DELAWARE

2021-2025 Strategic Highway Safety Plan:

Towards Zero Deaths

Roadway Departure Fatality & Serious Injury Data Analysis

October 26, 2022

Roadway Departure Definition

- Roadway Departure defined:

  A roadway departure occurs when a vehicle crosses an edge line, a center line, or otherwise leaves the traveled way of any roadway.

- Roadway Departure Crash defined:

  A roadway departure crash is a non-intersection crash that occurs when a vehicle leaves the traveled way and one or more of the following actions occurs:

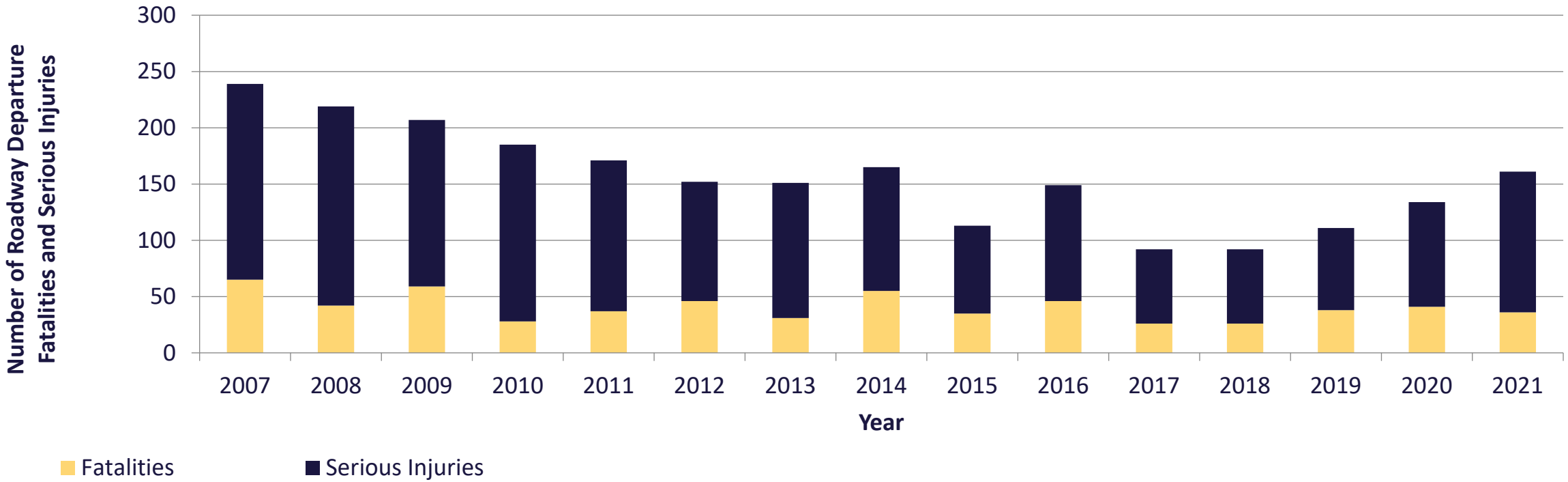
  - *The vehicle overturns*
  - *The departing vehicle strikes another vehicle (head-on or other crash type)*
  - *The departing vehicle strikes one or more fixed objects (man-made or natural)*

Types of Roadway Departure Crashes:

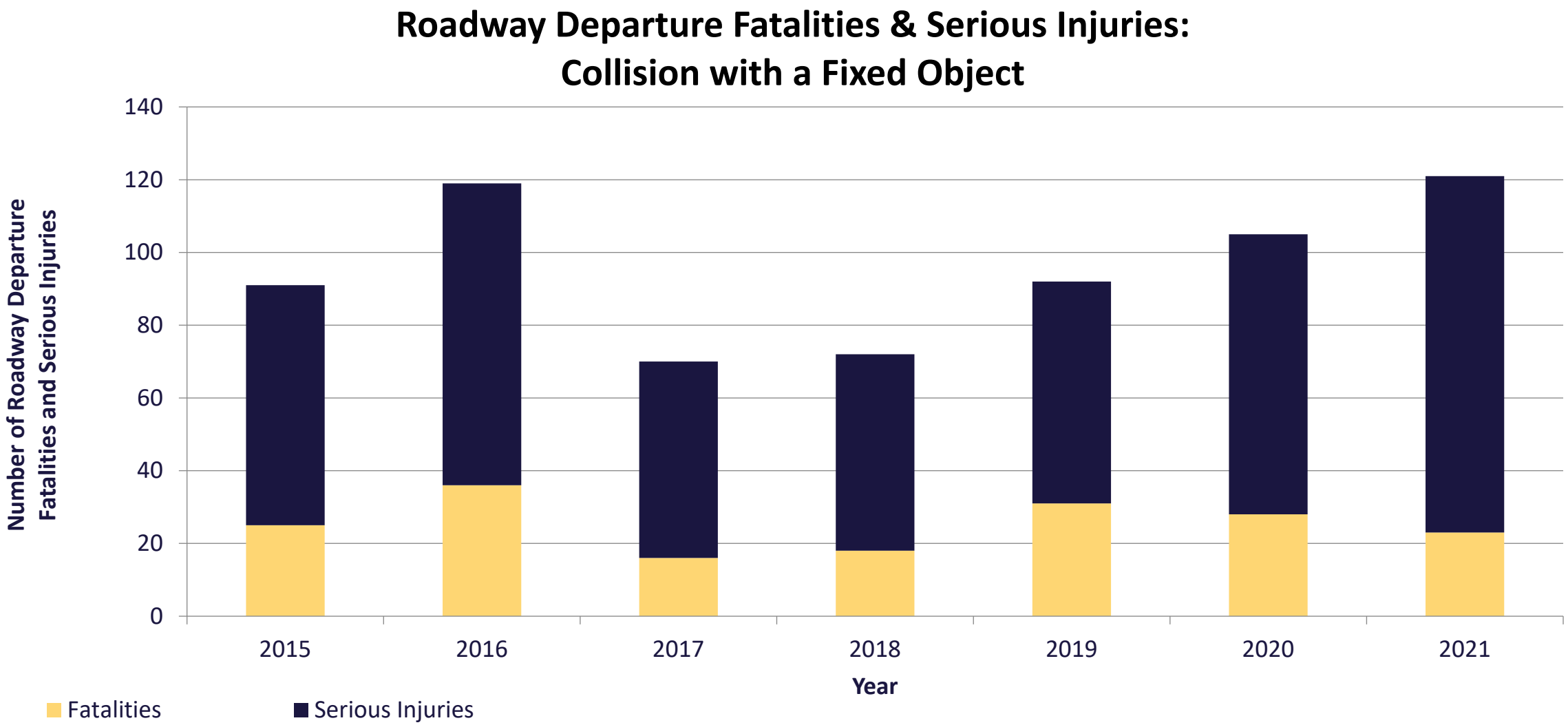
- ***Single Vehicle Hit Fixed Object***
- ***Single Vehicle Overturn***
- ***Head-On Crash***
- ***Median Crossover Crash***

