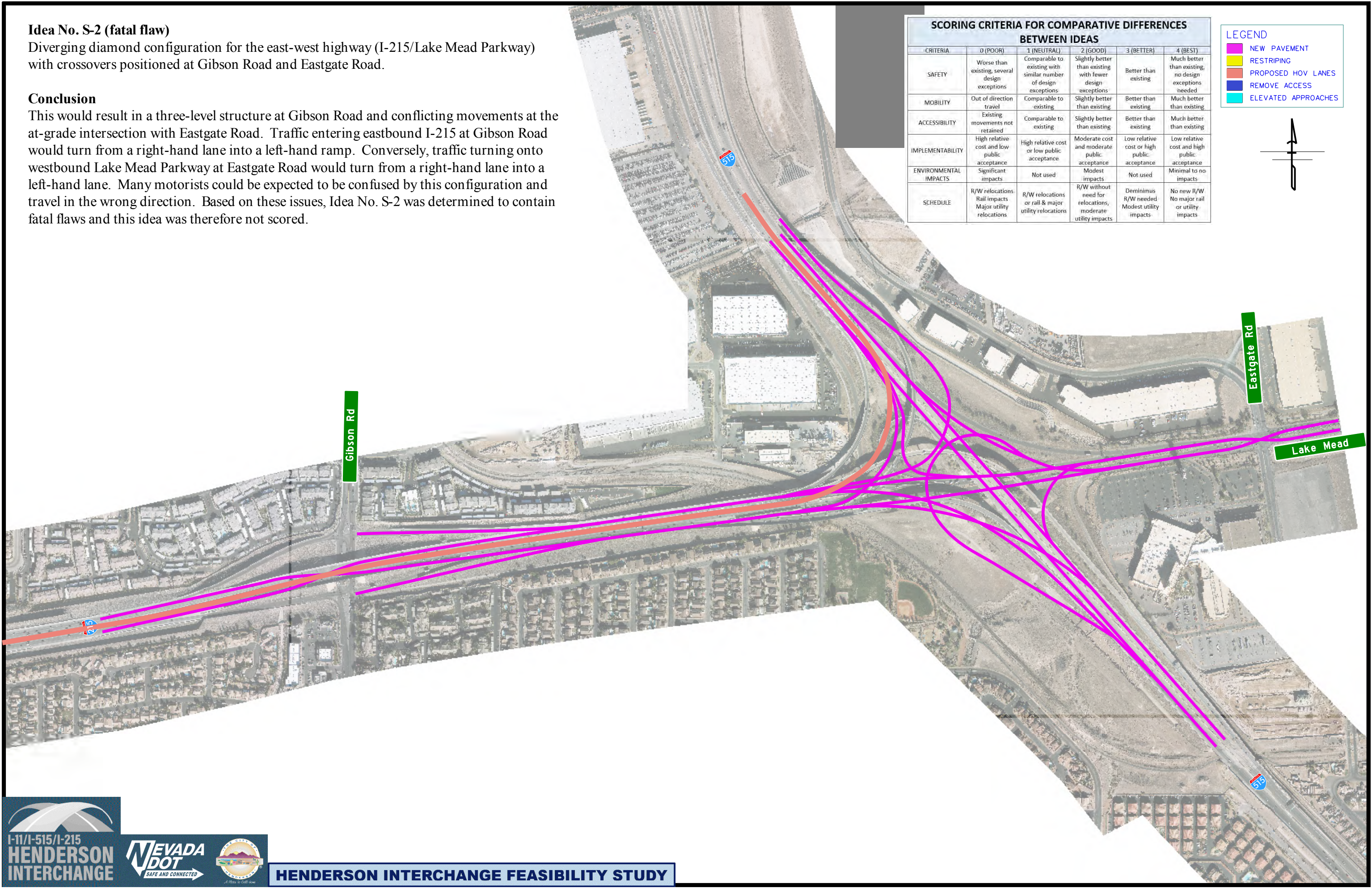
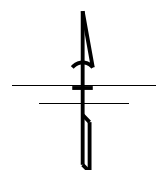
Diverging diamond configuration for the east-west highway (I-215/Lake Mead Parkway) with crossovers positioned at Gibson Road and Eastgate Road.

**Conclusion**

This would result in a three-level structure at Gibson Road and conflicting movements at the at-grade intersection with Eastgate Road. Traffic entering eastbound I-215 at Gibson Road would turn from a right-hand lane into a left-hand ramp. Conversely, traffic turning onto westbound Lake Mead Parkway at Eastgate Road would turn from a right-hand lane into a left-hand lane. Many motorists could be expected to be confused by this configuration and travel in the wrong direction. Based on these issues, Idea No. S-2 was determined to contain fatal flaws and this idea was therefore not scored.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Demimimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

- LEGEND**
- █ NEW PAVEMENT
  - █ RESTRIPIPING
  - █ PROPOSED HOV LANES
  - █ REMOVE ACCESS
  - █ ELEVATED APPROACHES





**Idea No. S-3 (carry forward)**

Construct a three-lane fork from southbound I-515 near Auto Show Drive that would accommodate traffic leading to both eastbound Lake Mead Parkway and westbound I-215. If constructed as an interim project, the three-lane exit would split around an existing straddle bent in order to fit within the existing interchange geometrics.

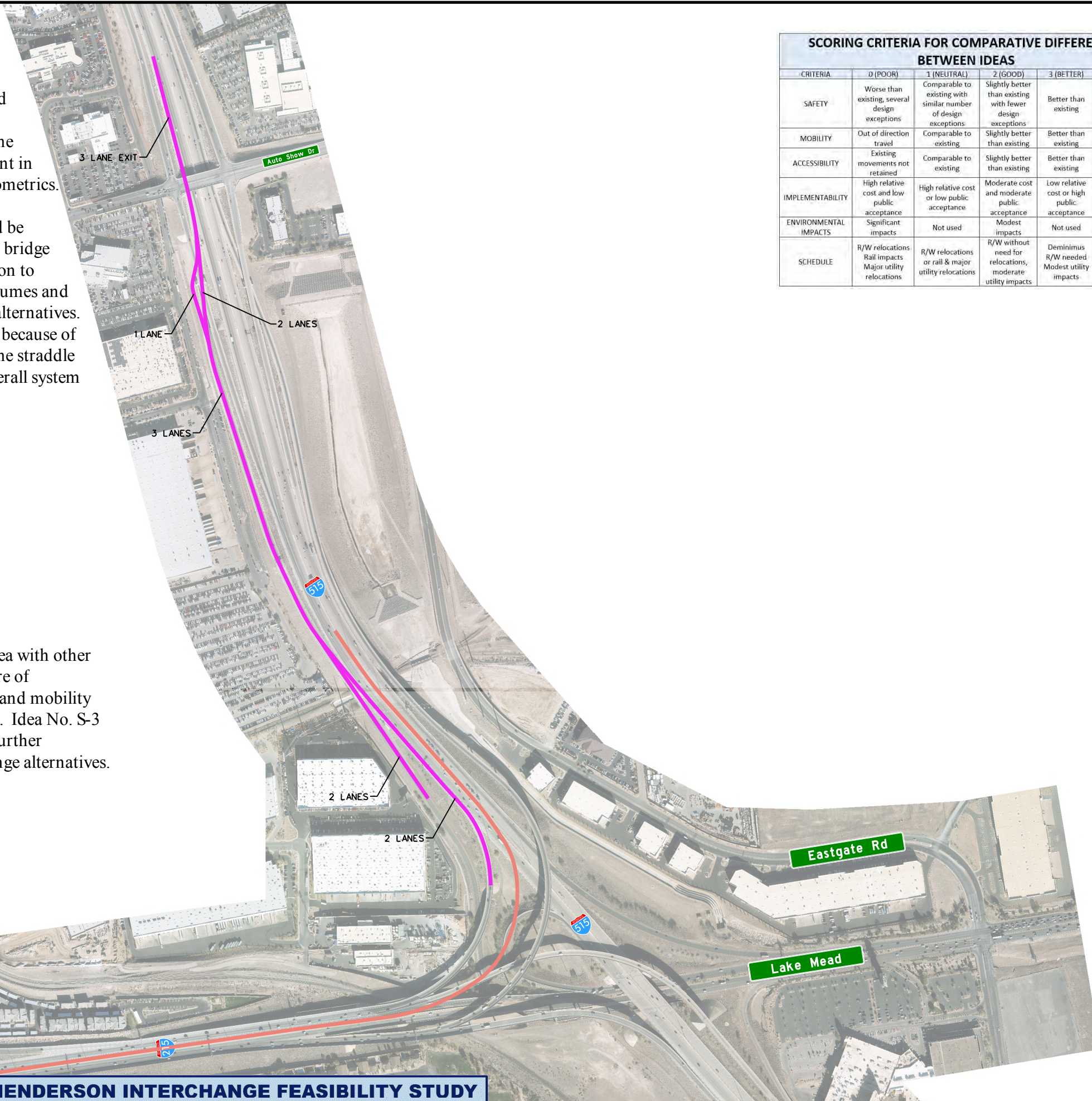
As part of a long-term solution, this idea could be constructed without the need to split around a bridge foundation. This idea presents a partial solution to meeting the needs of projected 2040 traffic volumes and will be incorporated into the full interchange alternatives. If scored as an interim idea, it would rank low because of safety issues associated with the split around the straddle bent and because the idea does not address overall system interchange issues.

**Screening Evaluation**

- Safety 2
- Mobility 2
- Accessibility 2
- Implementability 4
- Environmental Impacts 4
- Schedule Impacts 4
- Overall Performance Average 3.00

**Conclusion**

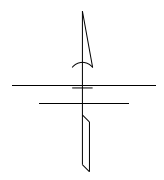
Making those issues moot by including this idea with other interchange ideas would result in a higher score of Accessibility would be comparable to existing and mobility would only be slightly improved from existing. Idea No. S-3 scored 3.00 out of 4 and is recommended for further consideration as a part of full system interchange alternatives.



SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations, Rail impacts, Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed, Modest utility impacts	No new R/W, No major rail or utility impacts

**LEGEND**

- █ NEW PAVEMENT
- █ RESTRIPING
- █ PROPOSED HOV LANES
- █ REMOVE ACCESS
- █ ELEVATED APPROACHES





**Idea No. S-4 (carried forward)**  
Crossover Interchange

**Screening Evaluation**

Safety	3
Mobility	4
Accessibility	4
Implementability	4
Environmental Impacts	2
Schedule Impacts	4
Overall Performance Average	3.50

**Conclusion**

Advantages include western crossover geometry that avoids the need for three and four level structures. The existing interchange would be retained with a curve radius that meets NDOT's minimum criteria. Design exceptions would be needed to implement the proposed design, but it is anticipated that they would be less than for other options. The curves would be longer than three times the design speed. Disadvantages include the need for elevated approaches. Information from engineers in Maryland and Alabama would be used to guide geometric details to mitigate driver expectations regarding

- Provide clear signing approaching entrances and exits
- Treat left hand exits as forks
- Treat left hand entrances as parallel approaches that add a lane and do not force a merge
- Align vertical profiles of left-hand approaches so that motorists can see adjacent traffic

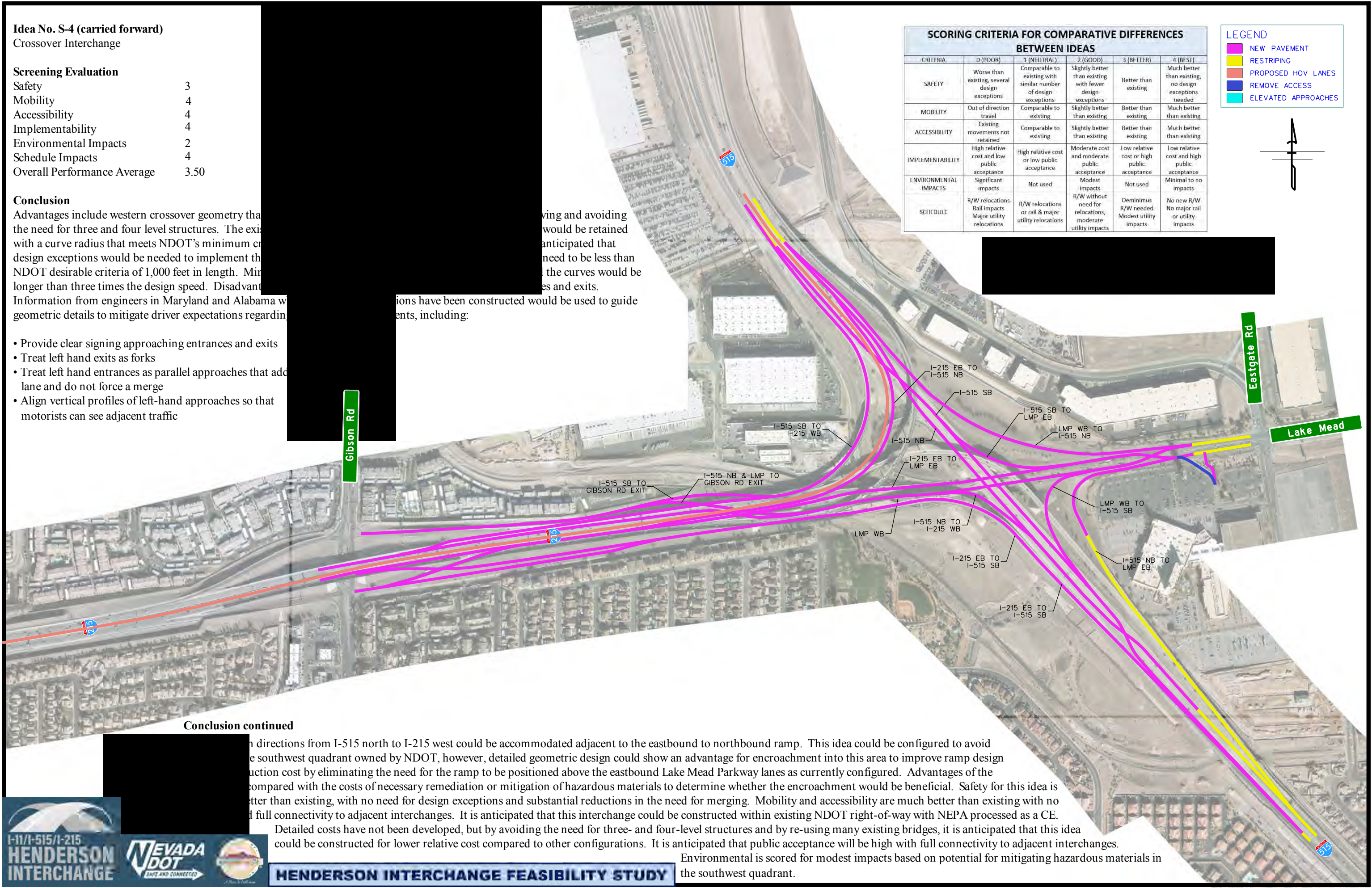
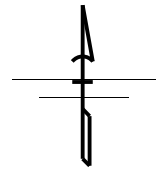
ing and avoiding the need for three and four level structures. The existing interchange would be retained with a curve radius that meets NDOT's minimum criteria. Design exceptions would be needed to implement the proposed design, but it is anticipated that they would be less than for other options. The curves would be longer than three times the design speed. Disadvantages include the need for elevated approaches. Information from engineers in Maryland and Alabama would be used to guide geometric details to mitigate driver expectations regarding

itions have been constructed would be used to guide geometric details to mitigate driver expectations regarding

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations, Rail impacts, Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed, Modest utility impacts	No new R/W or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES

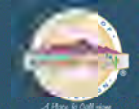


**Conclusion continued**

In directions from I-515 north to I-215 west could be accommodated adjacent to the eastbound to northbound ramp. This idea could be configured to avoid the southwest quadrant owned by NDOT, however, detailed geometric design could show an advantage for encroachment into this area to improve ramp design. Construction cost by eliminating the need for the ramp to be positioned above the eastbound Lake Mead Parkway lanes as currently configured. Advantages of the proposed design compared with the costs of necessary remediation or mitigation of hazardous materials to determine whether the encroachment would be beneficial. Safety for this idea is better than existing, with no need for design exceptions and substantial reductions in the need for merging. Mobility and accessibility are much better than existing with no need for full connectivity to adjacent interchanges. It is anticipated that this interchange could be constructed within existing NDOT right-of-way with NEPA processed as a CE.

Detailed costs have not been developed, but by avoiding the need for three- and four-level structures and by re-using many existing bridges, it is anticipated that this idea could be constructed for lower relative cost compared to other configurations. It is anticipated that public acceptance will be high with full connectivity to adjacent interchanges.

Environmental is scored for modest impacts based on potential for mitigating hazardous materials in the southwest quadrant.










**Idea No. S-5 (fatal flaw)**

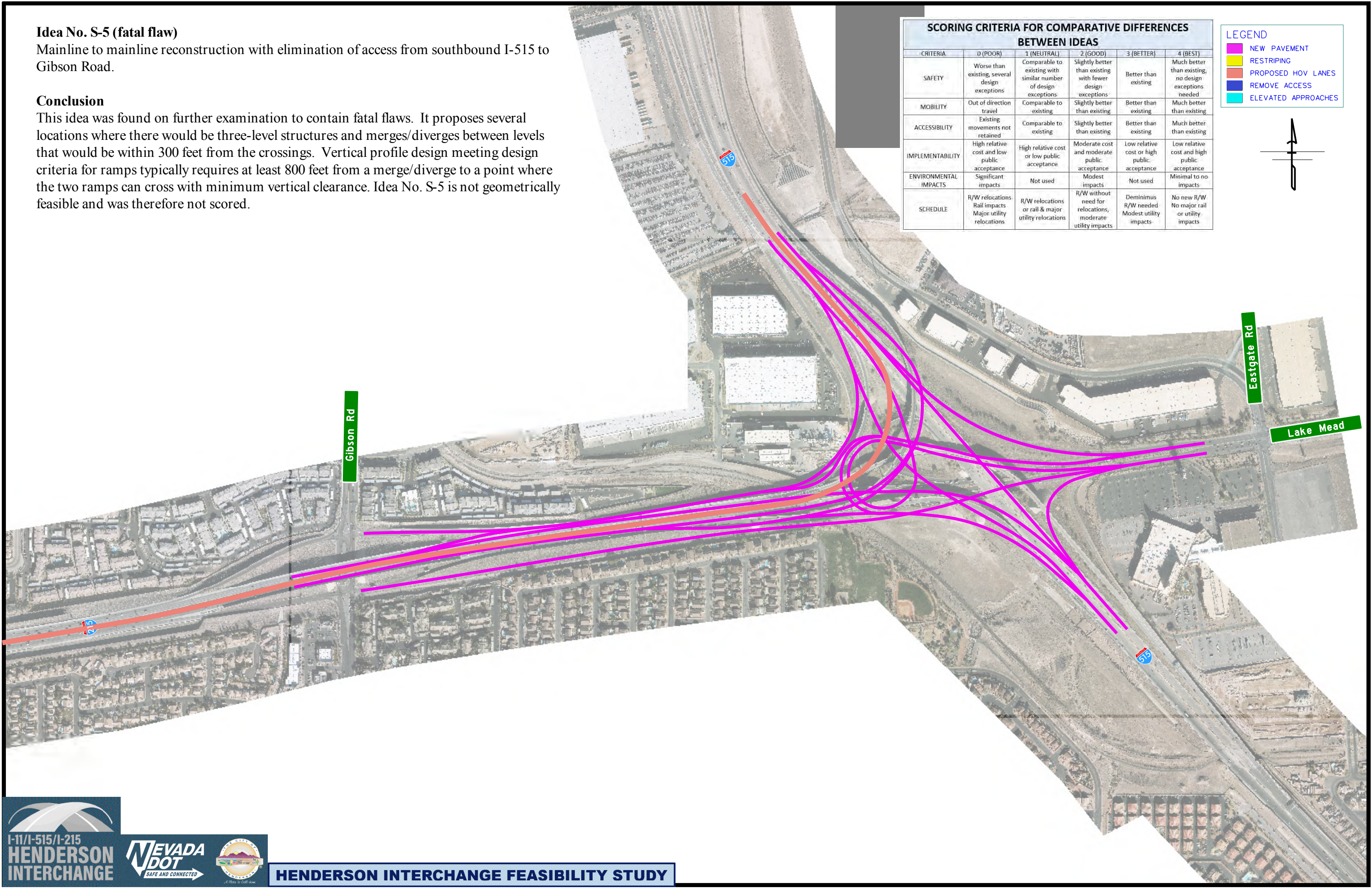
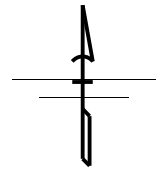
Mainline to mainline reconstruction with elimination of access from southbound I-515 to Gibson Road.

**Conclusion**

This idea was found on further examination to contain fatal flaws. It proposes several locations where there would be three-level structures and merges/diverges between levels that would be within 300 feet from the crossings. Vertical profile design meeting design criteria for ramps typically requires at least 800 feet from a merge/diverge to a point where the two ramps can cross with minimum vertical clearance. Idea No. S-5 is not geometrically feasible and was therefore not scored.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Demimimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

LEGEND	
	NEW PAVEMENT
	RESTRIPING
	PROPOSED HOV LANES
	REMOVE ACCESS
	ELEVATED APPROACHES





- LEGEND - DESCRIPTION

NEW PAVEMENT

BRIDGE

HOV LANES

Modified rotary – the proposed solution removed the service interchange traffic by separating it onto a separate system of collector-distributor type roadways that carry all the traffic bound to or coming from Lake Mead Pkwy, Auto Show Drive and Gibson Road. Multiple options for the Gibson and Auto Show interchanges can be considered separately and do not affect the selection of a Lake Mead interchange option. The system components of the Henderson Interchange remain largely the same and improves the southbound to westbound and eastbound to northbound ramps to two lanes each. The service interchange is operationally separated from the system movements. In the case of the modified rotary, these service movements go through a series of two phase signals.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**Idea No. S-6 (not recommended for further consideration)**

Eastbound traffic headed to Lake Mead Parkway would exit from I-215 west of the system interchange, and remaining I-215 lanes would subsequently fork. Lake Mead Parkway traffic would be carried by an arterial couplet with a service interchange at I-515 as proposed by SNTS Alternative 2. The service interchange would be controlled by four two-phase traffic signals spaced approximately 800' apart in the east-west direction and 300-400 feet apart in the north-south direction. The easternmost signal would be approximately one-quarter mile west of the Eastgate Road signal.

**Screening Evaluation**

Safety	0
Mobility	4
Accessibility	4
Implementability	2
Environmental Impacts	2
Schedule Impacts	2
Overall Performance Average	2.33

**Conclusion**

This idea would require acquisition of right-of-way from the chemical plant in the northwest quadrant (either fee or aerial easement for structure). While right-of-way acquisition is not a fatal flaw, this idea scored lower than other ideas (2.33 out of 4) due to diminished safety by adding traffic signals west of Eastgate Road; high relative cost due to right-of-way acquisition and viaduct over the chemical plant; low public acceptance of the additional signals; potential environmental mitigation or remediation at the chemical plant, and impacts to schedule that result from right-of-way acquisition. Idea No. S-6 is not recommended for further analysis.





**Idea No. S-7 (carry forward)**

Single point urban interchange (SPUI) for service movements at Lake Mead Parkway and I-515 with other system-to-system movements carried by directional ramps. On further examination, it was found that only the southbound I-515 off-ramp to Lake Mead Parkway and the southbound I-515 on-ramp from Lake Mead Parkway would need to be served by the SPUI, negating the need to reconstruct the I-515 bridges over Lake Mead Parkway in order to accommodate a single signal. HOV lanes on I-215 and I-515 would be connected through the interchange on a flyover structure.

