

Technical Feasibility Study of Passenger Rail Service along the West Route between Las Vegas and Los Angeles

Hualiang (Harry) Teng, Ph.D.

Associate Professor, Director, Railroad, High Speed Rail and Transit Initiative

Boniphace Kutela, Graduate Student

Department of Civil and Environmental Engineering and Construction

University of Nevada, Las Vegas

4505 Maryland Parkway, Box 454015

Las Vegas, NV 89154-4015

Western ITE Conference, Las Vegas, Nevada

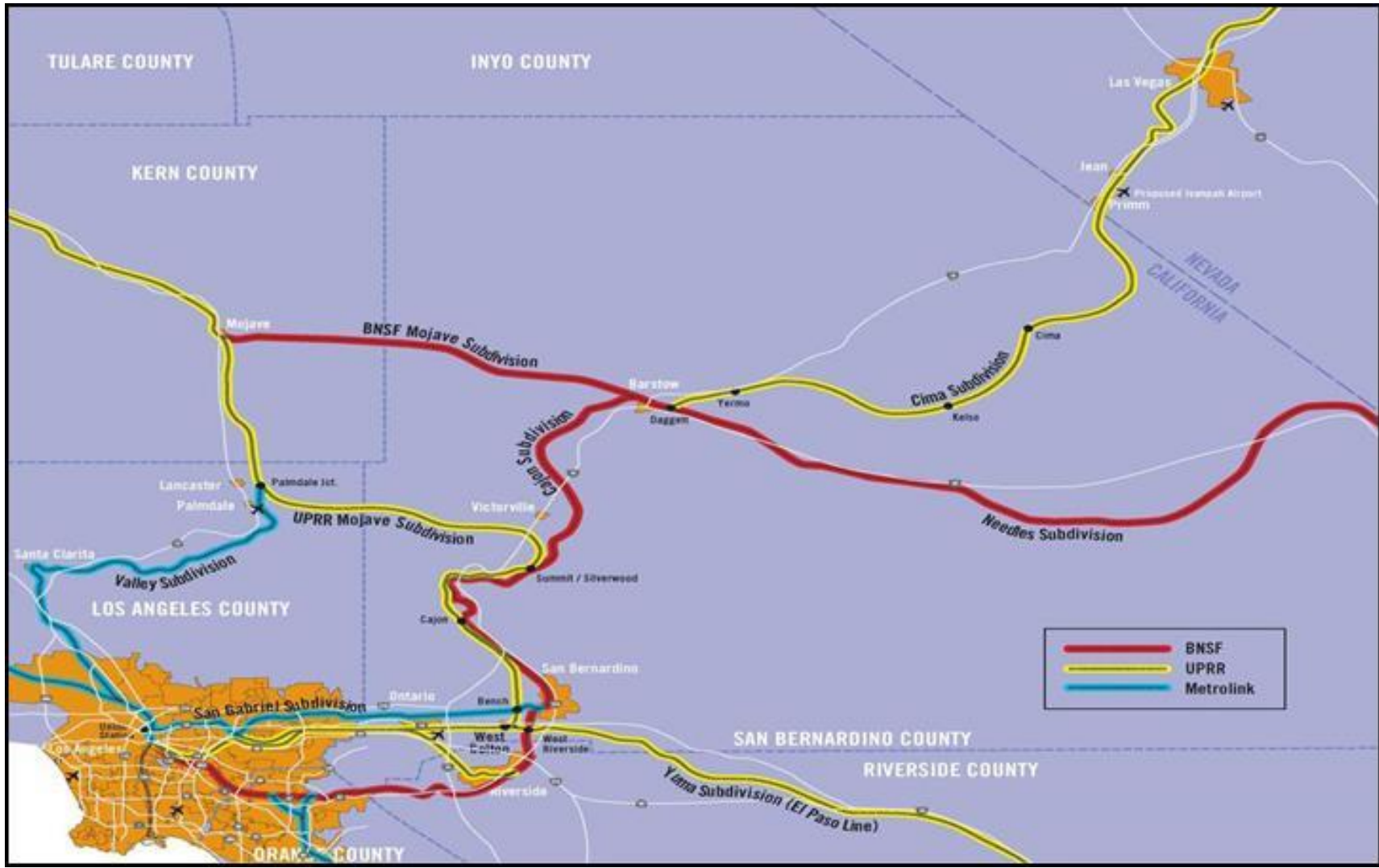
June 29, 2015

Content

- Background
- Methodology
- Infrastructure inventory and issues
- Data collection and analysis
- Results and discussions
- Conclusions and recommendations

