SAFETY INVESTIGATION MANUAL WORKSHEET

CASE STUDY: US-20 AND BARCLAY DR

Online Training

Presented by:

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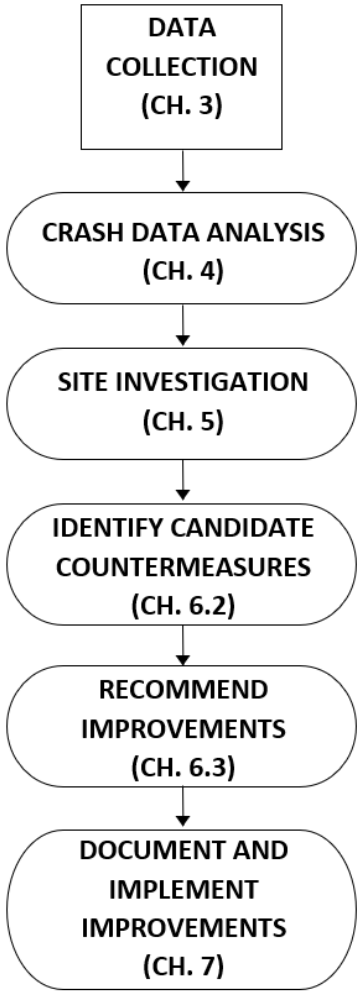
Case Study #2: US-20 and Barclay Dr

- US-20 (Santiam Highway) is a statewide expressway
  - Location is unsignalized intersection
- Five-year study period
- 1/1/2006 – 12/31/2010
  - MP 99.84 to MP 100.04 on US-20



Step 1: Data Collection

- In-Office Data
  - Crash Data
  - Oregon Traffic Data Explorer
  - Safety Priority Index System (SPIS) (SPIS Brochure)
  - Highway Inventory Reports
  - Facility Functional Class
    - TransGIS
  - Traffic Volumes
  - Digital Video Log
  - Google Maps
- Field Data

PAUSE VIDEO HERE WHILE YOU COMPLETE THE ITEMS BELOW

1. Download data and process data in the SIM Worksheet
2. Complete all necessary fields and selections in the SIM Worksheet
3. Assess and identify crash patterns on the intersections tab. Which crash types and patterns are highlighted?

Highway Inventory Report

- [Highway Inventory Reports]

Roadway	Mileage Type	Overlap Code	Mile Point	Dup	Roadway Codes	Description	# of Lanes	Total Lane Width	Total Surface Width	L1 SR TP	Engineering Station Code	Engineering Station ID	MEDIAN TYPE	MEDIAN WIDTH
1			99.93		S = | = S	016AJ CONN. (W. MCKINNEY BUTTE R) M.P. 1C99.97	1	16	19	AU			2	2
1			99.86				1	16	19	AU			2	2
1			99.86		| = S	HWY. 016 M.P. (2)90.86	1	16	19	AU			2	2
2			100.02	20	C L |	SISTERS	1	16	18	AU			0	0
2			100.02	10	| L C	SISTERS	1	16	18	AU			0	0
2			100.02		S = | = S	HWY. 016 M.P. 100.02	1	16	18	AU			0	0
2			100.00		|	MILEPOINT 100.00	1	16	18	AU			0	0
2			99.97				1	16	18	AU			0	0
2			99.96		S = | = S	016AJ CONN. (W. BARCLAY DR.) M.P. 1C99.95	1	20	22	AU			0	0
2			99.94		S = | = S	016AJ CONN. (W. BARCLAY DR.) M.P. 1C99.95	1	20	22	AU			0	0
2			99.86		S = |	HWY. 016 M.P. 99.86	1	16	18	AU			0	0

Please note that on this report, median width does NOT include the width of inside shoulders.

