

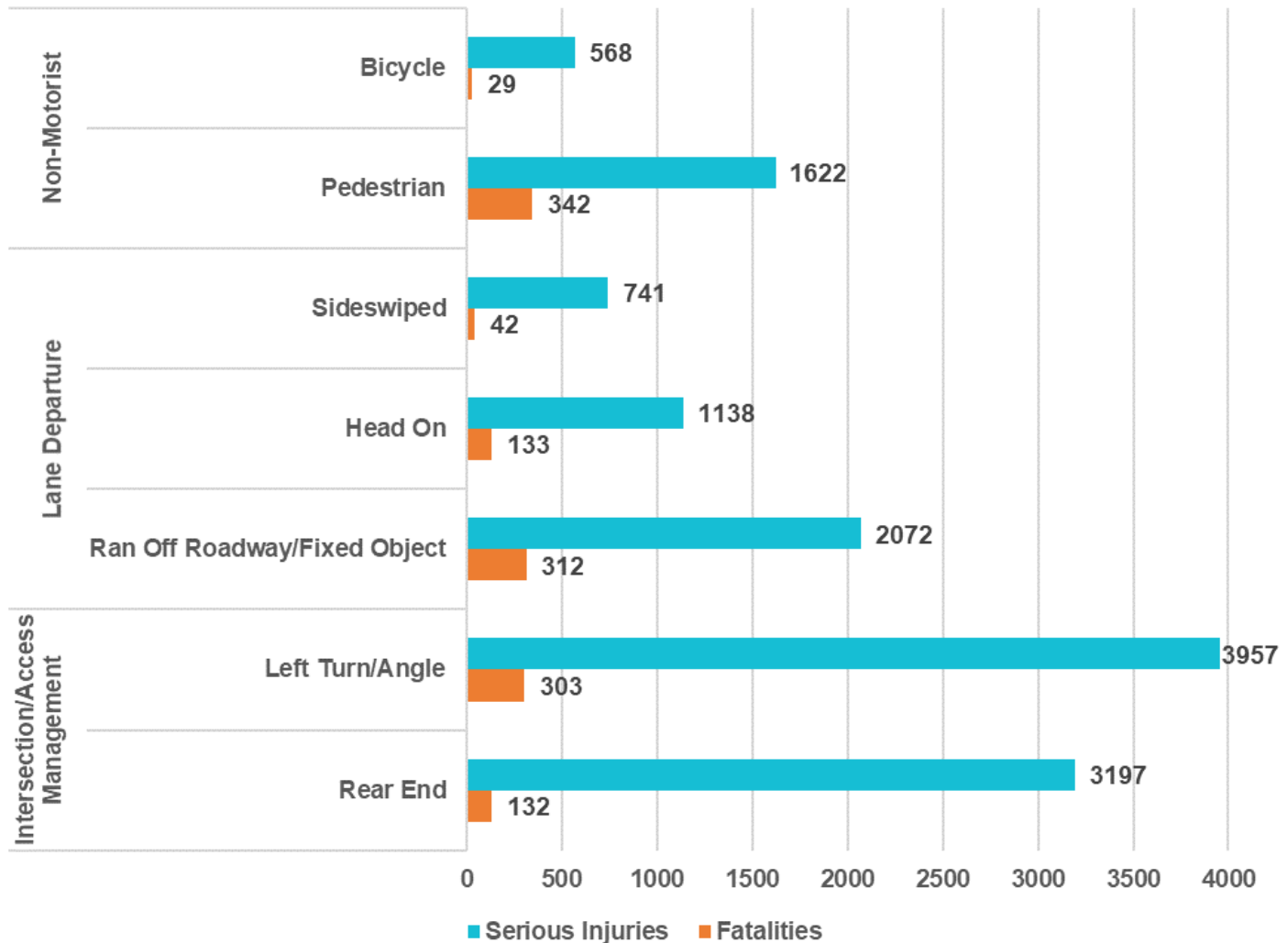
SAFETY STUDY: DEEPER DIVE DATA ANALYSIS