Roadway Departure Fatalities & Serious Injuries

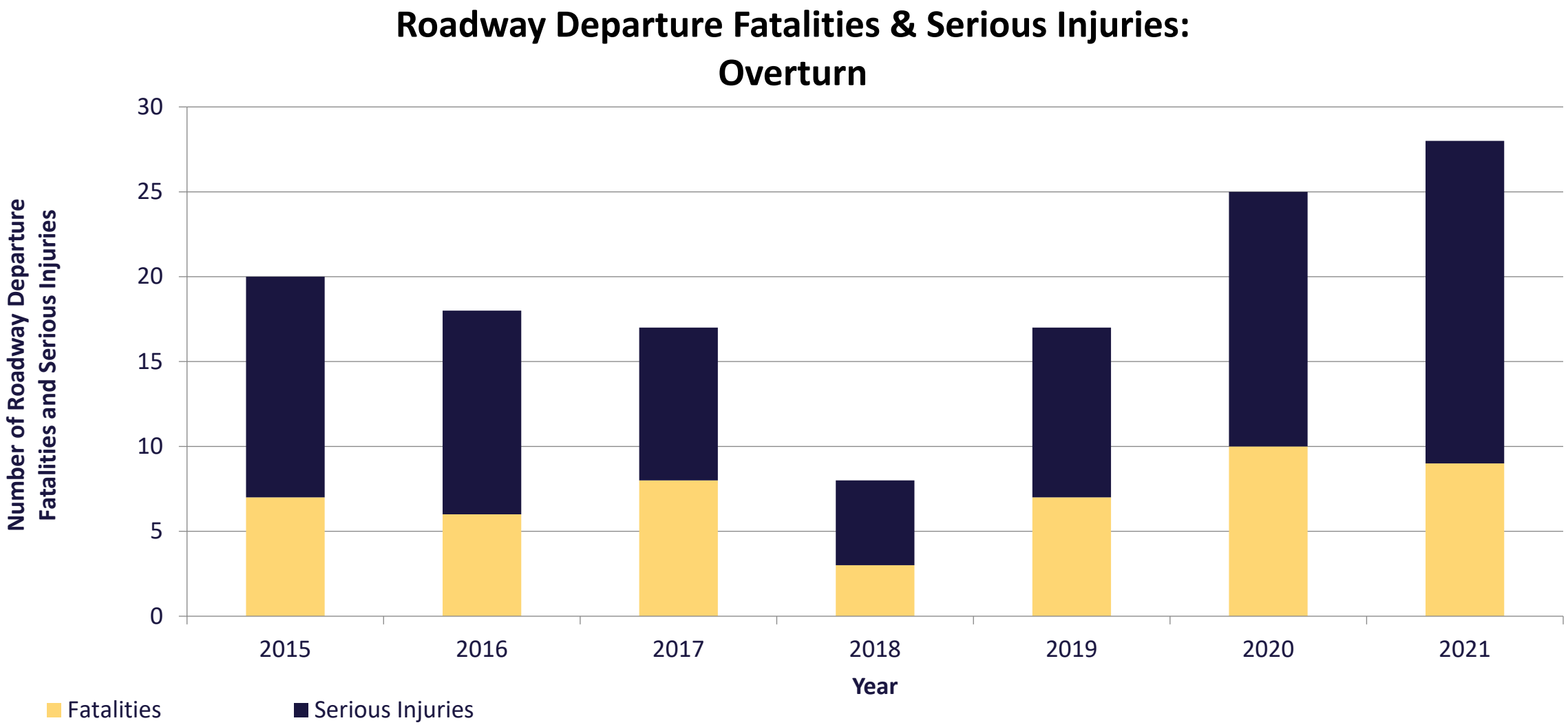
Roadway Departure	2015-2019 Crashes	2020-2021 Crashes
% of total fatalities	28%	**34%**
% of total serious injuries	16%	**22%**
% of total fatalities & serious injuries	18%	**24%**



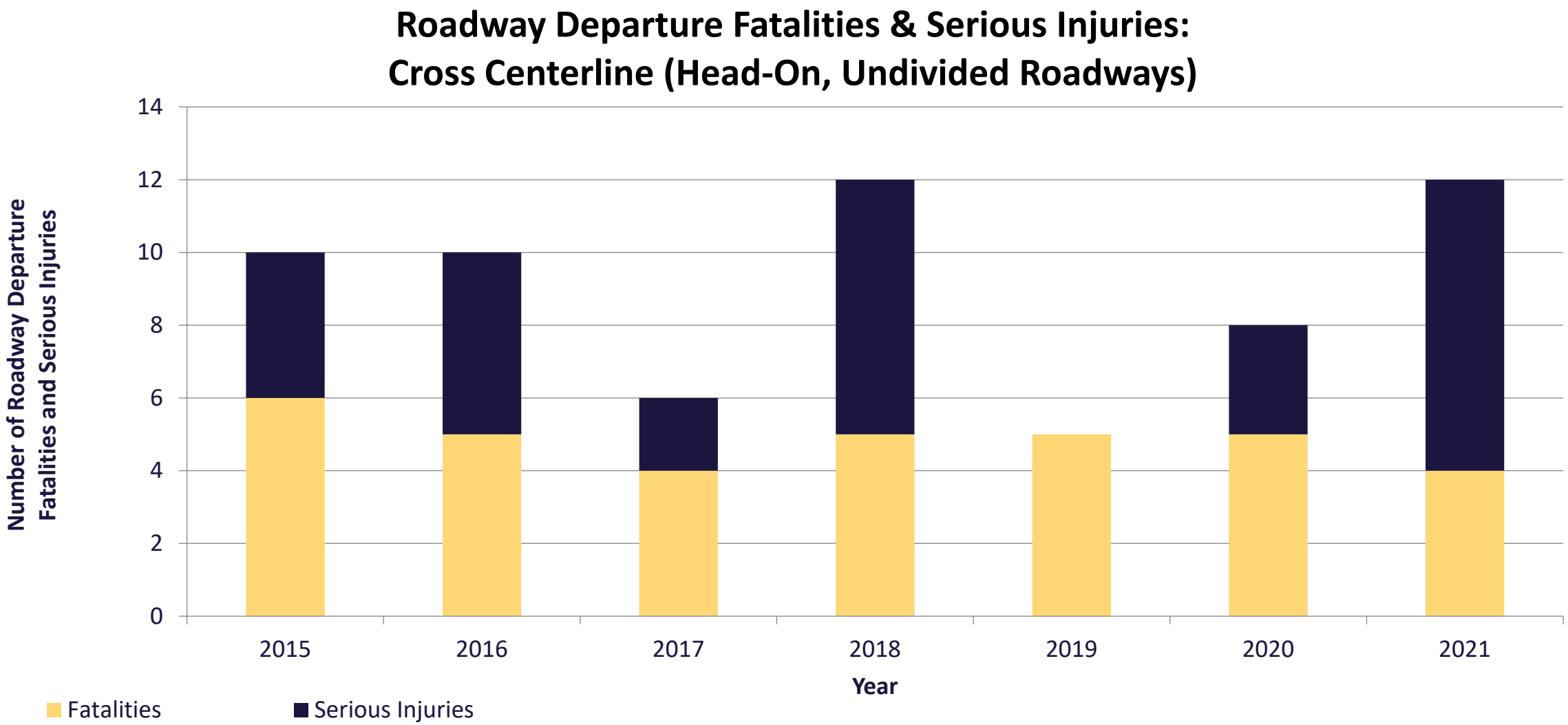
Roadway Departure Fatalities & Serious Injuries