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Functional Classification

- Facility Functional Class
  - Functional Classification Table by Highway and MP

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Functional Classification and National Highway System Status
As of November 2021* on Oregon State Highways

https://www.oregon.gov/ODOT/Data/Documents/FC_NHS_State_Highway_List.pdf

LRS	Hwy	Rdwy ID	Mlge Type	Begin MP	End MP	NHS	FC Code	Historic FC Code	FC Description	HPMS Area	Urban Area
01600D00	016	2		27.25	27.72	Yes	3	14	Other Principal Arterial	2	SWEET HOME
01600D00	016	2		99.86	100.02	Yes	3	02	Other Principal Arterial	1	
01600I00	016	1		-0.03	2.61	Yes	3	14	Other Principal Arterial	3	ALBANY
01600I00	016	1		2.61	2.64	Yes	4	16	Minor Arterial	3	ALBANY
01600I00	016	1		2.64	2.88	No	4	16	Minor Arterial	3	ALBANY
01600I00	016	1		2.88	11.71	No	4	06	Minor Arterial	1	

Traffic Volumes

- Traffic Volumes
  - Santiam Highway, No. 016
  - Milepost indicates distance from Albany-Junction City Highway OR-99E, in Albany
  - Except for 2009 and 2010, all MP fall within range of analysis location

Year	MP	AADT (All Vehicles)	Location
2006	100.03	10,400	0.33 mi north of OR-242
2007	99.74	10,400	0.38 mi north of OR-242
2008	100.03	9,300	0.33 mi north of OR-242
2009	100.05	9,400	0.10 mi south of Barclay Dr
2010	100.05	9,000	0.10 mi south of Barclay Dr

90.90	*4600*	0.01 mile west of Camp Sherman Road
90.92	*5100*	0.01 mile east of Camp Sherman Road
93.19	*8000*	* Sisters Automatic Traffic Recorder, Sta. 09-014, 0.31 mile south of Black Butte Ranch Road
100.03	*10400*	0.33 mile north of McKenzie Highway (OR242), west city limits of Sisters

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US-20 and Barclay Dr – SIM Output

Severity	Crash	Obs %	Ex %	P(Norm)
Fatal+ Inj A	2	18.2%	2.6%	**3.1%**
Injury B+C	5	45.5%	55.5%	83.5%
PDO	4	36.4%	41.9%	74.7%
	11	100.0%	100.0%	

Collision Type (All)	Crash	Obs %	Ex %	P(Norm)
Angle	4	36.4%	20.9%	18.1%
Head-on	0	0.0%	0.2%	
Rear	3	27.3%	38.1%	85.4%
Sideswipe-Meet	0	0.0%	0.2%	
Sideswipe-Over	0	0.0%	2.7%	
Turn	4	36.4%	31.6%	47.8%
Parked	0	0.0%	0.1%	
NonCollision	0	0.0%	0.1%	
Backing	0	0.0%	0.9%	
Pedestrian	0	0.0%	3.2%	
Fixed Object	0	0.0%	1.8%	
Other	0	0.0%	0.1%	
	11	100%	100%	

**P(norm) values in* ▭ *indicate overrepresentation*

Month	Crash	Obs %	Ex %	P(Norm)
January	3	27.3%	8.6%	6.2%
February	0	0.0%	7.5%	
March	0	0.0%	8.1%	
April	0	0.0%	7.8%	
May	0	0.0%	7.9%	
June	1	9.1%	8.2%	61.1%
July	2	18.2%	8.5%	23.7%
August	4	36.4%	8.3%	**1.0%**
September	1	9.1%	8.2%	61.0%
October	0	0.0%	9.1%	
November	0	0.0%	8.7%	
December	0	0.0%	9.2%	
UNK	0	0.0%		
	11	100%	100%	

Driver Age	Drivers	Obs %	Ex %	P(Norm)
<15	0	0.0%	0.0%	
15-18	2	8.3%	3.2%	17.6%
19-21	0	0.0%	4.4%	
22-24	2	8.3%	4.5%	29.6%
25-34	3	12.5%	13.8%	66.3%
35-44	5	20.8%	11.3%	12.6%
45-54	2	8.3%	9.7%	69.0%
55-64	8	33.3%	8.4%	**0.1%**
65-74	2	8.3%	5.2%	35.8%
>74	0	0.0%	2.7%	
Not Stated	0	0.0%	36.8%	
	24	100%	100%	

