



Characteristics of Pedestrian Fatal and Serious Injuries and Crashes in Washington State

Highlights of findings

A WSDOT analysis

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Pedestrian Safety Advisory Council Meeting

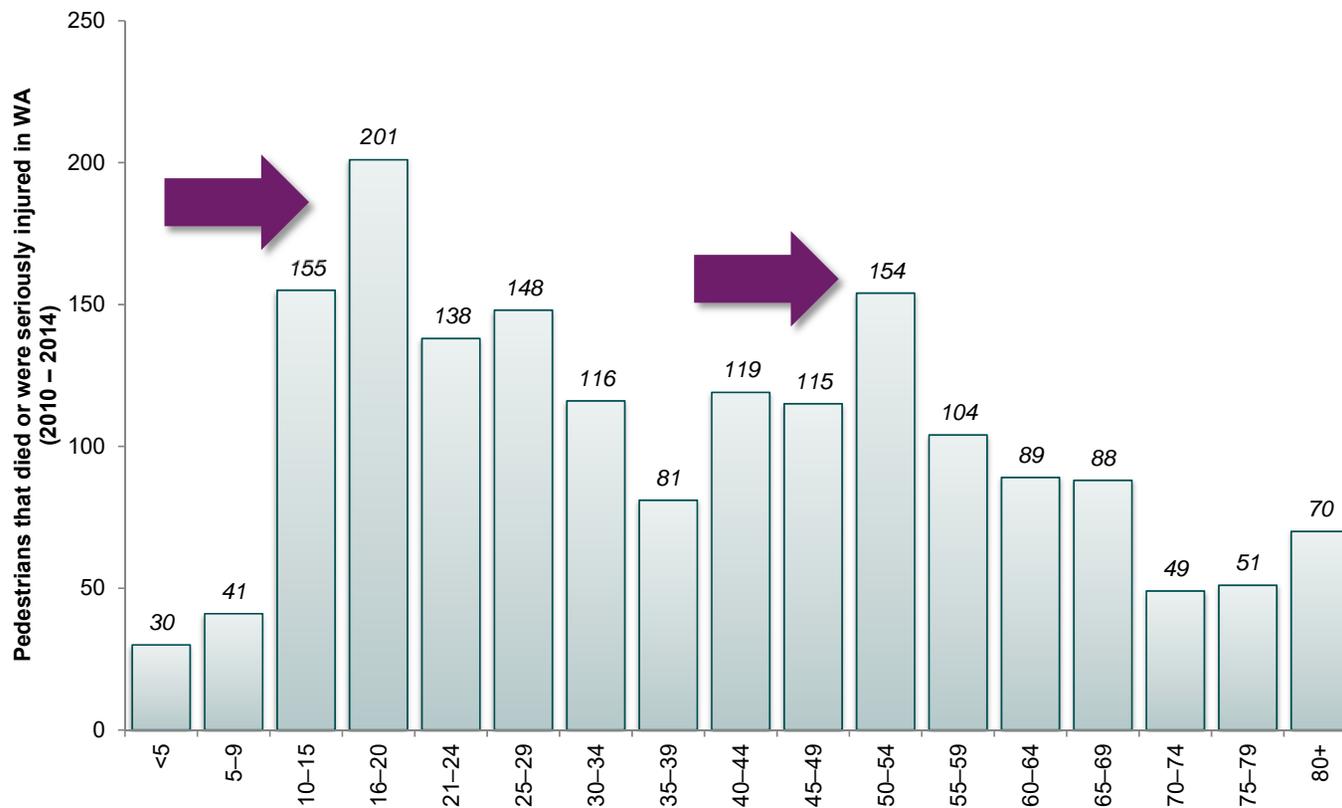
July 27, 2016

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Objectives

- Highlights of analysis completed in 2015 and 2016
 - Share findings that can be helpful in identifying potential action
 - Noteworthy
 - Items for further investigation
 - Items we looked at but wasn't revealing
- Data: WSDOT Crash Data Mart – note that fatalities are not exactly the same but usually only differs with a few.