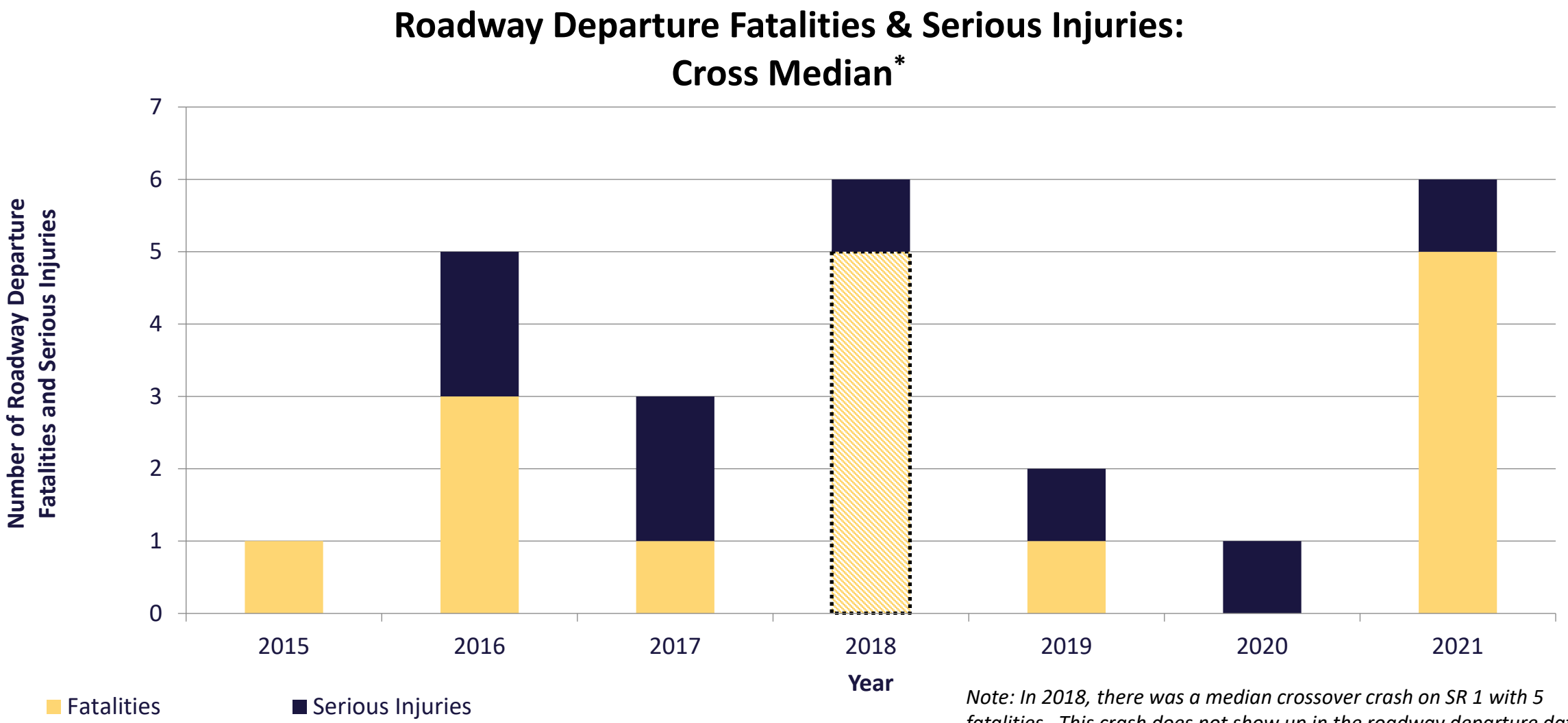
Roadway Departure Fatalities & Serious Injuries



Roadway Departure Fatalities & Serious Injuries



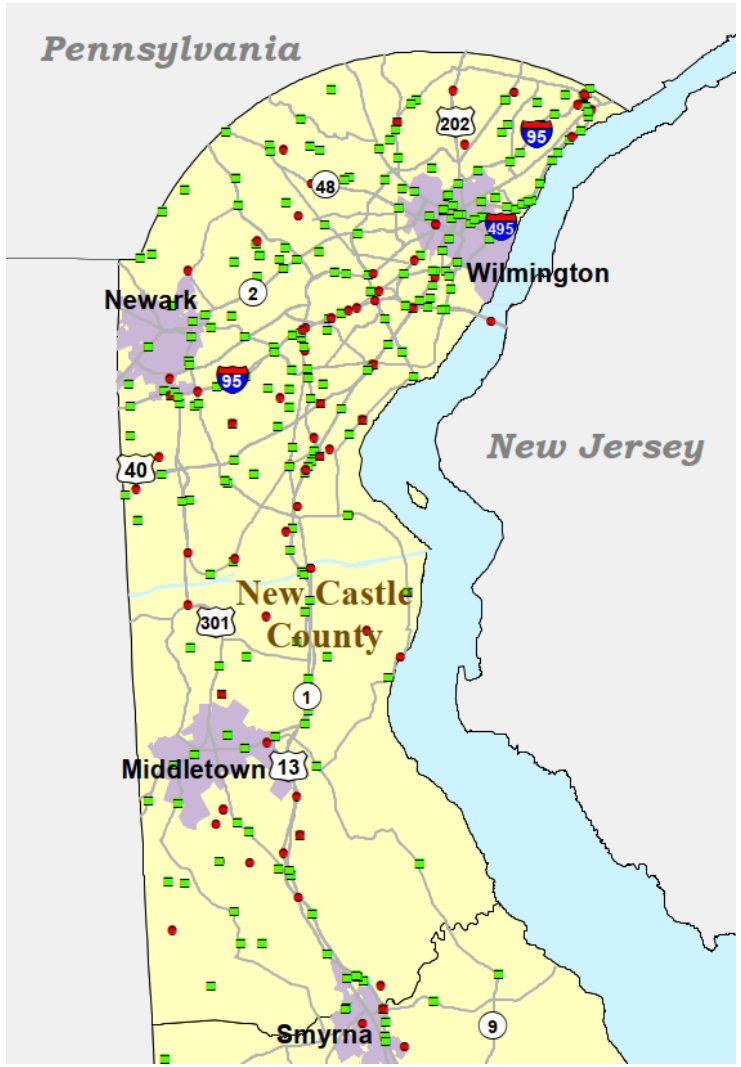
Roadway Departure Fatalities & Serious Injuries