**Screening Evaluation**

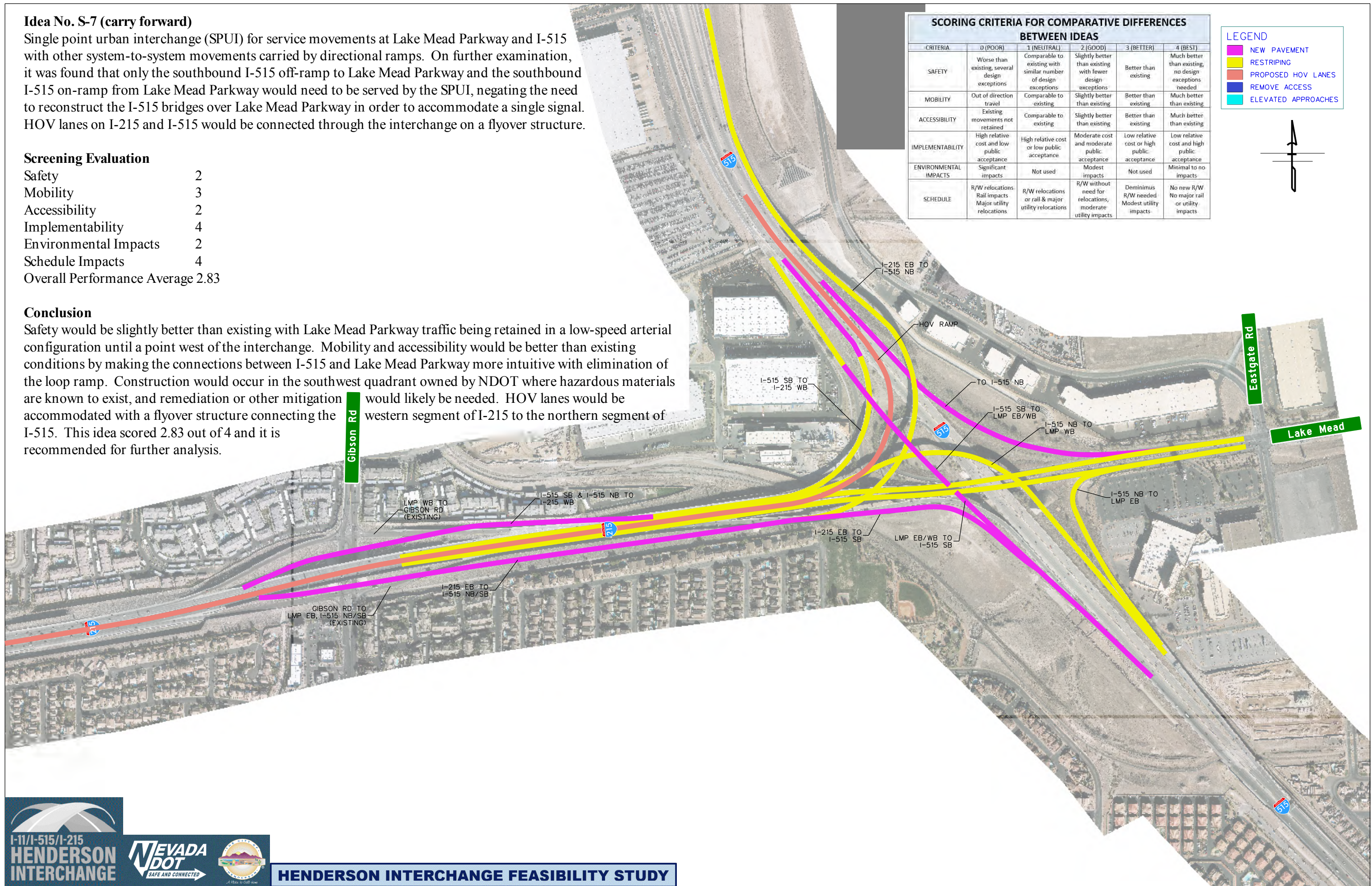
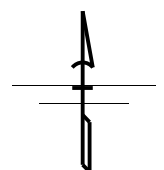
Safety	2
Mobility	3
Accessibility	2
Implementability	4
Environmental Impacts	2
Schedule Impacts	4
Overall Performance Average	2.83

**Conclusion**

Safety would be slightly better than existing with Lake Mead Parkway traffic being retained in a low-speed arterial configuration until a point west of the interchange. Mobility and accessibility would be better than existing conditions by making the connections between I-515 and Lake Mead Parkway more intuitive with elimination of the loop ramp. Construction would occur in the southwest quadrant owned by NDOT where hazardous materials are known to exist, and remediation or other mitigation would likely be needed. HOV lanes would be accommodated with a flyover structure connecting the western segment of I-215 to the northern segment of I-515. This idea scored 2.83 out of 4 and it is recommended for further analysis.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost or low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

LEGEND	
<span style="color: magenta;">█</span>	NEW PAVEMENT
<span style="color: yellow;">█</span>	RESTRIPING
<span style="color: orange;">█</span>	PROPOSED HOV LANES
<span style="color: blue;">█</span>	REMOVE ACCESS
<span style="color: cyan;">█</span>	ELEVATED APPROACHES





**Idea No. S-8 (carry forward)**

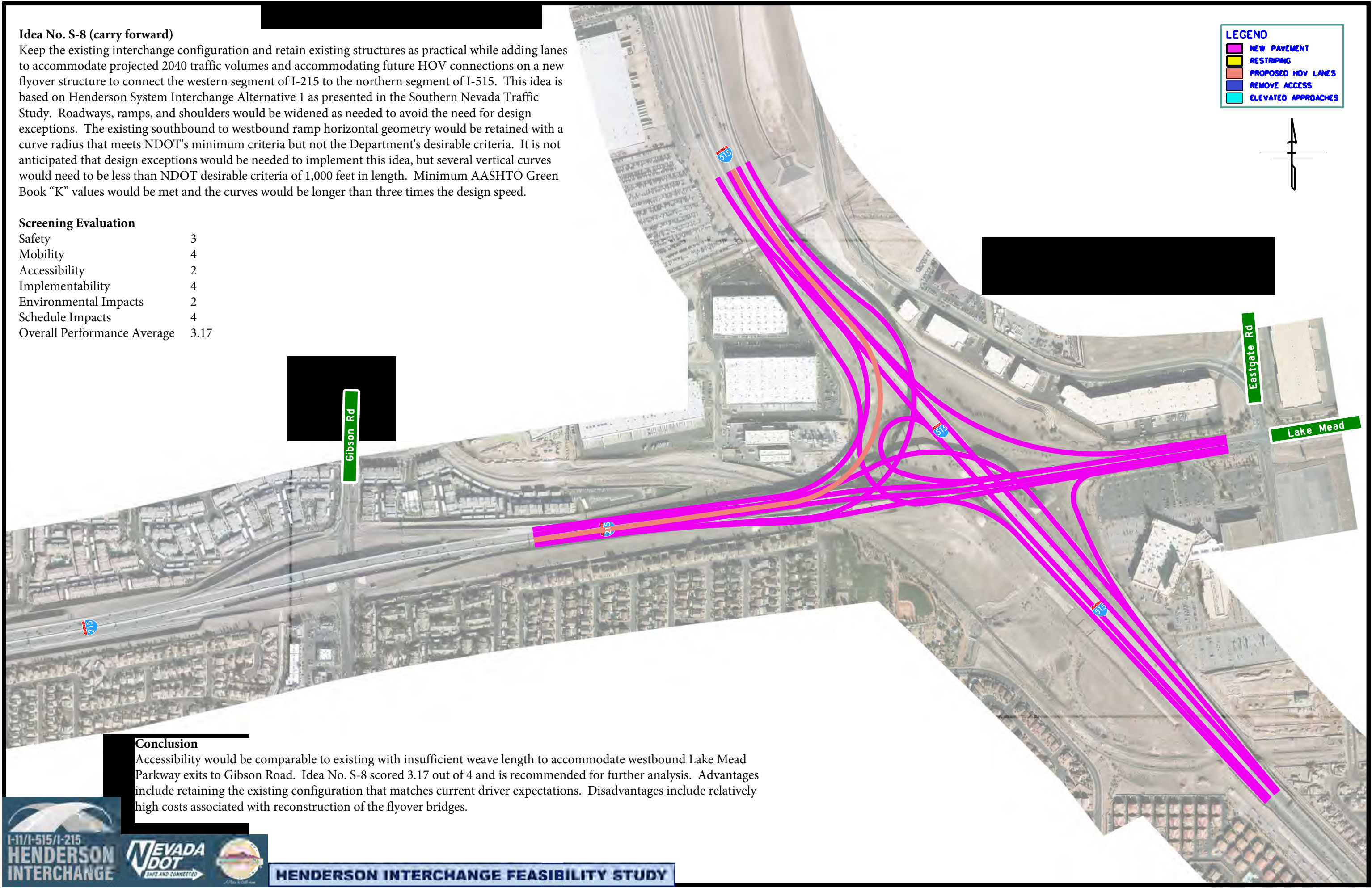
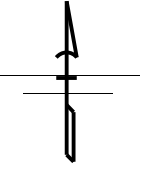
Keep the existing interchange configuration and retain existing structures as practical while adding lanes to accommodate projected 2040 traffic volumes and accommodating future HOV connections on a new flyover structure to connect the western segment of I-215 to the northern segment of I-515. This idea is based on Henderson System Interchange Alternative 1 as presented in the Southern Nevada Traffic Study. Roadways, ramps, and shoulders would be widened as needed to avoid the need for design exceptions. The existing southbound to westbound ramp horizontal geometry would be retained with a curve radius that meets NDOT's minimum criteria but not the Department's desirable criteria. It is not anticipated that design exceptions would be needed to implement this idea, but several vertical curves would need to be less than NDOT desirable criteria of 1,000 feet in length. Minimum AASHTO Green Book "K" values would be met and the curves would be longer than three times the design speed.

**Screening Evaluation**

Safety	3
Mobility	4
Accessibility	2
Implementability	4
Environmental Impacts	2
Schedule Impacts	4
Overall Performance Average	3.17

**LEGEND**

- NEW PAVEMENT
- RESTRIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES



**Conclusion**

Accessibility would be comparable to existing with insufficient weave length to accommodate westbound Lake Mead Parkway exits to Gibson Road. Idea No. S-8 scored 3.17 out of 4 and is recommended for further analysis. Advantages include retaining the existing configuration that matches current driver expectations. Disadvantages include relatively high costs associated with reconstruction of the flyover bridges.





**Idea No. S-9 (combined with other ideas and not scored separately)**

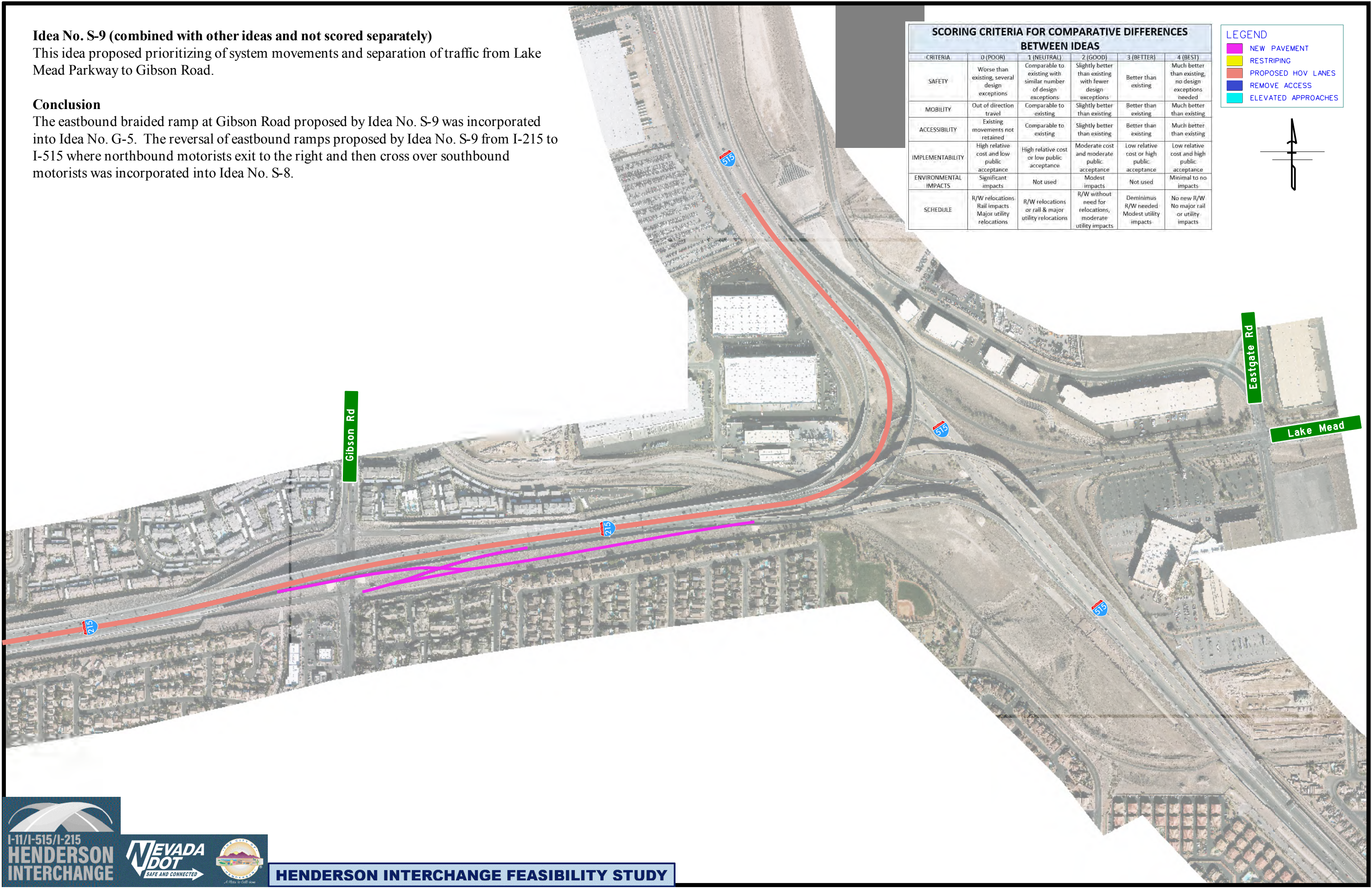
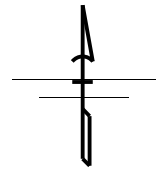
This idea proposed prioritizing of system movements and separation of traffic from Lake Mead Parkway to Gibson Road.

**Conclusion**

The eastbound braided ramp at Gibson Road proposed by Idea No. S-9 was incorporated into Idea No. G-5. The reversal of eastbound ramps proposed by Idea No. S-9 from I-215 to I-515 where northbound motorists exit to the right and then cross over southbound motorists was incorporated into Idea No. S-8.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations, Rail impacts, Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed, Modest utility impacts	No new R/W, No major rail or utility impacts

LEGEND	
<span style="color: magenta;">■</span>	NEW PAVEMENT
<span style="color: yellow;">■</span>	RESTRIPING
<span style="color: orange;">■</span>	PROPOSED HOV LANES
<span style="color: blue;">■</span>	REMOVE ACCESS
<span style="color: cyan;">■</span>	ELEVATED APPROACHES





**Idea No. G-1 (carry forward)**

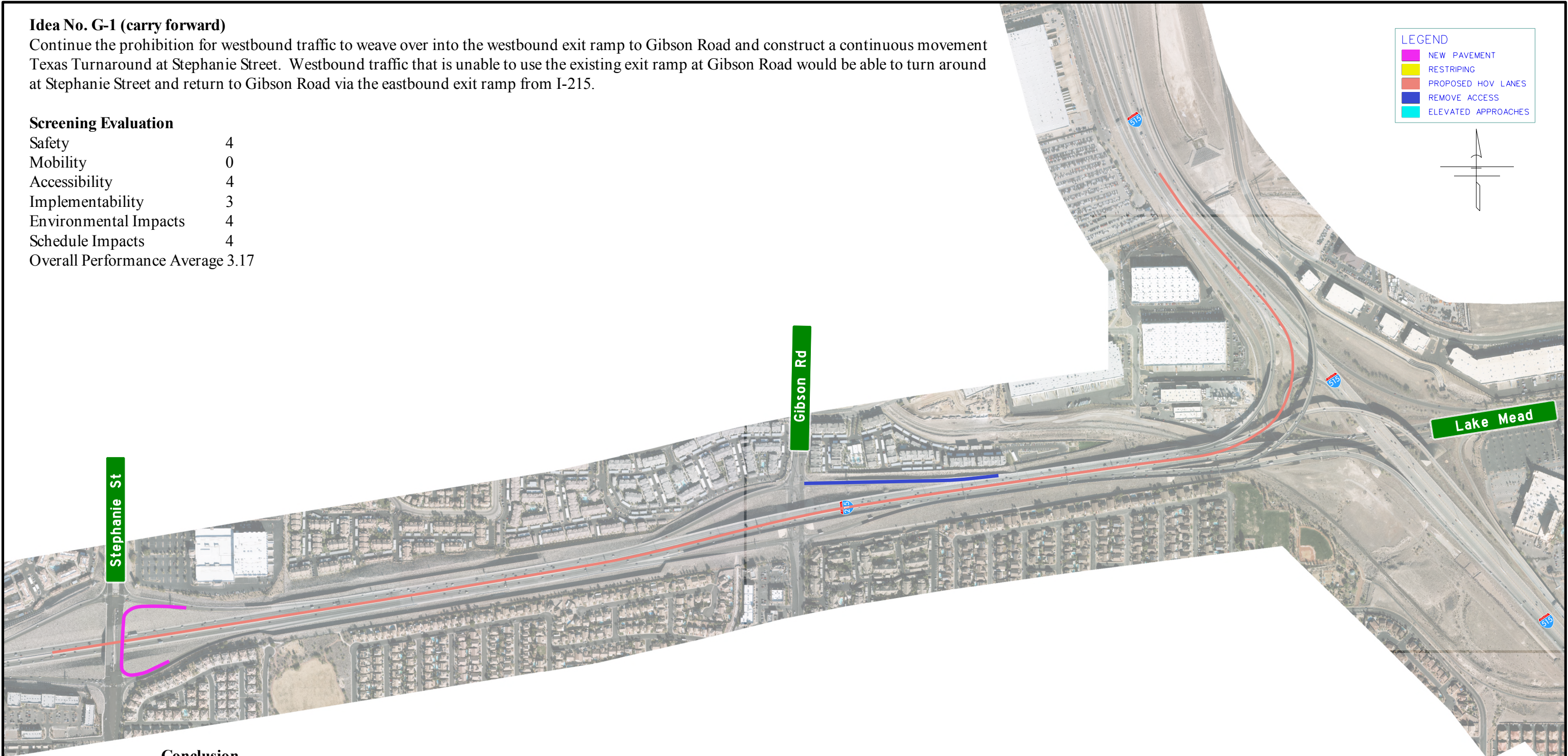
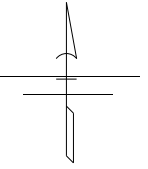
Continue the prohibition for westbound traffic to weave over into the westbound exit ramp to Gibson Road and construct a continuous movement Texas Turnaround at Stephanie Street. Westbound traffic that is unable to use the existing exit ramp at Gibson Road would be able to turn around at Stephanie Street and return to Gibson Road via the eastbound exit ramp from I-215.

**Screening Evaluation**

Safety	4
Mobility	0
Accessibility	4
Implementability	3
Environmental Impacts	4
Schedule Impacts	4
Overall Performance Average	3.17

**LEGEND**

- NEW PAVEMENT
- RESTRIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES



**Conclusion**

While common on Texas freeways to improve frontage road access, this idea has not been implemented to date in Nevada. Clear and concise signing and a robust public information program would be helpful in introducing this concept to motorists prior to implementation in the field. Signing would be warranted for both the motorists using the turnaround and the eastbound motorists entering from Stephanie Street who would merge with the turnaround traffic prior to merging with eastbound I-215 traffic. Safety would be improved by providing for a way to access Gibson Road without need for design exceptions. This idea would require out of direction travel on the order of 2.25 miles, and public acceptance would be diminished by this extra distance and time. Relative cost would be low, and this idea could be constructed within existing right-of-way. This idea scored 3.17 out of 4 and could be paired with any of the feasible system-to-system interchange ideas. Idea No. G-1 is recommended for further analysis.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations Major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts





**Idea No. G-2 (fatal flaw)**

Access from westbound Lake Mead Parkway to Gibson Road would be from a ramp that elevates beginning at the UPRR spur crossing up and over WB I-215 traffic using straddle bents, and then merges with the WB I-215 off ramp to Gibson Road.

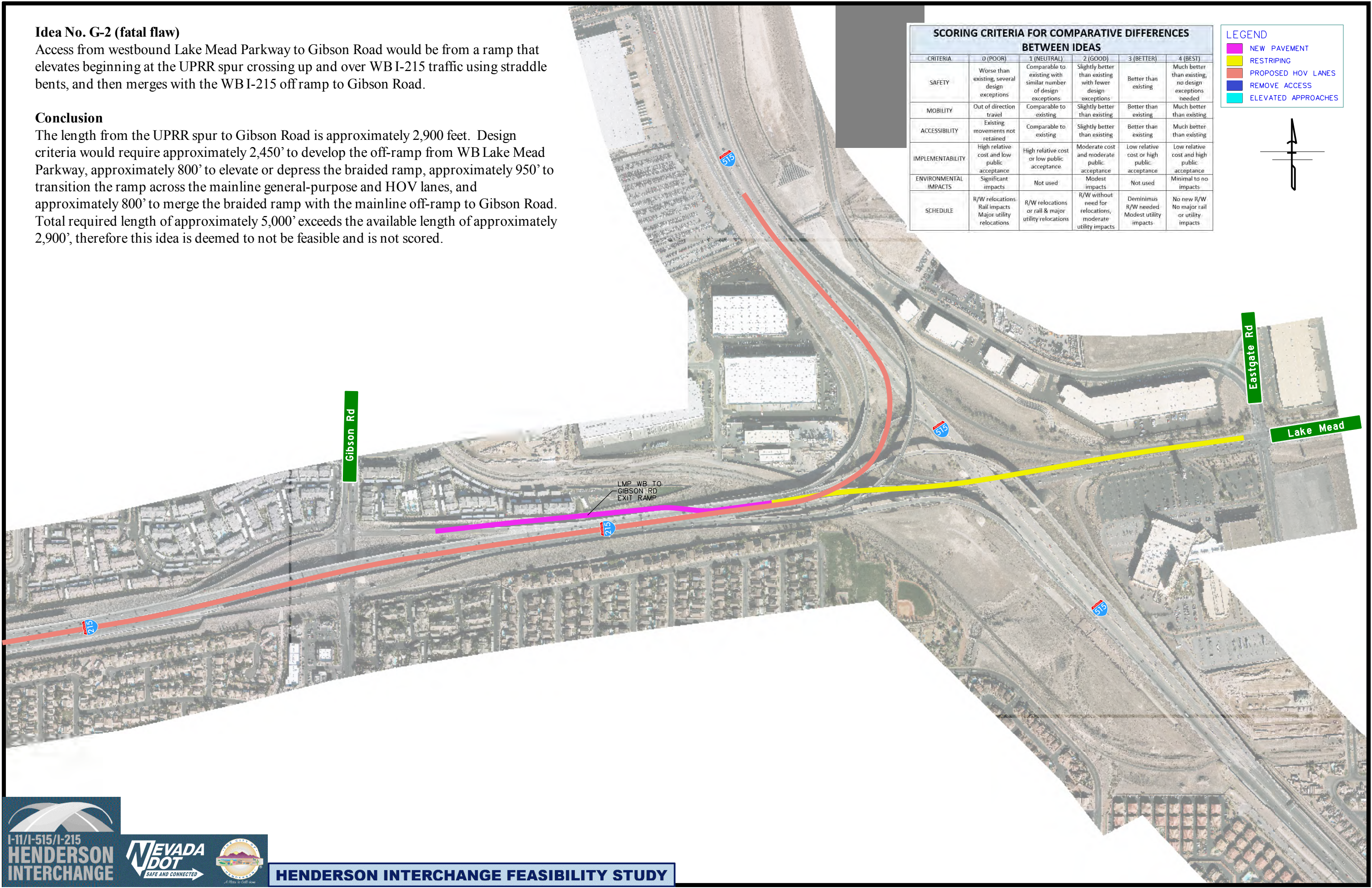
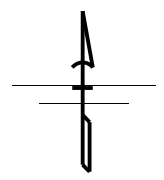
**Conclusion**

The length from the UPRR spur to Gibson Road is approximately 2,900 feet. Design criteria would require approximately 2,450' to develop the off-ramp from WB Lake Mead Parkway, approximately 800' to elevate or depress the braided ramp, approximately 950' to transition the ramp across the mainline general-purpose and HOV lanes, and approximately 800' to merge the braided ramp with the mainline off-ramp to Gibson Road. Total required length of approximately 5,000' exceeds the available length of approximately 2,900', therefore this idea is deemed to not be feasible and is not scored.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES





**Idea No. G-3 (not recommended for further consideration)**

Eliminate the westbound exit to Gibson Road for all motorists, and construct a separate roadway parallel to I-215/Lake Mead Parkway for eastbound traffic traveling from Gibson Road to Eastgate Road.