Pedestrian ages

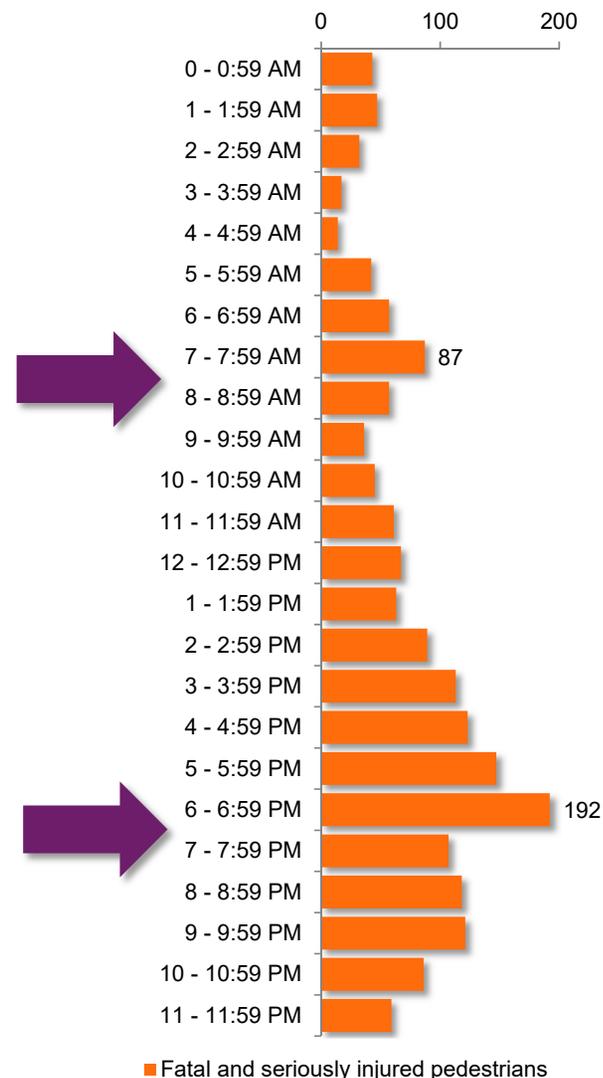


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Time of day

(2010 – 2014)

Distribution of pedestrian fatalities and serious injuries in crashes by time of day in WA (2010 – 2014)



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Hour of day and Month of Year

Pedestrian serious injuries (2011 to 2015)

Hour	January	February	March	April	May	June	July	August	September	October	November	December	
12:00 AM	2	4	3	1	2	1	3	2	3	2	4	7	34
1:00 AM	6	3	3	4	4	1	2	0	3	4	4	0	34
2:00 AM	2	4	2	0	0	3	1	2	5	5	2	2	28
3:00 AM	0	0	0	1	2	1	0	0	1	2	1	1	9
4:00 AM	3	1	1	2	0	0	1	0	2	1	0	1	12
5:00 AM	3	3	5	1	1	0	1	3	4	3	3	2	29
6:00 AM	7	4	6	2	1	0	2	0	5	8	4	7	46
7:00 AM	13	5	2	3	6	3	3	2	5	10	6	14	72
8:00 AM	2	4	6	5	0	3	4	1	6	8	2	4	45
9:00 AM	1	2	3	2	2	4	4	3	1	3	2	1	28
10:00 AM	1	3	3	2	7	2	6	5	3	4	4	1	41
11:00 AM	3	6	2	1	5	12	6	0	3	1	2	2	43
12:00 PM	6	5	1	11	7	4	4	5	5	8	6	4	66
1:00 PM	1	2	3	7	6	6	6	5	6	9	5	6	62
2:00 PM	5	6	7	5	2	11	5	9	7	6	6	5	74
3:00 PM	6	7	3	7	3	7	7	9	9	7	7	11	83
4:00 PM	8	5	12	6	6	4	9	4	7	12	12	14	99
5:00 PM	26	9	4	3	7	6	9	5	6	9	28	32	144
6:00 PM	28	8	8	4	8	6	5	6	7	18	24	29	151
7:00 PM	16	9	6	4	1	9	3	6	11	10	10	8	87
8:00 PM	8	4	12	10	3	5	1	8	16	9	10	12	98
9:00 PM	5	3	10	7	6	2	14	9	3	8	3	9	79
10:00 PM	4	5	5	2	5	9	6	8	4	10	5	4	67
11:00 PM	4	5	5	3	4	4	8	6	3	3	3	1	49
	154	107	112	93	88	103	110	98	125	160	153	177	1480

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Hour of day and Month of Year

Pedestrian fatalities (2011 to 2015)