Cause Codes	Crash	Obs %	Ex %	P(Norm)
CARELESS	0	0.0%	1.9%	
DEF BRKE	0	0.0%	0.3%	
DEF STER	0	0.0%	0.0%	
DIS TCD	0	0.0%	1.0%	
DIS--RAG	0	0.0%	35.1%	
FATIGUE	0	0.0%	0.5%	
IMP LN C	0	0.0%	3.2%	
IMP-OVER	1	7.7%	0.7%	8.3%
IMP-TURN	0	0.0%	7.9%	
IN RDWY	1	7.7%	0.3%	**4.4%**
INATTENT	1	7.7%	6.3%	57.1%
LEFT-CTR	1	7.7%	0.4%	**4.8%**
LOADSHFT	0	0.0%	0.0%	
MECH-DEF	0	0.0%	0.1%	
NO-YIELD	3	23.1%	27.1%	72.8%
NT VISBL	0	0.0%	0.1%	
OTHER	0	0.0%	0.2%	
OTHR-IMP	0	0.0%	2.0%	
PAS-STOP	2	15.4%	0.1%	**0.0%**
PHANTOM	0	0.0%	0.4%	
RECKLESS	0	0.0%	1.2%	
SPEED	0	0.0%	0.3%	
TOO-CLOS	3	23.1%	8.0%	8.0%
TOO-FAST	1	7.7%	2.6%	28.8%
WRNG WAY	0	0.0%	0.1%	
	13	100%	100%	

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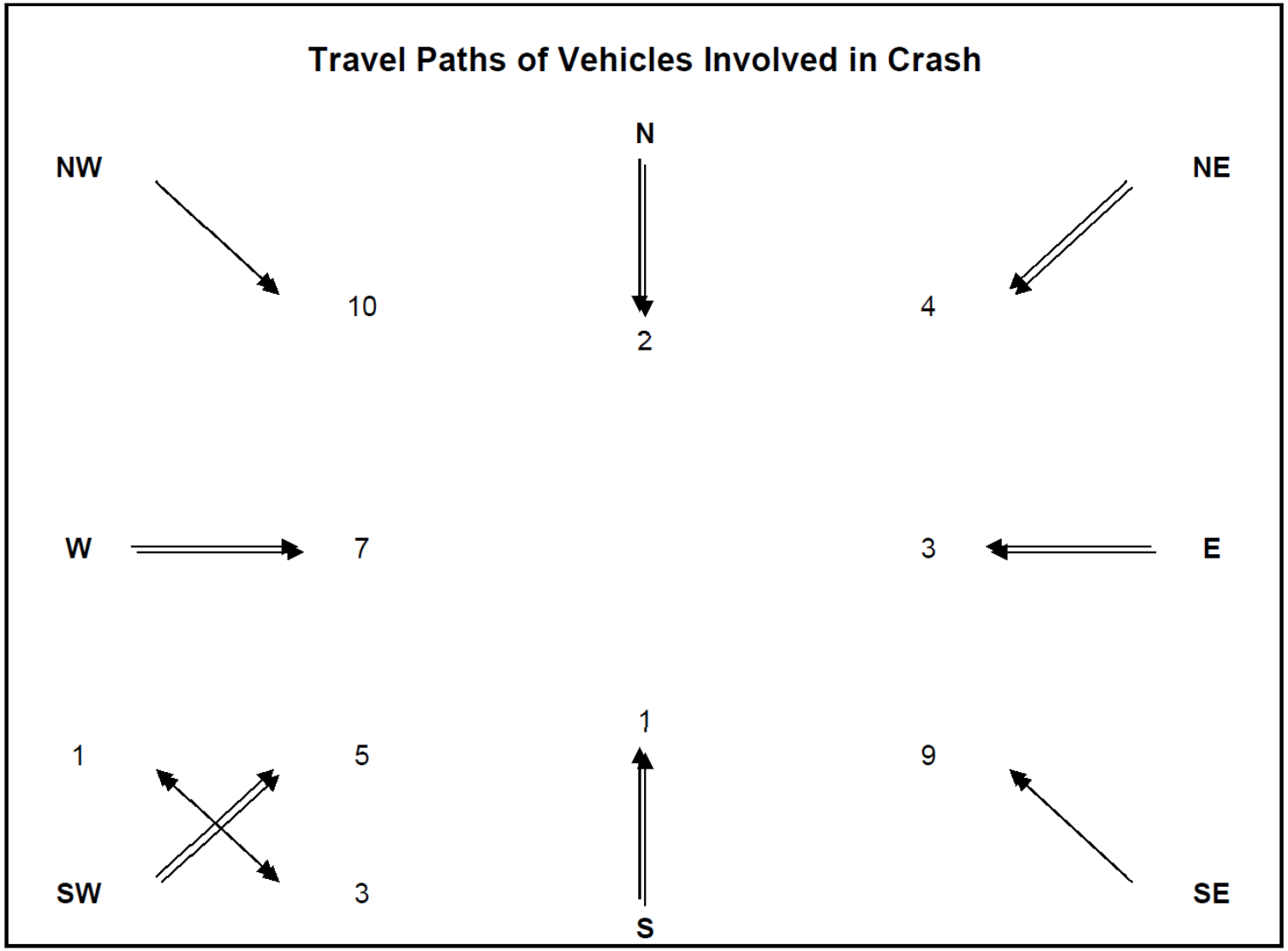
Collision Diagram