**Screening Evaluation**

Safety	2
Mobility	2
Accessibility	0
Implementability	2
Environmental Impacts	2
Schedule Impacts	1
Overall Performance Average	1.50

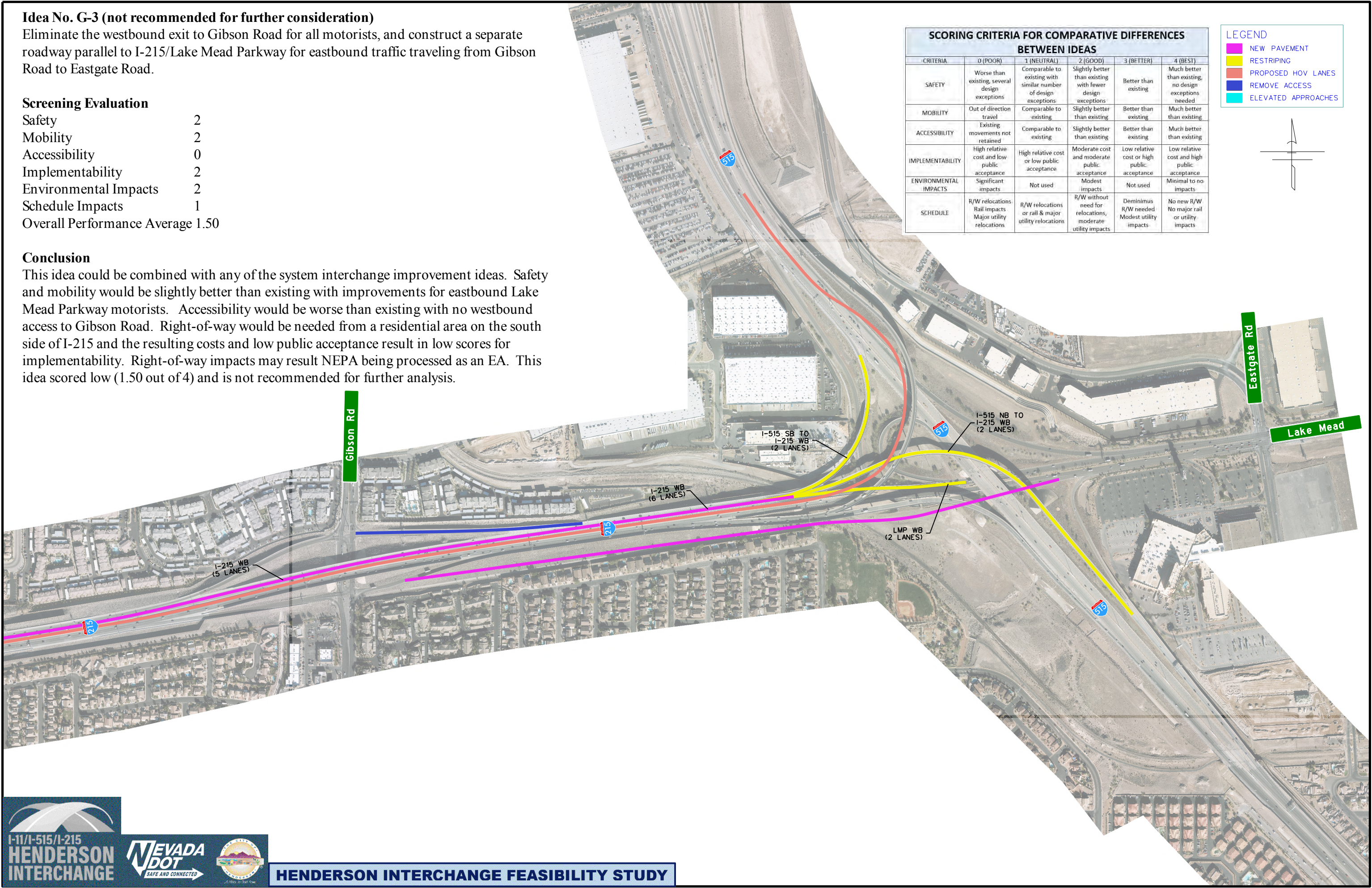
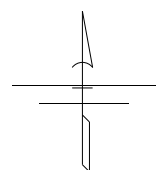
**Conclusion**

This idea could be combined with any of the system interchange improvement ideas. Safety and mobility would be slightly better than existing with improvements for eastbound Lake Mead Parkway motorists. Accessibility would be worse than existing with no westbound access to Gibson Road. Right-of-way would be needed from a residential area on the south side of I-215 and the resulting costs and low public acceptance result in low scores for implementability. Right-of-way impacts may result NEPA being processed as an EA. This idea scored low (1.50 out of 4) and is not recommended for further analysis.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**LEGEND**

- █ NEW PAVEMENT
- █ RESTRIPIPING
- █ PROPOSED HOV LANES
- █ REMOVE ACCESS
- █ ELEVATED APPROACHES





**Idea No. G-4 (not recommended for further consideration)**

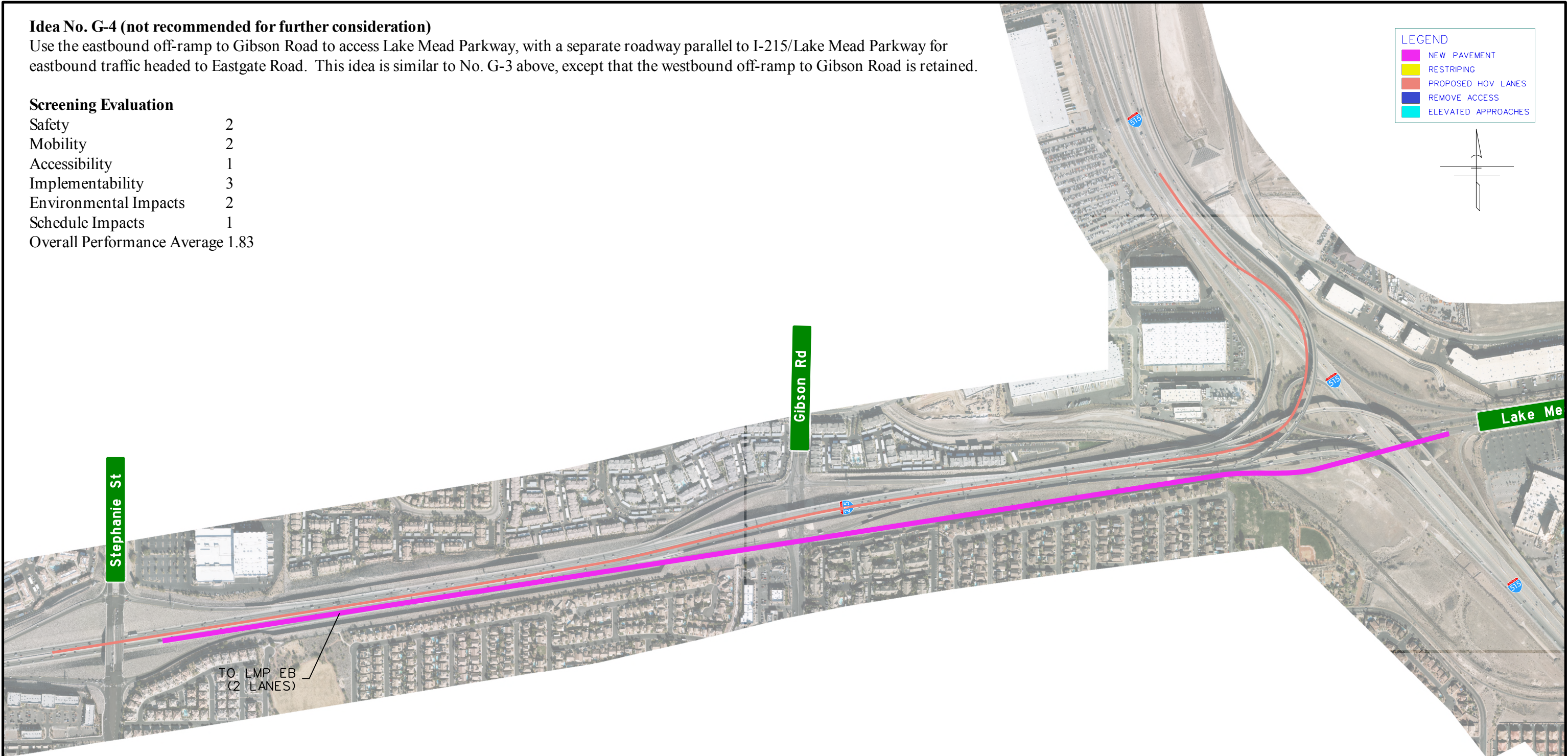
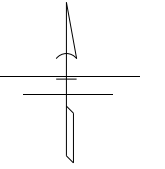
Use the eastbound off-ramp to Gibson Road to access Lake Mead Parkway, with a separate roadway parallel to I-215/Lake Mead Parkway for eastbound traffic headed to Eastgate Road. This idea is similar to No. G-3 above, except that the westbound off-ramp to Gibson Road is retained.

**Screening Evaluation**

Safety	2
Mobility	2
Accessibility	1
Implementability	3
Environmental Impacts	2
Schedule Impacts	1
Overall Performance Average	1.83

**LEGEND**

<span style="color: magenta;">█</span>	NEW PAVEMENT
<span style="color: yellow;">█</span>	RESTRIPING
<span style="color: orange;">█</span>	PROPOSED HOV LANES
<span style="color: blue;">█</span>	REMOVE ACCESS
<span style="color: cyan;">█</span>	ELEVATED APPROACHES



**Conclusion**

Safety and mobility would be slightly better than existing with improvements for eastbound Lake Mead Parkway motorists. Accessibility would be comparable to existing with no westbound access to Gibson Road from Lake Mead Parkway. Right-of-way would be needed from a residential area on the south side of I-215 and the resulting costs and low public acceptance result in low scores for implementability. Right-of-way impacts may result NEPA being processed as an EA. This idea scored low (1.83 out of 4) and is not recommended for further analysis.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations, Rail impacts, Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed, Modest utility impacts	No new R/W, No major rail or utility impacts





**Idea No. G-5 (carry forward)**

Construct braided ramps westbound to Gibson Road and eastbound from Gibson Road to connect with central lanes leading to and from Lake Mead Parkway.

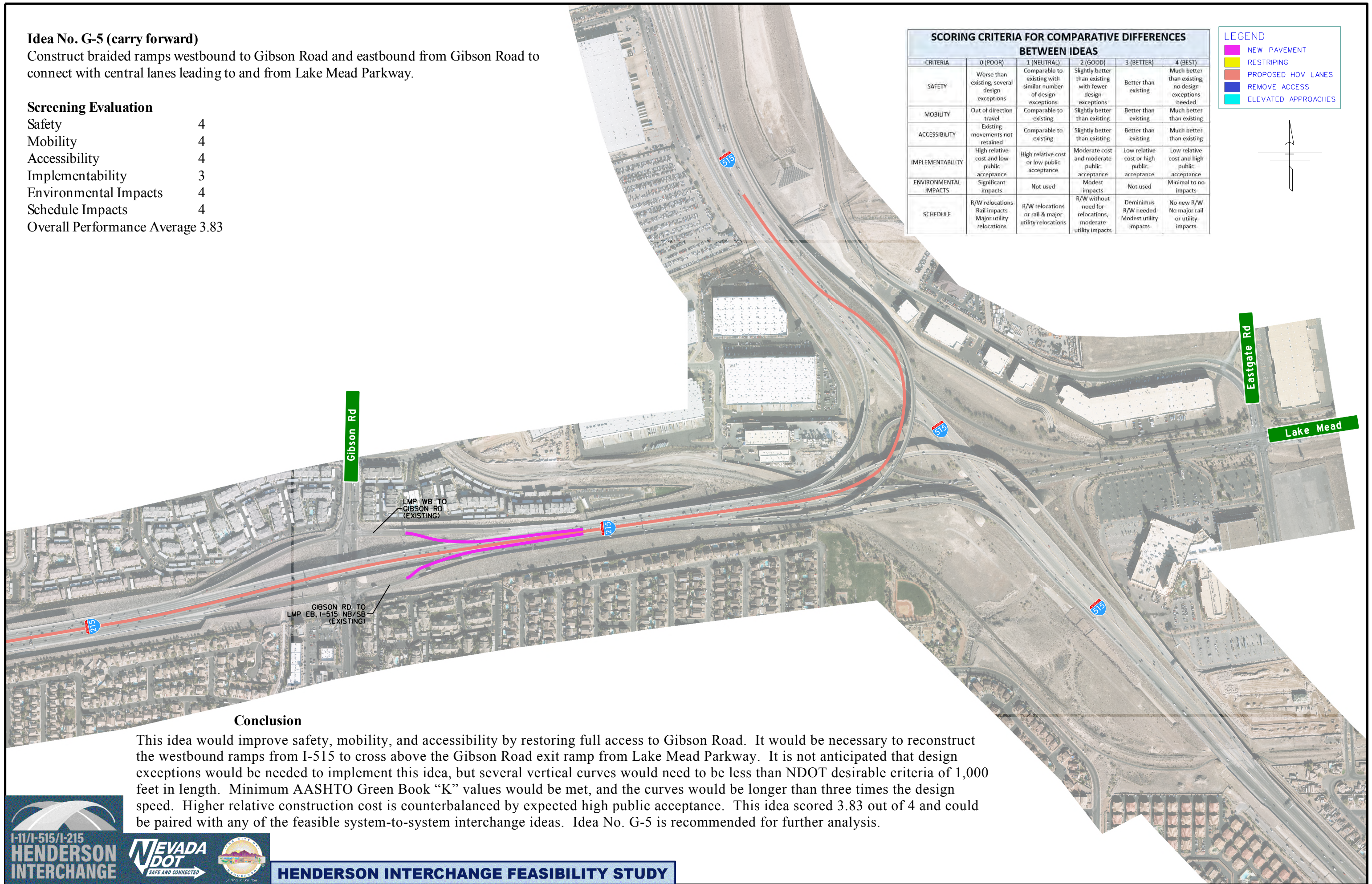
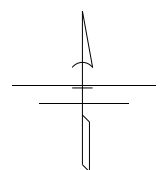
**Screening Evaluation**

Safety	4
Mobility	4
Accessibility	4
Implementability	3
Environmental Impacts	4
Schedule Impacts	4
<b>Overall Performance Average</b>	<b>3.83</b>

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations, Rail impacts, Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed, Modest utility impacts	No new R/W, No major rail or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES



**Conclusion**

This idea would improve safety, mobility, and accessibility by restoring full access to Gibson Road. It would be necessary to reconstruct the westbound ramps from I-515 to cross above the Gibson Road exit ramp from Lake Mead Parkway. It is not anticipated that design exceptions would be needed to implement this idea, but several vertical curves would need to be less than NDOT desirable criteria of 1,000 feet in length. Minimum AASHTO Green Book “K” values would be met, and the curves would be longer than three times the design speed. Higher relative construction cost is counterbalanced by expected high public acceptance. This idea scored 3.83 out of 4 and could be paired with any of the feasible system-to-system interchange ideas. Idea No. G-5 is recommended for further analysis.





**Idea No. G-6 (carry forward)**

Develop an exit from eastbound I-215 to both Gibson Road and southbound I-515 west of Gibson Road, with a subsequent fork between Gibson Road and southbound I-515. A collector-distributor (CD) road would be constructed south of and parallel to I-215 leading to southbound I-515. The eastbound on ramp from Gibson Road would have the option to enter eastbound I-215 that would lead to northbound I-515 and Lake Mead Parkway, or to enter the CD road toward southbound I-515.

**Screening Evaluation**

Safety	3
Mobility	2
Accessibility	3
Implementability	2
Environmental Impacts	4
Schedule Impacts	4
Overall Performance Average	3.00

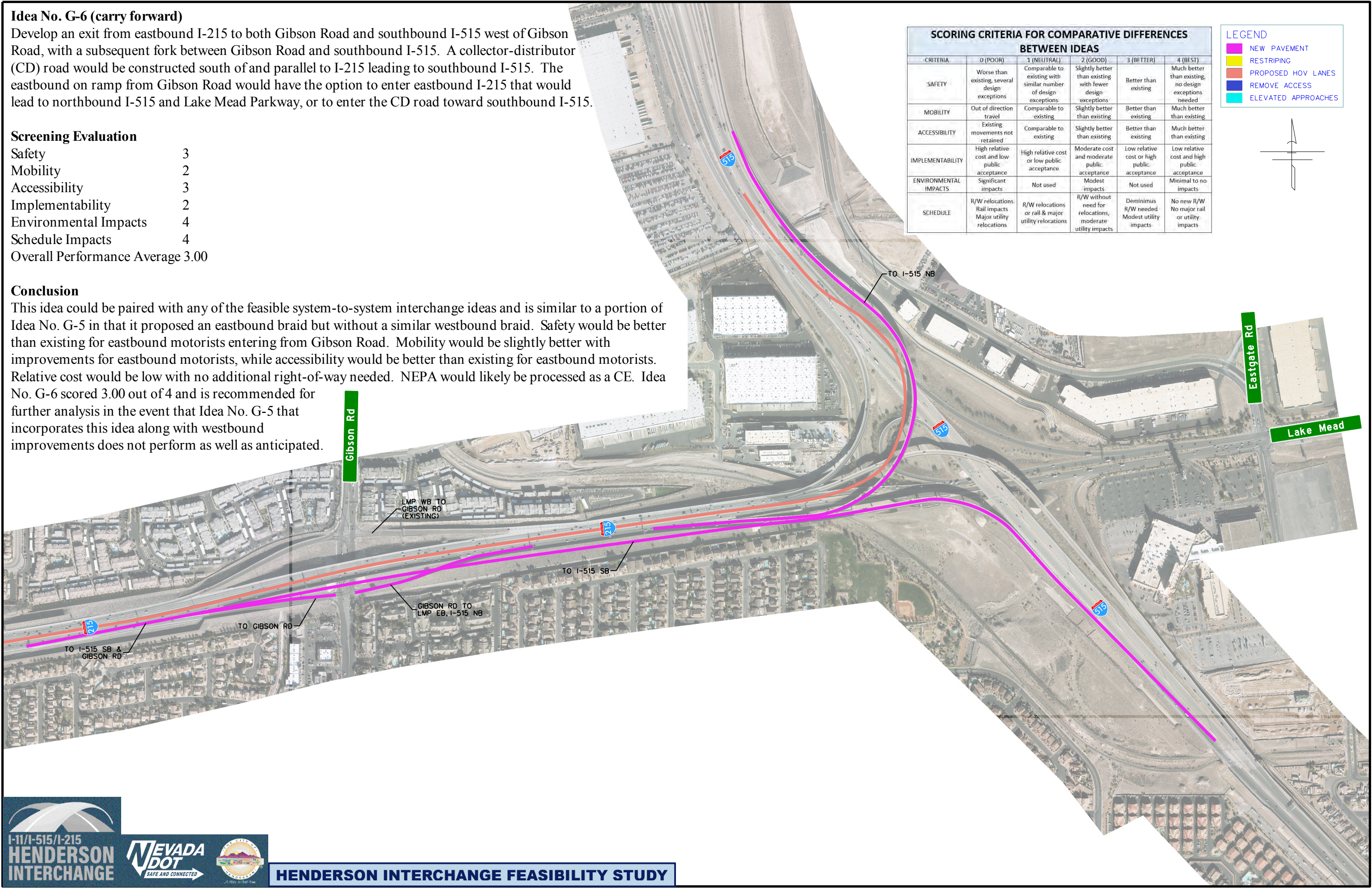
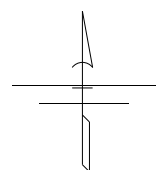
**Conclusion**

This idea could be paired with any of the feasible system-to-system interchange ideas and is similar to a portion of Idea No. G-5 in that it proposed an eastbound braid but without a similar westbound braid. Safety would be better than existing for eastbound motorists entering from Gibson Road. Mobility would be slightly better with improvements for eastbound motorists, while accessibility would be better than existing for eastbound motorists. Relative cost would be low with no additional right-of-way needed. NEPA would likely be processed as a CE. Idea No. G-6 scored 3.00 out of 4 and is recommended for further analysis in the event that Idea No. G-5 that incorporates this idea along with westbound improvements does not perform as well as anticipated.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**LEGEND**

- █ NEW PAVEMENT
- █ RESTRIPIING
- █ PROPOSED HOV LANES
- █ REMOVE ACCESS
- █ ELEVATED APPROACHES





**Idea No. G-7 (fatal flaw)**

Realign westbound Lake Mead Parkway to be north of and parallel to I-215 from the west side of I-515 through Gibson Road. Westbound Lake Mead Parkway would then continue onto WB I-215. A slip ramp would be provided to Gibson Road from westbound Lake Mead Parkway. The length from the diverge point to the slip ramp would be approximately 1,900’.

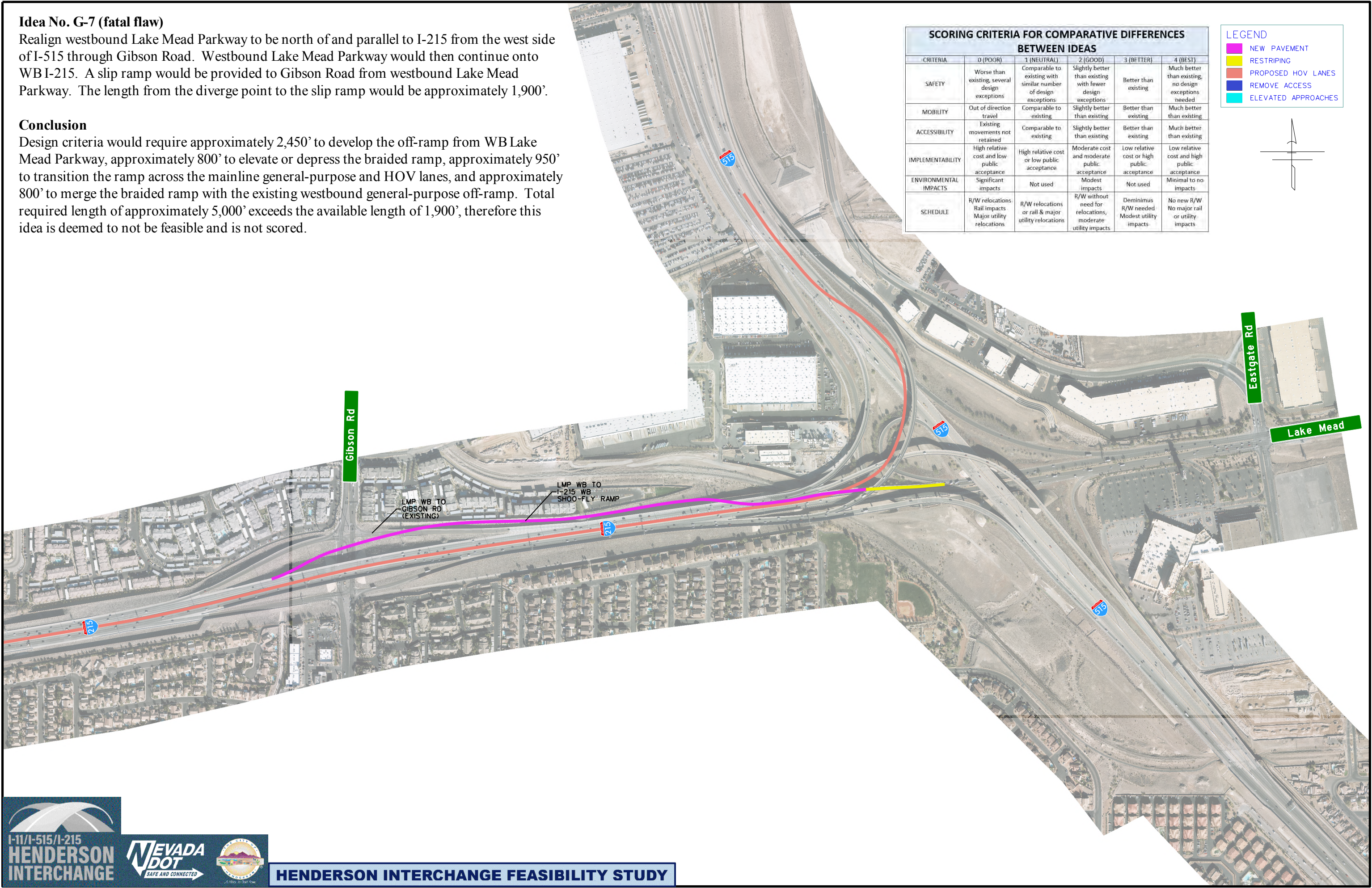
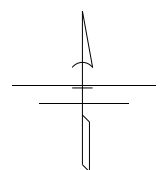
**Conclusion**

Design criteria would require approximately 2,450’ to develop the off-ramp from WB Lake Mead Parkway, approximately 800’ to elevate or depress the braided ramp, approximately 950’ to transition the ramp across the mainline general-purpose and HOV lanes, and approximately 800’ to merge the braided ramp with the existing westbound general-purpose off-ramp. Total required length of approximately 5,000’ exceeds the available length of 1,900’, therefore this idea is deemed to not be feasible and is not scored.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES





**Idea No. G-8 (not recommended for further consideration)**

Construct a median opening between EB and WBI-215 at Gibson Road to allow right-in and right-out access to ramps leading to and from Lake Mead Parkway. Left turns from westbound Lake Mead Parkway to southbound Gibson Road would be prohibited, as would left turns from southbound Gibson Road to eastbound Lake Mead Parkway. Median HOV lanes would need to be adjacent to the general-purpose lanes, with the median opening between opposing HOV lanes. Design criteria would require approximately 1,050' to develop the median exit or entrance and approximately 800' to elevate or depress the ramp. Required length of approximately 1,850' can be accommodated by the available length of approximately 1,900'.

