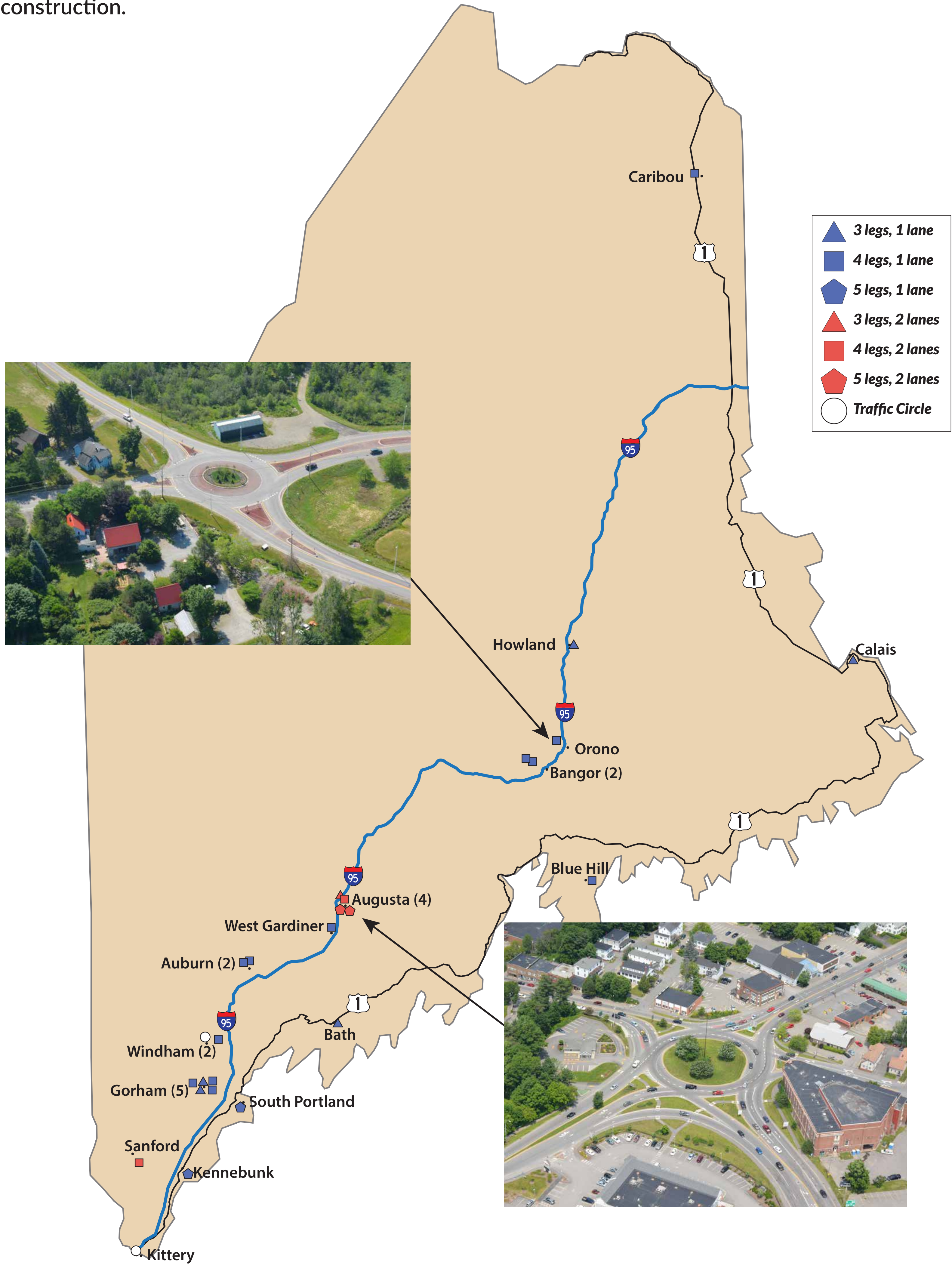


Maine's Statewide Experience in Using Roundabouts to Improve Intersection Safety

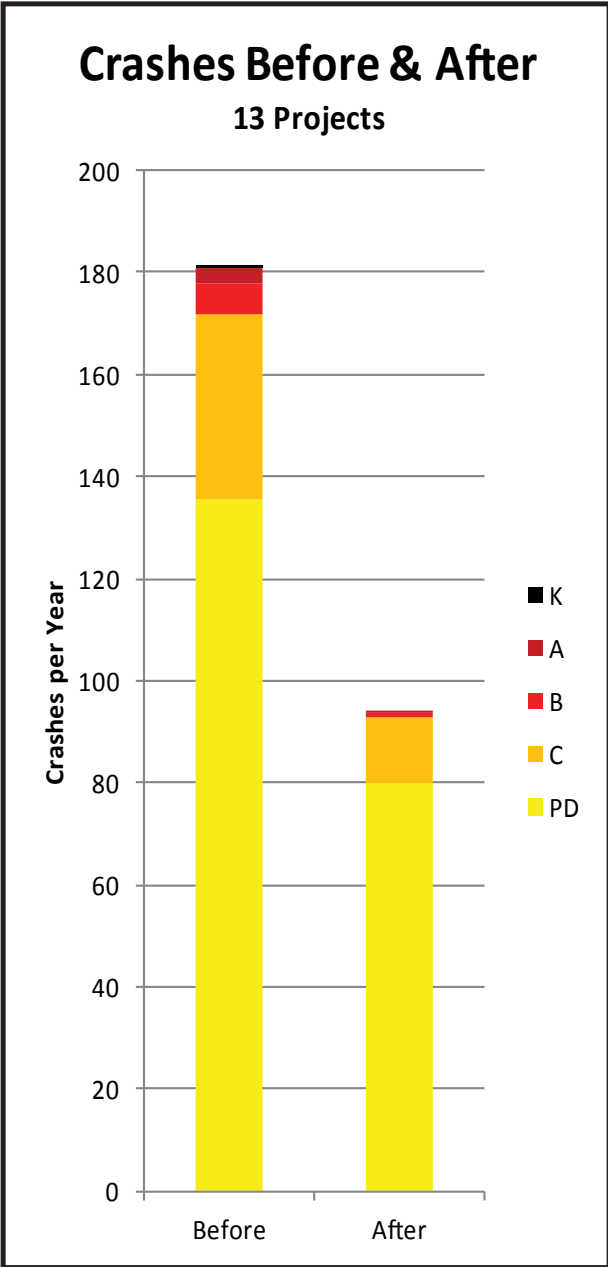
Roundabout Inventory

Maine has 26 operating roundabouts on its arterial and major collector highway network. This inventory includes two traditional traffic circles, one mini-roundabout, and 21 new modern roundabouts and two updated traffic circles. At least six more modern roundabouts are in design and funded for future construction.



