

Countywide Roundabout Right-of-Way Preservation Plan

Ada County Highway District
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INTRODUCTION

The Countywide Roundabout Preservation Plan provides a mechanism for the Ada County Highway District (ACHD) to preserve right-of-way (ROW) at intersections where future roundabouts are feasible. Roundabouts are sometimes ruled out as possible improvements due to their imposed property impacts because their footprints differ from more typical intersection configurations. By preserving appropriate ROW, ACHD will minimize future property impacts so project costs are less likely to offset the benefits of constructing roundabouts (e.g., improved efficiency and safety).

The Countywide Roundabout Preservation Plan evaluated nearly all existing and future planned intersections within Ada County, Idaho with more than two roadway approaches classified as a collector or arterial (785 intersections). The evaluation was completed through a screening process that considered traffic volumes, physical constraints, and the surrounding network.

TRAFFIC VOLUMES

Future peak hour volume forecasts from the regional travel demand model were heavily relied on to analyze the intersections due to the scale of this study. Table 1 summarizes the upper volume thresholds that were developed to analyze the traffic forecasts.

Table 1: Summary of Hourly Volume Upper Thresholds

Configuration	Definition	Total Entering Volume	Individual Leg Entering Volume
Single-Lane Roundabout	1 entry and exit lane per leg, 1 continuous circulating lane	2,200	1,000
Multilane Roundabout	2 entry and exit lanes on an intersecting road, 1 entry and exit lane on the other intersecting road, a combination of 1 and 2 circulating lanes	4,500	2,000 ¹
Dual-Lane Roundabout	2 entry and exit lanes per leg, 2 continuous circulating lanes	4,500	2,000
Triple-Lane Roundabout	3 entry and exit lanes per leg, 3 continuous circulating lanes	6,700	2,700 ²

1 – Multilane roundabout also requires that 3 approaches cannot exceed 1,000 veh/hr and 2 approaches cannot exceed 1,400 veh/hr

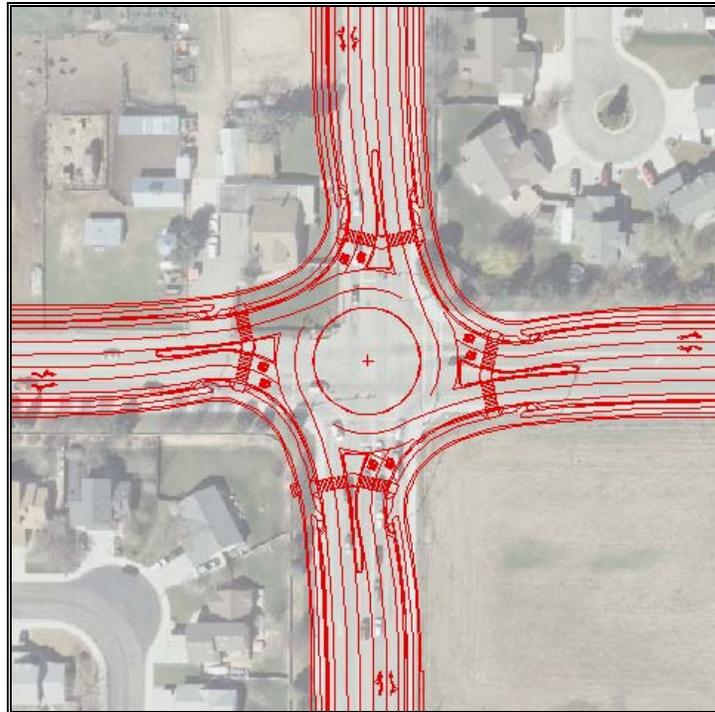
2 – Triple-lane roundabout also requires that 3 approaches cannot exceed 1,600 veh/hr

All study intersections were evaluated using the thresholds summarized in Table 1 to determine the number of lanes needed for a roundabout to operate acceptably. A refined analysis using forecast turning movement volumes was completed for 134 'borderline' intersections that were close to the thresholds summarized in Table 1. As a result of this refined analysis, 74 of the 134 'borderline' configurations did not change from the initial configurations identified though the threshold analysis. In addition, all intersections that exceeded the triple-lane roundabout volume threshold during the peak hour were analyzed for roundabout feasibility during the second highest hour of a typical weekday. If an intersection exceeded the roundabout capacity thresholds during the peak hour but not during the second highest hour it was included as a feasible location for a triple-lane roundabout. This ensures that roundabouts are not removed from consideration due to congestion during a single hour of the day. Intersections that have forecasts too high for a triple-lane roundabout during the second highest weekday hour were eliminated for roundabout ROW preservation.

PHYSICAL CONSTRAINTS

All of the intersections identified as possible future roundabouts through the traffic volume threshold analysis had their appropriate roundabout template overlaid on a Geographic Information System (GIS) aerial photo as illustrated in Figure 1. Sixteen roundabout templates were created to accurately estimate ROW needs and impacts. Intersections where a roundabout template would not fit the geometric constraints were given a “unique” designation. In these cases, a roundabout may still be the best solution for the intersection, but must be designed on an individual basis.