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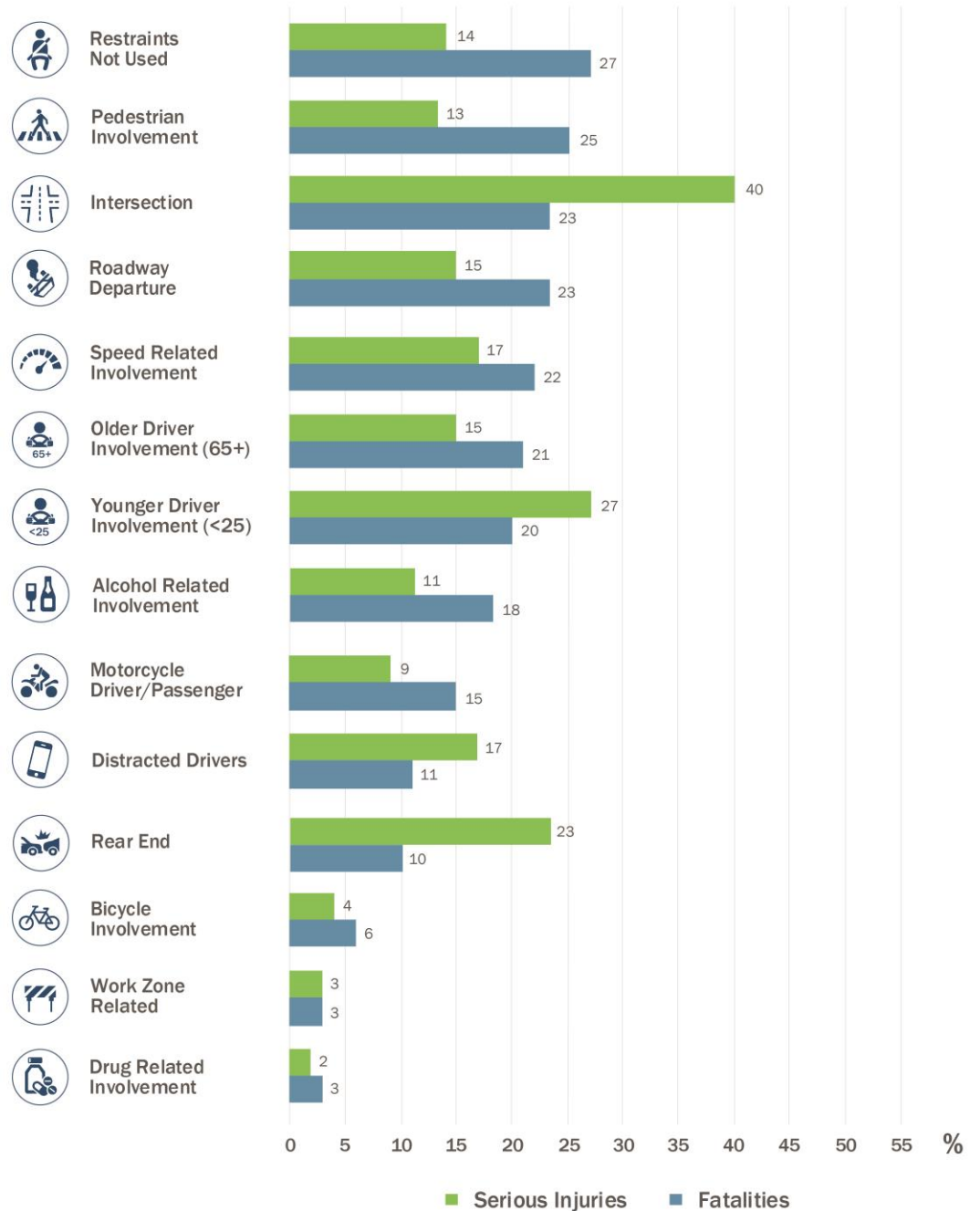
May 20, 2020