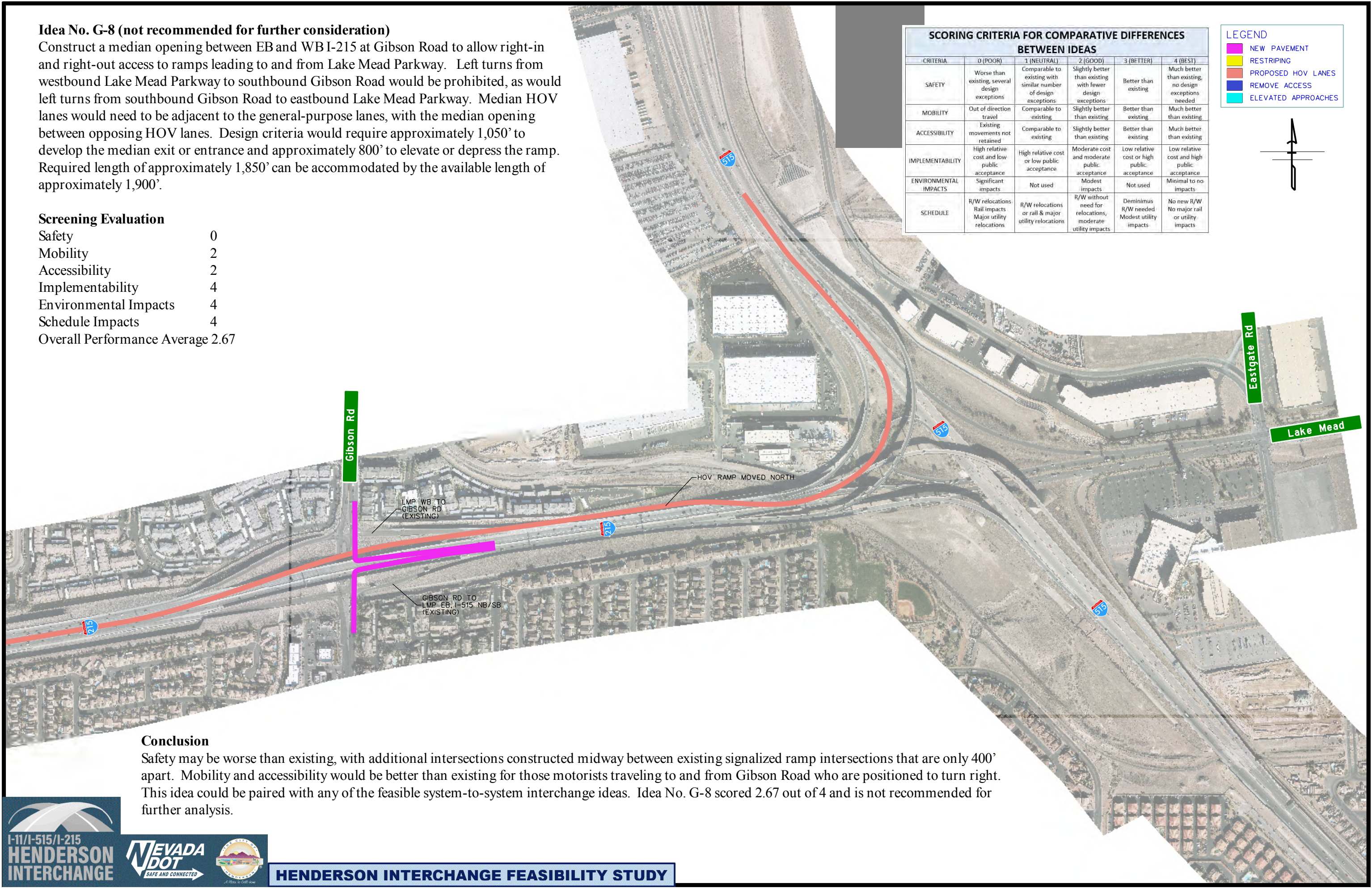
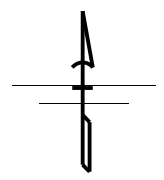
**Screening Evaluation**

Safety	0
Mobility	2
Accessibility	2
Implementability	4
Environmental Impacts	4
Schedule Impacts	4
Overall Performance Average	2.67

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES



**Conclusion**

Safety may be worse than existing, with additional intersections constructed midway between existing signalized ramp intersections that are only 400' apart. Mobility and accessibility would be better than existing for those motorists traveling to and from Gibson Road who are positioned to turn right. This idea could be paired with any of the feasible system-to-system interchange ideas. Idea No. G-8 scored 2.67 out of 4 and is not recommended for further analysis.





**Idea No. G-9 (not recommended for further consideration)**

Accommodate access from westbound Lake Mead Parkway to Gibson Road by reconstructing the NB I-515 ramp to WBI-215 so that it merges with I-215 west of Gibson Road. This would result in an inability for northbound I-515 motorists from accessing Gibson Road, thus solving an access issue for one set of motorists by introducing an access issue to a different set of motorists.

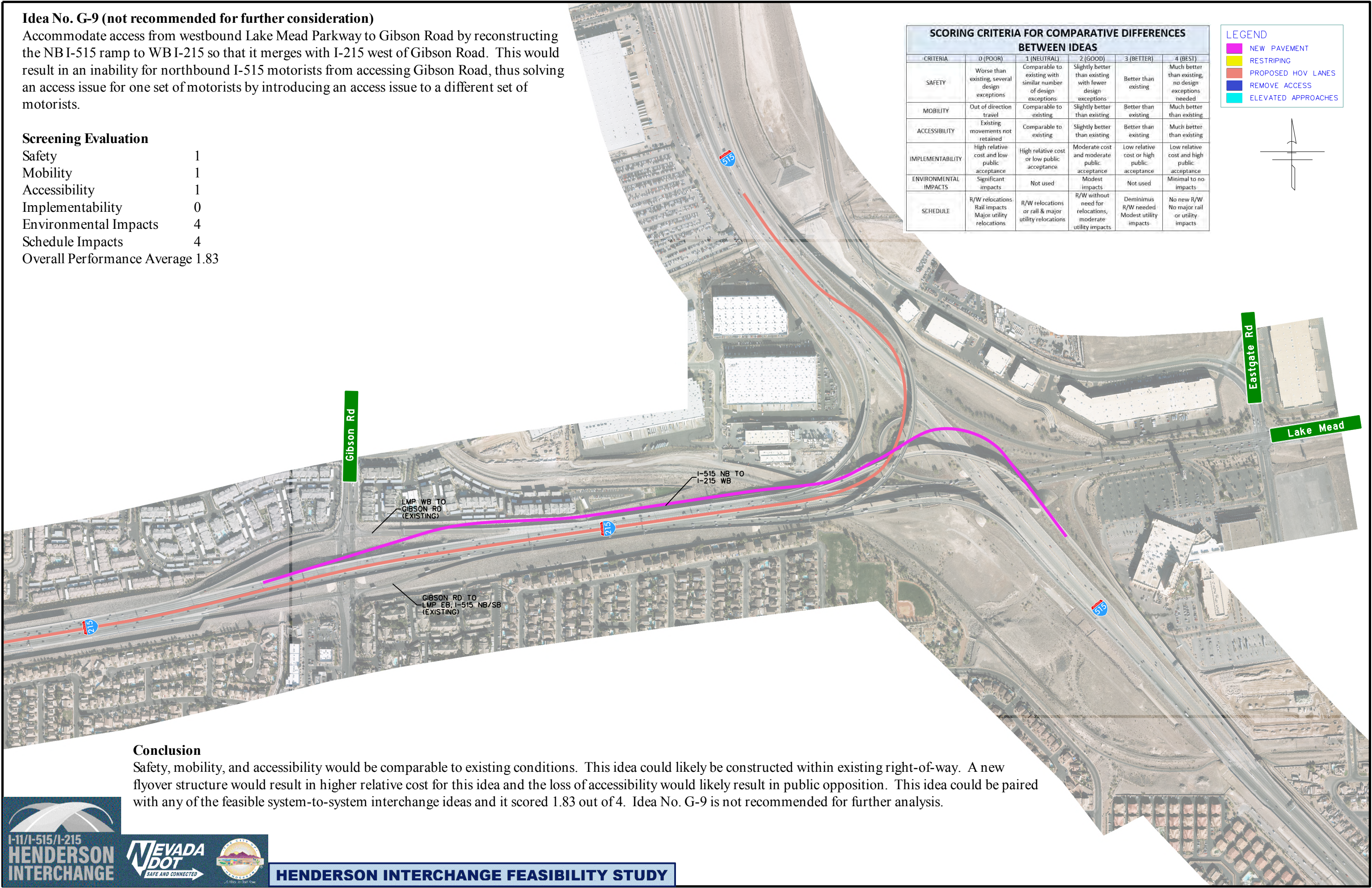
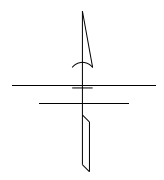
**Screening Evaluation**

Safety	1
Mobility	1
Accessibility	1
Implementability	0
Environmental Impacts	4
Schedule Impacts	4
Overall Performance Average	1.83

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES



**Conclusion**

Safety, mobility, and accessibility would be comparable to existing conditions. This idea could likely be constructed within existing right-of-way. A new flyover structure would result in higher relative cost for this idea and the loss of accessibility would likely result in public opposition. This idea could be paired with any of the feasible system-to-system interchange ideas and it scored 1.83 out of 4. Idea No. G-9 is not recommended for further analysis.





**Idea No. G-10 (combined into Idea No. G-5)**

Develop an exit ramp from EB I-215 to NBI-515 at a point west of the Gibson Road interchange, thus minimizing the eastbound weave ahead of the system interchange.

**Screening Evaluation**

Safety	3
Mobility	2
Accessibility	1
Implementability	1
Environmental Impacts	4
Schedule Impacts	4
Overall Performance Average	2.50

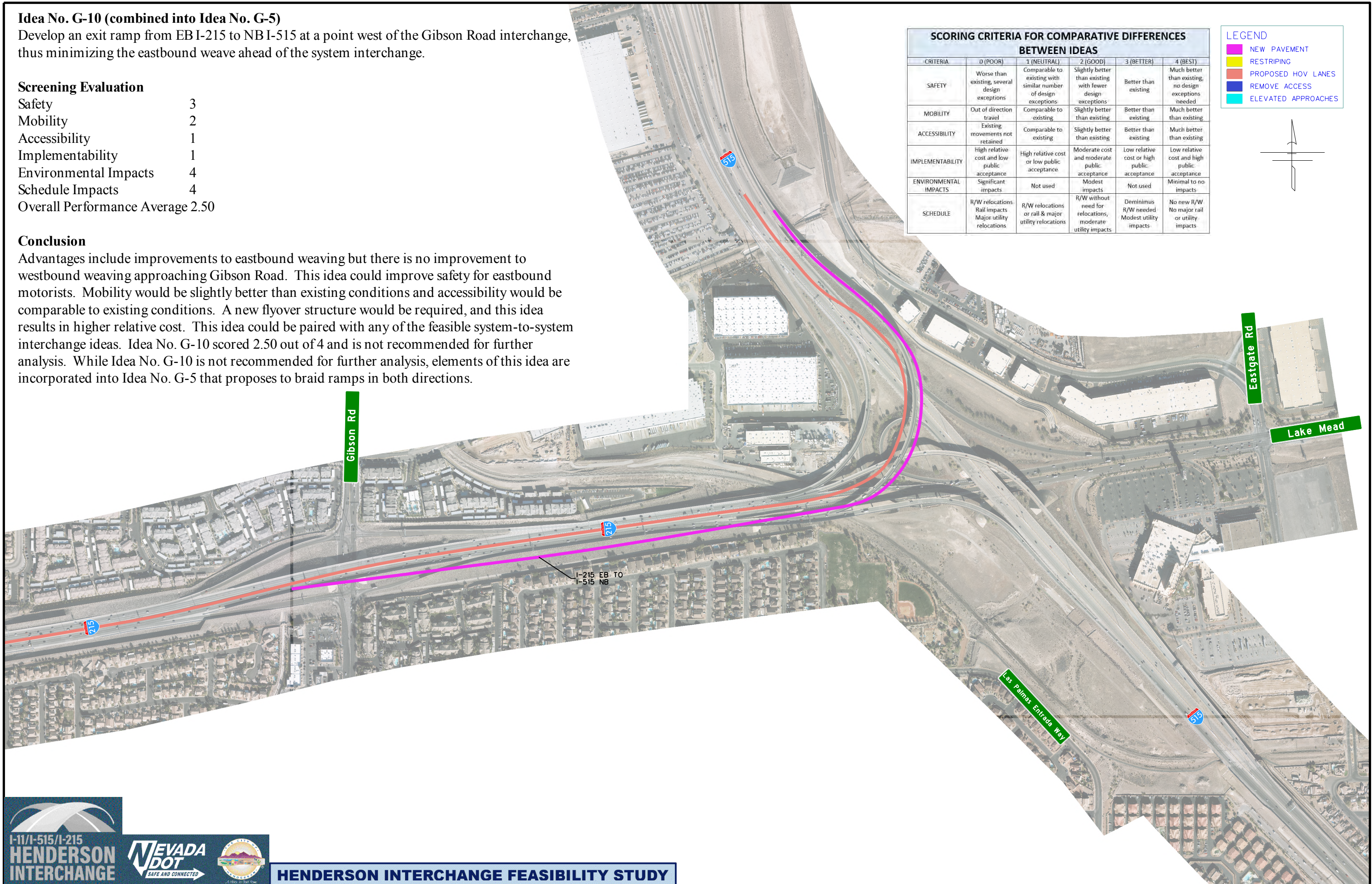
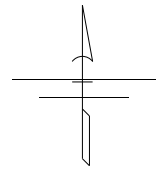
**Conclusion**

Advantages include improvements to eastbound weaving but there is no improvement to westbound weaving approaching Gibson Road. This idea could improve safety for eastbound motorists. Mobility would be slightly better than existing conditions and accessibility would be comparable to existing conditions. A new flyover structure would be required, and this idea results in higher relative cost. This idea could be paired with any of the feasible system-to-system interchange ideas. Idea No. G-10 scored 2.50 out of 4 and is not recommended for further analysis. While Idea No. G-10 is not recommended for further analysis, elements of this idea are incorporated into Idea No. G-5 that proposes to braid ramps in both directions.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES





**Idea No. G-11 (not recommended for further consideration)**

Construct a median opening between eastbound and westbound I-215 at Gibson Road with a full intersection with ramps leading to and from Lake Mead Parkway. This idea would eliminate weaving approaching and departing from Gibson Road. Idea No. G-11 could be paired with any of the feasible system-to-system interchange ideas and would require a new traffic signal midway between the existing signal at existing ramp termini. Signal spacing along Gibson Road would result in a series of three traffic signals spaced at 200 feet. Design criteria would require approximately 1,050 feet to develop the median exit or entrance and approximately 800 feet to elevate or depress the ramp. Required length of approximately 1,850 feet could be accommodated by the available length of approximately 1,900 feet.

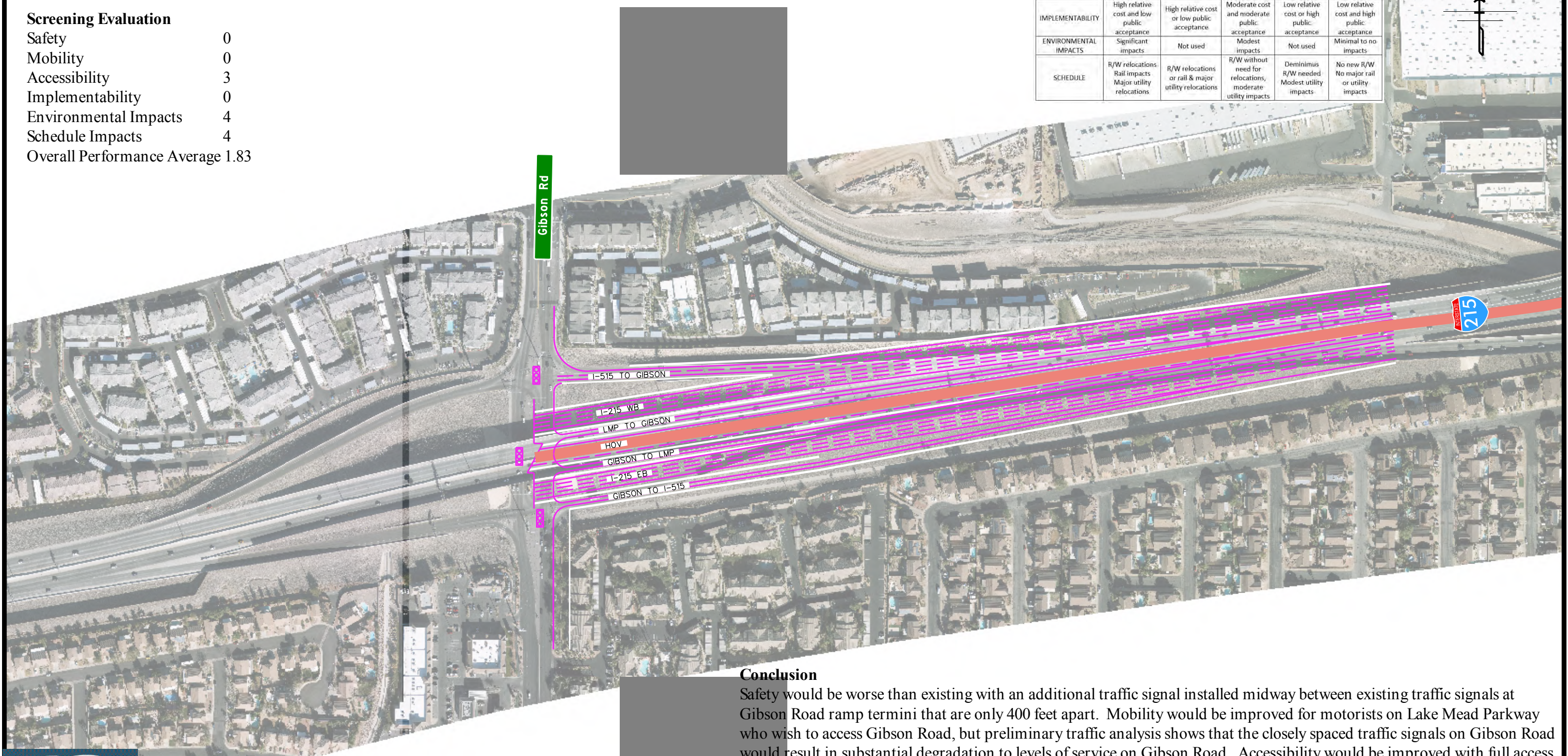
**Screening Evaluation**

Safety	0
Mobility	0
Accessibility	3
Implementability	0
Environmental Impacts	4
Schedule Impacts	4
Overall Performance Average	1.83

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES



**Conclusion**

Safety would be worse than existing with an additional traffic signal installed midway between existing traffic signals at Gibson Road ramp termini that are only 400 feet apart. Mobility would be improved for motorists on Lake Mead Parkway who wish to access Gibson Road, but preliminary traffic analysis shows that the closely spaced traffic signals on Gibson Road would result in substantial degradation to levels of service on Gibson Road. Accessibility would be improved with full access provided to Gibson Road. Higher relative construction cost and low public acceptance of Gibson Road level of service result in a low score for implementability. Idea No. G-11 could be constructed within existing NDOT right-of-way and NEPA is anticipated to be processed as a CE. This idea scored 1.83 out of 4 and is not recommended for further analysis.





**Idea No. G-12 (not recommended for further consideration)**

Construct eastbound and westbound frontage roads parallel to I-215 from Gibson Road to the I-515 underpass to accommodate local traffic on Lake Mead Parkway between Gibson Road and Eastgate Road.

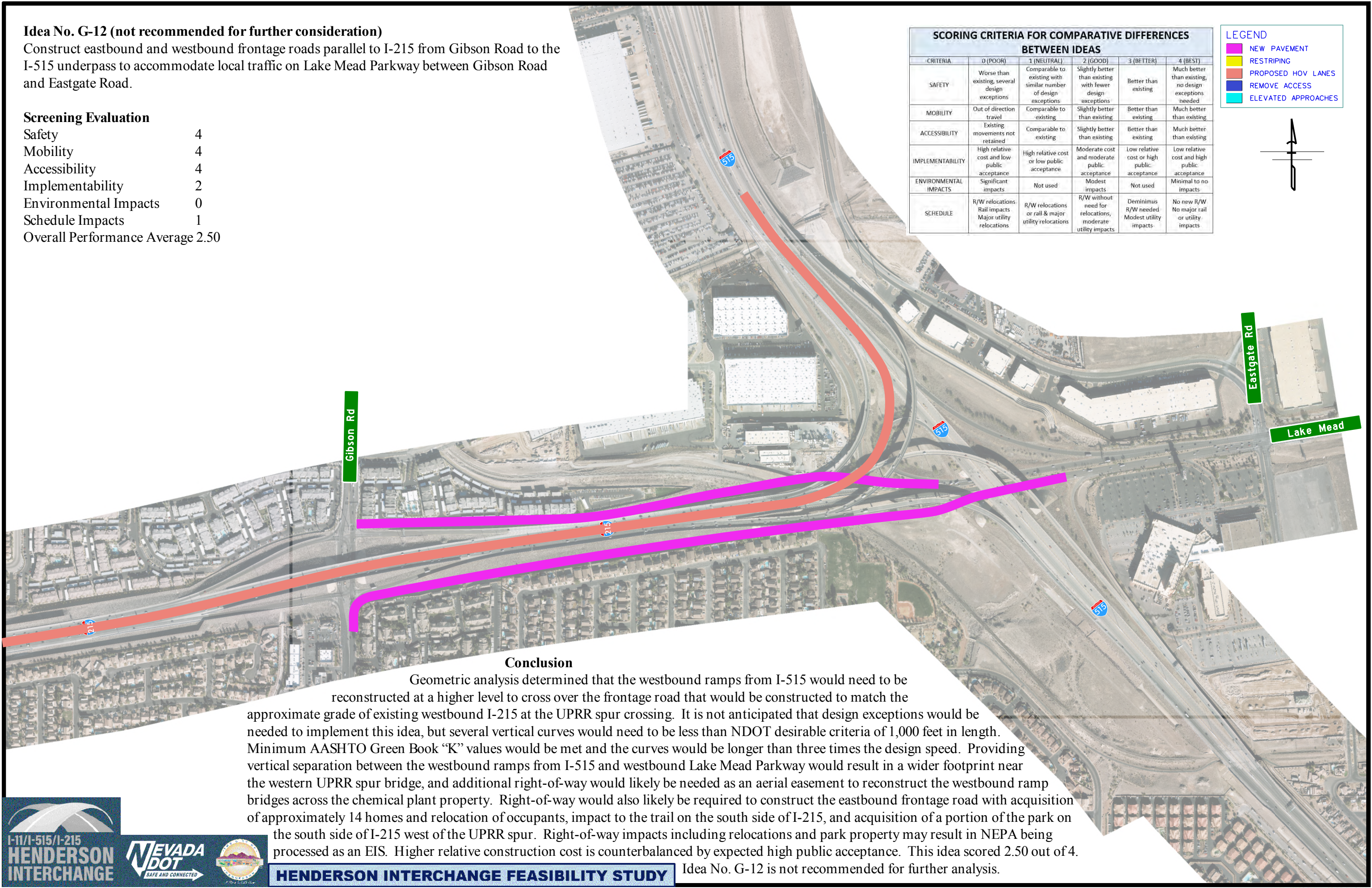
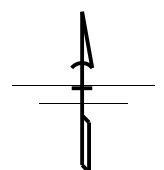
**Screening Evaluation**

Safety	4
Mobility	4
Accessibility	4
Implementability	2
Environmental Impacts	0
Schedule Impacts	1
Overall Performance Average	2.50

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Demimimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**LEGEND**

- █ NEW PAVEMENT
- █ RESTRIPING
- █ PROPOSED HOV LANES
- █ REMOVE ACCESS
- █ ELEVATED APPROACHES



**Conclusion**

Geometric analysis determined that the westbound ramps from I-515 would need to be reconstructed at a higher level to cross over the frontage road that would be constructed to match the approximate grade of existing westbound I-215 at the UPRR spur crossing. It is not anticipated that design exceptions would be needed to implement this idea, but several vertical curves would need to be less than NDOT desirable criteria of 1,000 feet in length. Minimum AASHTO Green Book “K” values would be met and the curves would be longer than three times the design speed. Providing vertical separation between the westbound ramps from I-515 and westbound Lake Mead Parkway would result in a wider footprint near the western UPRR spur bridge, and additional right-of-way would likely be needed as an aerial easement to reconstruct the westbound ramp bridges across the chemical plant property. Right-of-way would also likely be required to construct the eastbound frontage road with acquisition of approximately 14 homes and relocation of occupants, impact to the trail on the south side of I-215, and acquisition of a portion of the park on the south side of I-215 west of the UPRR spur. Right-of-way impacts including relocations and park property may result in NEPA being processed as an EIS. Higher relative construction cost is counterbalanced by expected high public acceptance. This idea scored 2.50 out of 4.

Idea No. G-12 is not recommended for further analysis.