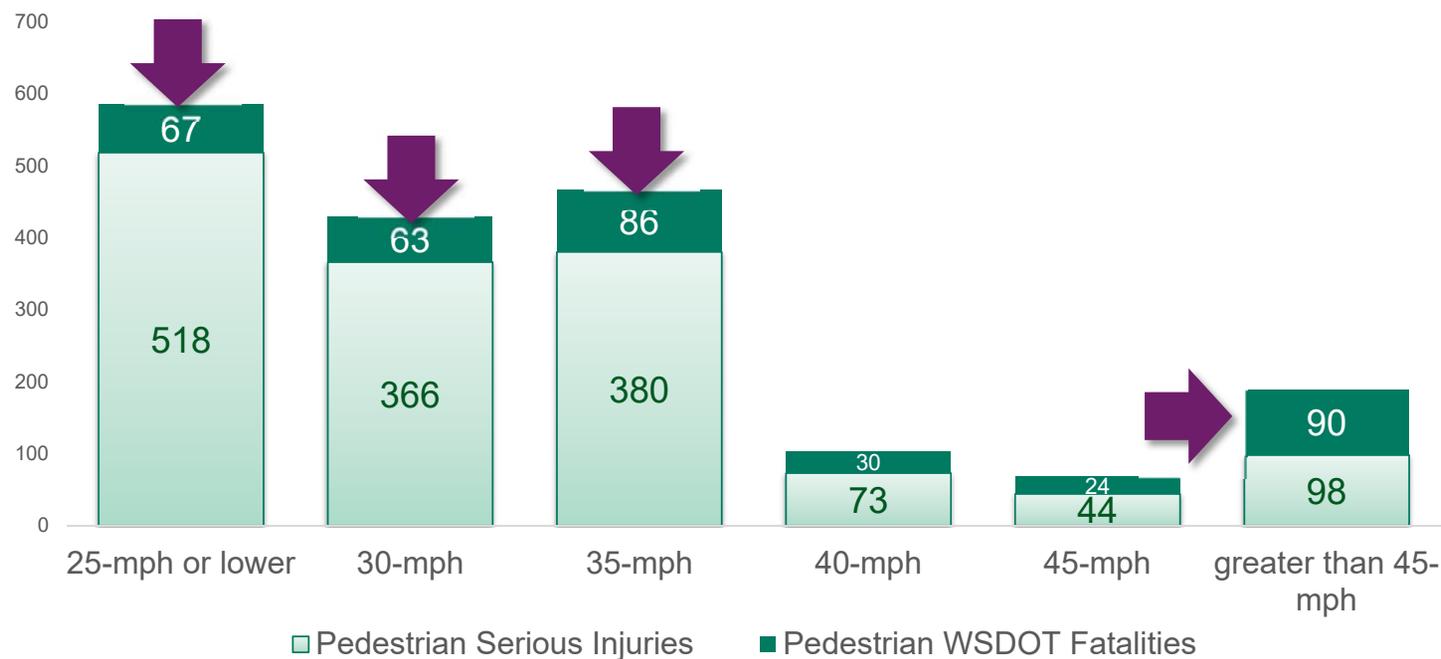
Hour	January	February	March	April	May	June	July	August	September	October	November	December	Total
12:00 AM	0	1	1	0	1	2	1	0	1	2	0	1	10
1:00 AM	1	1	1	1	3	0	0	2	1	1	0	0	11
2:00 AM	2	0	2	1	2	0	0	0	2	0	2	0	11
3:00 AM	0	1	1	0	0	0	1	2	0	1	0	1	7
4:00 AM	1	0	0	1	0	1	0	0	0	0	0	1	4
5:00 AM	1	1	2	1	1	0	0	1	0	1	1	3	12
6:00 AM	5	1	0	0	0	0	0	0	3	2	0	2	13
7:00 AM	2	1	1	1	0	0	0	0	1	1	0	2	9
8:00 AM	0	0	0	2	0	2	0	1	1	1	0	1	8
9:00 AM	1	1	0	0	1	1	1	0	0	0	0	0	5
10:00 AM	0	0	0	0	1	0	1	1	1	1	0	2	7
11:00 AM	1	0	0	0	2	2	1	1	1	0	0	5	13
12:00 PM	1	1	0	0	0	2	0	1	0	1	1	0	7
1:00 PM	0	1	0	0	0	2	1	0	0	0	0	0	4
2:00 PM	0	3	0	1	0	0	0	1	1	3	0	1	10
3:00 PM	0	1	2	1	3	1	1	1	4	1	2	4	21
4:00 PM	3	1	2	3	1	1	1	1	1	0	4	5	23
5:00 PM	0	3	0	0	1	2	0	0	1	0	3	13	23
6:00 PM	6	5	2	0	1	0	0	1	3	4	5	12	39
7:00 PM	1	2	1	1	2	0	1	3	3	5	4	3	29
8:00 PM	4	3	4	2	0	0	0	5	3	3	2	1	27
9:00 PM	2	1	4	3	2	0	2	7	4	4	3	4	36
10:00 PM	2	1	0	2	2	2	2	1	0	3	1	1	17
11:00 PM	0	1	1	0	1	3	3	2	1	0	1	1	14
	36	30	26	18	24	21	16	31	32	34	29	63	360

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Posted speed

(2011 - 2015)