Before & After Studies

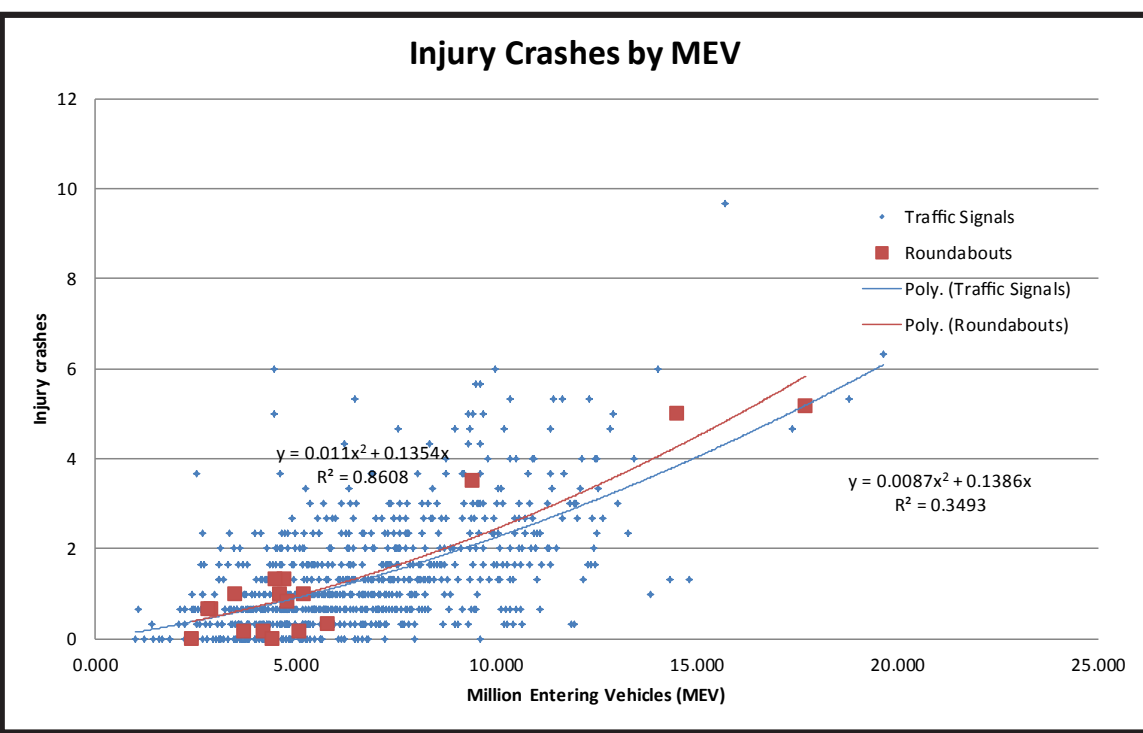
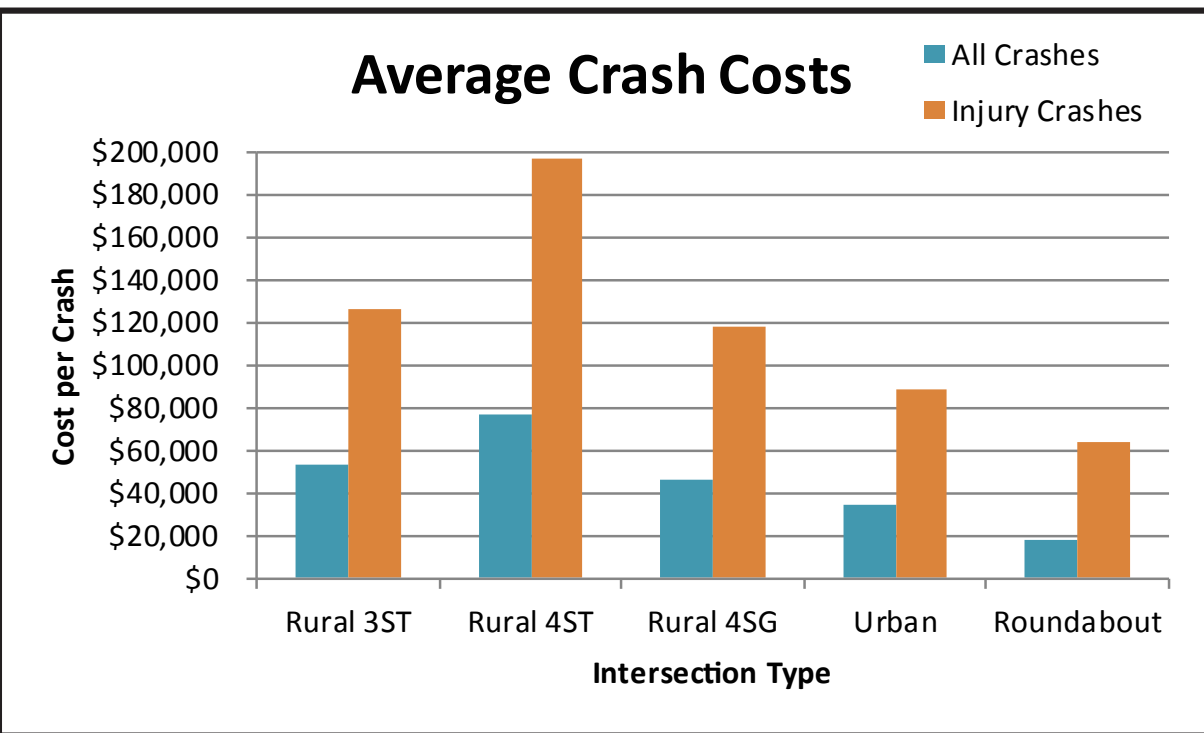
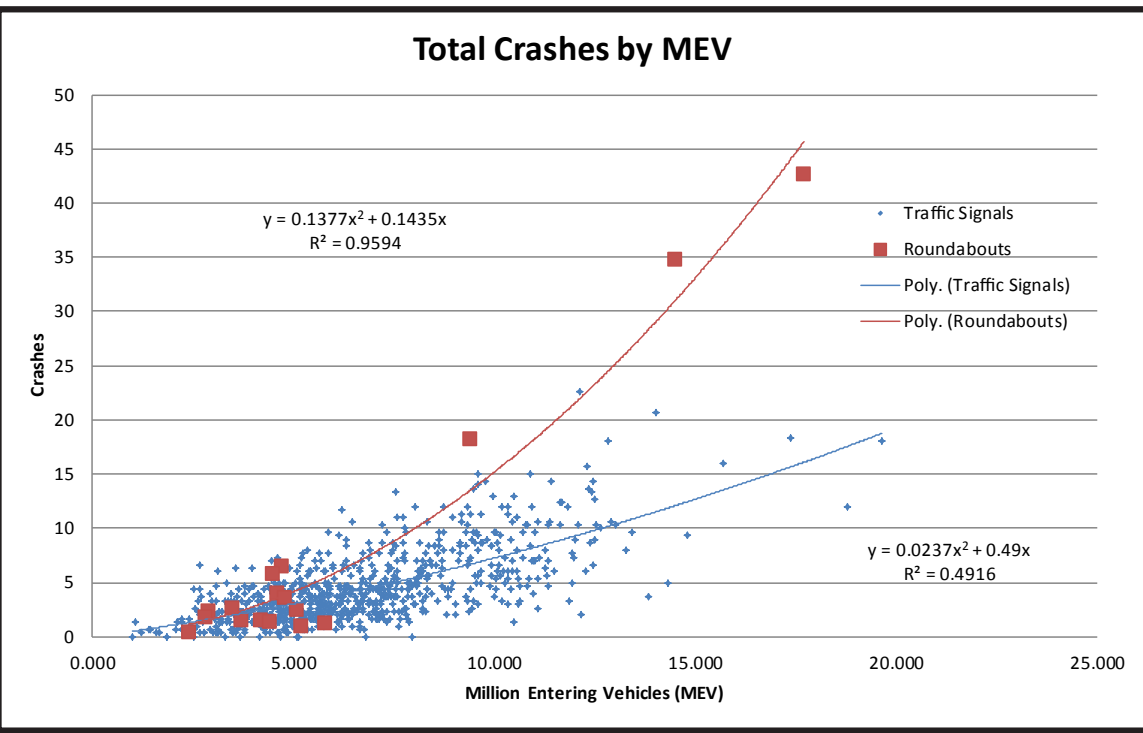
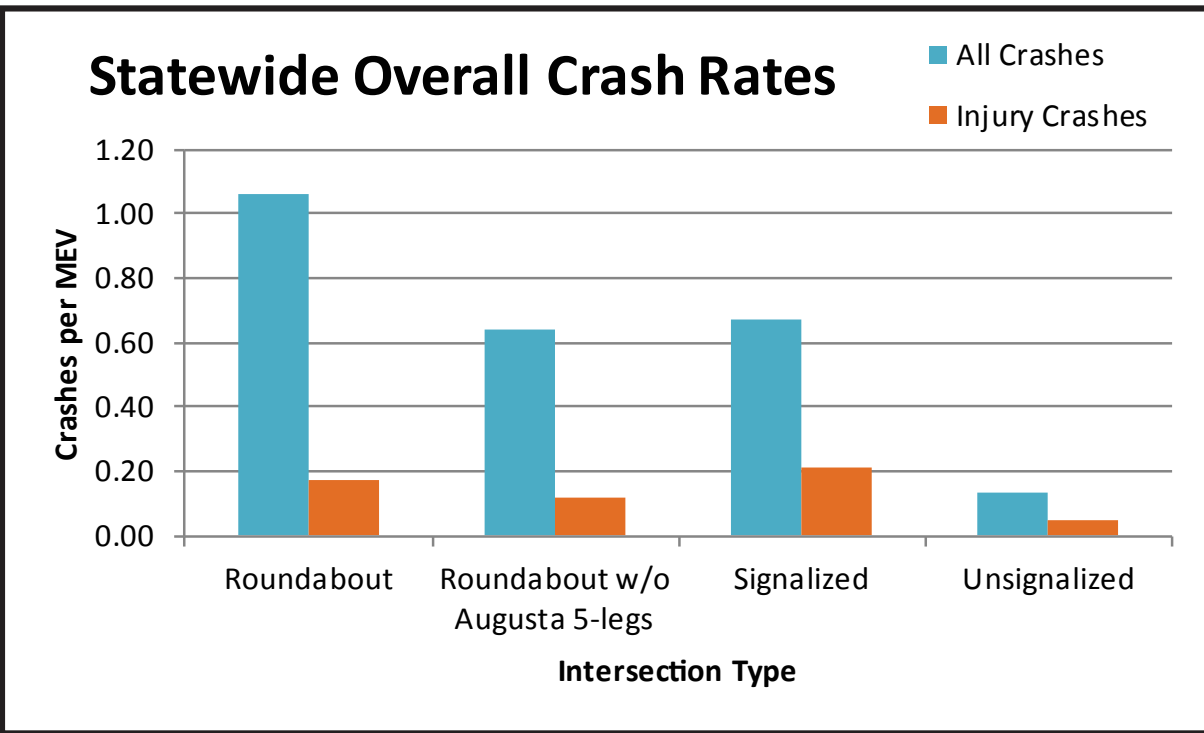
MaineDOT has conducted before-and-after safety comparisons at 13 roundabout project locations. The comparisons involve the review of crash experience in the three calendar years prior to the roundabout construction project and the three calendar years after construction. The study results from the individual locations were aggregated to show overall changes in crash rates for total crashes and injury crashes.