**Idea No. G-13 (not recommended for further consideration)**

Construct an eastbound frontage road parallel to I-215 from Gibson Road to the I-515 underpass to accommodate eastbound local traffic on Lake Mead Parkway between Gibson Road and Eastgate Road. The frontage road would pass over the UPRR spur. Distance from the rail spur to the nearest I-515 underpass structure is approximately 600' and this may be insufficient to accommodate the necessary vertical profile shift. Providing a 360 degree loop ramp with a radius of at least 250' could be used to accommodate the vertical profile shift.

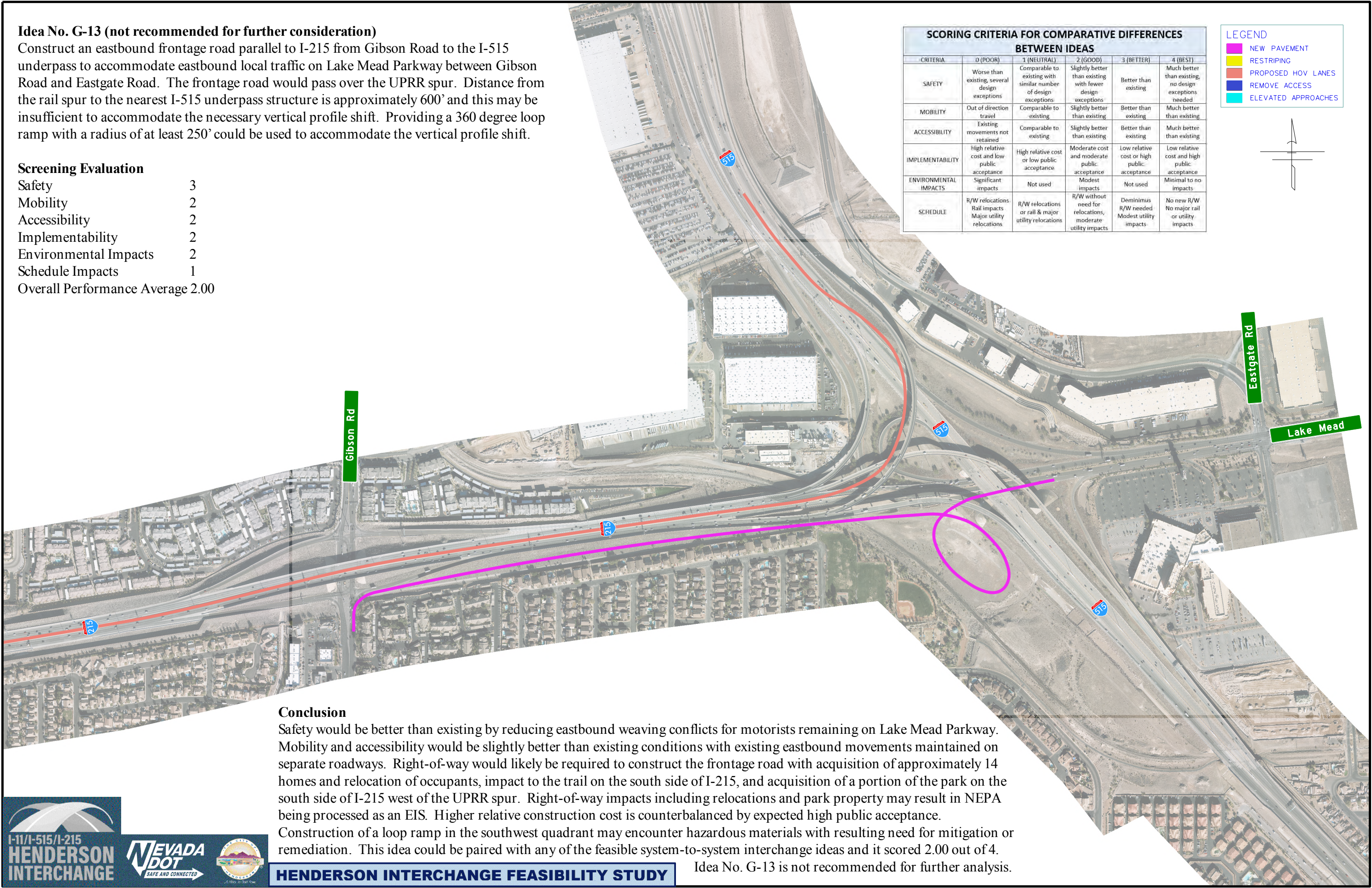
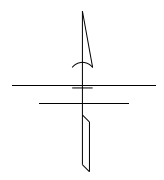
**Screening Evaluation**

Safety	3
Mobility	2
Accessibility	2
Implementability	2
Environmental Impacts	2
Schedule Impacts	1
Overall Performance Average	2.00

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations, Rail impacts, Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed, Modest utility impacts	No new R/W, No major rail or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES



**Conclusion**

Safety would be better than existing by reducing eastbound weaving conflicts for motorists remaining on Lake Mead Parkway. Mobility and accessibility would be slightly better than existing conditions with existing eastbound movements maintained on separate roadways. Right-of-way would likely be required to construct the frontage road with acquisition of approximately 14 homes and relocation of occupants, impact to the trail on the south side of I-215, and acquisition of a portion of the park on the south side of I-215 west of the UPRR spur. Right-of-way impacts including relocations and park property may result in NEPA being processed as an EIS. Higher relative construction cost is counterbalanced by expected high public acceptance. Construction of a loop ramp in the southwest quadrant may encounter hazardous materials with resulting need for mitigation or remediation. This idea could be paired with any of the feasible system-to-system interchange ideas and it scored 2.00 out of 4.

Idea No. G-13 is not recommended for further analysis.





**Idea No. G-14 (not recommended for further consideration)**

Eastbound traffic on I-215 destined for Lake Mead Parkway would exit from the freeway prior to Gibson Road, with the new road braided over or under the eastbound on-ramp from Gibson Road and positioned parallel to and south of I-215. The space formerly occupied by the eastbound lanes could be used for future HOV lanes.

**Screening Evaluation**

Safety	3
Mobility	2
Accessibility	2
Implementability	2
Environmental Impacts	2
Schedule Impacts	1
Overall Performance Average	2.00

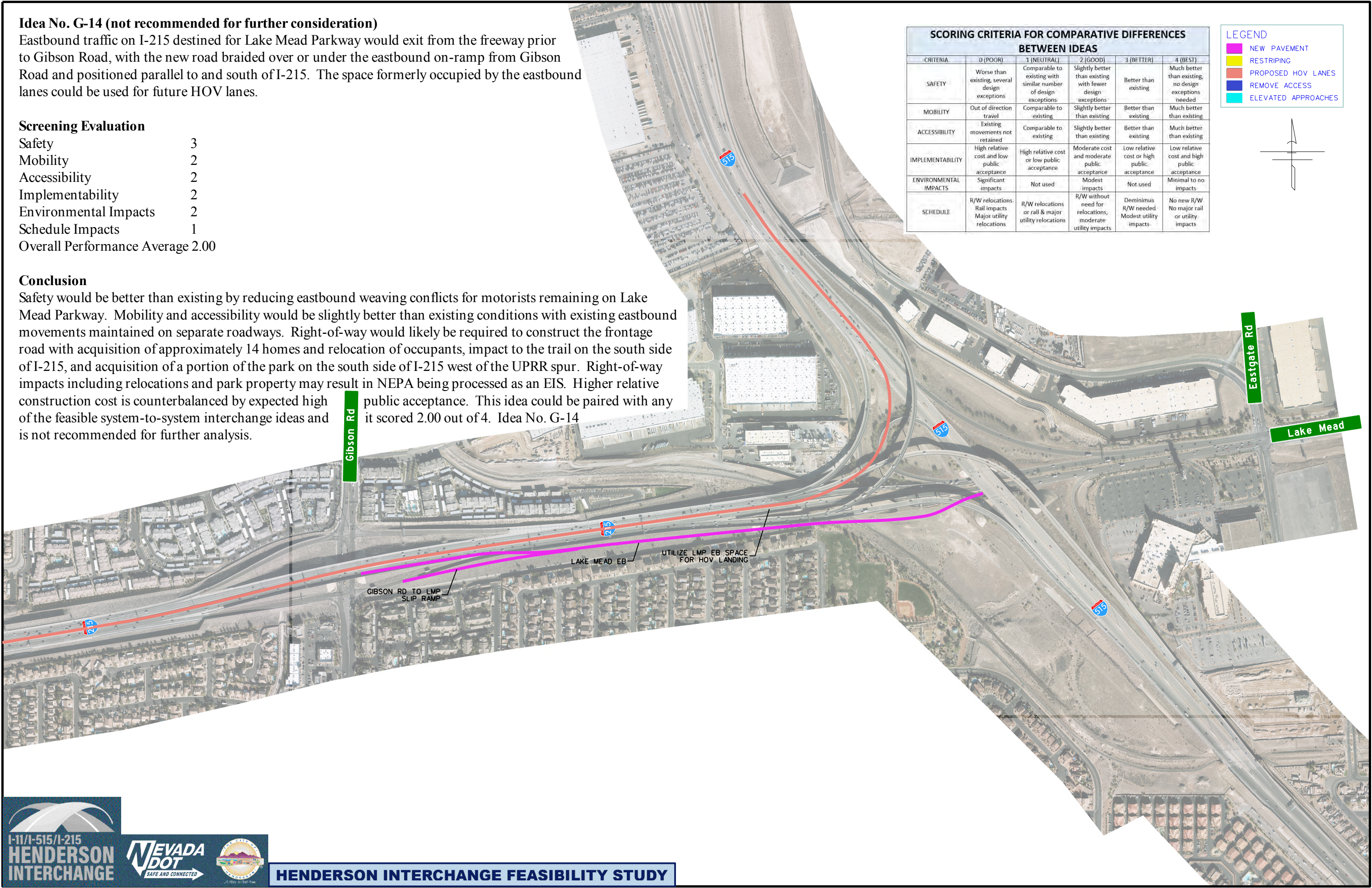
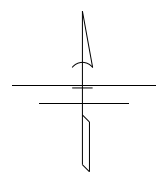
**Conclusion**

Safety would be better than existing by reducing eastbound weaving conflicts for motorists remaining on Lake Mead Parkway. Mobility and accessibility would be slightly better than existing conditions with existing eastbound movements maintained on separate roadways. Right-of-way would likely be required to construct the frontage road with acquisition of approximately 14 homes and relocation of occupants, impact to the trail on the south side of I-215, and acquisition of a portion of the park on the south side of I-215 west of the UPRR spur. Right-of-way impacts including relocations and park property may result in NEPA being processed as an EIS. Higher relative construction cost is counterbalanced by expected high public acceptance. This idea could be paired with any of the feasible system-to-system interchange ideas and is not recommended for further analysis.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPIING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES





**Idea No. E-1 (carry forward)**

Construct a local road connection between Fiesta Henderson Boulevard and Las Palmas Entrada Parkway crossing over or under I-515 near the UPRR spur. The existing I-515 bridge over the UPRR spur is not sufficiently long to accommodate the existing rail, existing trail, existing rail maintenance access road, plus a proposed local street. The distance from Fiesta Henderson Boulevard to I-515 is only 450 feet, much less than the approximately 1,600 feet that would be needed for a local street to cross over I-515. It would be feasible to extend existing Waterwheel Falls Drive to the west by acquisition of two single family homes and with construction of a new underpass structure beneath I-515. The intent of this idea is to provide an alternate route for motorists on opposite sides of I-515 to reach the other side, thus removing a portion of local traffic from the Eastgate Road intersection with Lake Mead Parkway.

**Screening Evaluation**

Safety	4
Mobility	4
Accessibility	4
Implementability	3
Environmental Impacts	2
Schedule Impacts	1
Overall Performance Average	3.00

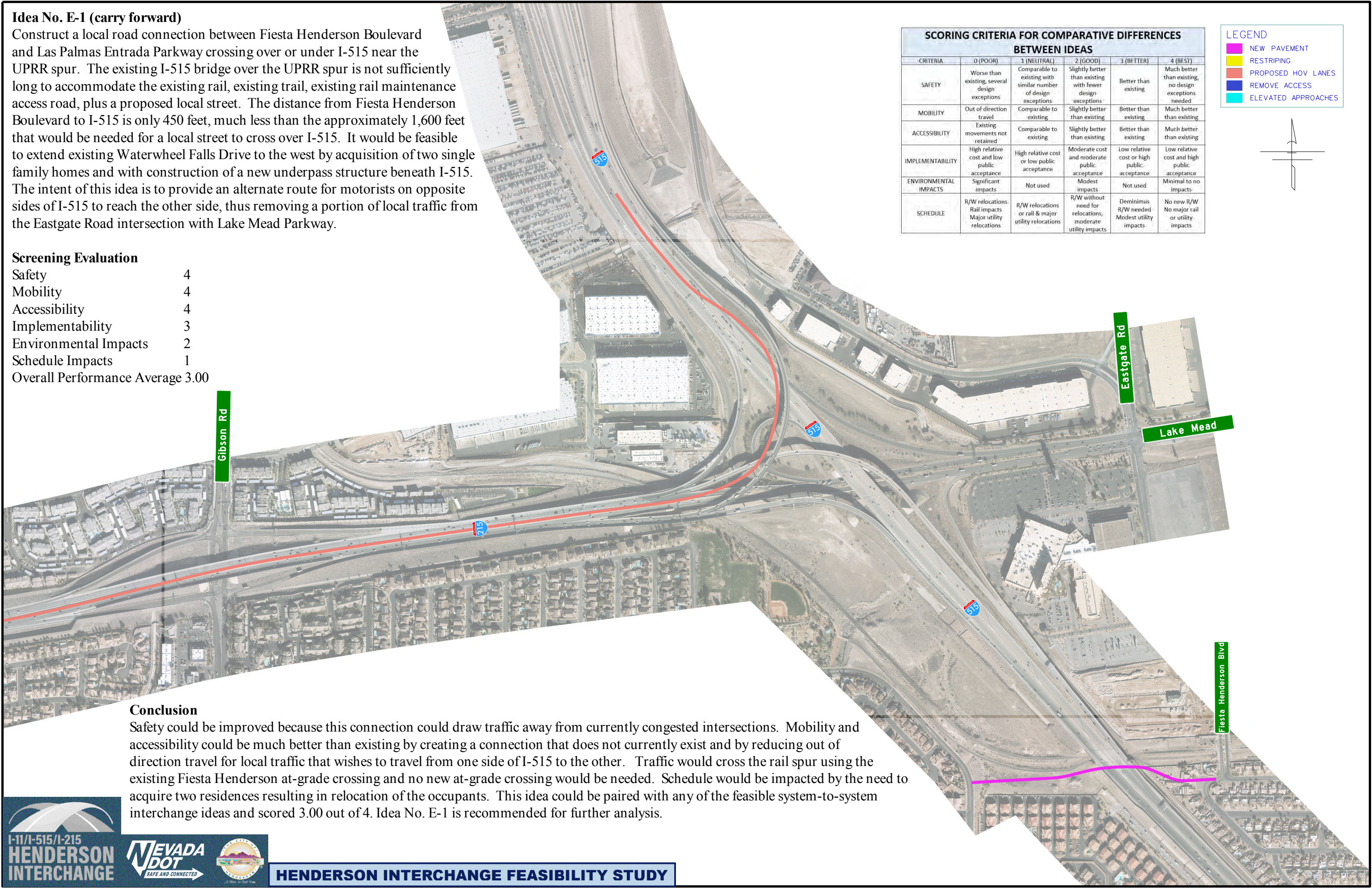
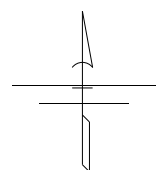
**Conclusion**

Safety could be improved because this connection could draw traffic away from currently congested intersections. Mobility and accessibility could be much better than existing by creating a connection that does not currently exist and by reducing out of direction travel for local traffic that wishes to travel from one side of I-515 to the other. Traffic would cross the rail spur using the existing Fiesta Henderson at-grade crossing and no new at-grade crossing would be needed. Schedule would be impacted by the need to acquire two residences resulting in relocation of the occupants. This idea could be paired with any of the feasible system-to-system interchange ideas and scored 3.00 out of 4. Idea No. E-1 is recommended for further analysis.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations, Rail impacts, Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed, Modest utility impacts	No new R/W or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES





**Idea No. E-2 (carry forward)**

Construct an echelon intersection between Eastgate Road/Fiesta Henderson Boulevard and Lake Mead Parkway with the westbound lanes elevated. The intent of this idea is to reduce travel delays associated with the traffic signal at Lake Mead Parkway and Eastgate Road/Fiesta Henderson Boulevard. Westbound traffic on Lake Mead Parkway would be unimpeded by a signal, and traffic on Eastgate Road turning to go westbound on Lake Mead Parkway would also be unimpeded by a signal. A three-phase traffic signal would control traffic on the lower level of the intersection with signal time divided between eastbound through/left, northbound through, and southbound through/left movements. All pedestrian movements and crossings would be accommodated at the lower level using the traffic signal.

If the echelon intersection is constructed with a typical configuration with northbound to westbound motorists turning left onto Lake Mead Parkway near the center of the overpass structure, those motorists would likely be unable to merge across three lanes of uncontrolled traffic within the available length of approximately 600 feet to gain access to the ramp leading to northbound I-515. This idea therefore proposes to include an elevated U-turn viaduct constructed east of Eastgate Road/Fiesta Henderson Boulevard. Motorists who wish to turn left from northbound Fiesta Henderson Boulevard would turn right onto a dedicated roadway that leads them up and over Lake Mead Parkway on a U-turn viaduct, delivering them back to the north side of the elevated echelon intersection where they would be in position to either enter the ramp leading to northbound I-515 or to merge one lane to the left so that they could continue on Lake Mead Parkway or to southbound I-515.

**LEGEND**

- NEW PAVEMENT
- RESTRIPIING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES



**SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS**

CRITERIA	0 POOR	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	Major R/W relocations or rail & major utility crossings	R/W relocations or rail & major utility crossings	R/W without need for R/W needed	Deminimus R/W needed	No new R/W or utility

**Screening Evaluation**

Safety	4
Mobility	4
Accessibility	4
Implementability	2
Environmental Impacts	2
Schedule Impacts	2
Overall Performance Average	3.00

**Conclusion**

Safety and mobility would be much better than existing by allowing uncontrolled westbound traffic flow. Accessibility would be better than existing with more traffic signal time available to those remaining movements in the area controlled by a traffic signal. Although the elevated U-turn involves out of direction travel, the movement would be an uncontrolled continuous movement that would provide a net travel time savings to motorists. Higher relative construction cost in the order of \$10M would be balanced by anticipated high levels of public acceptance. It is anticipated that right of way would need to be acquired along Lake Mead Boulevard with resulting environmental and schedule impacts. Portions of the grade separation structure could likely be retained if a future project upgraded Lake Mead Parkway to a limited access facility with grade separations and interchanges. This idea could be paired with any of the feasible system interchange ideas recommended for further analysis. Idea No. E-2 scored 3.00 out of 4 and is recommended for further analysis.





**Idea No. E-3 (carry forward)**

Reconstruct the Eastgate Road/Fiesta Henderson Boulevard intersection with Lake Mead Parkway as a through-turn continuous flow intersection to improve the intersection capacity for left turn movements.

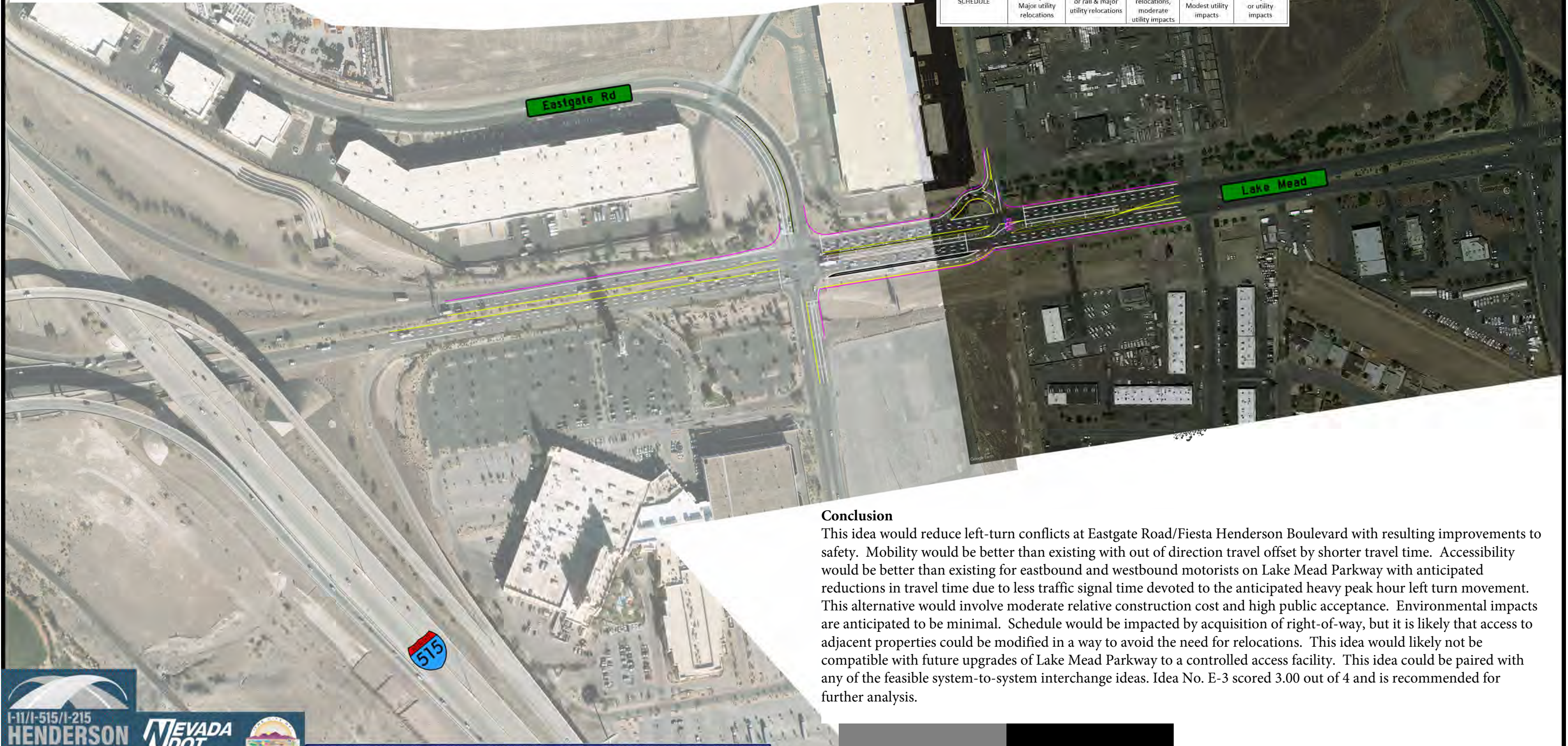
**Screening Evaluation**

Safety	3
Mobility	3
Accessibility	3
Implementability	4
Environmental Impacts	4
Schedule Impacts	2
Overall Performance Average	3.17

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES



**Conclusion**

This idea would reduce left-turn conflicts at Eastgate Road/Fiesta Henderson Boulevard with resulting improvements to safety. Mobility would be better than existing with out of direction travel offset by shorter travel time. Accessibility would be better than existing for eastbound and westbound motorists on Lake Mead Parkway with anticipated reductions in travel time due to less traffic signal time devoted to the anticipated heavy peak hour left turn movement. This alternative would involve moderate relative construction cost and high public acceptance. Environmental impacts are anticipated to be minimal. Schedule would be impacted by acquisition of right-of-way, but it is likely that access to adjacent properties could be modified in a way to avoid the need for relocations. This idea would likely not be compatible with future upgrades of Lake Mead Parkway to a controlled access facility. This idea could be paired with any of the feasible system-to-system interchange ideas. Idea No. E-3 scored 3.00 out of 4 and is recommended for further analysis.



**Idea No. E-4 (carry forward)**

Construction a grade separated interchange between Eastgate Road/Fiesta Henderson Boulevard and Lake Mead Parkway, with Lake Mead Parkway treated as the main line. This idea could be combined with any of the feasible system interchange ideas. If this idea is combined with the double diverging diamond system interchange Idea No. S-4, the Eastgate Road/Fiesta Henderson Boulevard interchange would need to be constructed as a three-level interchange to accommodate the grade separation of the eastern DDI crossover.