Background

- **The passenger rail service from Las Vegas to California can date back from 1981 to 1997**
 - Desert Wind through Barstow, Victorville, San Bernardino and Fullerton.
 - Unreliable travel time
- **Evaluation of re-establishing the service was done in 2007, by the Regional Transportation Commission of Southern Nevada**
 - Only considered public agencies



Background (cont.)

- **In 2009, a campaign for passenger train service was launched: The Las Vegas Railway Express Inc. (also called X-Train)**
 - East route
 - Las Vegas, Barstow, Cajon Pass, Fullerton

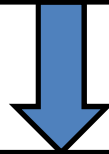
Background (cont.)

- **In 2014, West Route:**
 - Las Vegas, Barstow, Mojave, Lancaster, Union Station of LA
 - For special events
 - Fridays Eastbound
 - Sundays Westbound



Methodology

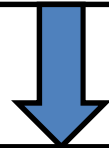
Infrastructure Needs



Operational Needs



Sensitivity Analysis



Recommendation Development

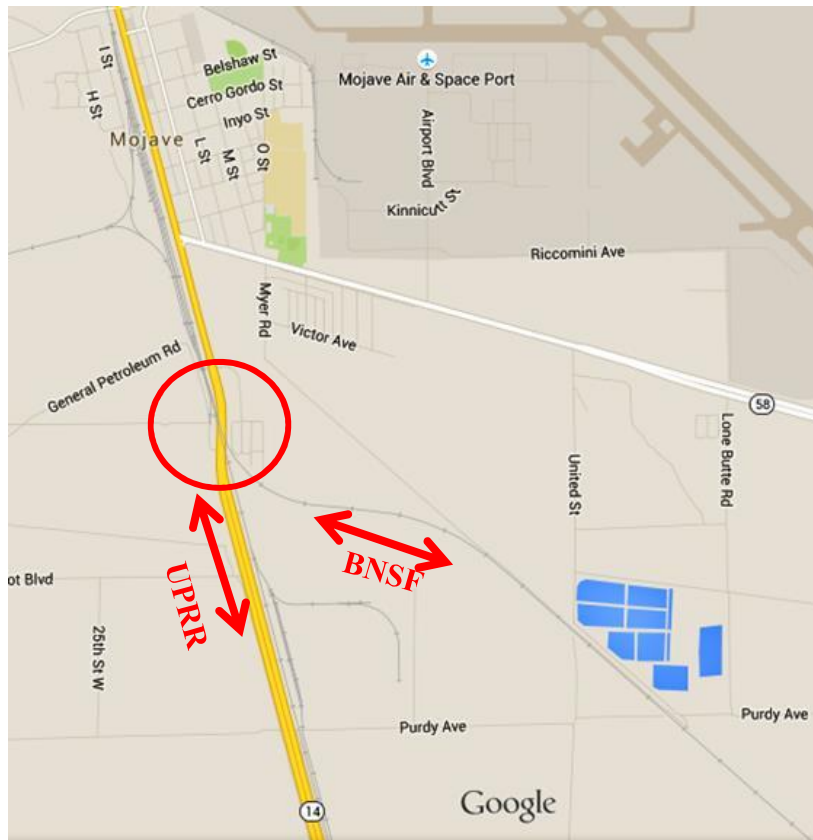
Infrastructure Inventory and Issues

- No platform exists for passengers at the Las Vegas Station



Infrastructure Inventory and Issues (cont.)

- The connection at Mojave is not ideal



Infrastructure Inventory and Issues (cont.)