Safety Impact of 13 Modern Roundabout Projects			
Performance Measure	Before	After	% Change
Total Crashes / MEV	2.45	1.27	-48%
Injury Crashes / MEV	0.62	0.19	-69%
Crash Costs / Year	5.9	1.8	-70%

Crash Rates at Intersections

As part of MaineDOT's implementation of the Highway Safety Manual (HSM), average crash rates and crash costs were calculated for various intersection types, including roundabouts.



Crash Prediction Model

To help MaineDOT evaluate the potential of roundabouts for future intersection projects, a Maine roundabout crash prediction model was developed from the crash prediction formulas published in the HSM and NCHRP Report 672. The formulas were adjusted by a calibration factor developed from 141 roundabout -years of crash experience at 21 Maine roundabout locations. These locations included the 13 locations from the before-and-after study locations plus eight roundabouts at new intersection locations.

Model for Predicting the Expected Total Crash Frequency per Year at Roundabouts by Number of Approaches, NCHRP 672				
Intersection:	Location name			
Town/City:	Town			
AADT:	18000	(Total <i>entering</i> AADT)	Maine Calibration Factor:	1.66
Number of Approach Legs:	4			
Number of Circulating Lanes:	2			
Prediction Using NCHRP 672 with Maine Calibration Factor (crashes/year)				
		Approach Legs		
Circulating lanes	3	4	5	
1	2.8	5.9	12.5	
	(4,000-31,000 AADT)	(4,000-37,000 AADT)	(4,000-18,000 AADT)	
2	4.6	9.7	18.6	
	(3,000-20,000 AADT)	(2,000-35,000 AADT)	(2,000-52,000 AADT)	
3	N/A	32.2	N/A	also applies to 4 circulating lanes
		(25,000-59,000 AADT)		
		Crashes/year	Cost/crash	Total Cost
% Injury crashes	19%	1.8	\$ 65,100	\$ 120,067
% PDO crashes	81%	7.9	\$ 8,900	\$ 69,979
		9.7	Total:	\$ 190,046