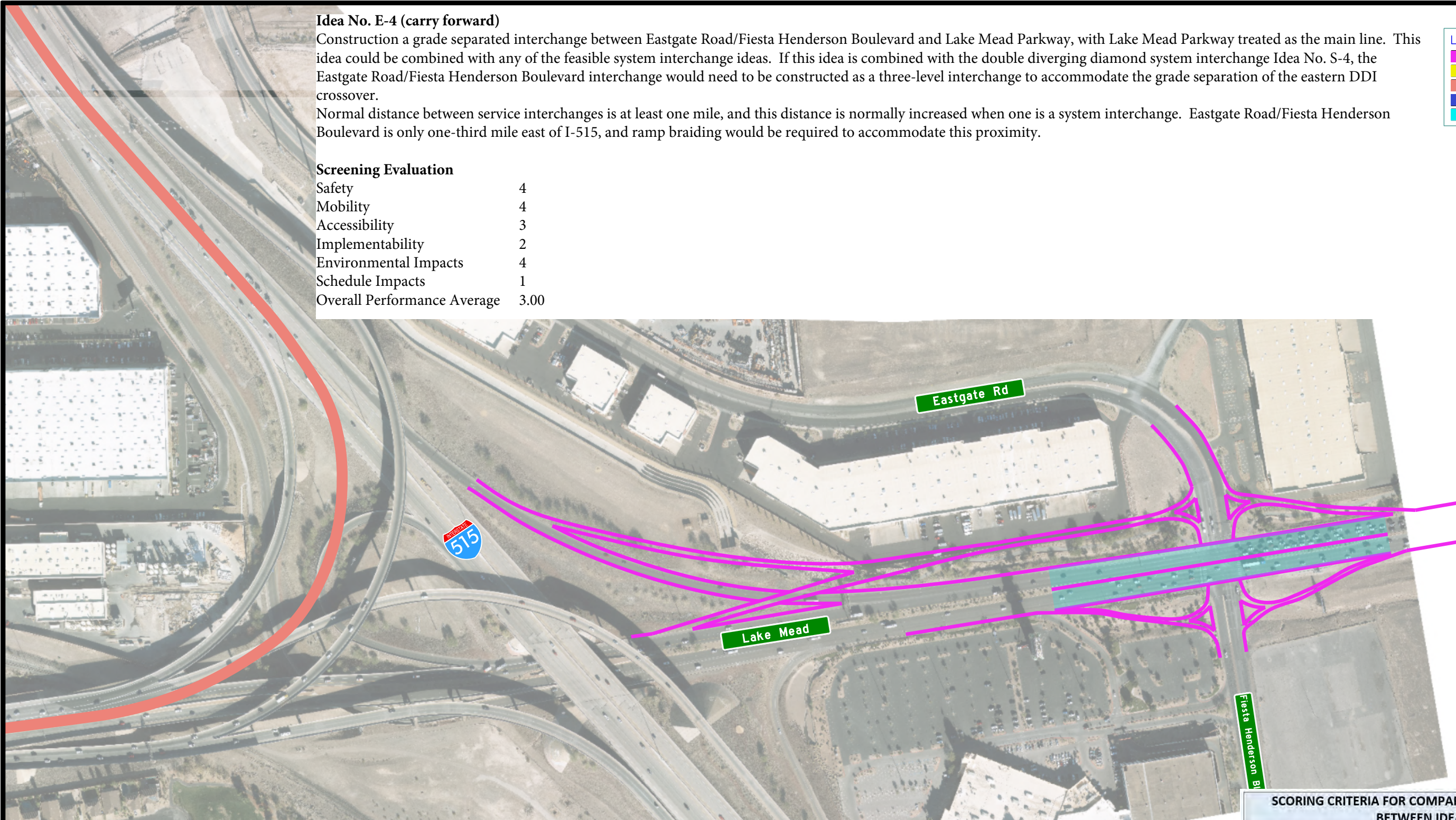
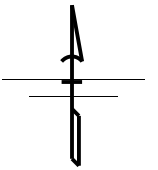
Normal distance between service interchanges is at least one mile, and this distance is normally increased when one is a system interchange. Eastgate Road/Fiesta Henderson Boulevard is only one-third mile east of I-515, and ramp braiding would be required to accommodate this proximity.

**Screening Evaluation**

Safety	4
Mobility	4
Accessibility	3
Implementability	2
Environmental Impacts	4
Schedule Impacts	1
Overall Performance Average	3.00

**LEGEND**

- NEW PAVEMENT
- RESTRIPIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES



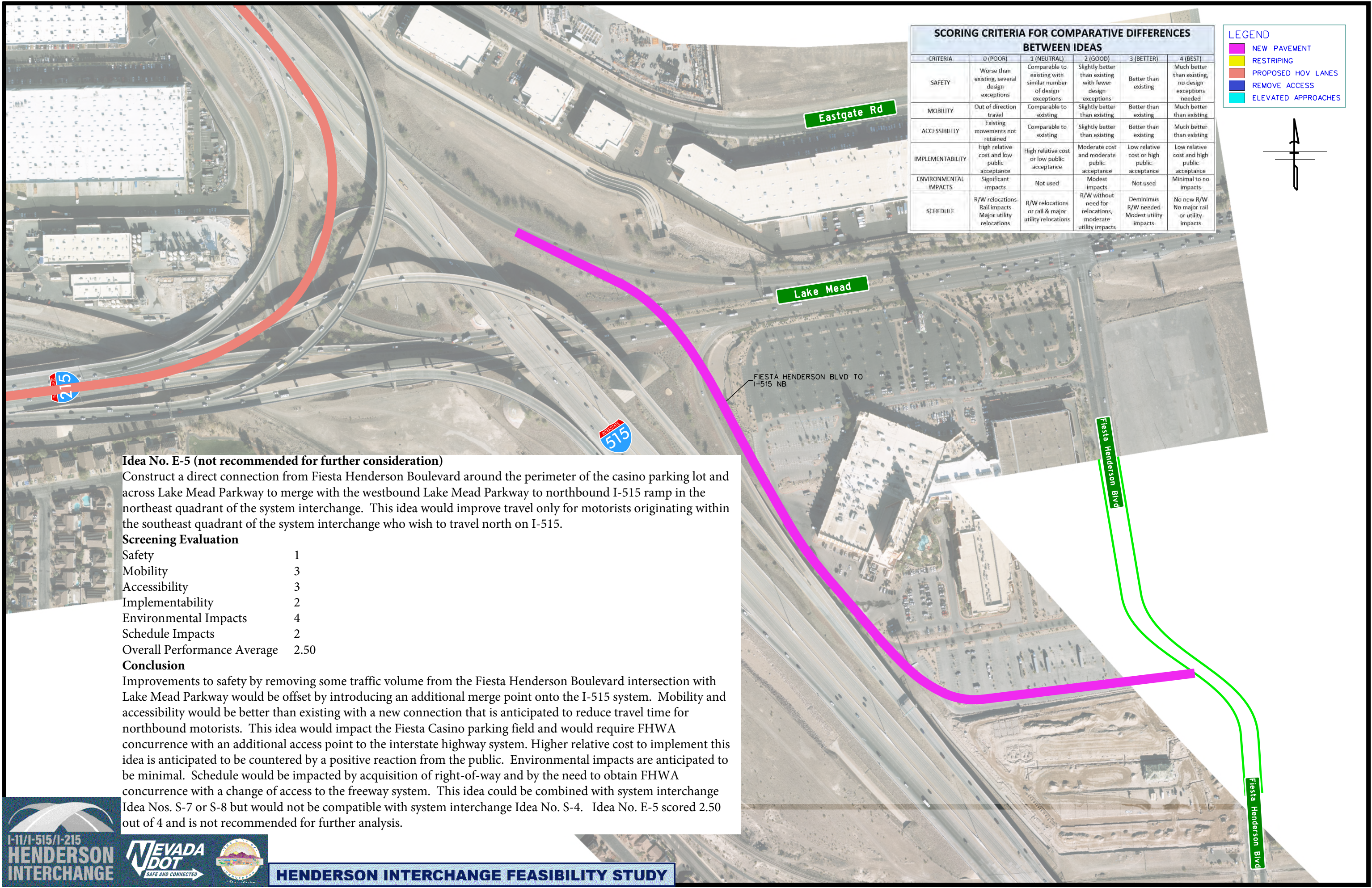
**Conclusion**

Safety would be much better than existing with uncontrolled through movement of traffic. Mobility would be much better than existing conditions with reductions in travel time through the interchange areas. Accessibility for motorists would be better than existing, except for those who wish to access businesses located at the four quadrants of the Eastgate Road/Fiesta Henderson Boulevard intersection. Implementability and schedule are impacted by the need to acquire right-of-way from all four quadrants of the intersection and because of related degradation of access to the adjacent businesses. These impacts are anticipated to require the acquisition of the business in the northeast quadrant. This idea scored 3.00 out of 4. Although this score is marginal, Idea No. E-4 is recommended for further analysis because it would be compatible with a potential future project to reconstruct Lake Mead Parkway as a limited access facility with frontage roads.

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS				
CRITERIA	1 (POOR)	2 (NEUTRAL)	3 (GOOD)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Minimal to no impacts
SCHEDULE	R/W relocations, Rail impacts, Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed, Modest utility impacts, No major rail or utility impacts

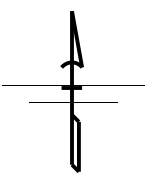






SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations, Rail impacts, Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed, Modest utility impacts	No new R/W, No major rail or utility impacts

LEGEND	
<span style="color: magenta;">█</span>	NEW PAVEMENT
<span style="color: yellow;">█</span>	RESTRIPING
<span style="color: red;">█</span>	PROPOSED HOV LANES
<span style="color: blue;">█</span>	REMOVE ACCESS
<span style="color: cyan;">█</span>	ELEVATED APPROACHES



**Idea No. E-5 (not recommended for further consideration)**

Construct a direct connection from Fiesta Henderson Boulevard around the perimeter of the casino parking lot and across Lake Mead Parkway to merge with the westbound Lake Mead Parkway to northbound I-515 ramp in the northeast quadrant of the system interchange. This idea would improve travel only for motorists originating within the southeast quadrant of the system interchange who wish to travel north on I-515.

**Screening Evaluation**

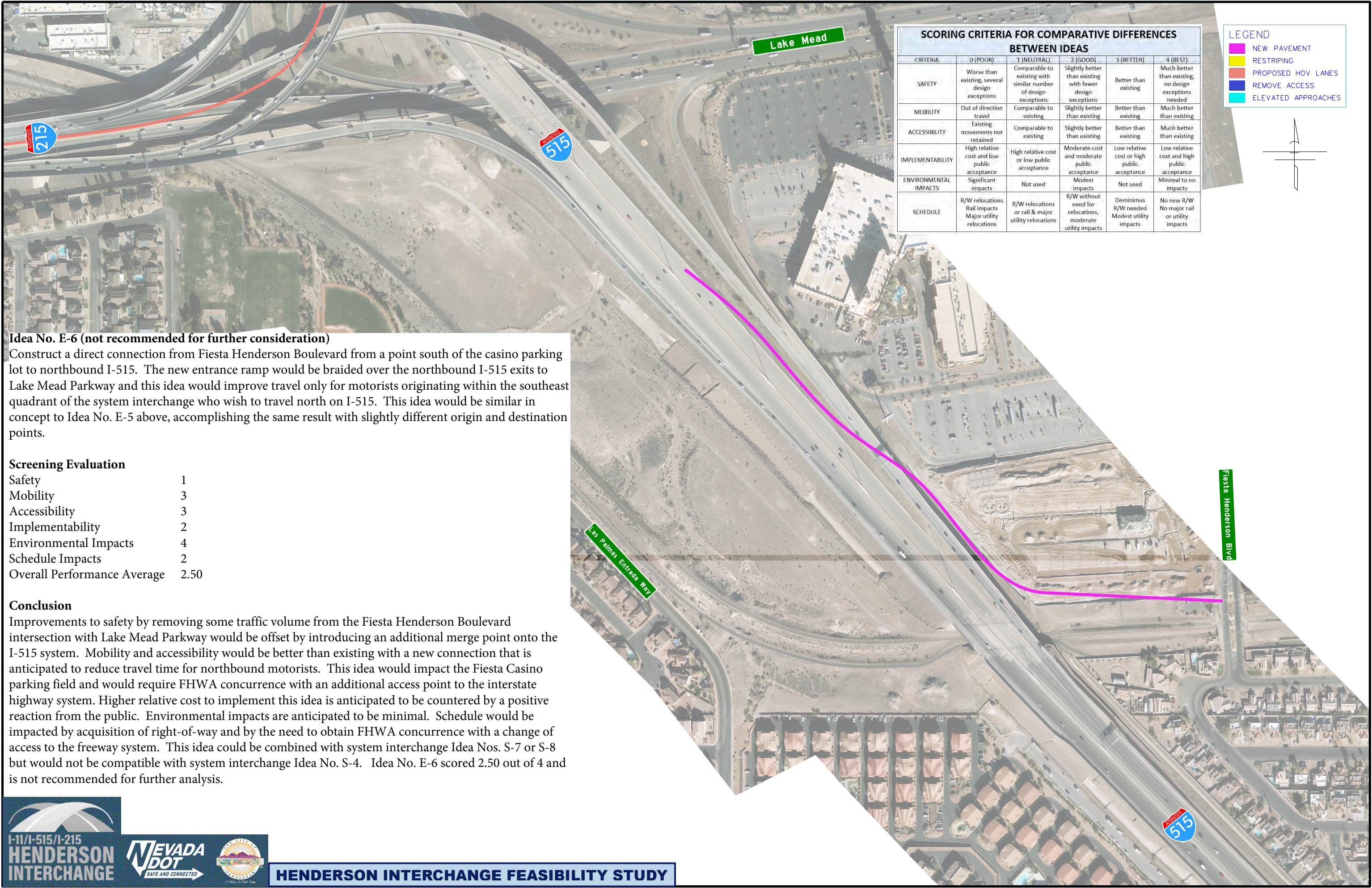
Safety	1
Mobility	3
Accessibility	3
Implementability	2
Environmental Impacts	4
Schedule Impacts	2
Overall Performance Average	2.50

**Conclusion**

Improvements to safety by removing some traffic volume from the Fiesta Henderson Boulevard intersection with Lake Mead Parkway would be offset by introducing an additional merge point onto the I-515 system. Mobility and accessibility would be better than existing with a new connection that is anticipated to reduce travel time for northbound motorists. This idea would impact the Fiesta Casino parking field and would require FHWA concurrence with an additional access point to the interstate highway system. Higher relative cost to implement this idea is anticipated to be countered by a positive reaction from the public. Environmental impacts are anticipated to be minimal. Schedule would be impacted by acquisition of right-of-way and by the need to obtain FHWA concurrence with a change of access to the freeway system. This idea could be combined with system interchange Idea Nos. S-7 or S-8 but would not be compatible with system interchange Idea No. S-4. Idea No. E-5 scored 2.50 out of 4 and is not recommended for further analysis.





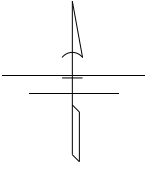


**SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS**

CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**LEGEND**

- █ NEW PAVEMENT
- █ RESTRIPIING
- █ PROPOSED HOV LANES
- █ REMOVE ACCESS
- █ ELEVATED APPROACHES



**Idea No. E-6 (not recommended for further consideration)**

Construct a direct connection from Fiesta Henderson Boulevard from a point south of the casino parking lot to northbound I-515. The new entrance ramp would be braided over the northbound I-515 exits to Lake Mead Parkway and this idea would improve travel only for motorists originating within the southeast quadrant of the system interchange who wish to travel north on I-515. This idea would be similar in concept to Idea No. E-5 above, accomplishing the same result with slightly different origin and destination points.

**Screening Evaluation**

Safety	1
Mobility	3
Accessibility	3
Implementability	2
Environmental Impacts	4
Schedule Impacts	2
Overall Performance Average	2.50

**Conclusion**

Improvements to safety by removing some traffic volume from the Fiesta Henderson Boulevard intersection with Lake Mead Parkway would be offset by introducing an additional merge point onto the I-515 system. Mobility and accessibility would be better than existing with a new connection that is anticipated to reduce travel time for northbound motorists. This idea would impact the Fiesta Casino parking field and would require FHWA concurrence with an additional access point to the interstate highway system. Higher relative cost to implement this idea is anticipated to be countered by a positive reaction from the public. Environmental impacts are anticipated to be minimal. Schedule would be impacted by acquisition of right-of-way and by the need to obtain FHWA concurrence with a change of access to the freeway system. This idea could be combined with system interchange Idea Nos. S-7 or S-8 but would not be compatible with system interchange Idea No. S-4. Idea No. E-6 scored 2.50 out of 4 and is not recommended for further analysis.





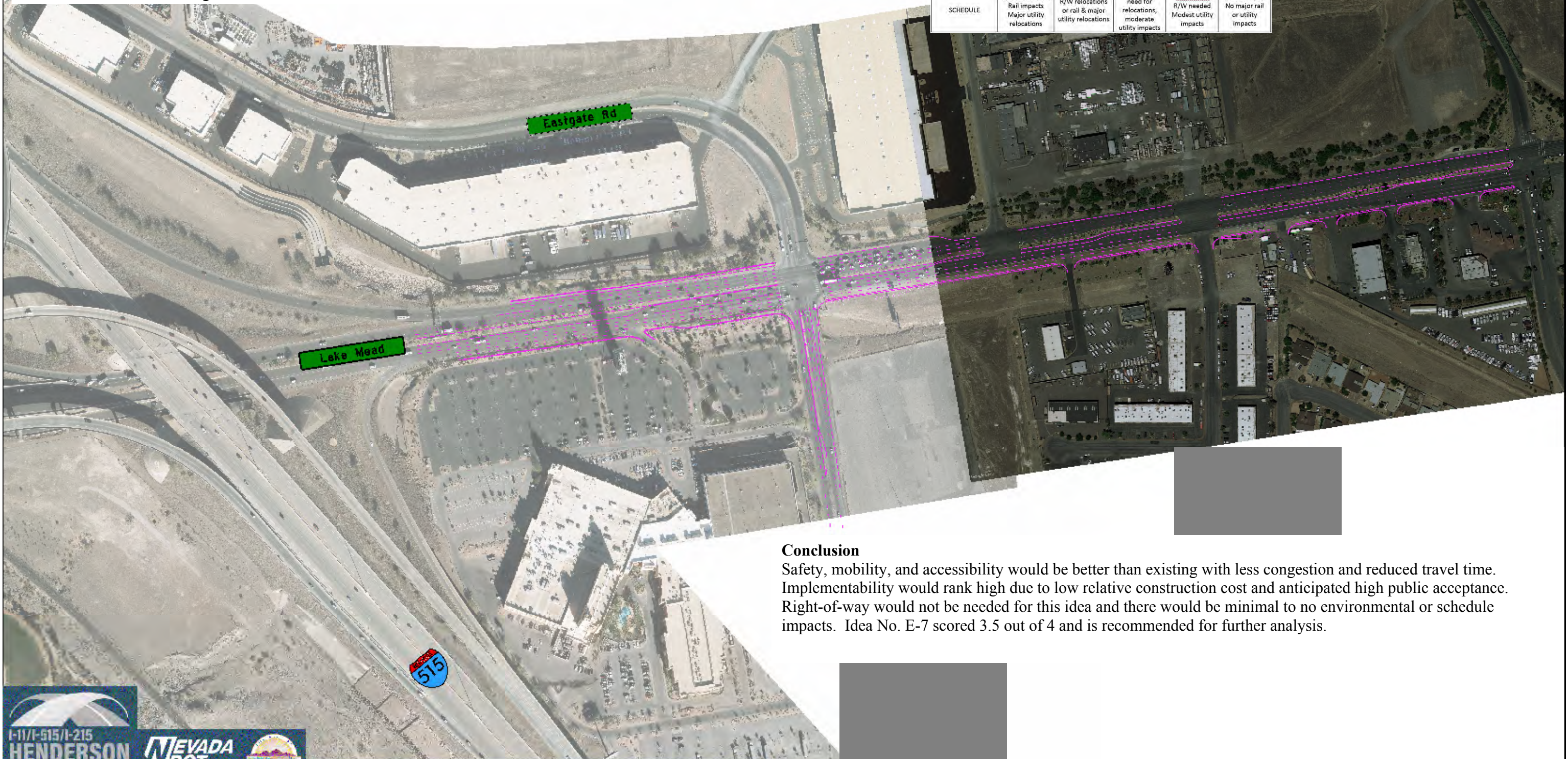
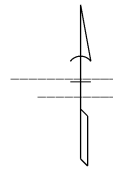
**Idea No. E-7 (carried forward)**

At-grade intersection configuration with lanes added as warranted by traffic projections.

**Screening Evaluation**

Safety	3
Mobility	3
Accessibility	3
Implementability	4
Environmental Impacts	4
Schedule Impacts	4
<b>Overall Performance Average</b>	<b>3.50</b>

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts



**Conclusion**

Safety, mobility, and accessibility would be better than existing with less congestion and reduced travel time. Implementability would rank high due to low relative construction cost and anticipated high public acceptance. Right-of-way would not be needed for this idea and there would be minimal to no environmental or schedule impacts. Idea No. E-7 scored 3.5 out of 4 and is recommended for further analysis.



**SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS**

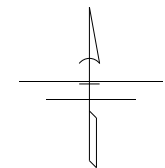
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**Idea No. N-1 (not recommended for further consideration)**

Construct a braided ramp leading from westbound Lake Mead Parkway to northbound I-515, entering I-515 north of the exit from I-515 to Auto Show Drive. The intent of this idea is to remove the northbound weave that currently exists between traffic entering I-515 from Lake Mead Parkway and existing I-515 to Auto Show Drive. The design year peak hour traffic entering northbound I-515 is forecast to be approximately 1400 vehicles per hour, merging with approximately 3,300 vehicles per hour on the northbound I-515. By relocating the merge point to be north of the Autoshow Drive exit, the mainline traffic would be reduced to approximately 3,000 vehicles per hour.

**LEGEND**

- NEW PAVEMENT
- RESTRIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES

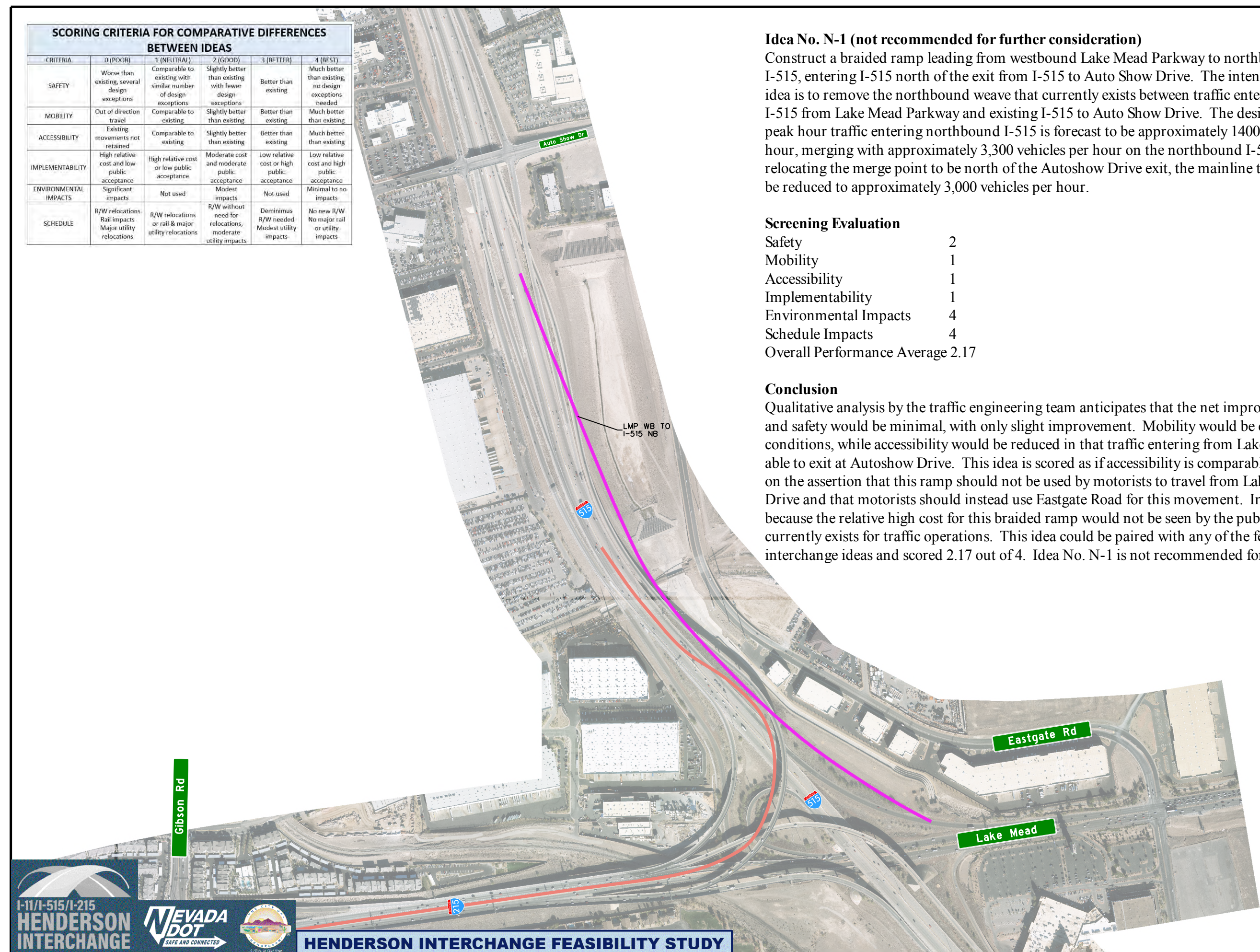


**Screening Evaluation**

Safety	2
Mobility	1
Accessibility	1
Implementability	1
Environmental Impacts	4
Schedule Impacts	4
Overall Performance Average	2.17

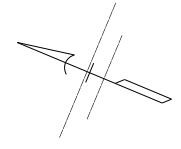
**Conclusion**

Qualitative analysis by the traffic engineering team anticipates that the net improvement to freeway operation and safety would be minimal, with only slight improvement. Mobility would be comparable to existing conditions, while accessibility would be reduced in that traffic entering from Lake Mead Parkway would not be able to exit at Autoshow Drive. This idea is scored as if accessibility is comparable to existing conditions based on the assertion that this ramp should not be used by motorists to travel from Lake Mead Parkway to Autoshow Drive and that motorists should instead use Eastgate Road for this movement. Implementability is scored low because the relative high cost for this braided ramp would not be seen by the public as solving a problem that currently exists for traffic operations. This idea could be paired with any of the feasible system-to-system interchange ideas and scored 2.17 out of 4. Idea No. N-1 is not recommended for further analysis.