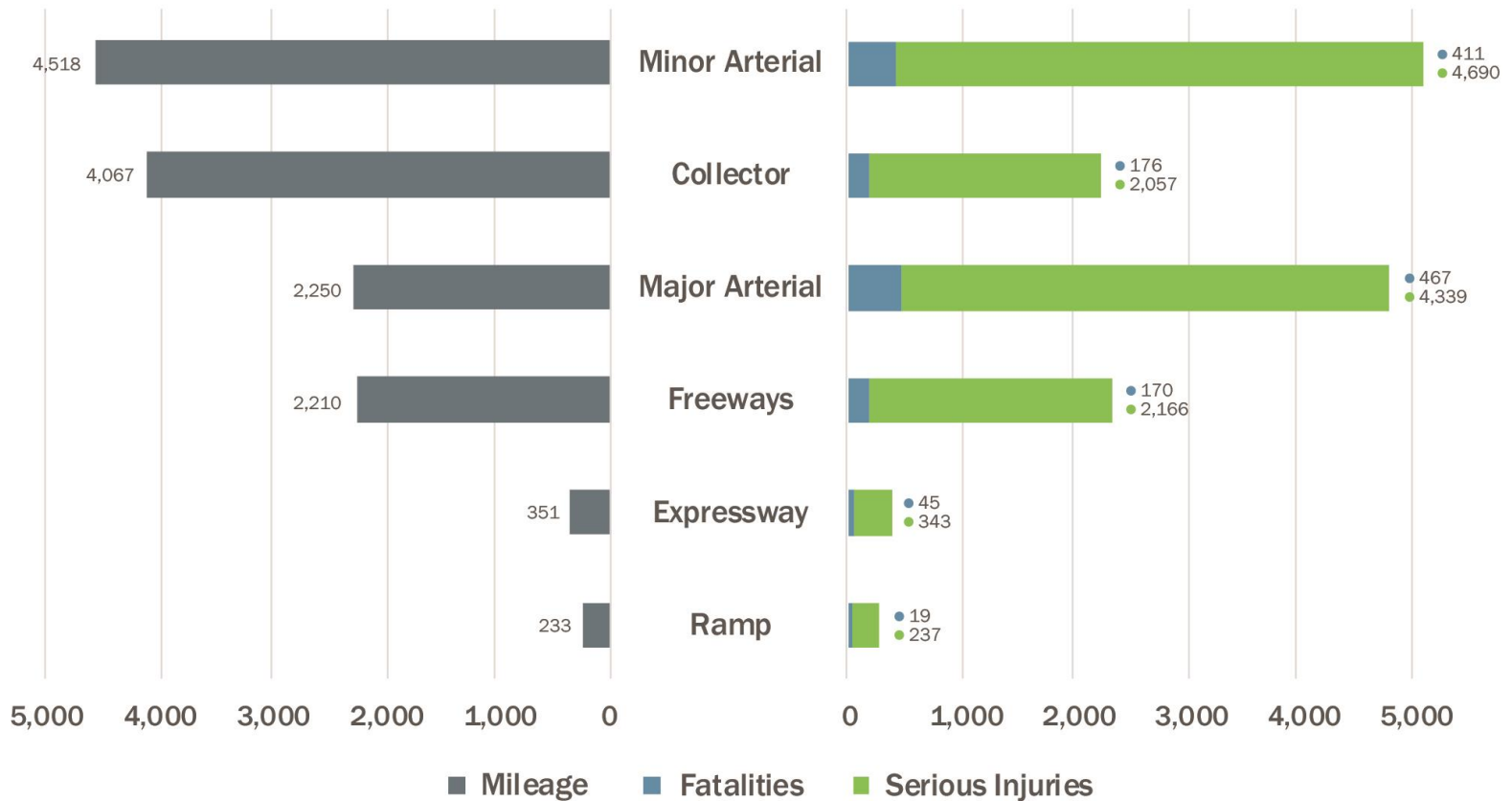
Crash Types (2013-2017)



Crash Contributing Factors (2013-2017)



Functional Class (2013-2017)