- **No siding and platform for the passenger train at Lancaster Station**

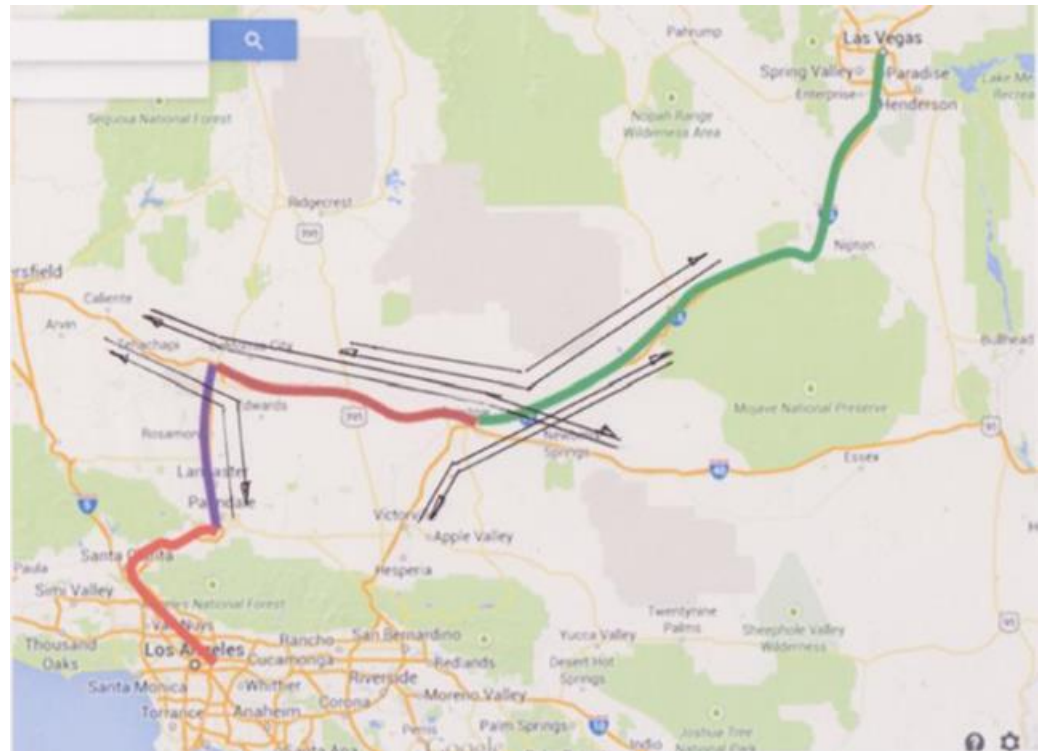


Data Collection

- Freight train flow patterns on the four railroad divisions

- Data sources

- ETT
- Railfan websites



Data Collection (cont.)

- **Data collected include:**
 - Track characteristics
 - Topography
 - Traffic count

Subdivision	Segment	Traffic Count by Direction	
		East	West
Cima (UPRR)	Las Vegas – Daggett	12	13
Needles (BNSF)	Daggett – Barstow	35	35
Mojave (BNSF)	Barstow – Mojave	14	15
Mojave (UPRR)	Mojave – Lancaster	18	17

Rail Traffic Controller (RTC)

- **RTC Inputs:**
 - **Topography (grades, curves)**
 - **Track characteristics (main lines, switches, signals, speeds)**
 - **Train schedules**
 - **Locomotive profiles**

