

2016 UDOT RESEARCH PROBLEM STATEMENT

*** Problem statement deadline is March 14, 2016. Submit statements to Tom Hales at tahales@utah.gov. ***

Title: Improving Long-term Passing Lane Needs Identification on Rural Utah Highways **No. (office use):** 16.05.06

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Select One Subject Area

Materials/Pavements

Maintenance

Traffic Mgmt/Safety

Preconstruction

Planning

Public Transportation

1. Describe the problem to be addressed.

In recent years, UDOT has enthusiastically embraced the value of passing lanes on rural highways. New passing lanes have been constructed in numerous locations throughout the state and there are plans for many more. The number of passing lane projects in UDOT's Long Range Plan increased from 18 projects in the 2011-2040 plan to 127 projects in the 2015-2040 plan. Given the high percentage of truck traffic on Utah highways, these passing lanes are critical to the movement of freight and goods throughout the country. Additionally, Utah's Primary Freight Network often serves a significant amount recreational traffic making passing lanes doubly important for allowing passenger cars to pass slower moving trucks and recreational vehicles.

Yet, in many ways passing lanes are still considered a localized spot treatment and there is a need to develop long-term passing lane identification and implementation strategies of Utah highways. This is especially critical for highways where meaningful growth is expected in the future. Spot treatments for present-day concerns may not necessarily be compatible the long range vision of a highway. Furthermore, the spot treatment method does not consider the importance of establishing passing lanes at regular intervals on a highway. There is currently no consistent mechanism in Utah for identifying the appropriate passing lane interval that considers individual volumes and terrain patterns unique to a highway.

Finally, UDOT has recently begun to incorporate the "2+1" highway concept in long range planning. The 2+1 concept includes a single travel lane in each direction and a continuous alternating passing lane. Primarily used in Europe, there is a need to determine the applicability of the 2+1 concept to Utah's rural highway system, establish guidelines for implementation, and develop methodologies for building passing lanes that alleviate short-term concerns but are also compatible with a future conversion to the 2+1 concept.

2. Explain why this research is important.

Passing lanes are a strategic method for addressing safety, congestion, and mobility concerns on rural Utah highways. Passing lanes offer many of the benefits of a full widening project for a fraction of the cost and are the project of choice for many rural highways. Establishing guidelines for long-term passing lanes needs is critical to shaping the future of Utah's rural highways. As innovative ideas like the 2+1 concept continue to gain traction among UDOT Regions, there is a need to understand the concept's applicability to Utah highways and establish guidelines for project identification and implementation.

3. List the research objective(s):

1. Establish a methodology for determining the appropriate passing lane intervals on Utah highways according to traffic flow, terrain, freight and recreational traffic composition, and seasonal peaking.
2. Determine the applicability of the 2+1 concept to Utah highways, including implications of terrain and access placement.
3. Establish guidelines and methodology for future conversion to a 2+1 concept.

4. List the major tasks:

1. Gather statewide rural traffic data for rural Utah highways.
2. Conduct Highway Capacity Manual analysis to determine LOS benefits of passing lanes for combinations of traffic and terrain conditions on Utah highways.

3. Establish criteria for determining appropriate passing lane intervals for rural Utah highways.
4. Literature review of 2+1 concept implementation. Summarize application to Utah highways and potential advantages and drawbacks.
5. Develop guidelines for long range planning for 2+1 concept and methods for phasing short-term passing lane projects that are compatible with a 2+1 design.

5. List the expected results:

1. Guidelines for the determination of the appropriate passing lane intervals on rural Utah highways
2. Evaluation of applicability of the 2+1 highway concept for rural Utah highways
3. Guidelines for long-term conversion to 2+1 highway concept

6. Describe how this research will be implemented.

The products of this research will allow for UDOT Regions and the UDOT Planning Division to better understand long-term passing lane needs and implementation. Criteria will aid in UDOT staff in determining the appropriate passing-lane interval for a highway given its unique terrain and traffic characteristics. Results will assist in identifying short-term passing lane locations that are compatible with long-term strategies, including the innovative 2+1 concept.

7. Requested from UDOT: \$50,000
(or UTA for Public Transportation)

Other/Matching Funds: \$

Total Cost: \$50,000

8. Outline the proposed schedule, including start and major event dates.

The project will be conducted in 7 months according to the following schedule:

Task	2016					2017	
	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1 Compile Rural Highway Traffic Data							
2 Analyze LOS Impacts of Passing Lanes							
3 Establish Passing Lane Interval Criteria							
4 2+1 Concept Literature Review							
5 Evaluation of 2+1 Applicability to Utah							
6 Establish Guidelines for Long-term 2+1 Implementation							
7 Summary Report							