Balls Bend - Economic Loss Calculations

	(1)	(2)	
Fatalities	1	× $7,064,655 =	$7,064,655
Suspected Serious	0	× $1,560,102 =	0
Suspected Minor	10	× $ 104,804 =	$1,048,040
Possible Injury	14	× $ 8,195 =	$ 114,730
			$8,227,425

$8,227,425 / 25 crashes = $329,097 / Fatal and Injury Crash

(2) $ 3,278 / PDO Crash

Fatal + Injury Reduction

5.54 $\frac{\text{crashes}}{\text{yr}}$ (3) − 1.98 $\frac{\text{crashes}}{\text{yr}}$ (4) = 3.56 $\frac{\text{crash}}{\text{yr}}$ × $329,097

= $ 1,171,585

PDO Reduction

8.41 $\frac{\text{crash}}{\text{yr}}$ (5) − 2.72 $\frac{\text{crash}}{\text{yr}}$ (6) = 5.69 $\frac{\text{crash}}{\text{yr}}$ × $3,278

= $18,652

Annual Reduction in Economic Loss Due to Crash Reduction

$1,190,237

Parameters | Group Tree | 1 / 1+ | 120%

Main Report

228 Balls Bend

Date Range: 1/1/2013 to 12/31/2017

Area of Interest: (In County 10 On State Route 0228(P) Between Segment 0170 Offset 0 and Segment 0210 Offset 1195)

MONTH OF YEAR

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
CRASHES	4	6	6	9	9	9	3	10	4	5	11	6	82
PCT	5%	7%	7%	11%	11%	11%	4%	12%	5%	6%	13%	7%	100%

DAY OF W

	CRASHES
PCT	

HOUR OF DAY

	01	04	05	06	07	09	10	11	12	13	14	15	16	17	18	19	20	
CRASHES	3	1	4	4	6	5	1	4	3	3	6	9	6	12	5	3	4	
PCT	4%	1%	5%	5%	7%	6%	1%	5%	4%	4%	7%	11%	7%	15%	6%	4%	5%	2

YEAR

	CRASHES	PCT
2013	19	23%
2014	15	18%
2015	15	18%
2016	14	17%
2017	19	23%
TOTAL	82	100%

COLLISION TYPE

	CRASHES	PCT
REAR END	45	55%
ANGLE	12	15%
HIT FIX OBJ	12	15%
UNKNOWN	6	7%
HEAD ON	3	4%
NON COLL	2	2%
OPP DIR SS	2	2%
TOTAL	82	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
FATAL	1	1%
SUSP MINOR	10	12%
POSSIBLE INJURY	11	13%
UNK SEVERITY	2	2%
UNK IF INJURED	1	1%
PDO	57	70%
TOTAL	82	100%

SEVERITY COUNT

FATALITIES
SUSPECTED SERIOUS
SUSPECTED MINOR
POSSIBLE INJURY
UNK SEVERITY
UNK IF INJURED

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	97	58%
SMALL TRUCK	32	19%
SUV	29	17%
LARGE TRUCK	5	3%
VAN	5	3%
TOTAL	168	100%

ROAD CONDITION

	CRASHES	PCT
DRY	55	67%
WET	24	29%
OTHER	2	2%
SNOW	1	1%
TOTAL	82	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	62	76%
DARK	16	20%
STREET LIGHTS	2	2%
DAWN	1	1%
DUSK	1	1%
TOTAL	82	100%

WEATHER

	CRASH
CLEAR	
RAIN	
SNOW	
UNK	
TOTAL	

IMPORTANT: This traffic engineering and safety study is confidential pursuant to 75 Pa. C.S. §3754 and 23 U.S.C. §409 and may not be

CDART - CRASH SUMMARY REPORT (09-0E

2-4 LANE RURAN 0.712

Fatalities and Injuries—Five-Year Trends

Total reported crashes in 2017 decreased 1.0% compared to 2016; fatalities decreased by 4.3% while total injuries decreased by 2.8%.