Overview of Priority Area Analysis

- Pedestrian Involvement
- Intersection Crashes
- Principal Arterials



PEDESTRIANS



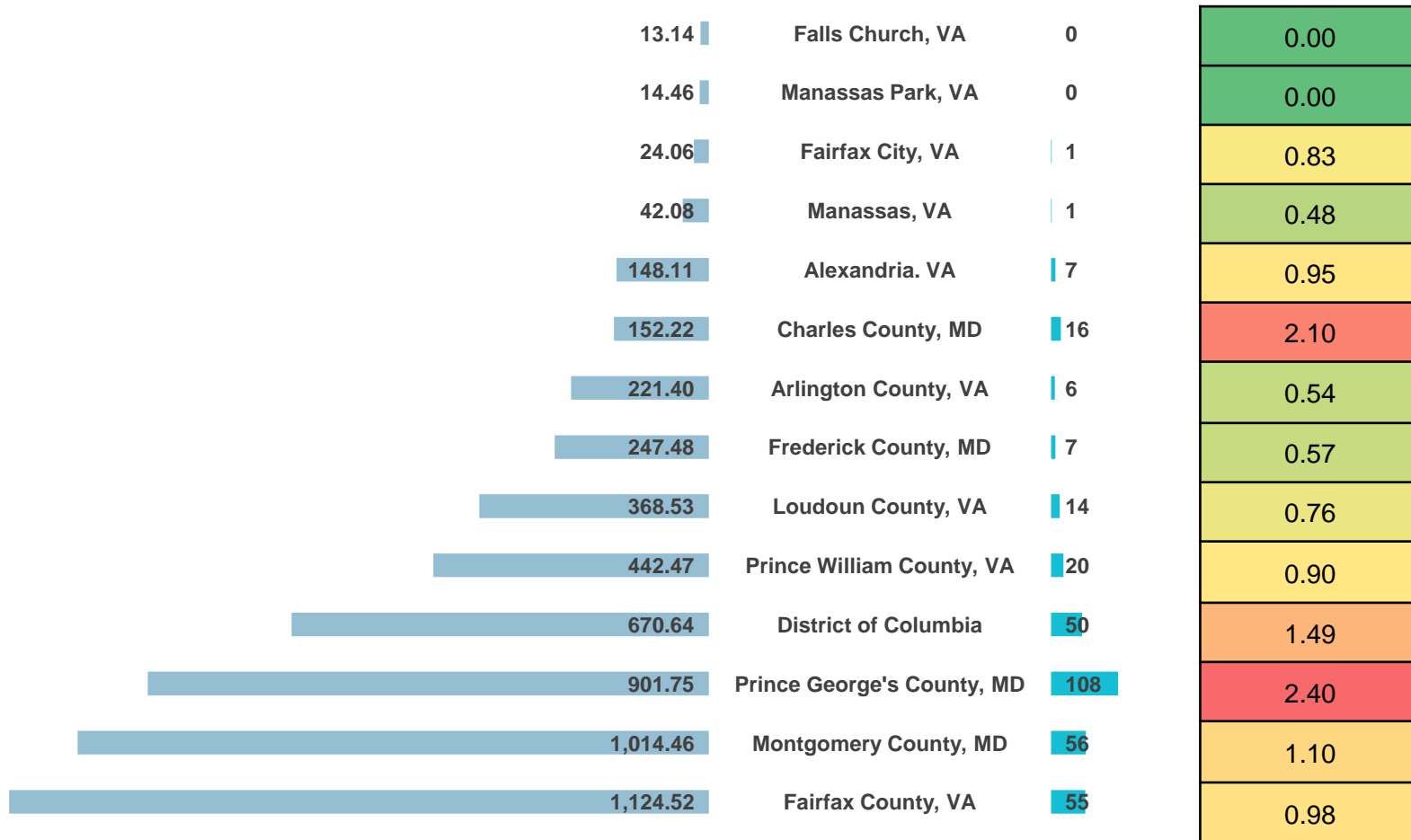
Pedestrian Crash Severity By Jurisdiction

Pedestrian Crash Severity by Jurisdiction			
Jurisdiction	Fatalities	Serious Injuries	Total Crashes
District of Columbia	50	399	5,431
Charles County, MD	16	49	208
Frederick County, MD	7	36	284
Montgomery County, MD	56	318	2,297
Prince George's County, MD	108	269	2,156
Arlington County, VA	6	74	693
Fairfax County, VA	55	331	1,024
Fauquier County, VA (urbanized area)	1	7	24
Loudoun County, VA	14	57	235
Prince William County, VA	20	96	299
Alexandria, VA	7	58	338
Fairfax City, VA	1	21	54
Falls Church, VA	0	13	30
Manassas, VA	1	39	74
Manassas Park, VA	0	0	7
Urban Core	63	531	6,462
Inner Suburbs	220	952	5,561
Outer Suburbs	59	284	1,131
National Capital Region Total	342	1,767	13,154



Pedestrian Fatality Rate by Population

Fatalities per 100,000 people



■ Average Population 2013-2017 (1,000's) ■ Pedestrian Fatalities



Pedestrian Crash Severity by Time of Day

Pedestrian Injury Severity by Time of Day			
Time of Day	Fatalities	Serious Injuries	Total Crashes
Midnight - 0:59 a.m.	11	37	206
1:00 a.m. - 1:59 a.m.	13	35	161
2:00 a.m. - 2:59 a.m.	13	35	163
3:00 a.m. - 3:59 a.m.	7	31	131
4:00 a.m. - 4:59 a.m.	10	4	67
5:00 a.m. - 5:59 a.m.	15	29	187
6:00 a.m. - 6:59 a.m.	24	65	390
7:00 a.m. - 7:59 a.m.	12	85	623
8:00 a.m. - 8:59 a.m.	3	88	673
9:00 a.m. - 9:59 a.m.	7	57	543
10:00 a.m. - 10:59 a.m.	11	59	498
11:00 a.m. - 11:59 a.m.	8	64	547
12:00 p.m. - 12:59 p.m.	6	64	531
1:00 p.m. - 1:59 p.m.	5	68	588
2:00 p.m. - 2:59 p.m.	9	84	726
3:00 p.m. - 3:59 p.m.	11	107	872
4:00 p.m. - 4:59 p.m.	12	104	862
5:00 p.m. - 5:59 p.m.	12	151	1,103
6:00 p.m. - 6:59 p.m.	25	166	1,151
7:00 p.m. - 7:59 p.m.	26	137	911
8:00 p.m. - 8:59 p.m.	34	103	757
9:00 p.m. - 9:59 p.m.	33	99	632
10:00 p.m. - 10:59 p.m.	28	92	518
11:00 p.m. - 11:59 p.m.	18	65	311