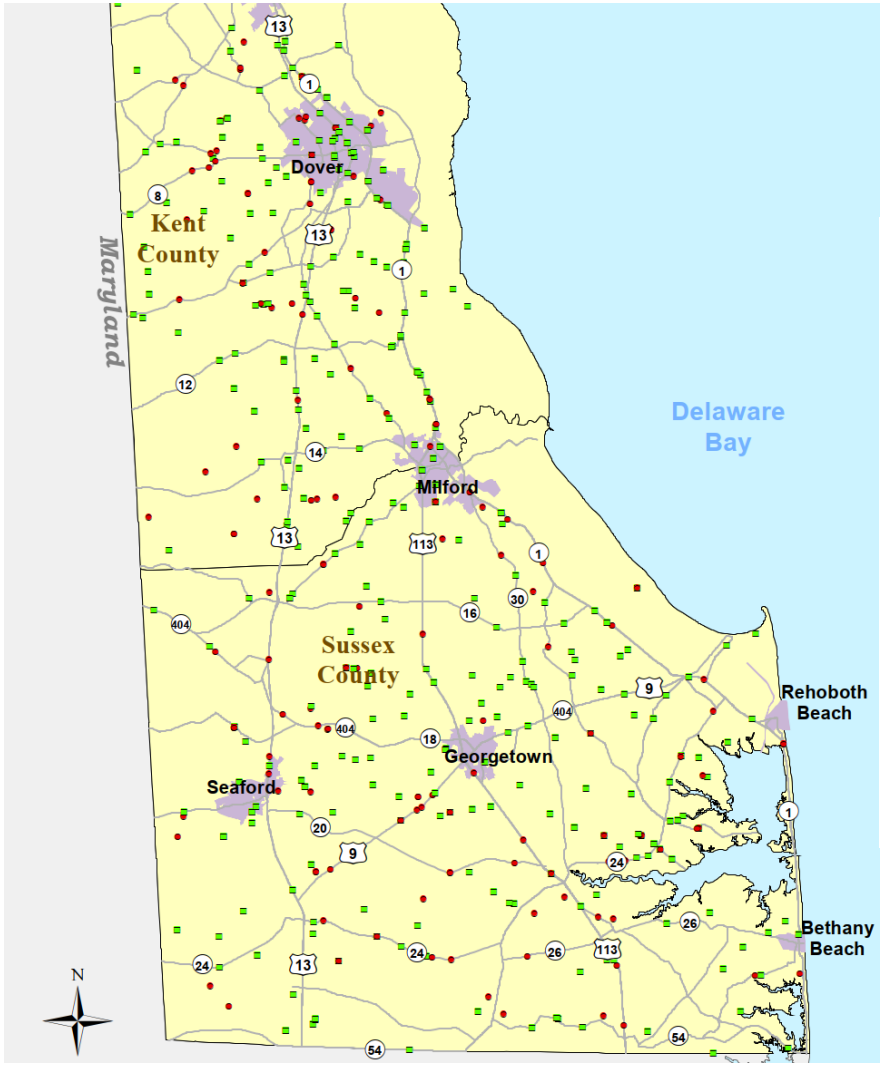


Note: In 2018, there was a median crossover crash on SR 1 with 5 fatalities. This crash does not show up in the roadway departure data set due to how the crash report was coded. Complaint # 09-18-037628

**Cross Median crashes pertain to divided highways only*

Roadway Departure Fatalities & Serious Injuries





Roadway Departure

Year	New Castle County		Kent County		Sussex County	
	Fatalities	Serious Injuries	Fatalities	Serious Injuries	Fatalities	Serious Injuries
2015	12	35	7	23	16	20
2016	16	41	14	24	16	38
2017	9	25	8	15	9	26
2018	10	24	4	15	12	27
2019	7	34	12	18	19	21
2020	17	35	7	25	17	33
2021	11	54	17	41	8	30
Total	82	248	69	161	97	195
	330		230		292	
%	39%		27%		34%	

Fatality*

Serious Injury*

Municipality

** Each symbol represents a crash location. Multiple crashes may have occurred at or near the same location, therefore, symbols may overlap. Additionally, multiple fatalities and/or serious injuries may have resulted from a single crash.*

Roadway Departure Fatalities & Serious Injuries:
Additional Data Analyses

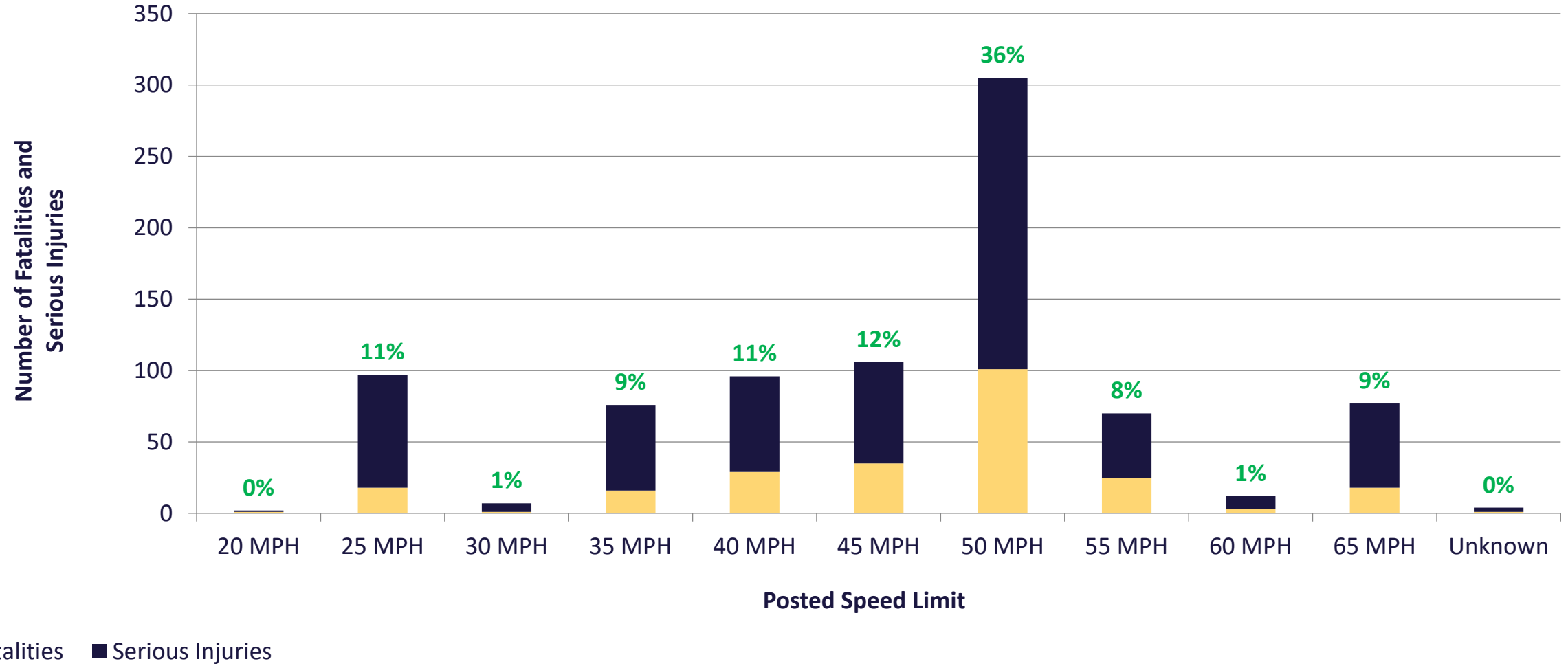
- 2021-2025 Delaware SHSP includes data analysis of roadway departure crashes (2015-2019 crash data)
- Additional data analyses include:
  - Expansion of previous data analysis to include 2020-2021 crashes
  - Evaluation of roadway departures based on posted speed limit *(presented herein)*
  - Comparison of 2015-2019 Roadway Departure crashes to 2020-2021 Roadway Departure crashes *(presented herein)*
    - Determine if there are changes in roadway departure trends
  - Comparison of roadway departure crashes on divided and undivided roadways *(presented herein)*
  - Comparison of roadway departure crashes on tangent and curved segments of roadways *(presented herein)*