**Pedestrian WSDOT fatalities and serious injuries
by posted speed limit category (2011 - 2015)**

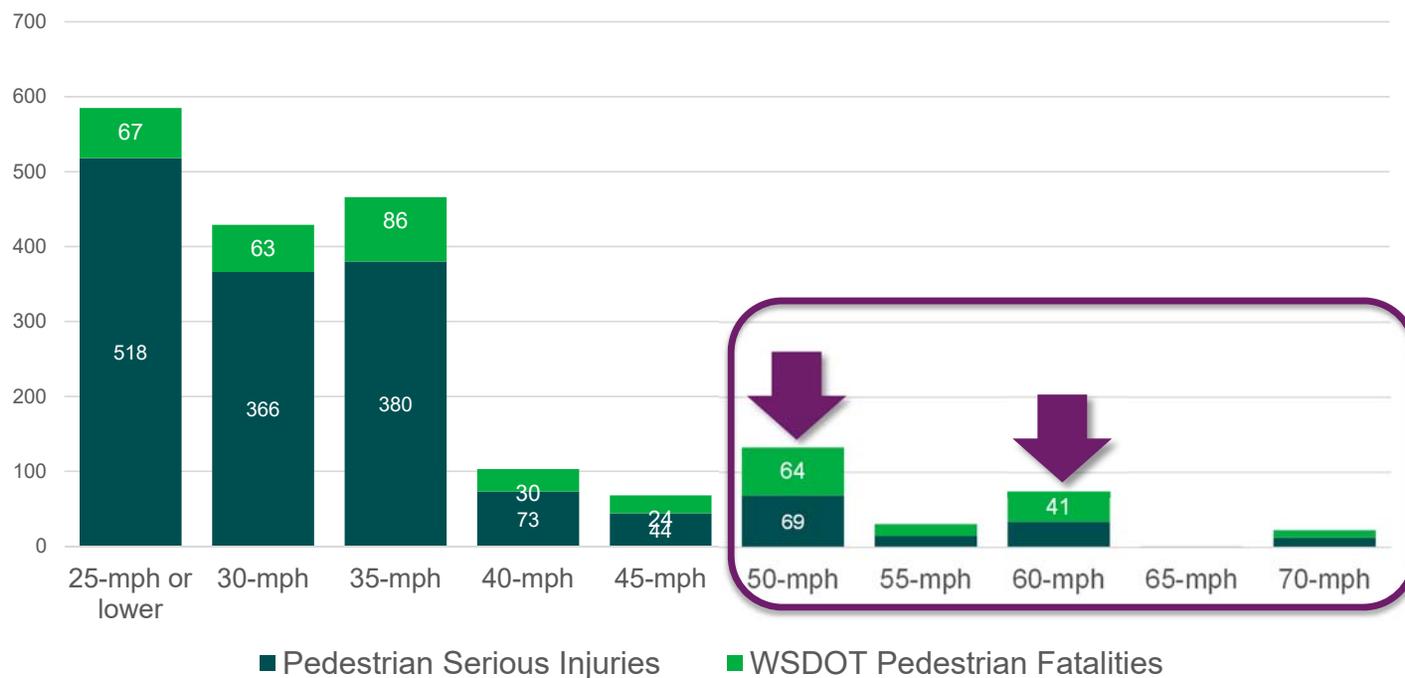


Posted speed limit unknown for
1 serious pedestrian injury

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Pedestrian WSDOT fatalities and serious injuries by posted speed
(2011 - 2015)



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Roadway type (2011 - 2015)



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Roadway type and posted speed

(2011 – 2015): Two Way Undivided Roadways

Roadway Type: Two Way - Undivided	Pedestrian Serious Injuries	% Pedestrian Serious Injuries	Pedestrian WSDOT Fatalities	% Pedestrian WSDOT Fatalities
25-mph or lower	308	20.8	32	8.9
30-mph	214	14.5	30	8.3
35-mph	191	12.9	48	13.3
40-mph	27	1.8	11	3.1
45-mph	21	1.4	10	2.8
greater than 45-mph	34	2.3	34	9.4

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Functional Class (2011 - 2015) for State Routes

State routes:
143 (40%) of the
360 pedestrian WSDOT fatalities
383 (26%) of the
1480 pedestrian serious injuries

Pedestrian WSDOT State Route fatalities and serious injuries
by functional class (2011 - 2015)



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Interstates vs the rest of the state highway system

(2011 – 2015) for State Routes

Federal Functional Class	State Route Pedestrian Serious Injuries	% Pedestrian Serious Injuries	State Route Pedestrian WSDOT Fatalities	% Pedestrian WSDOT Fatalities
Interstate	36	2%	36	10%
Other State Route	347	23%	107	30%



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Number of lanes (2011 – 2015) for State Routes

State routes:

- 143 (40%) of the 360 pedestrian WSDOT fatalities
- 383 (26%) of the 1480 pedestrian serious injuries