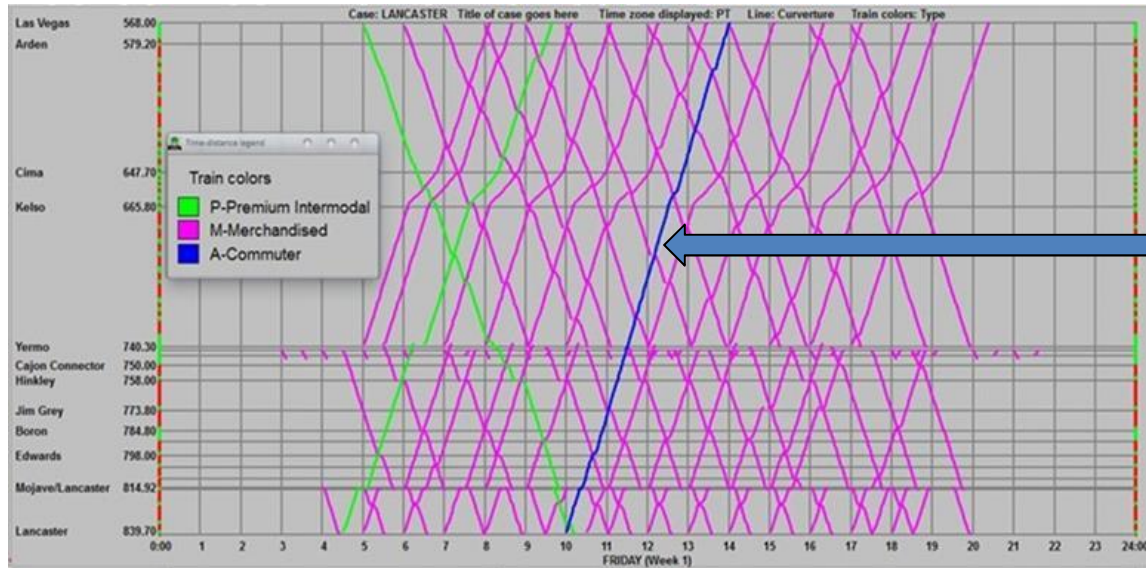
- **RTC Outputs**
 - **Overall network performance by type trains**
 - **Time-distance graphs for specific corridors**
 - **Train Performance Calculator (TPC) results**

Passenger Train Schedule

Assumptions:

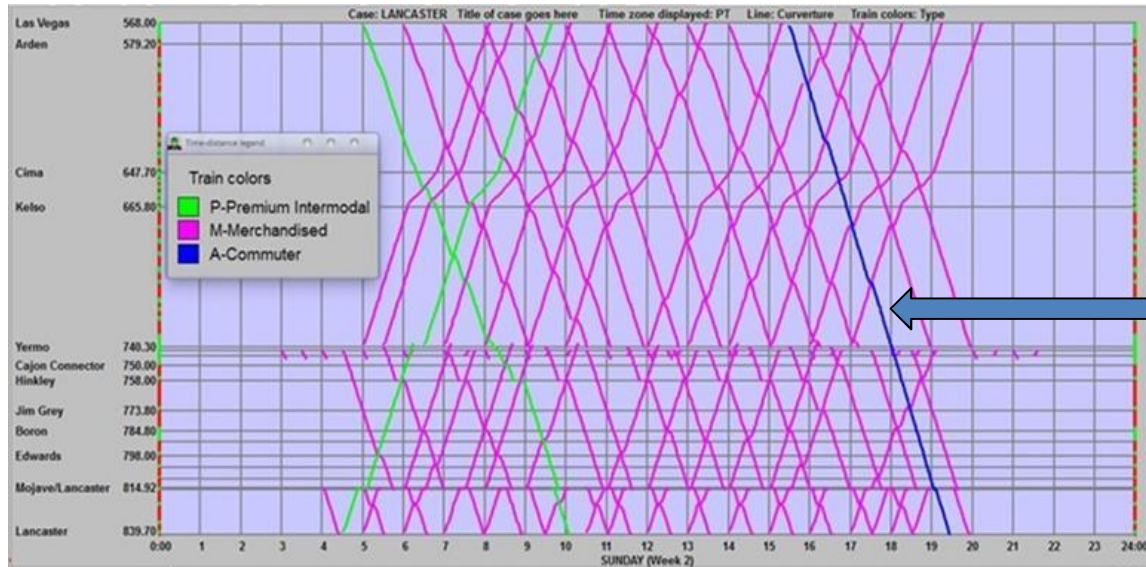
- **More than 50% of the trips are made during the daytime**
- **Headways 30 minutes for busy and 1 hour for non-busy locations**
- **Four night hours were left for maintenance activities**
- **Passenger train Schedule**
 - The eastbound train will depart Lancaster on Friday around 9:30 am;
 - The westbound will depart Las Vegas on Sunday around 4:00 pm