Roadway Departure Fatalities & Serious Injuries

Fatalities & Serious Injuries by Posted Speed Limit

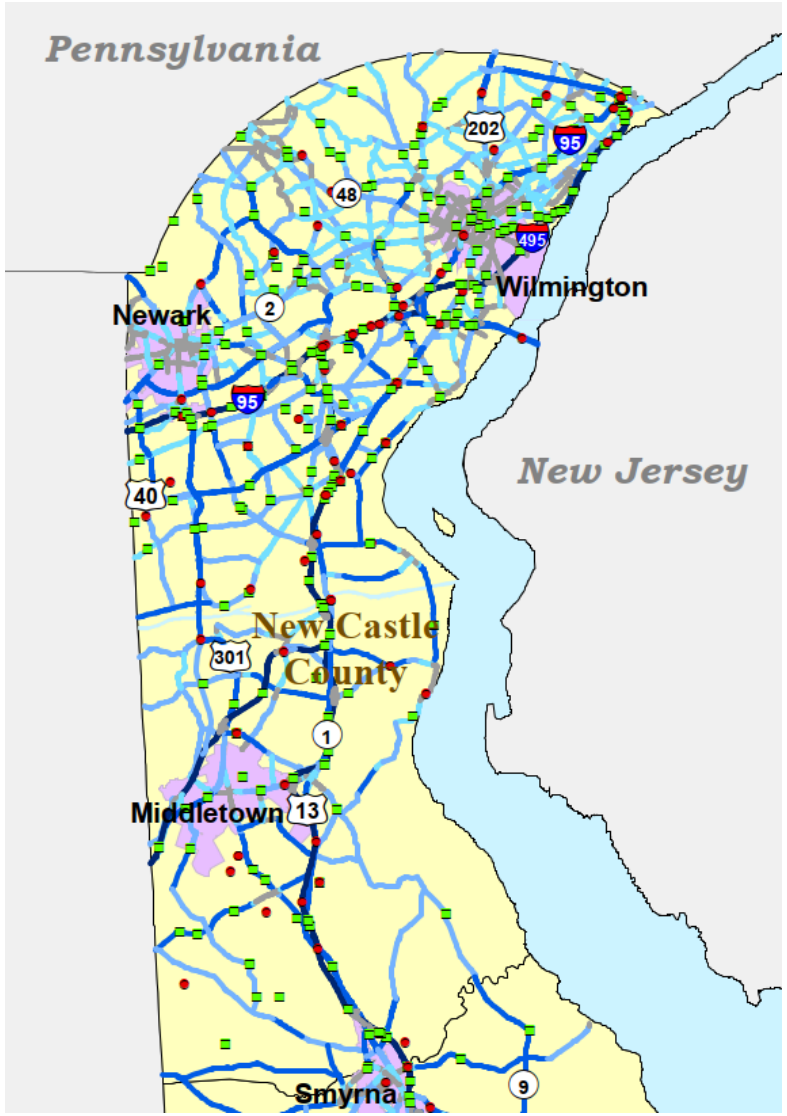
Roadway Departure: Roadway Posted Speed Limit