Number of lanes	State Route Pedestrian Serious Injuries	% Pedestrian Serious Injuries	State Route Pedestrian WSDOT Fatalities	% Pedestrian WSDOT Fatalities
1	7	0%	3	1%
2	86	6%	42	12%
3	24	2%	1	0%
4	200	14%	58	16%
5	11	1%	6	2%
6	40	3%	23	6%
7	4	0%	3	1%
8	8	1%	7	2%
9	1	0%	0	0%

Number of lanes unknown for 2 serious pedestrian injuries

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Functional class, number of lanes and posted speed

(2011 – 2015) for State Routes: highlights

State routes:

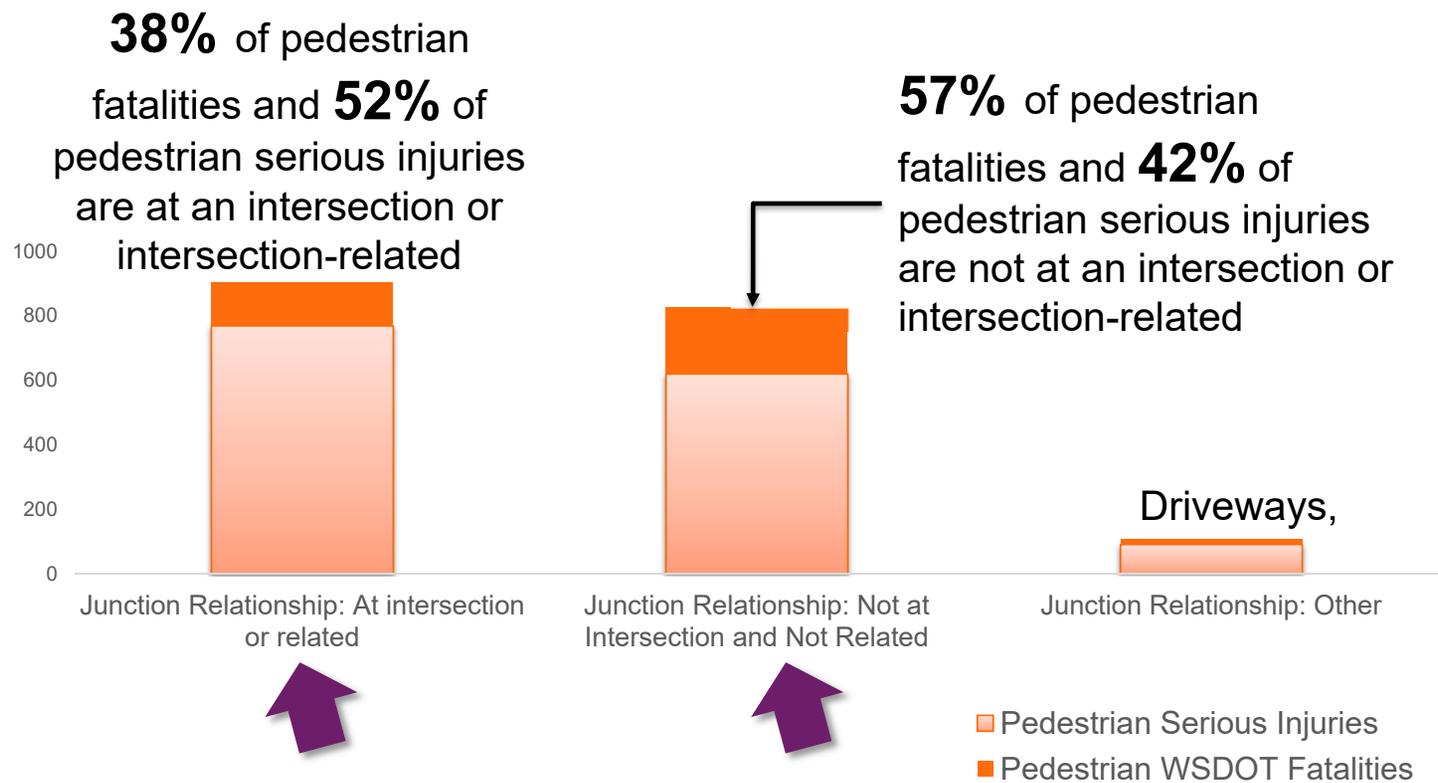
- 143 (40%) of the 360 pedestrian WSDOT fatalities
- 383 (26%) of the 1480 pedestrian serious injuries

Federal Functional Class	Posted speed limit category	State Route Pedestrian Serious Injuries	% Pedestrian Serious Injuries	State Route Pedestrian WSDOT Fatalities	% Pedestrian WSDOT Fatalities
Rural Interstate	greater than 45-mph	13	1%	9	3%
Urban Interstate	greater than 45-mph	16	1%	25	7%
Urban Other Freeways / Expressways	greater than 45-mph	18	1%	13	4%
Urban Other Principal Arterial	25-mph or lower	25	2%	3	1%
	30-mph	37	3%	5	1%
	35-mph	63	4%	9	3%
	40-mph	42	3%	10	3%
	45-mph	51	3%	19	5%