Figure 1: Example Roundabout Template Loaded in GIS



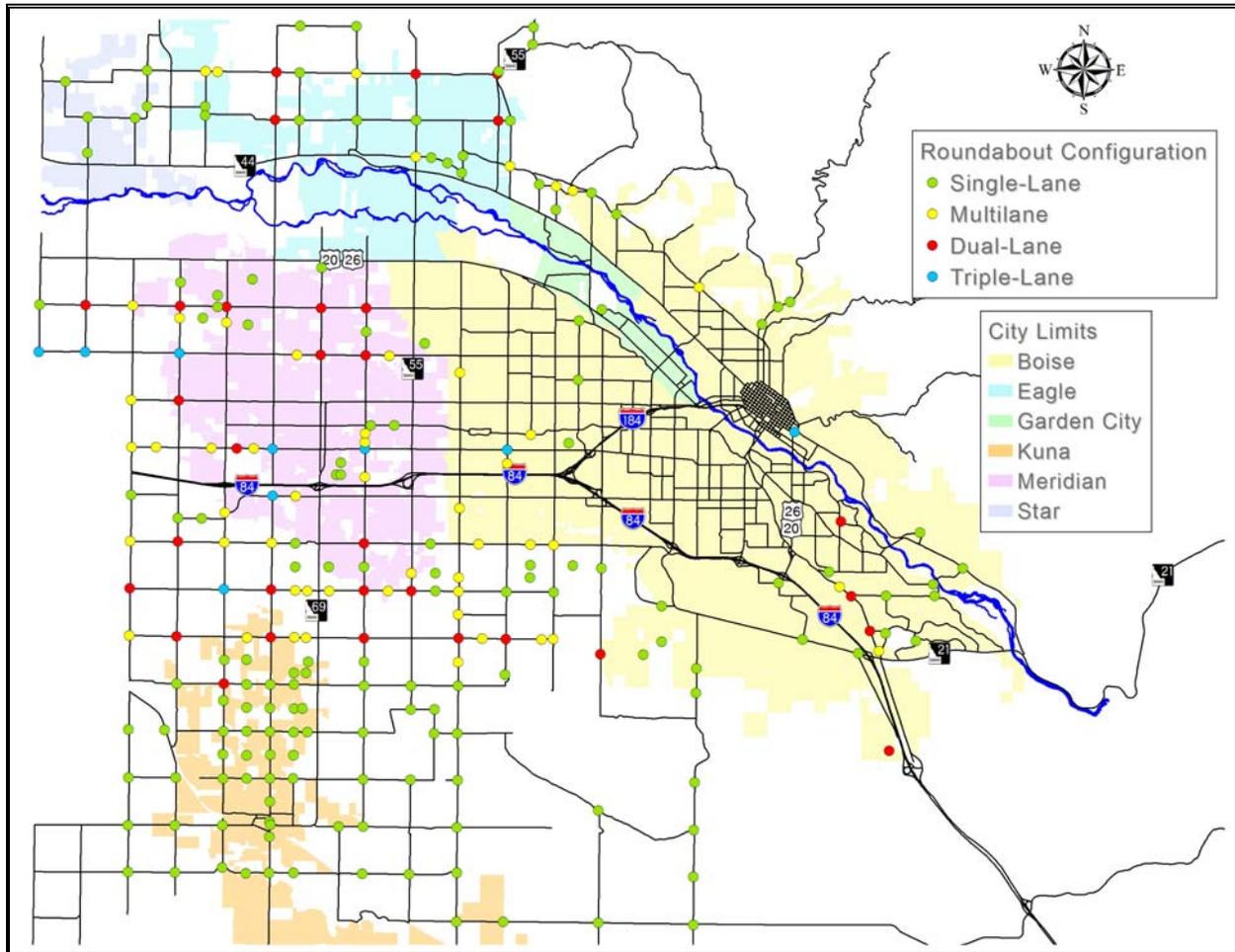
The anticipated ROW impact at each intersection was evaluated while considering extent of impact, existing land use, redevelopment potential, and geographic constraints. Intersections where a roundabout does not fit within the physical constraints, have been recently improved, or that are unlikely to be significantly altered in the future were removed from consideration for roundabout ROW preservation.

SURROUNDING NETWORK

The remaining possible future roundabouts were evaluated with their surrounding network in mind. Locations where a roundabout would be within a coordinated signal network, close to a high-volume intersection with long queues, or in a consistently signalized corridor were generally not carried forward for ROW preservation.

RESULTS

The study resulted in an adopted plan that aims to preserve ROW at the 242 potential future roundabout intersections identified in Figure 2. The plan has been distributed to the land-use jurisdictions and development community within the county and is a vital planning tool when considering ROW preservation through development or capital improvement.

Figure 2: Intersections Identified for Roundabout ROW Preservation

IMPLEMENTATION

The Countywide Roundabout Preservation Plan provides predictability to the development community, resulting in fewer potential conflicts, and to date there have been minimal issues. New development adjacent to intersections identified for roundabout preservation dedicates the ROW with no compensation except where intersection improvements are identified in the Capital Improvements Plan.

This study also led to additional discussion regarding intersections identified for roundabout preservation within ACHD capital projects. The appropriate immediate action can vary by project and the results range from doing nothing, to purchasing the ROW, to building a roundabout.

CONCLUSION

The ACHD Countywide Roundabout Preservation Plan is among the first of its kind. The results will save ACHD significant ROW costs through early identification of potential roundabout locations and timely acquisition of ROW. Ultimately, the public will benefit from fewer crashes, decreased travel times, and an enhanced environment as expected through an increased number of roundabouts in the community.

Please contact us with any questions or comments about this project. Author Andrew Cibor can be reached at acibor@achdidaho.org or (208) 387-6149. Co-author Amar Pillai can be reached at apillai@achdidaho.org or (208) 387-6238.