Time-Distance Diagrams



Friday's Schedule
4 hours

Passenger Train



Sunday's Schedule
4 hours

Passenger Train

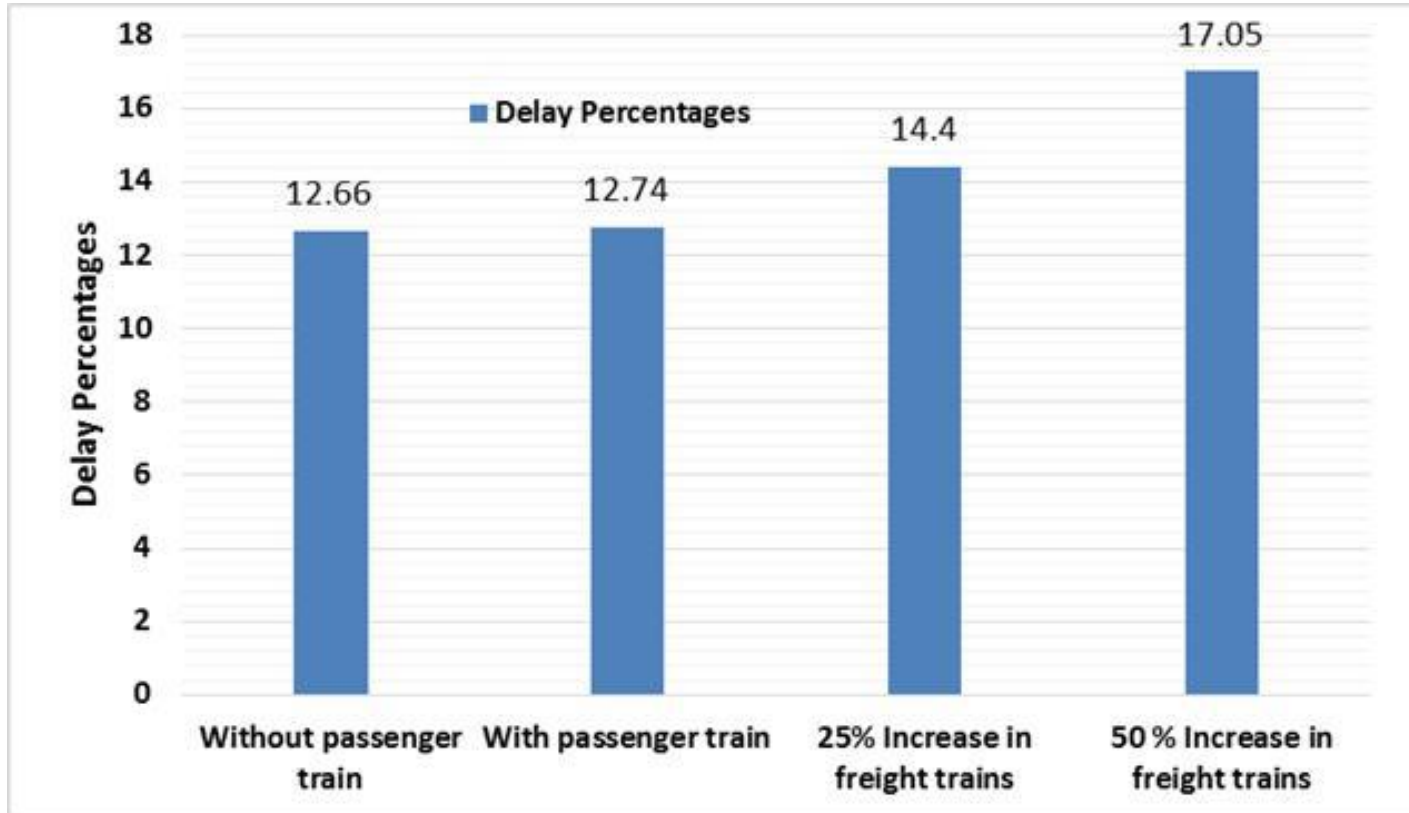
Sensitivity Analysis

- **To investigate the magnitude of the impact when the freight train flow is high**
 - The current level of train flow may contain certain variations
 - Train flows may increase significantly in the near future
 - 50% increase of freight train was considered in two steps