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Junction relationship

(2011 – 2015)



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Motor vehicle action

(2011 – 2015)

- Motor vehicle going straight 
 - 82% of pedestrian fatalities*
 - 69% of pedestrian serious injuries
- Motor vehicle turning left
 - 8% of pedestrian WSDOT fatalities
 - 17% of pedestrian serious injuries
- Motor vehicle turning right
 - 3% of pedestrian WSDOT fatalities
 - 7% of pedestrian serious injuries

* Fatalities from WSDOT Crash Data Mart

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Pedestrian Actions

(2011 - 2015)

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Pedestrian Actions	Pedestrian Serious Injuries	% Pedestrian Serious Injuries	Pedestrian WSDOT Fatalities	% Pedestrian WSDOT Fatalities
At Intersection Not Using Crosswalk	79	5%	20	6%
Fell or Pushed Into Path of Vehicle	23	2%	8	2%
From Behind Parked Vehicle	44	3%	3	1%
Lying in Roadway	12	1%	15	4%
Not in Roadway	62	4%	20	6%
Playing in Roadway	32	2%	3	1%
Pushing or Working on Vehicle	11	1%	6	2%
Standing or Working in Roadway	38	3%	18	5%
Walking in Roadway Opposite Traffic	20	1%	12	3%
Walking in Roadway with Traffic	52	4%	33	9%
Walking on Roadway Shoulder Opposite Traffic	17	1%	4	1%
Walking on Roadway Shoulder with Traffic	24	2%	8	2%
Xing - Non Intersection - In X Walk	34	2%	3	1%
Xing - Non Intersection - No X Walk	288	19%	81	23%
Xing at Intersection - Diagonally	9	1%	2	1%
Xing at Intersection - No Signal	256	17%	45	13%
Xing at Intersection Against Signal	92	6%	18	5%
Xing at Intersection with Signal	228	15%	24	7%
All Other Actions	159	11%	37	10%

Pedestrian actions for intersection and intersection related crashes

(2011 - 2015)

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Pedestrian Actions for Intersection and Intersection Related Pedestrian Crashes	Pedestrian Serious Injuries	% Pedestrian Serious Injuries	Pedestrian WSDOT Fatalities	% Pedestrian WSDOT Fatalities
Crash Involves Ped(s) Xing at Intersection - Diagonal	9	1%	2	1%
Crash Involves Ped(s) Xing at Intersection: against signal	92	6%	18	5%
Crash Involves Ped(s) Xing at Intersection: no signal	237	16%	40	11%
Crash Involves Ped(s) Xing at Intersection: with signal	227	15%	24	7%
Crash Involves Ped(s) Xing at Intersection	564	38%	84	23%

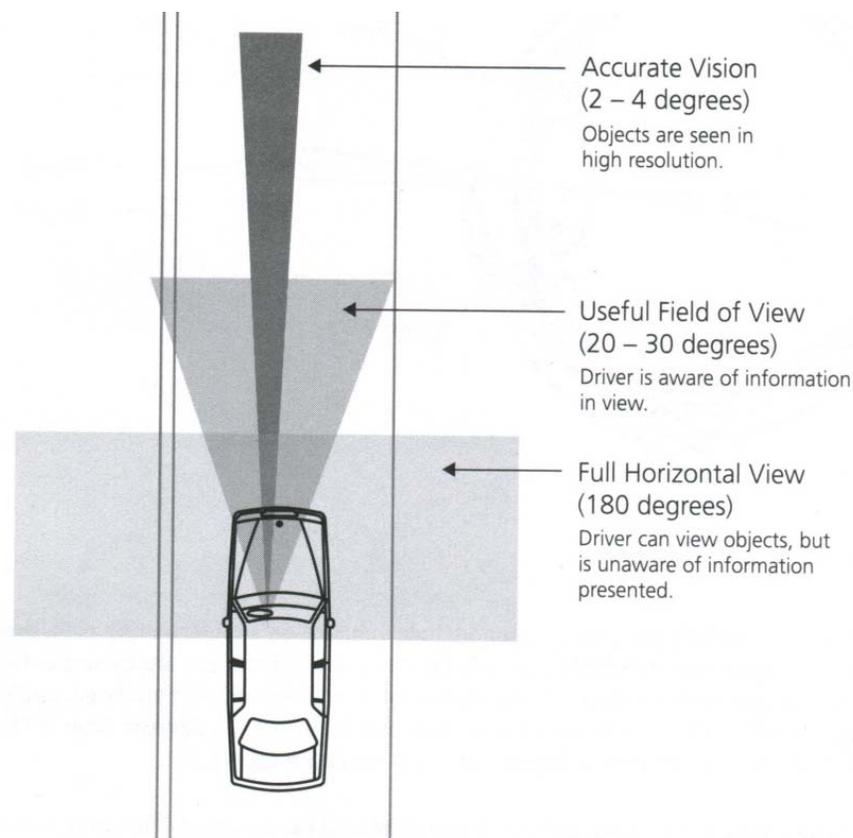
Vehicle movement for intersection and intersection related crashes where pedestrian is crossing at signal (2011 - 2015)