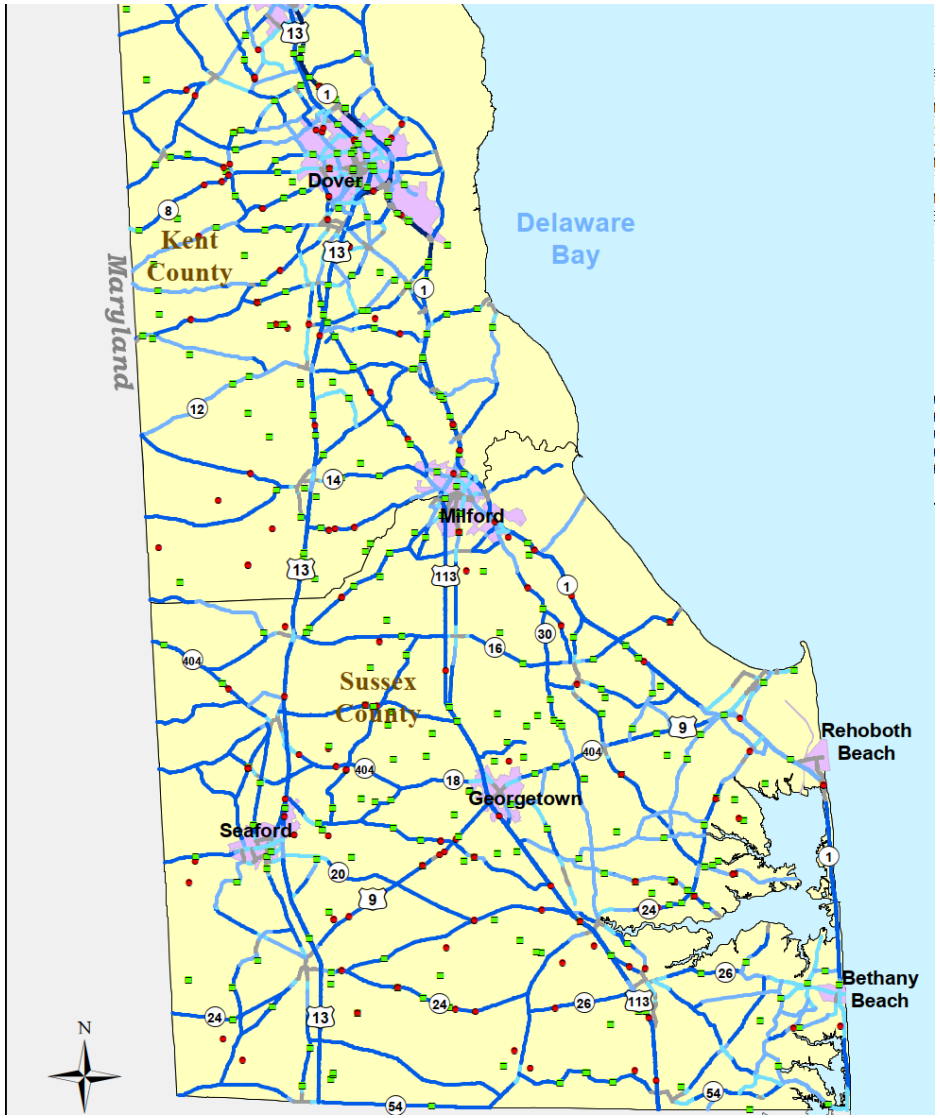
2015-2021 Data



% Roadway Departure Fatalities & Serious Injuries

Roadway Departure: Roadway Posted Speed Limit





Roadway Departure

Year	New Castle County		Kent County		Sussex County	
	Fatalities	Serious Injuries	Fatalities	Serious Injuries	Fatalities	Serious Injuries
2015	12	35	7	23	16	20
2016	16	41	14	24	16	38
2017	9	25	8	15	9	26
2018	10	24	4	15	12	27
2019	7	34	12	18	19	21
2020	17	35	7	25	17	33
2021	11	54	17	41	8	30
Total	82	248	69	161	97	195
	330		230		292	
%	39%		27%		34%	

Fatality*

Serious Injury*

Municipality

SPEED LIMIT

Less than 30 mph

30/35 mph

40/45 mph

50/55 mph

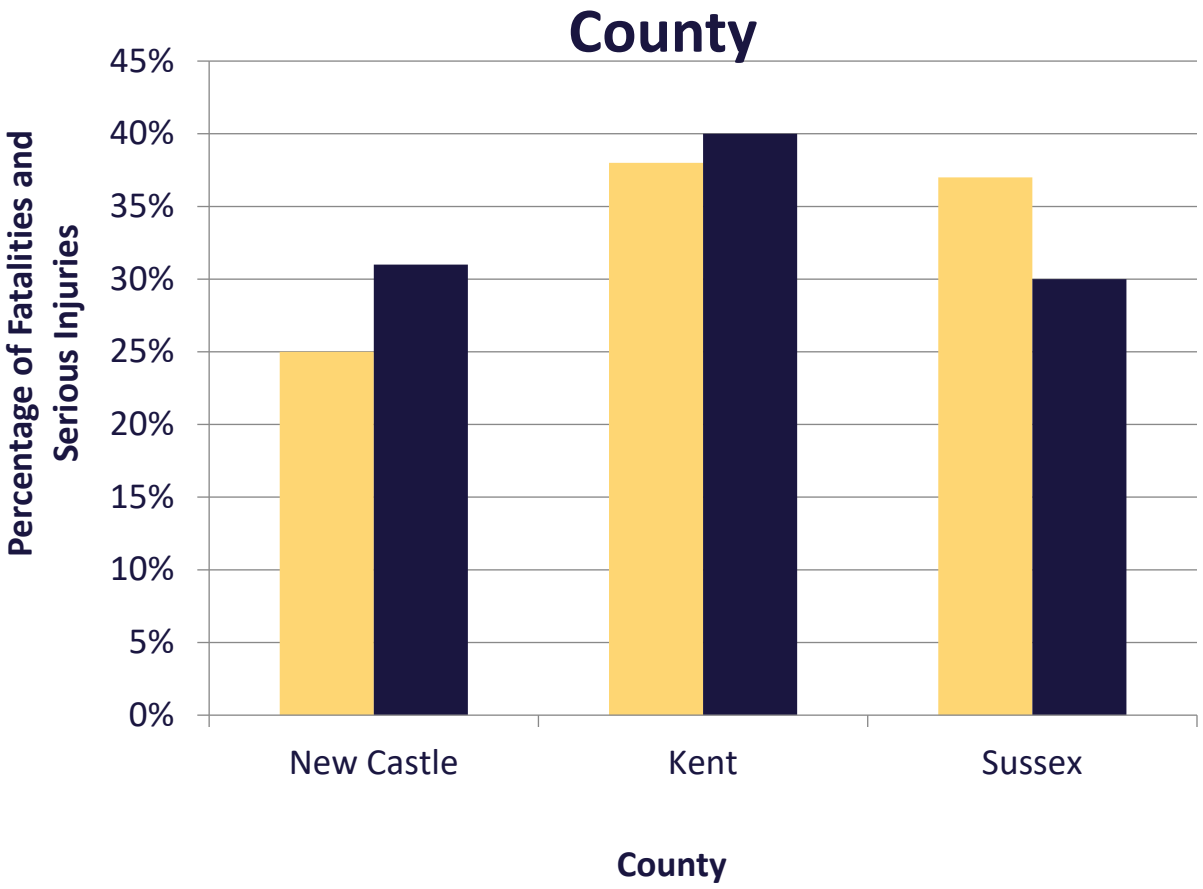
60/65 mph

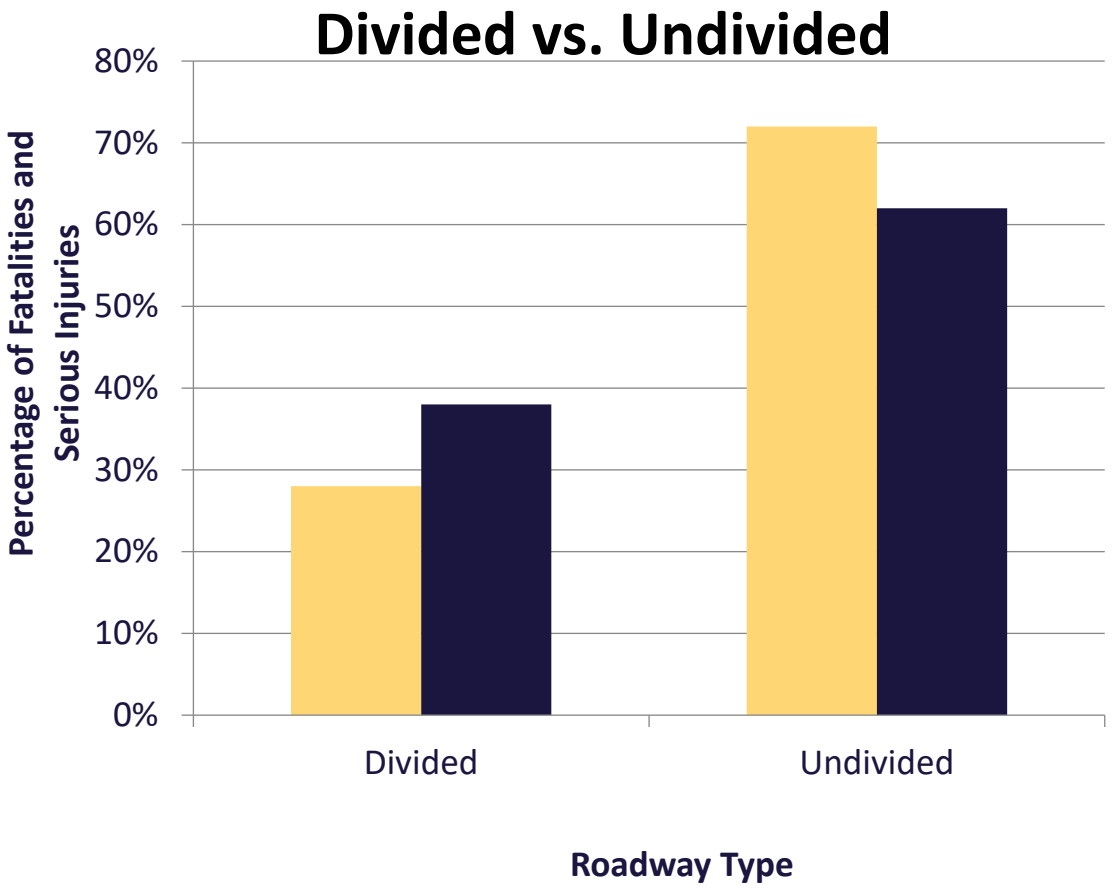
** Each symbol represents a crash location. Multiple crashes may have occurred at or near the same location, therefore, symbols may overlap. Additionally, multiple fatalities and/or serious injuries may have resulted from a single crash.*