	2013	2014	2015	2016	2017
Reported Crashes	124,149	121,317	127,127	129,395	128,188
Total Fatalities	1,208	1,195	1,200	1,188	1,137
Total Injuries	83,089	79,758	82,004	82,971	80,612
Suspected Serious Injury	*3,254*	*3,042*	*3,030*	*4,397*	*4,227*
Suspected Minor Injury	*12,662*	*12,075*	*12,503*	*26,284*	*27,237*
Possible Injury	*41,755*	*40,071*	*40,364*	*23,050*	*22,629*
Unknown Severity	*25,418*	*24,570*	*26,107*	*29,240*	*26,519*
Pedestrian Fatalities	151	166	153	172	150
Pedestrian Injuries	4,413	3,985	4,002	4,218	4,106
Motorcyclist Fatalities	181	186	179	192	185
Motorcyclist Injuries	3,322	3,207	3,312	3,321	3,052
Bicyclist Fatalities	11	19	16	16	21
Bicyclist Injuries	1,374	1,298	1,268	1,298	1,127
Heavy-Truck-Related Fatalities	147	151	149	162	155
Alcohol-Related Fatalities	381	333	345	297	293
Speed-Related Fatalities	322	312	302	316	304
Billions of Vehicle-Miles*	99.5	98.6	99.8	100.9	101.1
Deaths per 100 Million Vehicle-Miles*	1.21	1.21	1.20	1.18	1.12

Note: Speed-Related Fatalities only count those crashes where speed was considered the prime contributing factor in the crash.

* Vehicle mileage uses the prior years' vehicle mileage information (because at the time of publication, the current year's vehicle mileage is not available).

Economic Loss Due to Reportable Traffic Crashes

Severity	Number	Average Cost	Estimated Total Costs
Fatalities (persons)	1,137	$7,064,655	$8,032,512,735
Suspected Serious Injury (persons)	4,227	$1,560,102	$6,594,551,154
Suspected Minor Injury (persons)	27,237	$104,804	$2,854,546,548
Possible Injury (persons)	22,629	$8,195	$185,444,655
Property Damage Only (crashes)	68,901	$3,278	$225,857,478
Unknown Severity (persons)	26,519	$8,195	$217,323,205
		TOTAL	**$18,110,235,775**

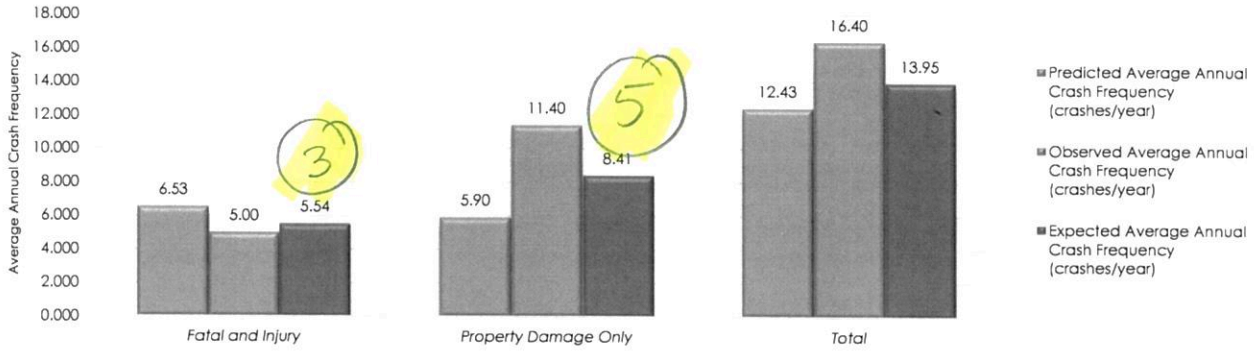
In 2017, the economic loss due to traffic crashes was
$1,414
to every man, woman, and child in Pennsylvania.

The economic loss per Pennsylvania citizen is based on the ratio of estimated total cost to the estimated total population of Pennsylvania. Also note that the Federal guidelines changed for determining the average cost of a fatality in 2017.

Rural Two-Lane Roads Safety Performance Summary Report

Project Description	228 Balls Bend
Date	42383
Analysis Year	2016
Analysis Type	Site Level Analysis
Facility Type(s)	Rural Two-Lane Roads

Summary of Average Safety Performance for the Project (crashes/year)



Rural Two-Lane Totals	Fatal and Injury Crashes	Property Damage Only Crashes	Total Crashes
Predicted Average Annual Crash Frequency	6.53	5.90	12.43
Observed Average Annual Crash Frequency	5.00	11.40	16.40
Expected Average Annual Crash Frequency	5.54	8.41	13.95
Potential for Safety Improvement (PSI)	-0.99	2.50	1.51