Vehicle movement for Intersection and Intersection Related Pedestrian Crashes where Pedestrian is crossing at in intersection with a signal	Pedestrian Serious Injuries	% Pedestrian Serious Injuries	Pedestrian WSDOT Fatalities	% Pedestrian WSDOT Fatalities
Vehicle moving straight ahead	44	3%	6	2%
Vehicle turning left	145	10%	14	4%
Vehicle turning right	35	2%	4	1%

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Pedestrian clothing

Reviewing clothing descriptions & considering field of vision it is unclear how helpful clothing in itself would be as a stand-alone action item – rather: awareness of the pedestrian that it may be challenging to see them even if it seems like the driver should be able to



Source: AASHTO (2010). Highway Safety Manual, 1st Edition, Washington, D..C

Traffic control

- Reliability of the field questionable – opportunity for further investigation of specific traffic control types

Impairment

- WA FARS impairment data quality

Urban and urbanized areas

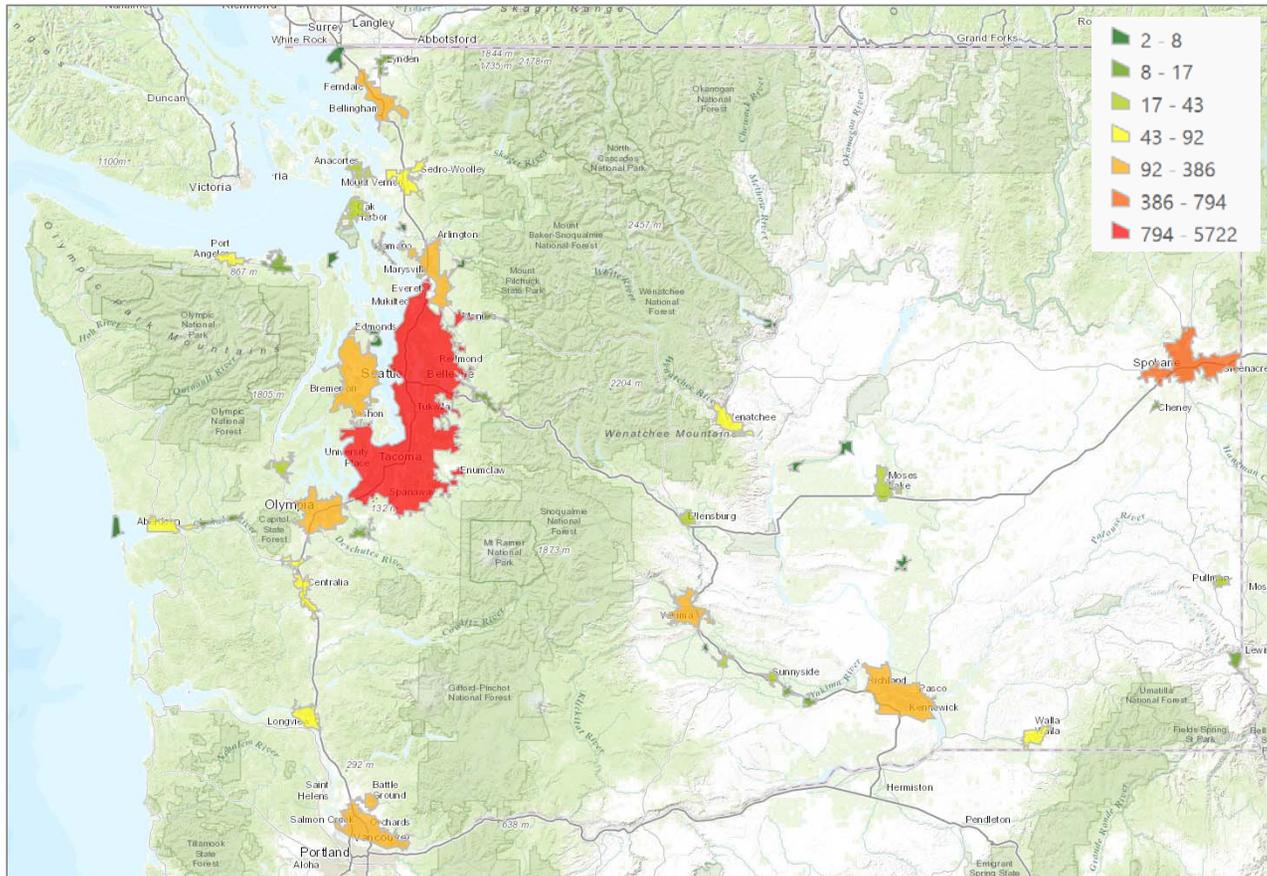
Pedestrian involved crash count (2010 – 2014)