Pedestrian Crash Severity by Month

Pedestrian Injury Severity by Month			
Month	Fatalities	Serious Injuries	Total Crashes
January	28	151	1,162
February	28	136	929
March	27	145	984
April	23	149	1,027
May	31	155	1,101
June	23	150	1,087
July	22	109	892
August	29	160	967
September	24	156	1,117
October	40	180	1,389
November	38	163	1,242
December	40	176	1,257



Pedestrian Crash Severity by Location

Injury Severity by Pedestrian Location			
Pedestrian Location	Fatalities	Serious Injuries	Total Crashes
Unknown	65	414	4,270
Unmarked Crosswalk	6	54	386
Marked Crosswalk	61	536	3,927
Sidewalk	7	33	252
In Roadway/Unmarked Midblock/Not at Intersection	197	675	3,770
Median/Island	2	4	28
Outside Roadway	15	114	521



Driver Age in Pedestrian Crashes

Driver Age in Pedestrian Crashes			
Driver Age	Fatal Pedestrian Crashes	Serious Injury Pedestrian Crashes	Total Drivers in Pedestrian Crashes
Younger than 5	0	0	0
5-9	0	0	0
10-14	0	0	0
15-19	12	52	280
20-24	32	159	960
25-29	34	174	1,213
30-34	37	180	1,190
35-39	32	164	1,012
40-44	36	144	947
45-49	30	173	998
50-54	36	142	1,033
55-59	34	133	952
60-64	20	101	759
65-69	16	97	588
70-74	5	49	395
75-79	8	44	259
80-84	6	20	165
Older than 84	42	158	1,079



Relevance of Pedestrian Crash Analysis

- Data imply that lack of visibility in the evenings, especially during the winter months increases the likelihood of drivers hitting pedestrians
- Data show a preponderance of pedestrian fatalities and serious injuries in the roadway and not at an intersection
- Data show that drivers over the age of 84 are involved in more pedestrian fatal and serious injury crashes than any other 5-year group

Potential countermeasures to inform recommendations

- Find ways to provide improved lighting at key locations and throughout the transportation network
- Find ways to provide even more alternatives to driving for older drivers
- Find ways to implement more countermeasures such as pedestrian roadway safety audits, pedestrian hybrid beacons, pedestrian refuge islands, road diets, more Street Smart-like activities with street teams, etc.



INTERSECTIONS



Intersection Crash Severity by Jurisdiction

Intersection Crash Severity by Jurisdiction			
Jurisdiction	Fatalities	Serious Injuries	Total Crashes
District of Columbia	56	929	57,450
Charles County, MD	24	379	4,323
Frederick County, MD	16	139	4,244
Montgomery County, MD	79	954	23,860
Prince George's County, MD	118	733	22,101
Arlington County, VA	9	152	6,290
Fairfax County, VA	58	1,479	27,461
Fauquier County, VA (urbanized area)	1	37	690
Loudoun County, VA	19	439	10,983
Prince William County, VA	44	463	12,905
Alexandria, VA	4	119	4,004
Fairfax City, VA	4	60	1,339
Falls Church, VA	0	44	339
Manassas, VA	1	210	1,900
Manassas Park, VA	0	4	215
Urban Core	69	1,200	67,744
Inner Suburbs	259	3,270	75,100
Outer Suburbs	105	1,671	35,260
National Capital Region Total	433	6,141	178,104



Intersection Crash Severity by Time of Day

Intersection Injury Severity by Time of Day			
Time of Day	Fatalities	Serious Injuries	Total Crashes
Midnight - 0:59 a.m.	12	154	3,365
1:00 a.m. - 1:59 a.m.	18	98	2,425
2:00 a.m. - 2:59 a.m.	15	131	2,329
3:00 a.m. - 3:59 a.m.	9	78	2,161
4:00 a.m. - 4:59 a.m.	5	45	1,455
5:00 a.m. - 5:59 a.m.	12	91	2,337
6:00 a.m. - 6:59 a.m.	10	216	4,708
7:00 a.m. - 7:59 a.m.	21	284	8,420
8:00 a.m. - 8:59 a.m.	12	329	10,665
9:00 a.m. - 9:59 a.m.	17	273	9,337
10:00 a.m. - 10:59 a.m.	16	255	7,987
11:00 a.m. - 11:59 a.m.	15	272	8,386
12:00 p.m. - 12:59 p.m.	16	299	9,528
1:00 p.m. - 1:59 p.m.	16	321	9,573
2:00 p.m. - 2:59 p.m.	22	319	10,381
3:00 p.m. - 3:59 p.m.	19	415	12,595
4:00 p.m. - 4:59 p.m.	12	409	13,072
5:00 p.m. - 5:59 p.m.	22	431	14,354
6:00 p.m. - 6:59 p.m.	37	427	12,640
7:00 p.m. - 7:59 p.m.	22	315	8,883
8:00 p.m. - 8:59 p.m.	27	311	6,960
9:00 p.m. - 9:59 p.m.	32	271	6,454
10:00 p.m. - 10:59 p.m.	22	219	5,543
11:00 p.m. - 11:59 p.m.	24	177	4,539