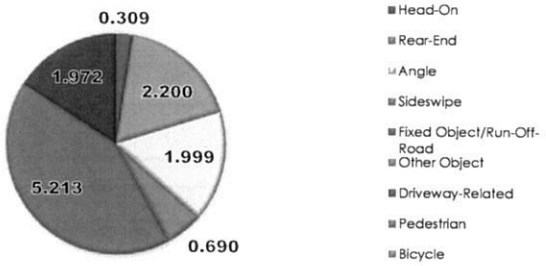
Rural Two-Lane Roads Summary

Segments	Fatal and Injury	Property Damage Only	Total
Predicted Average Annual Crash Frequency (crashes/yr)	4.56	4.17	8.73
Observed Average Annual Crash Frequency (crashes/yr)	5	11	16
Expected Average Annual Crash Frequency (crashes/yr)	4.91	7.90	12.81

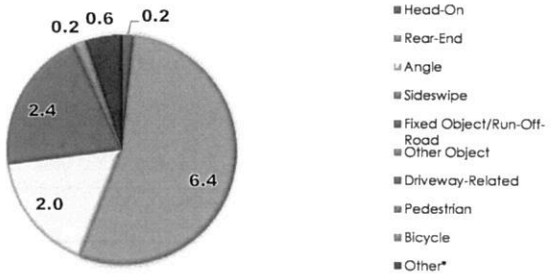
Intersections	Fatal and Injury	Property Damage Only	Total
Predicted Average Annual Crash Frequency (crashes/yr)	1.97	1.74	3.71
Observed Average Annual Crash Frequency (crashes/yr)	0	0	0
Expected Average Annual Crash Frequency (crashes/yr)	0.63	0.50	1.13

Total	Fatal and Injury	Property Damage Only	Total
Predicted Average Annual Crash Frequency (crashes/yr)	6.53	5.90	12.43
Observed Average Annual Crash Frequency (crashes/yr)	5	11	16
Expected Average Annual Crash Frequency (crashes/yr)	5.54	8.41	13.95

Rural Two-Lane Roads: Predicted Crashes by Crash Type



Rural Two-Lane Roads: Observed Crashes by Crash Type



*Note: "Other Crashes" include animal, overturn, parked vehicle, noncollisions, and other single-/multiple-vehicle crashes

Project Safety Performance Summary Report

Project Description	Balls Bend Proposed
Date	6/12/2018
Analysis Year	2019
Analysis Type	Predicted Only (No Crash Data Analysis)
Facility Type(s)	Rural Multilane Highways

Summary of Average Safety Performance for the Project (crashes/year)

Project Totals	Fatal and Injury Crashes	Property Damage Only Crashes	Total Crashes
Predicted Average Annual Crash Frequency	1.98	2.72	4.70
Observed Average Annual Crash Frequency	0.00	0.00	0.00
Expected Average Annual Crash Frequency	--	--	--
Potential for Safety Improvement (PSI)	--	--	--

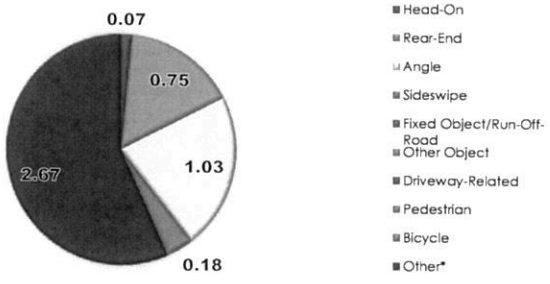
Total Project Summary

Segments	Fatal and Injury	Property Damage Only	Total
Predicted Average Annual Crash Frequency (crashes/yr)	1.22	1.90	3.11
Observed Average Annual Crash Frequency (crashes/yr)	N/A	N/A	N/A
Expected Average Annual Crash Frequency (crashes/yr)	--	--	--

Intersections	Fatal and Injury	Property Damage Only	Total
Predicted Average Annual Crash Frequency (crashes/yr)	0.77	0.82	1.59
Observed Average Annual Crash Frequency (crashes/yr)	N/A	N/A	N/A
Expected Average Annual Crash Frequency (crashes/yr)	--	--	--

Total	Fatal and Injury	Property Damage Only	Total
Predicted Average Annual Crash Frequency (crashes/yr)	1.98	2.72	4.70
Observed Average Annual Crash Frequency (crashes/yr)	0.00	0.00	0.00
Expected Average Annual Crash Frequency (crashes/yr)	--	--	--

Project Total: Predicted Crashes by Crash Type



Project Total: Observed Crashes by Crash Type

*Note: "Other Crashes" include animal, overturn, parked vehicle, noncollisions, and other single-/multiple-vehicle crashes