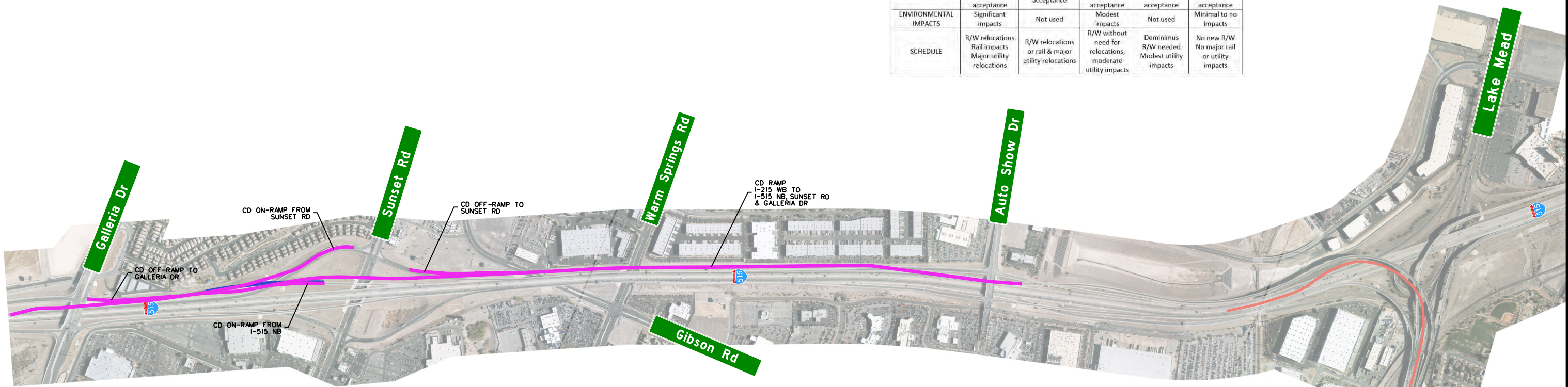




SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts



LEGEND	
<span style="color: magenta;">█</span>	NEW PAVEMENT
<span style="color: yellow;">█</span>	RESTRIPING
<span style="color: orange;">█</span>	PROPOSED HOV LANES
<span style="color: blue;">█</span>	REMOVE ACCESS
<span style="color: cyan;">█</span>	ELEVATED APPROACHES



**Idea No. N-2 (carry forward)**

Construct a northbound collector-distributor road that would serve Auto Show Drive, Sunset Road and Galleria Drive. The C-D road would begin with the existing northbound exit to Auto Show Drive. The intent of this idea is to reduce weaving on northbound mainline I-515 by requiring motorists who wish to access Auto Show Drive, Sunset Road or Galleria Drive to exit northbound I-515 south of Auto Show Drive.

**Screening Evaluation**

- Safety 4
- Mobility 3
- Accessibility 3
- Implementability 3
- Environmental Impacts 4
- Schedule Impacts 4
- Overall Performance Average 3.50

**Conclusion**

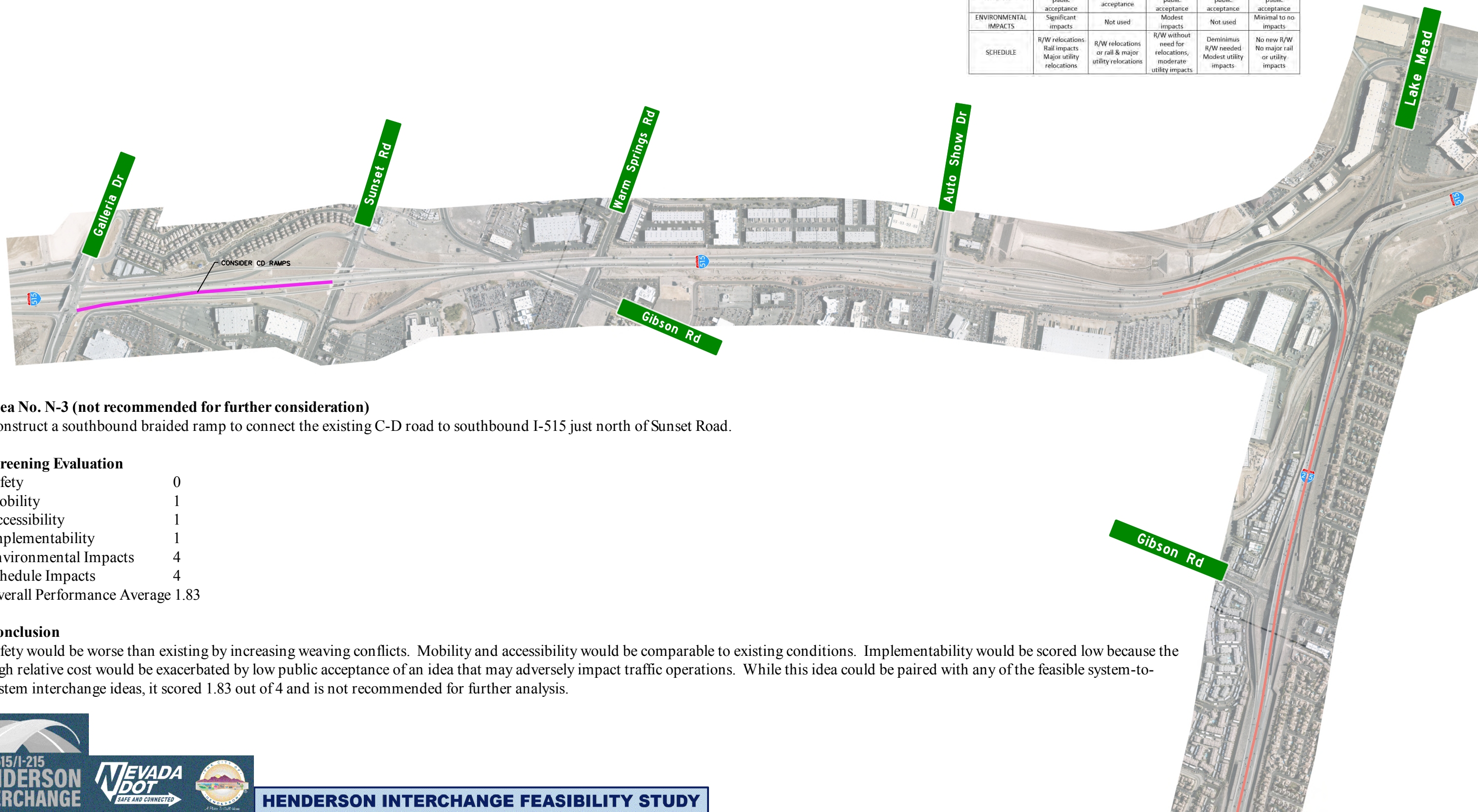
Safety would be much better than existing by reducing weaving conflicts. Mobility and accessibility would be better than existing by maintaining existing connections and reducing congestion. Relative high construction cost would be countered by high public acceptance of an idea that is anticipated to reduce travel time. Environmental and schedule impacts are anticipated to be minimal. This idea could be paired with any of the feasible system-to-system interchange ideas and scored 3.50 out of 4 and is recommended for further analysis.





SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

LEGEND	
<span style="color: magenta;">█</span>	NEW PAVEMENT
<span style="color: yellow;">█</span>	RESTRIPING
<span style="color: orange;">█</span>	PROPOSED HOV LANES
<span style="color: blue;">█</span>	REMOVE ACCESS
<span style="color: cyan;">█</span>	ELEVATED APPROACHES



**Idea No. N-3 (not recommended for further consideration)**

Construct a southbound braided ramp to connect the existing C-D road to southbound I-515 just north of Sunset Road.

**Screening Evaluation**

Safety	0
Mobility	1
Accessibility	1
Implementability	1
Environmental Impacts	4
Schedule Impacts	4
Overall Performance Average	1.83

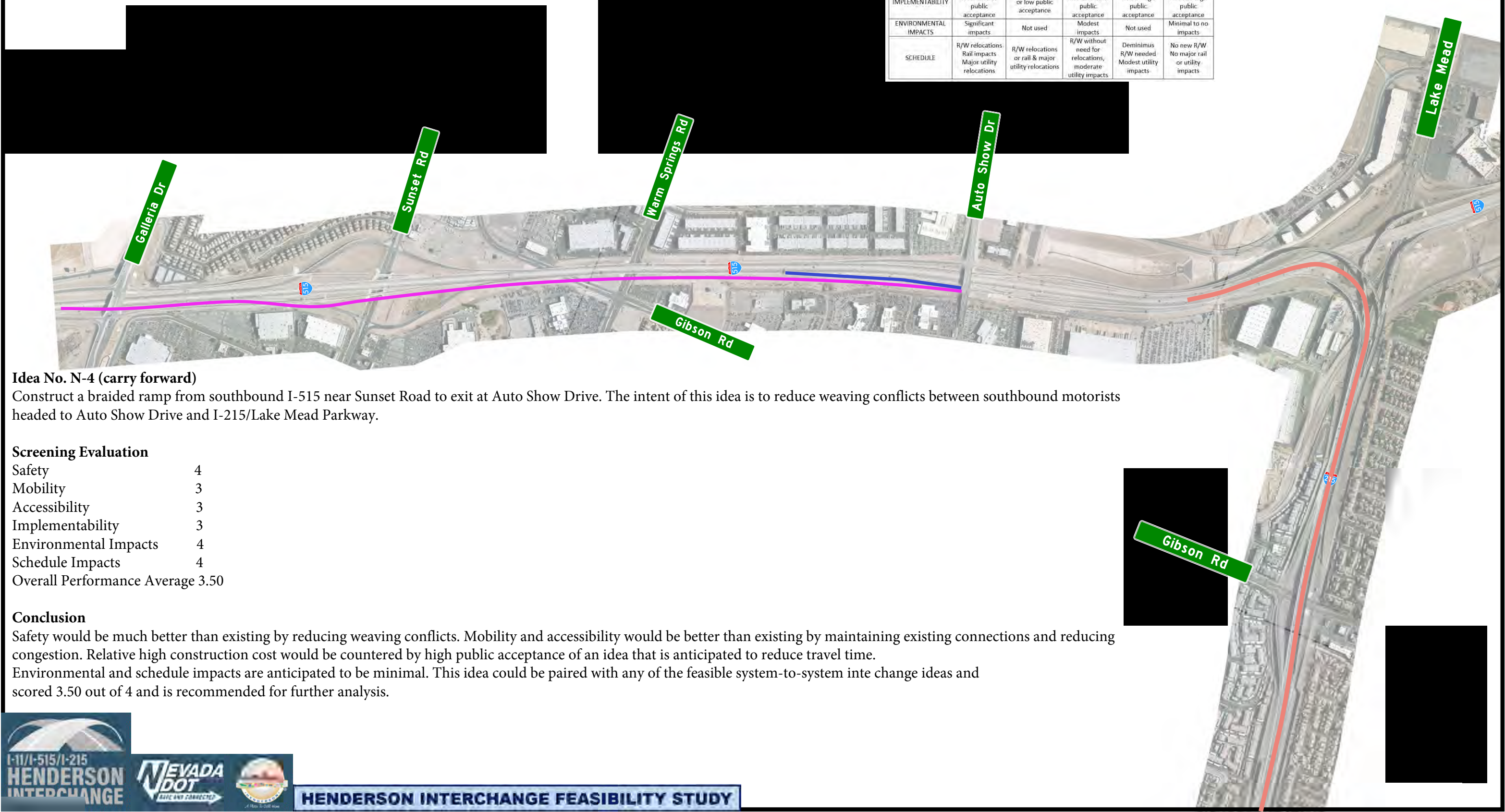
**Conclusion**

Safety would be worse than existing by increasing weaving conflicts. Mobility and accessibility would be comparable to existing conditions. Implementability would be scored low because the high relative cost would be exacerbated by low public acceptance of an idea that may adversely impact traffic operations. While this idea could be paired with any of the feasible system-to-system interchange ideas, it scored 1.83 out of 4 and is not recommended for further analysis.



SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

LEGEND	
	NEW PAVEMENT
	RESTRIPING
	PROPOSED HOV LANES
	REMOVE ACCESS
	ELEVATED APPROACHES



**Idea No. N-4 (carry forward)**

Construct a braided ramp from southbound I-515 near Sunset Road to exit at Auto Show Drive. The intent of this idea is to reduce weaving conflicts between southbound motorists headed to Auto Show Drive and I-215/Lake Mead Parkway.

**Screening Evaluation**

Safety	4
Mobility	3
Accessibility	3
Implementability	3
Environmental Impacts	4
Schedule Impacts	4
Overall Performance Average	3.50

**Conclusion**

Safety would be much better than existing by reducing weaving conflicts. Mobility and accessibility would be better than existing by maintaining existing connections and reducing congestion. Relative high construction cost would be countered by high public acceptance of an idea that is anticipated to reduce travel time.

Environmental and schedule impacts are anticipated to be minimal. This idea could be paired with any of the feasible system-to-system interchange ideas and scored 3.50 out of 4 and is recommended for further analysis.





**Idea No. N-5 (carried forward)**

Widening of I-515 in both directions between the system interchange area and the northern study limit at Galleria Drive, as warranted by traffic projections.

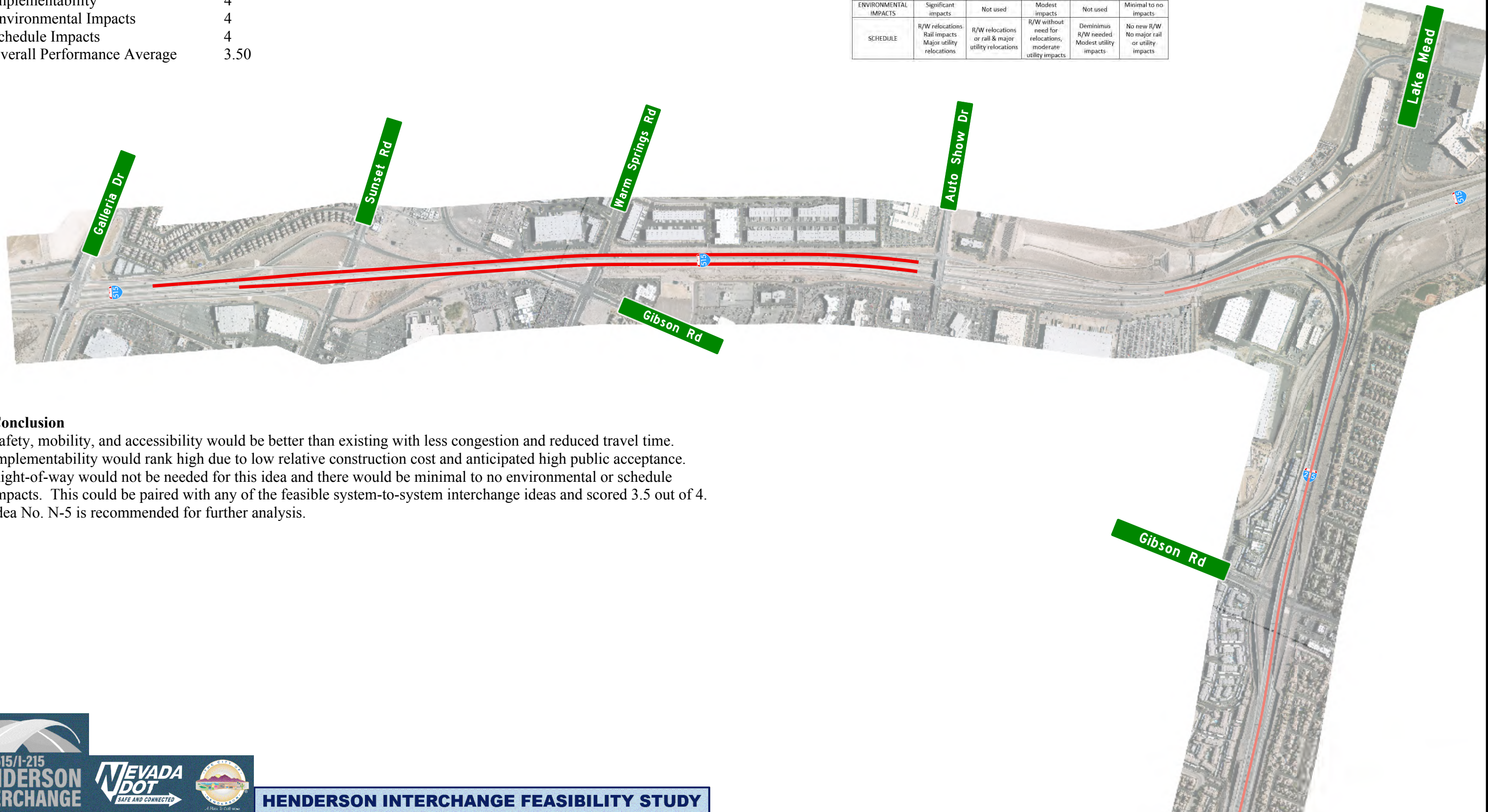
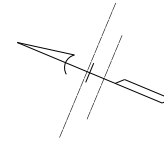
**Screening Criteria**

Safety	3
Mobility	3
Accessibility	3
Implementability	4
Environmental Impacts	4
Schedule Impacts	4
Overall Performance Average	3.50

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations, Rail impacts, Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed, Modest utility impacts	No new R/W, No major rail or utility impacts

**LEGEND**

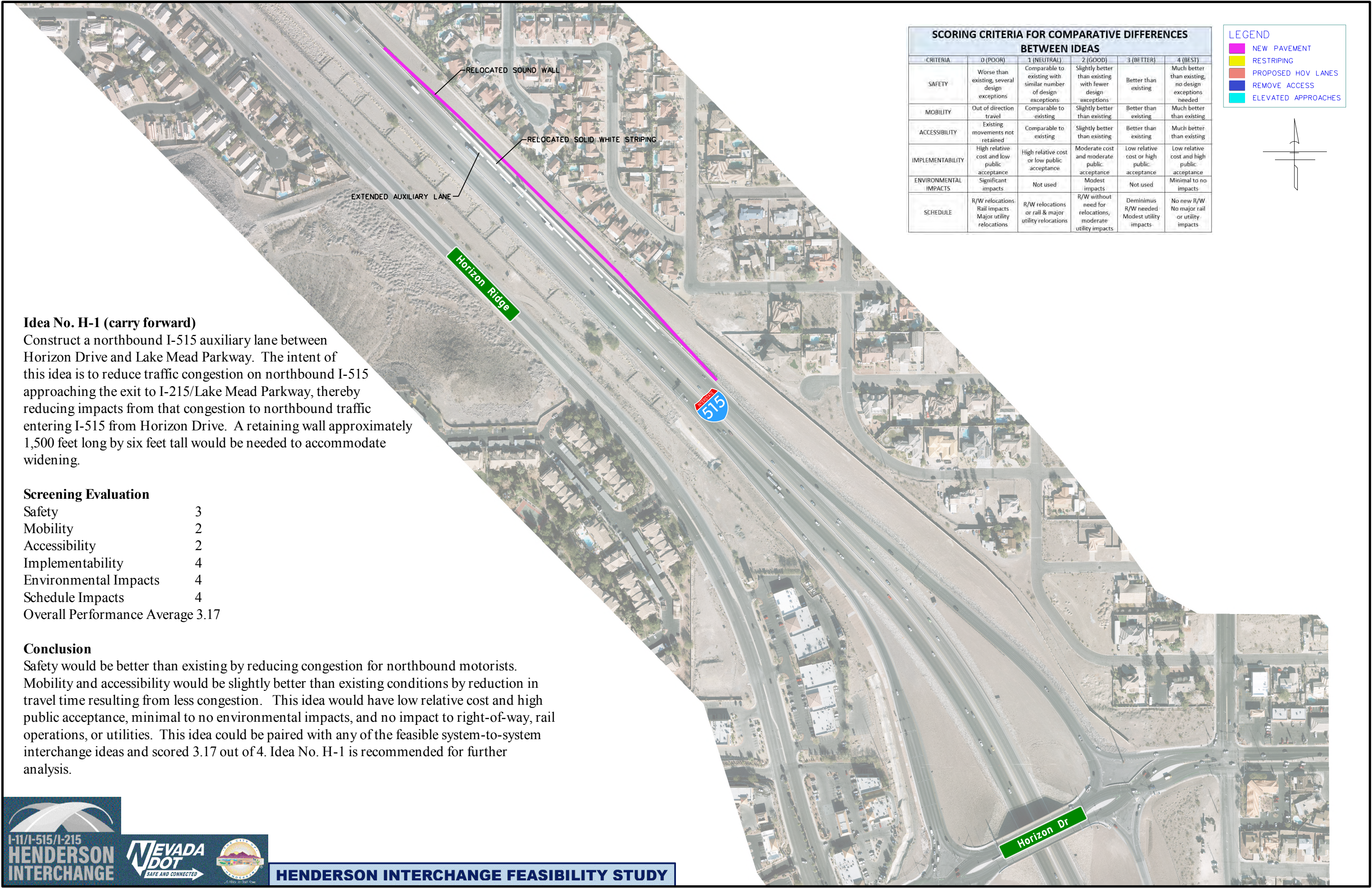
- NEW PAVEMENT
- RESTRIPIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES
- WIDENING



**Conclusion**

Safety, mobility, and accessibility would be better than existing with less congestion and reduced travel time. Implementability would rank high due to low relative construction cost and anticipated high public acceptance. Right-of-way would not be needed for this idea and there would be minimal to no environmental or schedule impacts. This could be paired with any of the feasible system-to-system interchange ideas and scored 3.5 out of 4. Idea No. N-5 is recommended for further analysis.

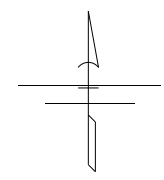




SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations, Rail impacts, Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed, Modest utility impacts	No new R/W, No major rail or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPIPING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES



**Idea No. H-1 (carry forward)**

Construct a northbound I-515 auxiliary lane between Horizon Drive and Lake Mead Parkway. The intent of this idea is to reduce traffic congestion on northbound I-515 approaching the exit to I-215/Lake Mead Parkway, thereby reducing impacts from that congestion to northbound traffic entering I-515 from Horizon Drive. A retaining wall approximately 1,500 feet long by six feet tall would be needed to accommodate widening.