Crash Severity by Intersection Control Type

Injury Severity by Intersection Control Type			
Intersection Control Type	Fatalities	Serious Injuries	Total Crashes
Flashing	13	89	4,222
Officer or Flagger	0	15	441
Other	27	308	11,653
Signal	225	3,311	100,074
Stop Sign	68	837	25,240
Turn Restricted	0	2	63
Yield	9	39	2,383

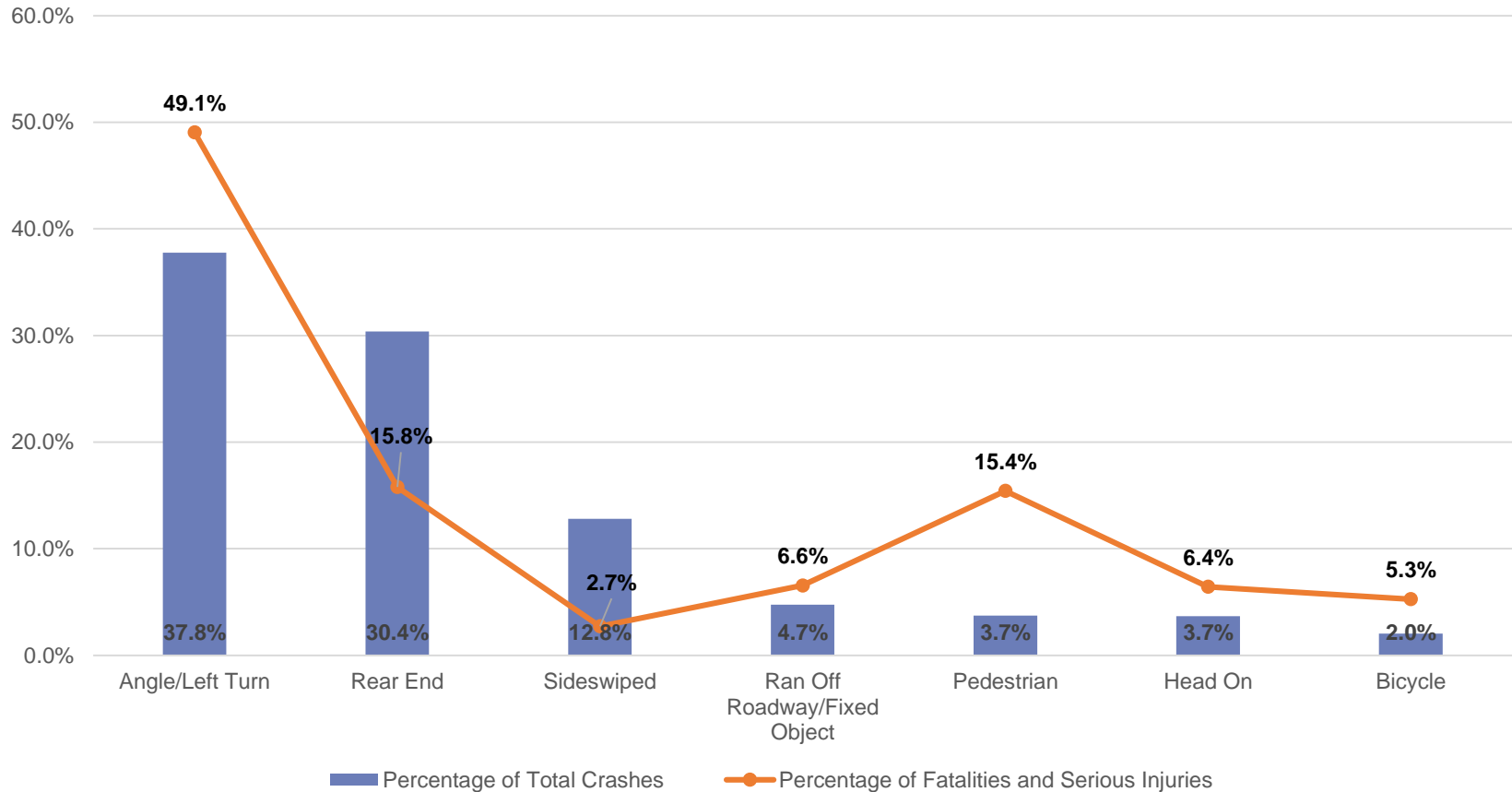


Intersection Crash Severity by Functional Class

Intersection Injury Severity by Functional Class			
Functional Class	Fatalities	Serious Injuries	Total Crashes
Collector	53	1,045	28,744
Expressway	17	132	3,584
Freeway	10	165	5,586
Major Arterial	185	2,226	68,598
Minor Arterial	147	2,475	68,505
Ramp	3	66	1,878



Intersection Collision Types by Contribution



Relevance of Intersection Crash Analysis

- Data show that most intersection crashes are at signalized intersections along arterials
- Angle/left turn crashes account for about 38% of intersection crashes but result in 49% of fatalities and serious injuries
- Crashes with pedestrians account for less than 4% of intersection crashes yet result in over 15% of fatalities and serious injuries

Potential countermeasures to inform recommendations

- Find ways to make intersections safer in our region by implementing more roundabouts, improving left turn and right turn channelization at more intersections, implementing leading pedestrian intervals at more intersections, installing more LED heads and reflective backplates, applying high friction treatments at intersections with high numbers of rear end collisions, etc.



MAJOR ARTERIALS



Major Arterial Crash Severity by Jurisdiction

Major Arterial Crash Severity by Jurisdiction			
