

# 2019 UDOT RESEARCH PROBLEM STATEMENT

\*\*\* Problem statement deadline is Feb. 6, 2019. Submit statements to [UTRAC@utah.gov](mailto:UTRAC@utah.gov). \*\*\*

**Title:** Rural Trail Crossing Treatments

**No. (Office Use):** 19.03.15

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**UDOT Champion (if different):**      **Email:**      **Phone:**

**Select ONE Subject Area**     Materials/Pavements     Maintenance     Traffic Mgmt/Safety     Structures/Geotech  
 Planning     Perf Mgmt/Data Analytics     Public Transportation     Other

## 1. Describe the problem to be addressed:

With so much of Utah designated as public land administered for recreational use, and hundreds of miles of backcountry trails, four-wheel drive, ATV terrain, and hiking trails are never far away. For example, the Paiute Trail System near Richfield alone includes over 2,800 miles of OHV and ATV trails and roads and several hundred miles of hiking trails ([www.utah.com/atv](http://www.utah.com/atv)). In a large number of locations, particular in the more rural parts of the state, these trails can intersect with local roadways and state highways. While the trail's themselves are typically maintained by Utah State Parks or the U.S. Forest Service, the crossings are left to local jurisdictions. There is little conformity to a standard and in many cases the crossings are ad hoc and very dangerous.

Research has been conducted examining environmental factors, as well as rider preferences for trail attributes and methods for estimating trail usage and volumes, and even optimizing trail locations. These models have incorporated everything from trail impacts and benefits associated with water bodies, to slope, land ownership, noise, trail separation, views, and rider preferences for vegetation types and loop trails (Snyder, Whitmore, Schneider, and Becker, 2008). However little research has examined the intersection where off-road trails come in contact and cross paved roads and highways. Only one study to date has evaluated the safety impact of ATVs coming in contact with passing cars while crossing a paved roadway (Williams, et al, 2014). Right-of-way determinations for cars, bicycles and pedestrians can be complex, and depend on the definitions of "crosswalk," "intersection," "vehicle" and "roadway." Because trail crossings occur between intersections, off-road/highway vehicles must yield to those traveling on the local roadway or highway. The same rules apply for pedestrians or non-motorized cyclists.

This goal of this research is to synthesize best practices observed statewide in Utah and nationally in order to provide engineers and other transportation professionals with guidance on safety treatment applications at trail crossings. This guidance can be used by UDOT and local city and counties to improve safety along heavily used trail crossings as well as improving visibility and signage at the less traveled crossings. A decision tree-based treatment selection methodology will be created identifying appropriate options based on the conditions at a particular trail crossing. These conditions include urban/rural setting of the crossing, number of lanes of the crossed roadway, whether the crossed roadway is divided or undivided, the speed limit and average daily traffic (ADT) of the crossed roadway, and whether the crossing is a midblock or parallel path crossing.

## 2. Write the project objective (25 words or less):

Identify recommendations and best practices for the design of off-road trail crossings of municipal roadways and state highways.

## 3. Explain why this research is important:

(In response, consider addressing specific UDOT goals, applicability in Utah or other states, etc.)

This research will identify standard guidelines for improving trail crossings. This will provide a concise guidance for all jurisdictions to utilize similar methods and standards for improvements and minimize necessary resources. This will improve safety for both off-road trail users and vehicles who may come into contact with them at crossings.

## 4. List the major tasks:

1. Meet with the technical advisory committee to refine the scope, timeline, and deliverables of this research