Roadway Departure Fatalities & Serious Injuries

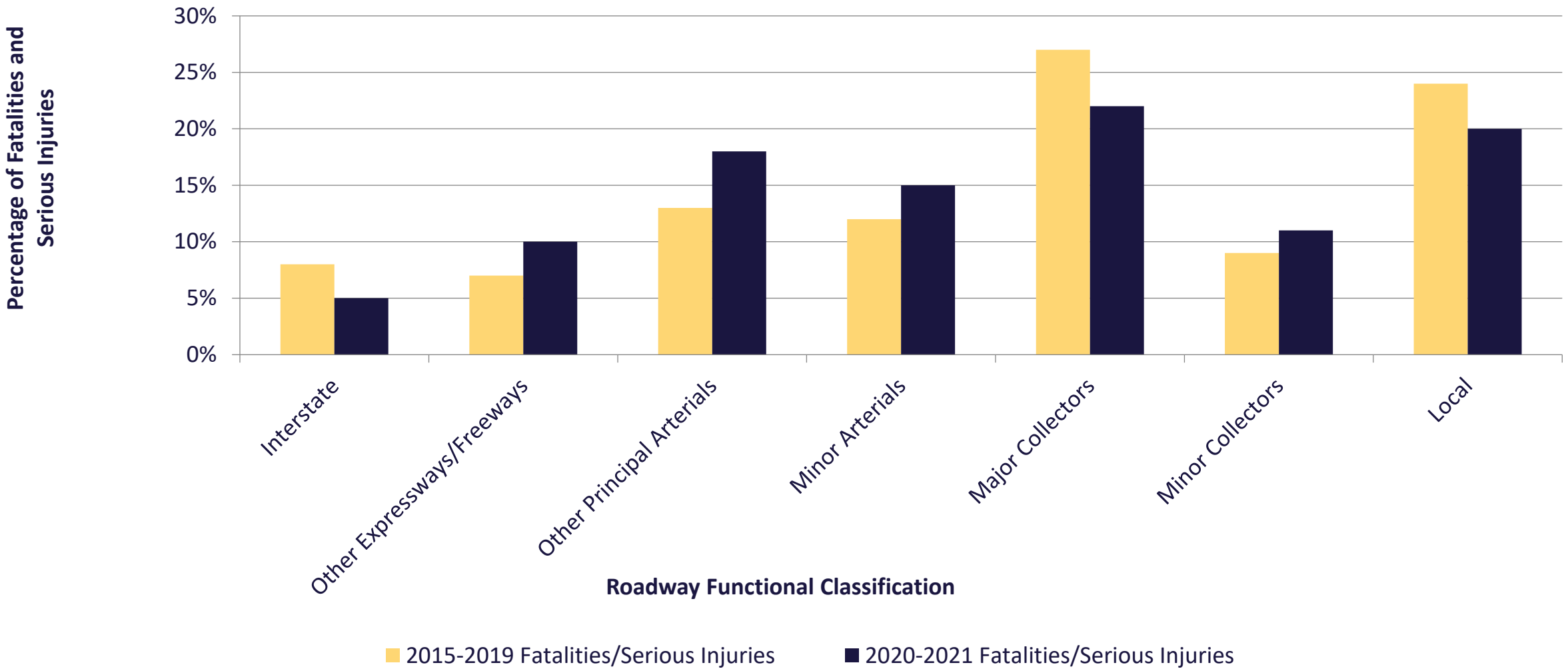
Comparison of 2015-2019 and 2020-2021 Roadway Departure crash data

Roadway Departure: Where?