**Screening Evaluation**

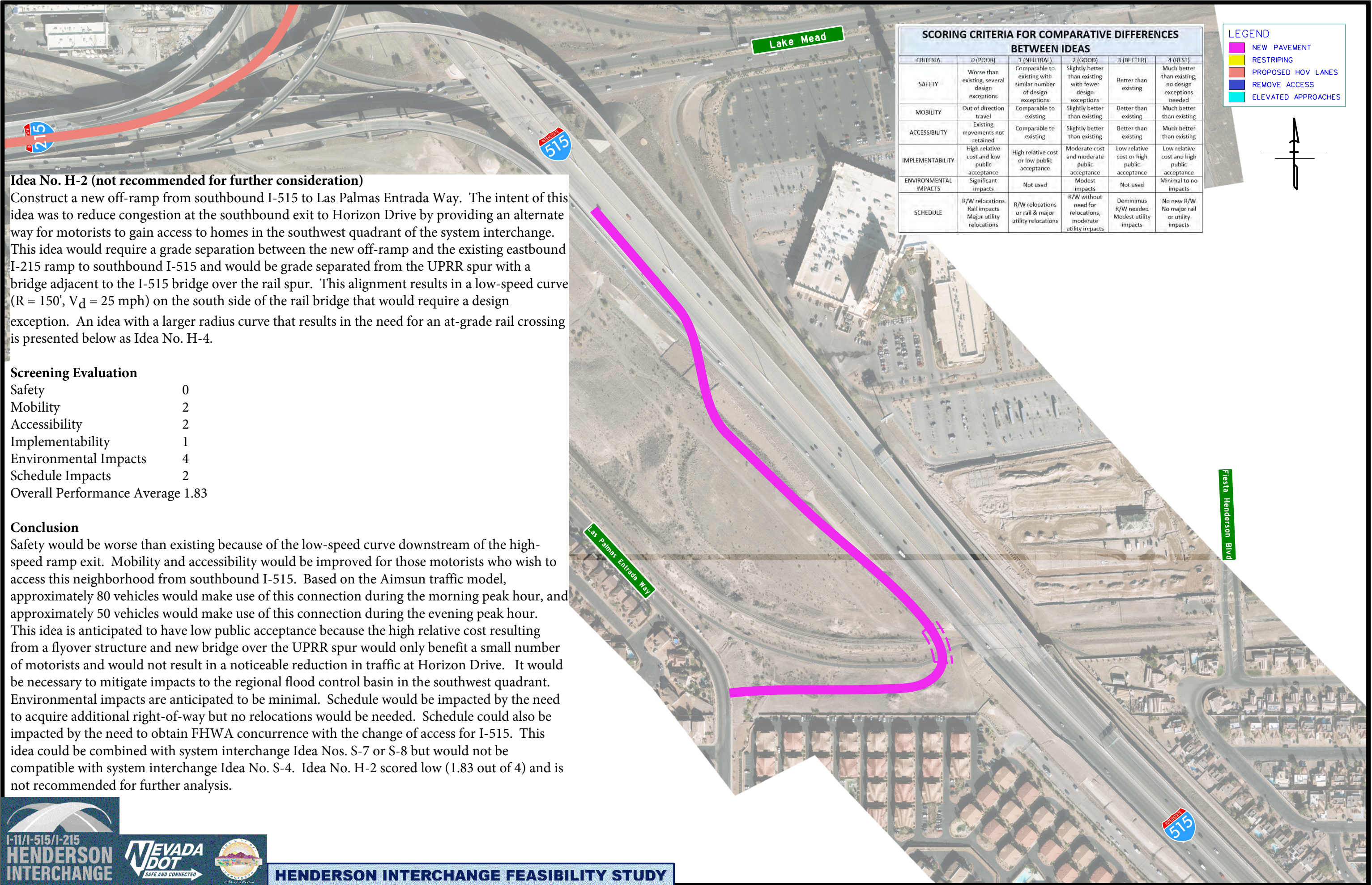
- Safety 3
- Mobility 2
- Accessibility 2
- Implementability 4
- Environmental Impacts 4
- Schedule Impacts 4
- Overall Performance Average 3.17

**Conclusion**

Safety would be better than existing by reducing congestion for northbound motorists. Mobility and accessibility would be slightly better than existing conditions by reduction in travel time resulting from less congestion. This idea would have low relative cost and high public acceptance, minimal to no environmental impacts, and no impact to right-of-way, rail operations, or utilities. This idea could be paired with any of the feasible system-to-system interchange ideas and scored 3.17 out of 4. Idea No. H-1 is recommended for further analysis.

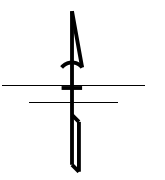






SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

LEGEND	
<span style="color: magenta;">█</span>	NEW PAVEMENT
<span style="color: yellow;">█</span>	RESTRIPING
<span style="color: orange;">█</span>	PROPOSED HOV LANES
<span style="color: blue;">█</span>	REMOVE ACCESS
<span style="color: cyan;">█</span>	ELEVATED APPROACHES



**Idea No. H-2 (not recommended for further consideration)**

Construct a new off-ramp from southbound I-515 to Las Palmas Entrada Way. The intent of this idea was to reduce congestion at the southbound exit to Horizon Drive by providing an alternate way for motorists to gain access to homes in the southwest quadrant of the system interchange. This idea would require a grade separation between the new off-ramp and the existing eastbound I-215 ramp to southbound I-515 and would be grade separated from the UPRR spur with a bridge adjacent to the I-515 bridge over the rail spur. This alignment results in a low-speed curve (R = 150', V<sub>d</sub> = 25 mph) on the south side of the rail bridge that would require a design exception. An idea with a larger radius curve that results in the need for an at-grade rail crossing is presented below as Idea No. H-4.

**Screening Evaluation**

- Safety 0
- Mobility 2
- Accessibility 2
- Implementability 1
- Environmental Impacts 4
- Schedule Impacts 2
- Overall Performance Average 1.83

**Conclusion**

Safety would be worse than existing because of the low-speed curve downstream of the high-speed ramp exit. Mobility and accessibility would be improved for those motorists who wish to access this neighborhood from southbound I-515. Based on the Aimsun traffic model, approximately 80 vehicles would make use of this connection during the morning peak hour, and approximately 50 vehicles would make use of this connection during the evening peak hour. This idea is anticipated to have low public acceptance because the high relative cost resulting from a flyover structure and new bridge over the UPRR spur would only benefit a small number of motorists and would not result in a noticeable reduction in traffic at Horizon Drive. It would be necessary to mitigate impacts to the regional flood control basin in the southwest quadrant. Environmental impacts are anticipated to be minimal. Schedule would be impacted by the need to acquire additional right-of-way but no relocations would be needed. Schedule could also be impacted by the need to obtain FHWA concurrence with the change of access for I-515. This idea could be combined with system interchange Idea Nos. S-7 or S-8 but would not be compatible with system interchange Idea No. S-4. Idea No. H-2 scored low (1.83 out of 4) and is not recommended for further analysis.







SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminimus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

- LEGEND**
- NEW PAVEMENT
  - RESTRIPIING
  - PROPOSED HOV LANES
  - REMOVE ACCESS
  - ELEVATED APPROACHES



**Idea No. H-3 (carry forward)**

Construct a new off-ramp from southbound I-515 to Horizon Ridge Parkway. The intent of this idea is to reduce congestion at the southbound exit to Horizon Drive by providing an alternate way for motorists to gain access to homes in the southwest quadrant of the system interchange. This idea could be combined with any of the system interchange ideas recommended for further consideration. Year 2040 southbound traffic existing at Horizon Drive during the peak hours and turning right is anticipated to be 710 vehicles in the morning and 860 vehicles in the evening. Approximately two-thirds of those vehicles would be expected to turn north or south onto Horizon Ridge Parkway.

**Screening Evaluation**

- Safety 3
- Mobility 4
- Accessibility 4
- Implementability 3
- Environmental Impacts 4
- Schedule Impacts 2
- Overall Performance Average 3.33

**Conclusion**

Safety, mobility, and accessibility would be better than existing by allowing these vehicles to reach their destination more directly and with fewer traffic signals. High relative construction cost resulting from the flyover structure carrying northbound Horizon Ridge Parkway over the southbound ramp would be offset by high public acceptance of an idea that reduces travel time and congestion. Environmental impacts are anticipated to be minimal. Schedule would be impacted by the need to acquire additional right-of-way and the need to obtain concurrence from FHWA for a change in access to I-515. Idea No. H-3 scored 3.33 out of 4 and is recommended for further analysis.





**Idea No. H-4 (not recommended for further consideration)**

Construct a new off-ramp from southbound I-515 to Las Palmas Entrada Way, similar to Idea No. H-2. Idea No. H-4 differs from Idea No. H-2 in that it proposes an at-grade rail crossing with the UPRR spur in order to accommodate ramp geometry that could be constructed without the need for design exceptions. The intent of this idea was to reduce congestion at the southbound exit to Horizon Drive by providing an alternate way for motorists to gain access to homes in the southwest quadrant of the system interchange. This idea would necessitate a grade separation between the new off-ramp and the existing eastbound I-215 ramp to southbound I-515.

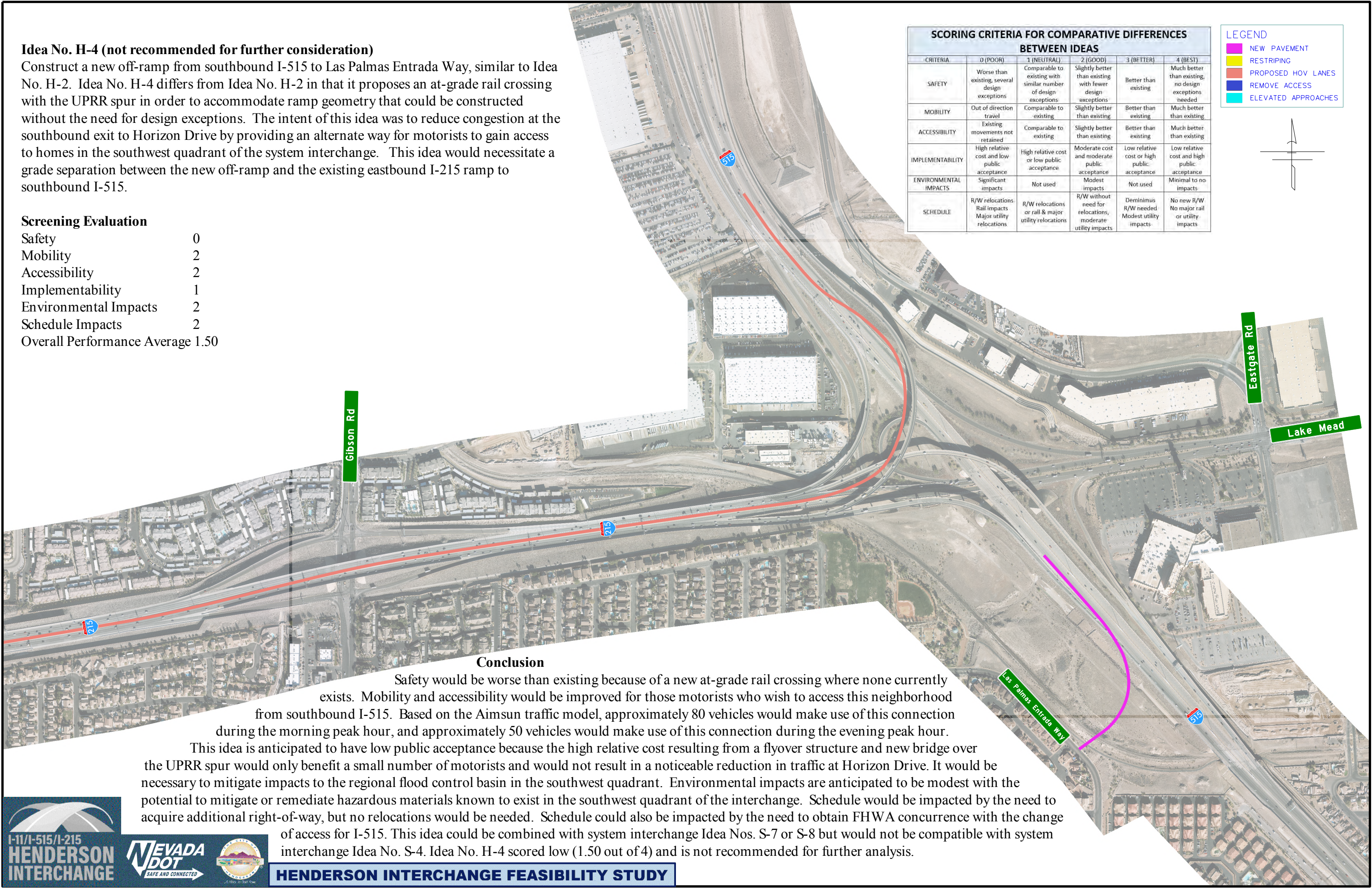
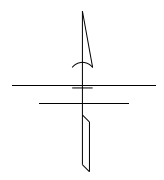
**Screening Evaluation**

Safety	0
Mobility	2
Accessibility	2
Implementability	1
Environmental Impacts	2
Schedule Impacts	2
Overall Performance Average	1.50

SCORING CRITERIA FOR COMPARATIVE DIFFERENCES BETWEEN IDEAS					
CRITERIA	0 (POOR)	1 (NEUTRAL)	2 (GOOD)	3 (BETTER)	4 (BEST)
SAFETY	Worse than existing, several design exceptions	Comparable to existing with similar number of design exceptions	Slightly better than existing with fewer design exceptions	Better than existing	Much better than existing, no design exceptions needed
MOBILITY	Out of direction travel	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
ACCESSIBILITY	Existing movements not retained	Comparable to existing	Slightly better than existing	Better than existing	Much better than existing
IMPLEMENTABILITY	High relative cost and low public acceptance	High relative cost or low public acceptance	Moderate cost and moderate public acceptance	Low relative cost or high public acceptance	Low relative cost and high public acceptance
ENVIRONMENTAL IMPACTS	Significant impacts	Not used	Modest impacts	Not used	Minimal to no impacts
SCHEDULE	R/W relocations Rail impacts Major utility relocations	R/W relocations or rail & major utility relocations	R/W without need for relocations, moderate utility impacts	Deminus R/W needed Modest utility impacts	No new R/W No major rail or utility impacts

**LEGEND**

- NEW PAVEMENT
- RESTRIPIING
- PROPOSED HOV LANES
- REMOVE ACCESS
- ELEVATED APPROACHES



**Conclusion**

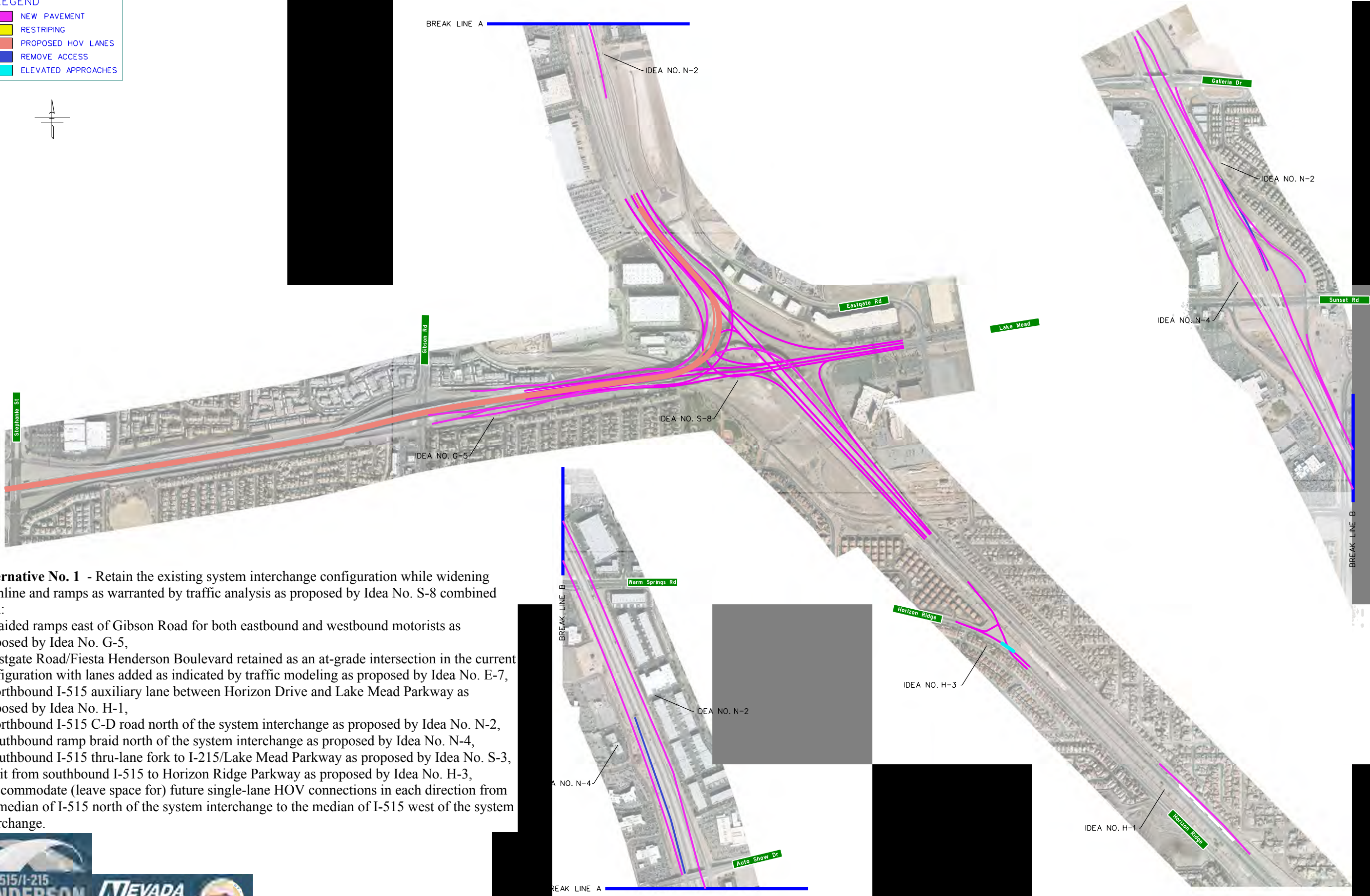
Safety would be worse than existing because of a new at-grade rail crossing where none currently exists. Mobility and accessibility would be improved for those motorists who wish to access this neighborhood from southbound I-515. Based on the Aimsun traffic model, approximately 80 vehicles would make use of this connection during the morning peak hour, and approximately 50 vehicles would make use of this connection during the evening peak hour.

This idea is anticipated to have low public acceptance because the high relative cost resulting from a flyover structure and new bridge over the UPRR spur would only benefit a small number of motorists and would not result in a noticeable reduction in traffic at Horizon Drive. It would be necessary to mitigate impacts to the regional flood control basin in the southwest quadrant. Environmental impacts are anticipated to be modest with the potential to mitigate or remediate hazardous materials known to exist in the southwest quadrant of the interchange. Schedule would be impacted by the need to acquire additional right-of-way, but no relocations would be needed. Schedule could also be impacted by the need to obtain FHWA concurrence with the change of access for I-515. This idea could be combined with system interchange Idea Nos. S-7 or S-8 but would not be compatible with system interchange Idea No. S-4. Idea No. H-4 scored low (1.50 out of 4) and is not recommended for further analysis.





LEGEND	
	NEW PAVEMENT
	RESTRIPING
	PROPOSED HOV LANES
	REMOVE ACCESS
	ELEVATED APPROACHES








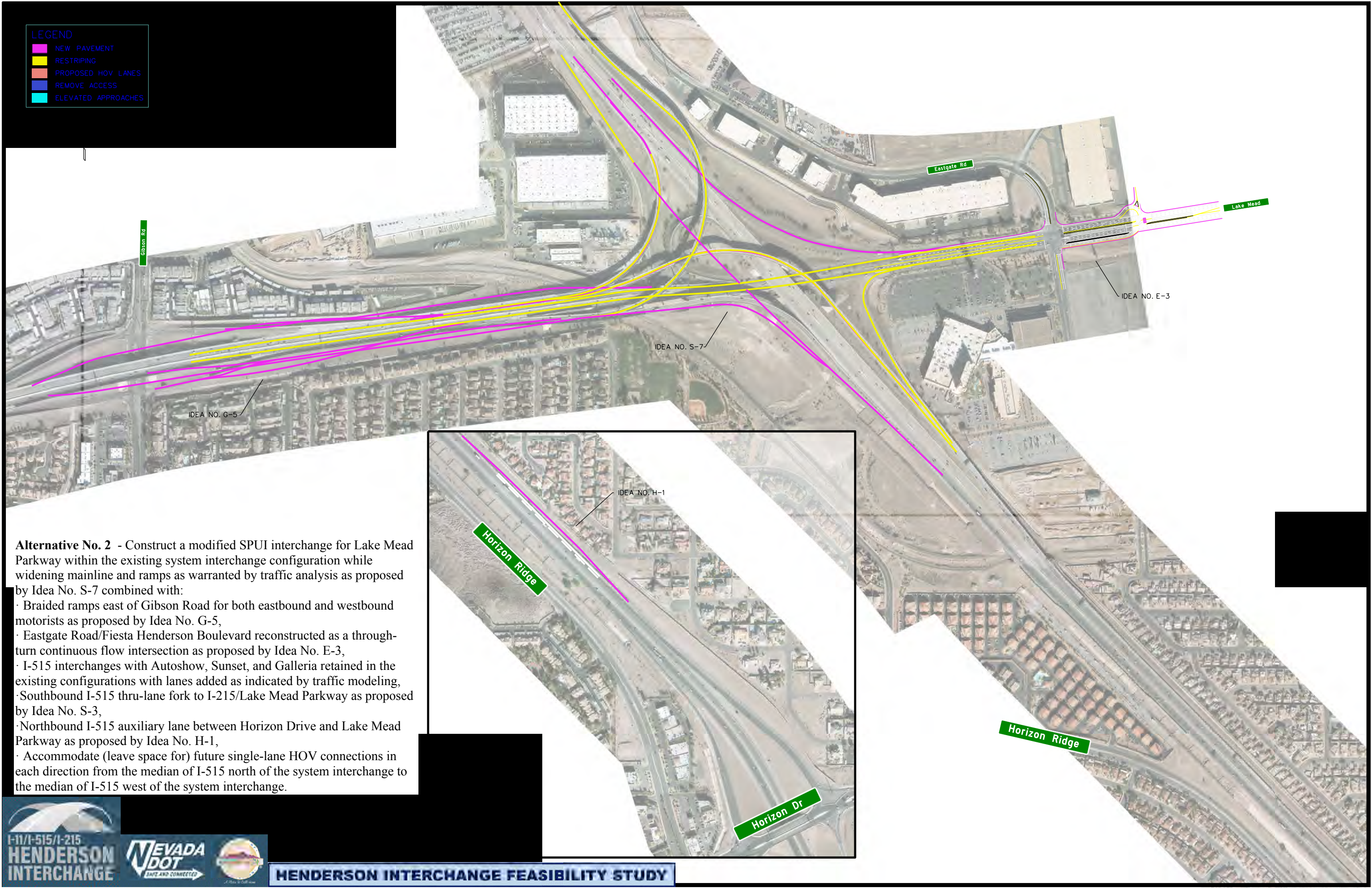
**Alternative No. 1** - Retain the existing system interchange configuration while widening mainline and ramps as warranted by traffic analysis as proposed by Idea No. S-8 combined with:

- Braided ramps east of Gibson Road for both eastbound and westbound motorists as proposed by Idea No. G-5,
- Eastgate Road/Fiesta Henderson Boulevard retained as an at-grade intersection in the current configuration with lanes added as indicated by traffic modeling as proposed by Idea No. E-7,
- Northbound I-515 auxiliary lane between Horizon Drive and Lake Mead Parkway as proposed by Idea No. H-1,
- Northbound I-515 C-D road north of the system interchange as proposed by Idea No. N-2,
- Southbound ramp braid north of the system interchange as proposed by Idea No. N-4,
- Southbound I-515 thru-lane fork to I-215/Lake Mead Parkway as proposed by Idea No. S-3,
- Exit from southbound I-515 to Horizon Ridge Parkway as proposed by Idea No. H-3,
- Accommodate (leave space for) future single-lane HOV connections in each direction from the median of I-515 north of the system interchange to the median of I-515 west of the system interchange.





LEGEND	
	NEW PAVEMENT
	RESTRIPING
	PROPOSED HOV LANES
	REMOVE ACCESS
	ELEVATED APPROACHES



**Alternative No. 2** - Construct a modified SPUI interchange for Lake Mead Parkway within the existing system interchange configuration while widening mainline and ramps as warranted by traffic analysis as proposed by Idea No. S-7 combined with:

- Braided ramps east of Gibson Road for both eastbound and westbound motorists as proposed by Idea No. G-5,
- Eastgate Road/Fiesta Henderson Boulevard reconstructed as a through-turn continuous flow intersection as proposed by Idea No. E-3,
- I-515 interchanges with Autoshow, Sunset, and Galleria retained in the existing configurations with lanes added as indicated by traffic modeling,
- Southbound I-515 thru-lane fork to I-215/Lake Mead Parkway as proposed by Idea No. S-3,
- Northbound I-515 auxiliary lane between Horizon Drive and Lake Mead Parkway as proposed by Idea No. H-1,
- Accommodate (leave space for) future single-lane HOV connections in each direction from the median of I-515 north of the system interchange to the median of I-515 west of the system interchange.





LEGEND	
	NEW PAVEMENT
	RESTRIPING
	PROPOSED HOV LANES
	REMOVE ACCESS
	ELEVATED APPROACHES



- Alternative No. 3** – Crossover system interchange as depicted in Idea No. S-4 combined with:
- Braided ramps leading to and from Gibson Road as proposed by Idea No. G-5,
  - Eastgate Road/Fiesta Henderson Boulevard retained as an at-grade intersection in the current configuration with lanes added as indicated by traffic modeling as proposed by Idea No. E-7,
  - Northbound I-515 entrance ramp from Lake Mead Parkway braided with the northbound Auto Show exit ramp as proposed by Idea No. N-1,
  - I-515 interchanges with Auto Show Drive, Sunset Road, and Galleria Drive retained in the existing configurations with lanes added as indicated by traffic modeling as proposed by Idea No. N-5,
  - Northbound I-515 auxiliary lane between Horizon Drive and Lake Mead Parkway as proposed by Idea No. H-1,
  - Exit from southbound I-515 to Horizon Ridge Parkway as proposed by Idea No. H-3,
  - Accommodate (leave space for) future single-lane HOV connections in each direction from the median of I-515 north of the system interchange to the median of I-515 west of the system interchange.