Jurisdiction	Fatalities	Serious Injuries	Total Crashes
District of Columbia	44	618	45,775
Charles County, MD	37	443	5,422
Frederick County, MD	26	89	3,665
Montgomery County, MD	98	851	25,836
Prince George's County, MD	165	727	23,564
Arlington County, VA	9	98	4,231
Fairfax County, VA	42	803	17,307
Fauquier County, VA (urbanized area)	2	55	1,160
Loudoun County, VA	12	142	4,585
Prince William County, VA	24	195	5,301
Alexandria, VA	2	69	2,624
Fairfax City, VA	5	82	2,357
Falls Church, VA	0	66	492
Manassas, VA	1	100	823
Manassas Park, VA	0	1	109
Urban Core	55	785	52,630
Inner Suburbs	310	2,529	69,556
Outer Suburbs	102	1,025	21,065
National Capital Region Total	467	4,339	143,251



Major Arterial Crash Severity by Time of Day

Major Arterial Injury Severity by Time of Day			
Time of Day	Fatalities	Serious Injuries	Total Crashes
Midnight - 0:59 a.m.	20	115	2,935
1:00 a.m. - 1:59 a.m.	23	93	2,298
2:00 a.m. - 2:59 a.m.	22	94	2,336
3:00 a.m. - 3:59 a.m.	21	74	2,182
4:00 a.m. - 4:59 a.m.	19	42	1,471
5:00 a.m. - 5:59 a.m.	14	83	2,150
6:00 a.m. - 6:59 a.m.	19	154	3,949
7:00 a.m. - 7:59 a.m.	12	182	6,374
8:00 a.m. - 8:59 a.m.	8	221	7,984
9:00 a.m. - 9:59 a.m.	11	209	7,331
10:00 a.m. - 10:59 a.m.	15	187	6,607
11:00 a.m. - 11:59 a.m.	14	193	6,687
12:00 p.m. - 12:59 p.m.	13	222	7,697
1:00 p.m. - 1:59 p.m.	17	225	7,959
2:00 p.m. - 2:59 p.m.	13	227	8,617
3:00 p.m. - 3:59 p.m.	14	297	10,198
4:00 p.m. - 4:59 p.m.	22	274	10,385
5:00 p.m. - 5:59 p.m.	23	309	11,193
6:00 p.m. - 6:59 p.m.	30	281	9,855
7:00 p.m. - 7:59 p.m.	29	199	6,929
8:00 p.m. - 8:59 p.m.	28	167	5,267
9:00 p.m. - 9:59 p.m.	29	189	4,859
10:00 p.m. - 10:59 p.m.	22	153	4,379
11:00 p.m. - 11:59 p.m.	29	149	3,601

