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SAFETY DATA
CASE STUDIES

Visit: https://highways.dot.gov/research/safety/interactive-highway-safety-design-model/interactive-highway-safety-design-model-ihsdm-overview [5]

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Turner-Fairbank Highway Research Center

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https://highways.dot.gov/research/turner-fairbank-highway-research-center/offices/office-safety-research-development [10]

Interactive Highway Safety Design Model (IHSDM)-Related Safety Data Case Studies

The Federal Highway Administration (FHWA) Roadway Safety Data Program is working with State and local agencies to develop case studies around roadway safety data collection, management, and analysis issues. These case studies help illuminate both the challenges that agencies encounter on data issues and the solutions they are implementing to address those challenges (https://highways.dot.gov/safety/data-analysis-tools/rsdp/safety-data-case-studies).[1]

Projects That Used IHSDM To Apply *Highway Safety Manual Part C* Predictive Methods:[2]

State/ Agency	Year	Case Study Title, Link, and Description
AL	2022	**Alabama's West South Boulevard Redesign Safety Assessment (FHWA-SA-21-075):** https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-06/ALDOT_West%20South%20Blvd_508.pdf[3] FHWA's Geometric Design Lab, in collaboration with the Alabama Department of Transportation (ALDOT) and the FHWA Alabama Division, used IHSDM to assess the safety performance of a high-volume, high-speed suburban arterial in Montgomery, AL. The results informed ALDOT's decisionmaking on the project and increased confidence in the pedestrian safety elements selected for the final design.
MI	2021	**Michigan's US 31 at I–94 Interchange Alternatives Analysis' (FHWA-SA-21-020):** https://safety.fhwa.dot.gov/rsdp/downloads/MDOT%20I94%20US31_Case%20Study_Final.pdf[4] Michigan Department of Transportation (MDOT) used an iterative approach to project development that used IHSDM to identify a preferred design alternative based on a broad suite of traffic, safety, and cost considerations. The strategic application of IHSDM enabled MDOT to assess different design alternatives and project assumptions to make data-driven decisions for the proposed I–94 and US 31 interchange and surrounding network.
WI	2021	**WIS 75 Intersection Screening & Project Development Process (FHWA-SA-21-074):** https://safety.fhwa.dot.gov/rsdp/downloads/WisDOT%20Intersection%20Analysis_Case%20Study_Final.pdf[6] Wisconsin DOT (WisDOT) applied IHSDM to evaluate potential alternatives and assess predicted crashes. With predicted outcomes based on several alternatives, WisDOT used IHSDM's Economic Analyses Tool to identify the most cost-effective alternative to improve safety at the candidate intersection.[5]
FHWA-WFLHD	2021	**FHWA Western Federal Lands Highway Division: Yale-Kilgore Road Safety and Traffic Assessment (FHWA-SA-21-073):** https://safety.fhwa.dot.gov/rsdp/downloads/FHWA-SA-21-073_WFLHD_yale_kilgore_rd_case_study.pdf[7] Western Federal Lands Highway Division (WFLHD) used IHSDM as part of the design process for the rehabilitation of the Yale-Kilgore Road. The WFLHD team used IHSDM to conduct the analysis tradeoffs necessary to make informed design and safety countermeasure decisions.
IN	2021	**Indiana's State Road 37 Improvement Project (FHWA-SA-21-019):** https://safety.fhwa.dot.gov/rsdp/downloads/FHWA-SA-21-019_INDOTSR37_Case_Study.pdf[8] Indiana DOT separately analyzed individual facility types for the no-build and proposed designs using IHSDM, including mainline segments, intersections, entrance and exit ramps, ramp terminals, and crossing street segments.
ID	2010	**Highway Safety Manual Case Study 1: Using Predictive Methods for a Corridor Study in Idaho:** https://safety.fhwa.dot.gov/hsm/casestudies/id_cstd.cfm[9] The researchers used IHSDM to identify existing geometric deficiencies, specific locations requiring further evaluation or locations requiring possible design improvements, and potential safety issues on existing Idaho SH–8 corridor conditions.

IHSDM 2021 (Ver.17.0.0) Capabilities[11]											
Facility Type		Number of Lanes	Traffic Control Type	Policy Review Module (PRM)	Crash Prediction Module (CPM)	Design Consistency Module (DCM)	Traffic Analysis Module (TAM)	Driver Vehicle Module (DVM)	Calibration Tool	Economic Analysis (EA) Tool	Notes
Rural two-lane highways	Segments	2	N/A	X	X	X	X	X	X	X	
	3-leg intersections	N/A	Stop (minor road), stop (major road turns), signal, roundabout		X				X	X	
	4-leg intersections		Stop (minor road), stop (all way), signal, roundabout		X				X	X	
Rural multilane highways	Segments	4	N/A	X	X				X	X	
	3-leg intersections	N/A	Stop (minor road), signal, roundabout		X				X	X	
	4-leg intersections		Stop (minor road), signal, roundabout		X				X	X	
Urban/ suburban arterials	Segments	2–8	N/A		X				X	X	Including one-way arterials (2–4 lanes).
	3-leg intersections	N/A	Stop (minor road), stop (major road turns), stop (all way), signal, roundabout		X				X	X	Including "high-speed" (i.e., posted speed >= 50 mph) stop (minor road) and signalized intersections.
	4-leg intersections		Stop (minor road), stop (all way), signal, roundabout		X				X	X	
	5-leg intersections		Signal		X				X	X	
Freeways	Segments	4–8 (rural), 4–10 (urban and suburban)	N/A		X				X	X	
	Speed-change lanes				X				X	X	
Ramps	Ramps and C-D roads	1 (rural), 1–2 (urban and suburban)			X				X	X	
Ramp terminals	3-leg ramp terminals	N/A	Stop (minor road), stop (all way), signal, roundabout		X				X	X	Ramp terminal types: A2, B2, D3en, D3ex.
	4-leg ramp terminals		Stop (minor road), stop (all way), signal, roundabout		X				X	X	Ramp terminal types: A4, B4, D4.
	SPDI		Signal		X				X	X	CPM is only available in site-based.
	TDI				X				X	X	

C-D = collector-distributor; en = entrance; ex = exit; N/A = not applicable; SPDI = single-point diamond interchange; TDI = tight diamond interchange.

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5. FHWA. 2023. "Interactive Highway Safety Design Model (IHSDM) Overview" (web page). https://highways.dot.gov/research/safety/interactive-highway-safety-design-model/interactive-highway-safety-design-model-ihsdm-overview, last accessed September 30, 2024.
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11. FHWA. 2021. *Interactive Highway Safety Design Model (IHSDM)* (software). Version 17.0.0.