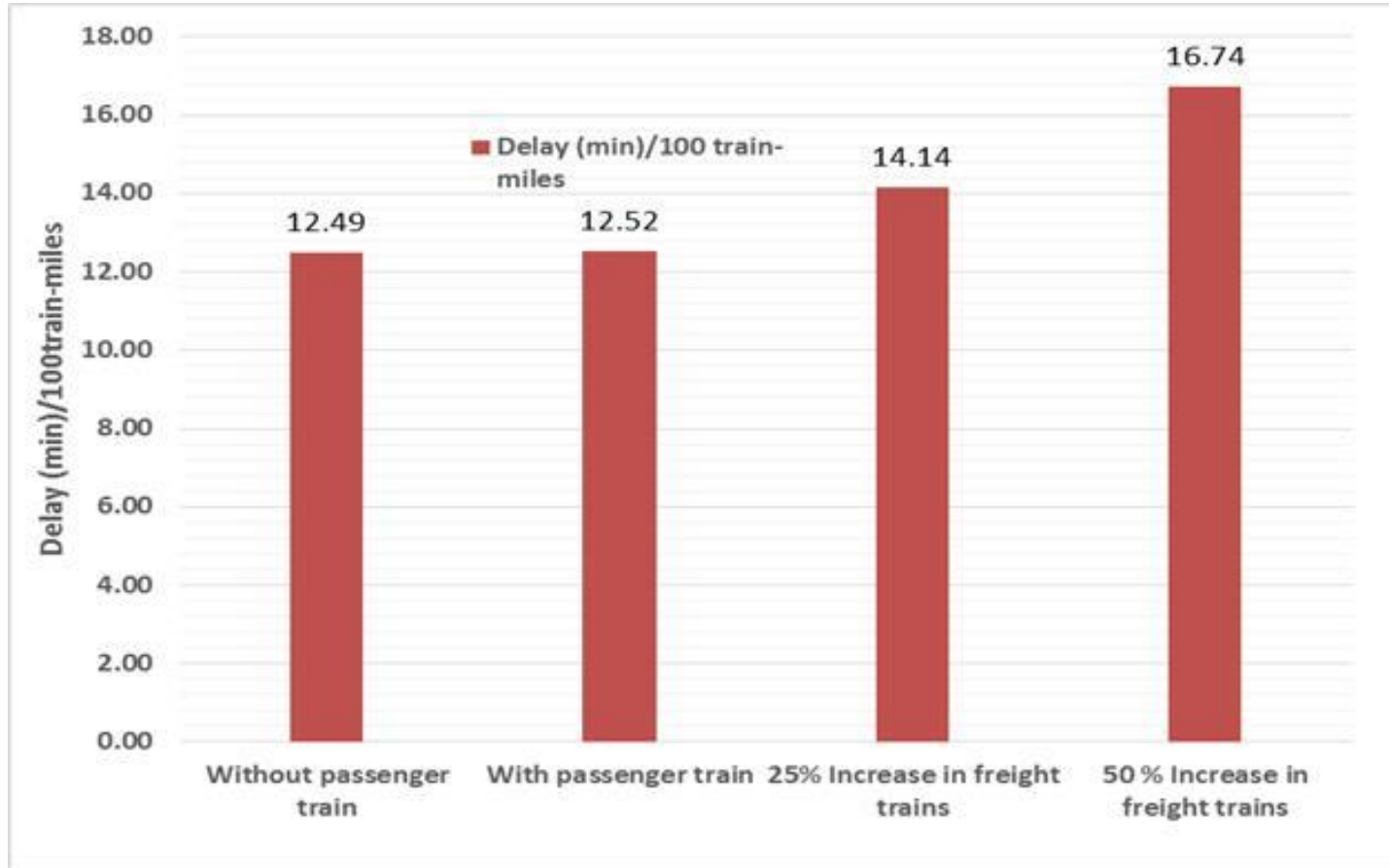
Sensitivity Analysis - Performance Criteria

- **Delay in Percentage: the percent of time that a train is delayed en route for**
 - Conflicts,
 - Extended dwells or
 - Randomized late departures
- **Delay in Minutes/100 Train-miles: the time trains are stopped waiting for a clear route**
- **Average Speed: the over-the-rail train speed not including**
 - Terminal dwell time,
 - Time for loading and unloading, and
 - The time trains spend in storage yards.