Rank ordered urban and urbanized areas with more than 100 pedestrian involved crashes
 (pedestrian involved crashes and pedestrian injuries in WA for 2010 to 2014)

Urban area name	Total crashes	Number of pedestrian fatalities	Number of pedestrians that were seriously injured	Number of pedestrians that died or were seriously injured	Number of pedestrians with evident injuries
Seattle/ Tacoma/ Everett	5722	148	830	978	2317
Spokane/Spokane Valley	794	19	107	126	329
Vancouver/ Camas/ Battle Ground	386	22	82	104	166
Olympia/ Lacey/ Tumwater	284	8	45	53	120
Kennewick/ Pasco/ Richland	185	7	30	37	106
Yakima/ Selah/ Union Gap	180	7	33	40	82
Bellingham/ Ferndale	172	7	28	35	87
Marysville/ Tulalip	165	6	25	31	56
Bremerton/ Port Orchard/ Bainbridge Island	163	8	25	33	64

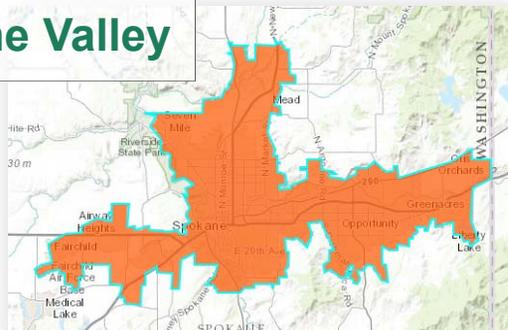
Urban and urbanized areas

Pedestrian involved crash count (2010 - 2014)

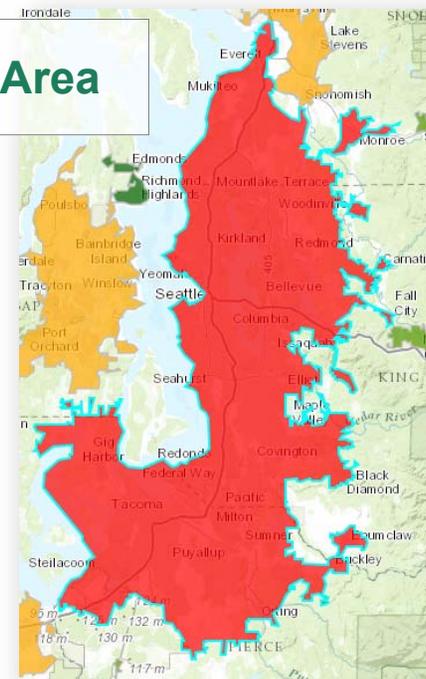


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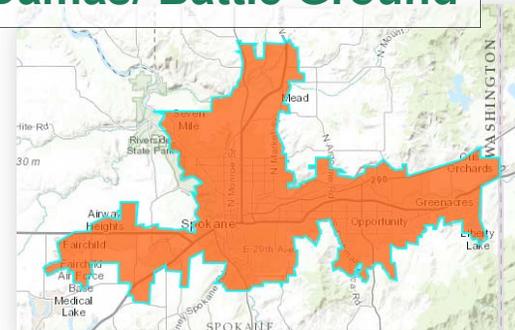
Spokane/ Spokane Valley



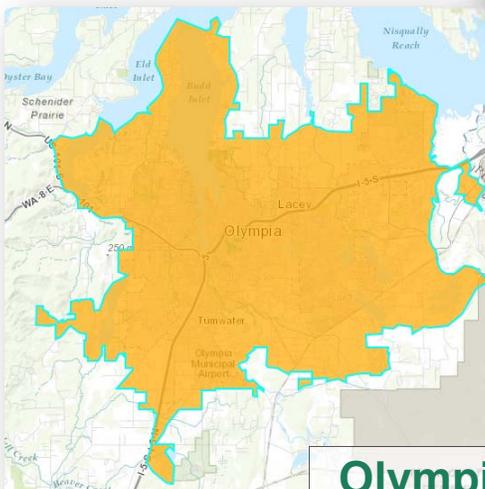
Greater Seattle Area



Vancouver/ Camas/ Battle Ground



Olympia/ Lacey/ Tumwater



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QUESTIONS?

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