Note: This figure shows the travel paths of vehicles 1 and 2 involved in crashes. Unless all crashes are single vehicle, the sum of these counts will not match the total number of crashes. For example, a rear-end crash in the eastbound direction would show a count of "2" vehicles on that travel path. To see counts of actual collisions between movements, use the "Direction_Cross_Tab" sheet created by the tool or construct a collision diagram.

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1. Use the Digital Video Log and Google Maps to show conditions before countermeasure was implemented.

Digital Video Log

- Digital Video Log

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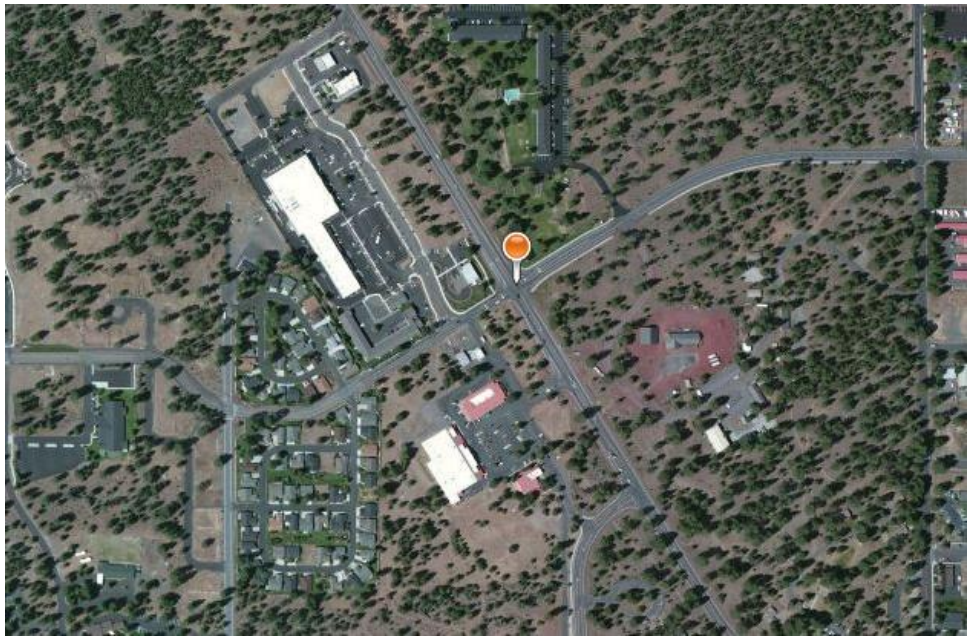
Google Maps and Streetview



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1. Summarize your site investigation.

Summary of Site Investigation

- 11 crashes
- 2 severe injury crashes, 5 minor injury crashes
- 4 angle crashes and 4 turning movement crashes
- 8 crashes involved drivers aged 55-64 years
- Leading causes
  - Following too close (3 crashes)
  - Failure to yield right-of-way (3 crashes)
  - Passed stop sign (2 crashes)

Step 4: Identify Countermeasure

- FHWA Intersection Safety
- CMF Clearinghouse
- ARTS Crash Reduction Factor (CRF) List
- ARTS Crash Countermeasure Selection Tool

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1. Identify potential countermeasures.

Step 5: Recommended Solution

- Implemented Solution
  - Install roundabout at intersection.
  - Crash reduction factor (all severities):
    - 29%

Step 6: Documentation and Implementation