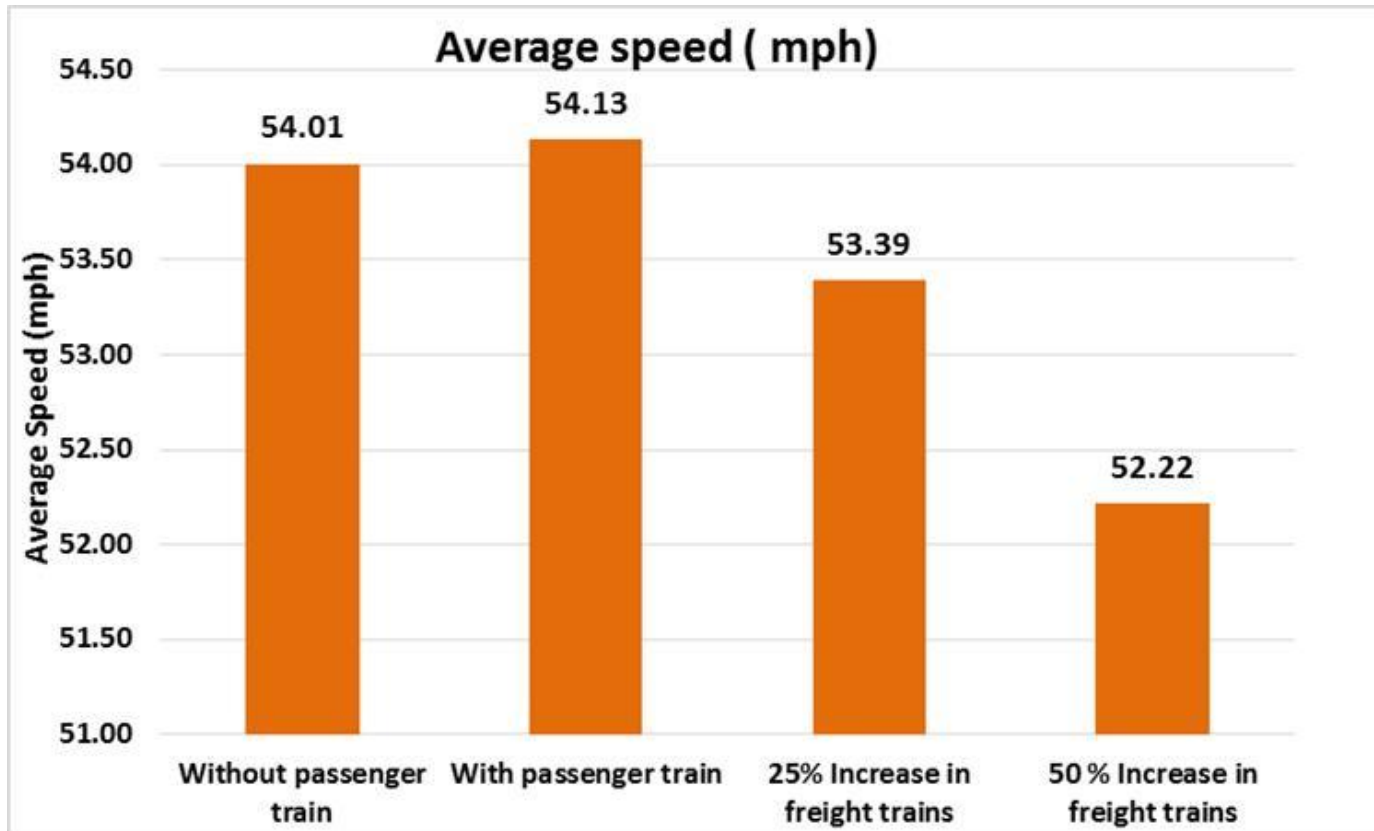
Sensitivity Analysis (cont.)



Sensitivity Analysis (cont.)



Sensitivity Analysis (cont.)



Conclusions

- The passenger train service is feasible
- No significant negative impact on freight trains performance

Recommendations

- Platforms should be built at the Las Vegas and Lancaster Stations
- A direct connection to be built at Mojave, CA
- The economic feasibility needs to be performed to determine
 - ridership,
 - revenue, and
 - cost of the passenger train service

Acknowledgement

- Thanks go to:
 - The contributions made by three reviewers.
 - Berkeley Simulation Software,
 - Las Vegas Railway Express, Inc. (X-Train)

Thank you!