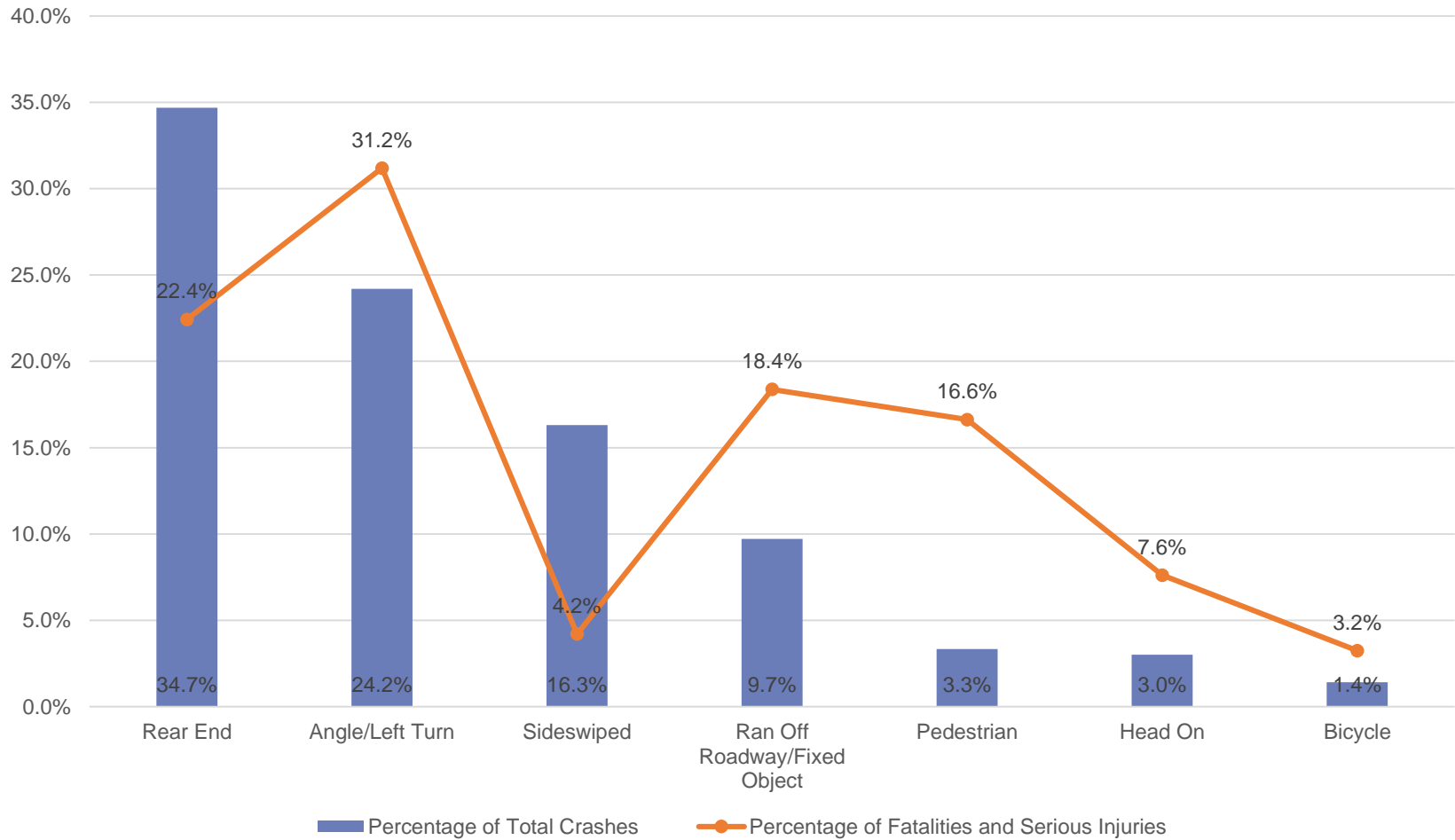


Major Arterial Crash Severity by Day of Week

Major Arterial Injury Severity by Day of the Week			
Day of Week	Fatalities	Serious Injuries	Total Crashes
Sunday	82	595	15,369
Monday	60	583	19,502
Tuesday	48	615	21,577
Wednesday	59	603	21,487
Thursday	66	623	21,882
Friday	69	671	23,826
Saturday	83	649	19,609



Major Arterial Collision Types by Contribution



Relevance of Major Arterial Crash Analysis

- Data show that most of the fatalities and serious injuries along major arterials are associated with angle/left turn crashes
- Crashes where vehicles left the roadway and hit fixed objects in addition to head on crashes account for a high proportion of fatalities and serious injuries
- Crashes with pedestrians account for less than 4% of major arterial crashes yet result in over 16% of fatalities and serious injuries

Potential countermeasures to inform recommendations

- Find ways to keep more vehicles on the roadway by adding more rumble strips, adding enhanced delineation treatments ahead of curves, installing high friction treatments, install the SafetyEdge at more locations, etc.
- Identify roadways that would benefit from road diets to reduce speeds and improve pedestrian safety



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