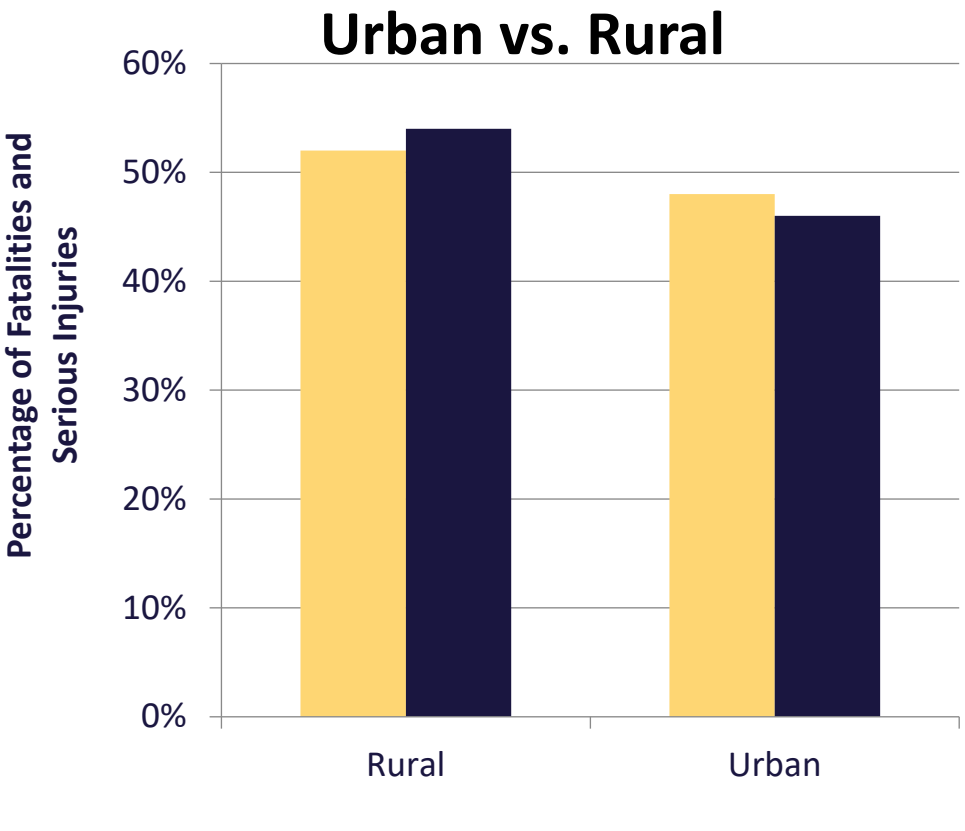


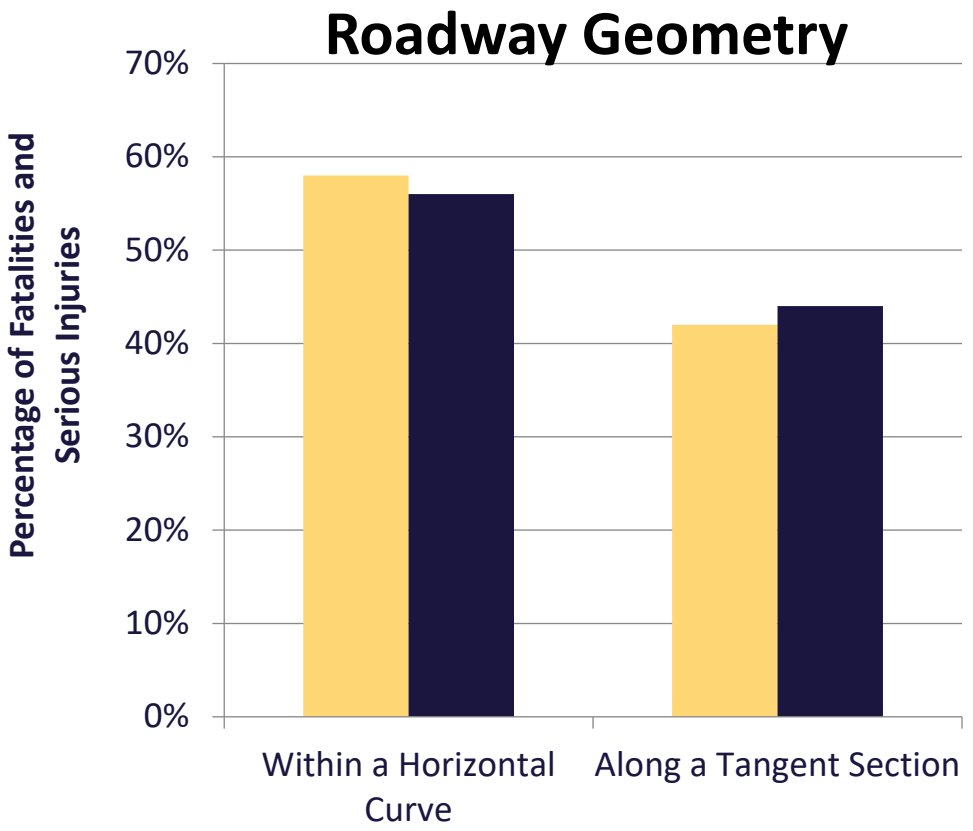


Roadway Departure: Where?

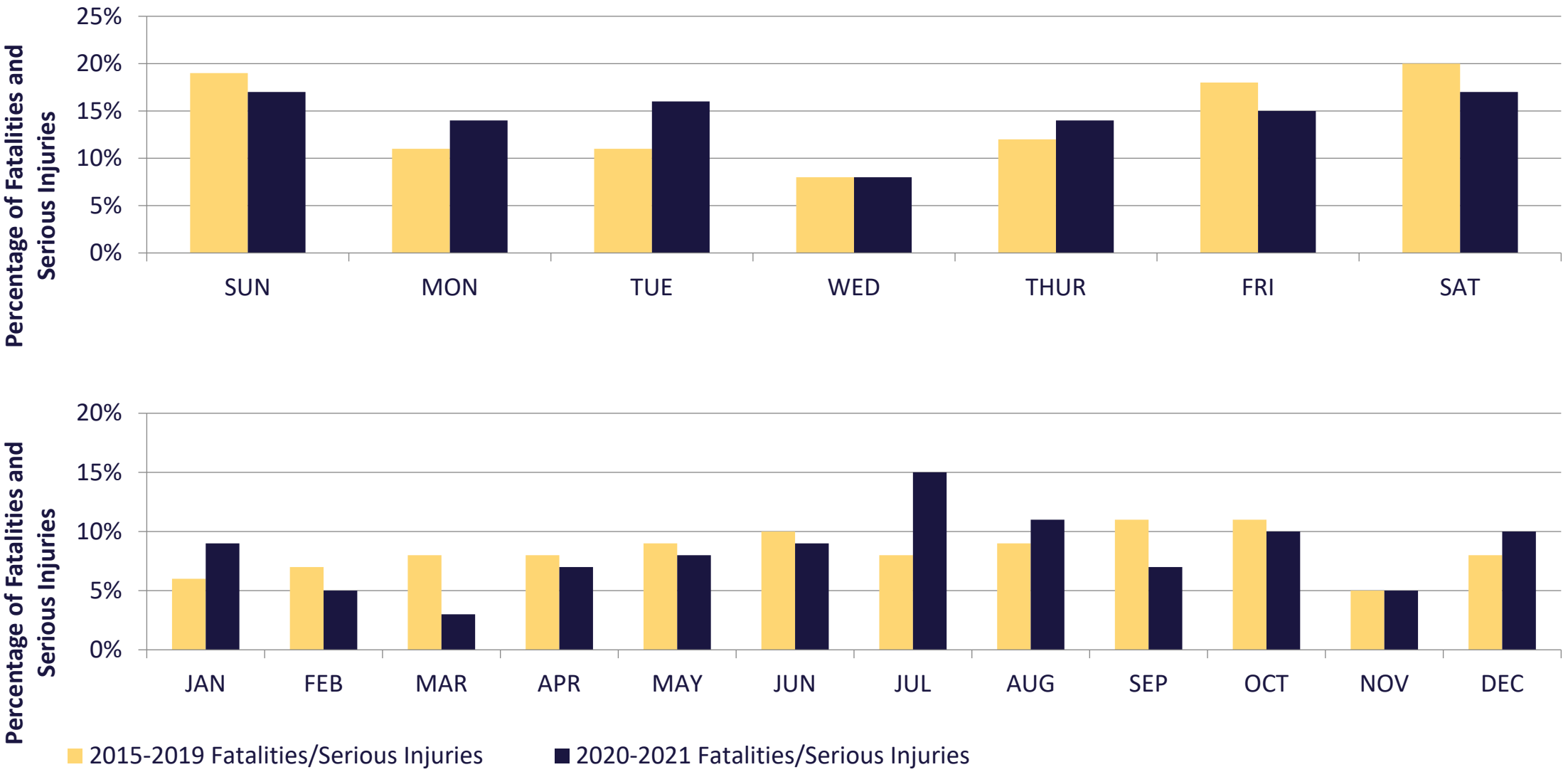


Roadway Departure: Where?

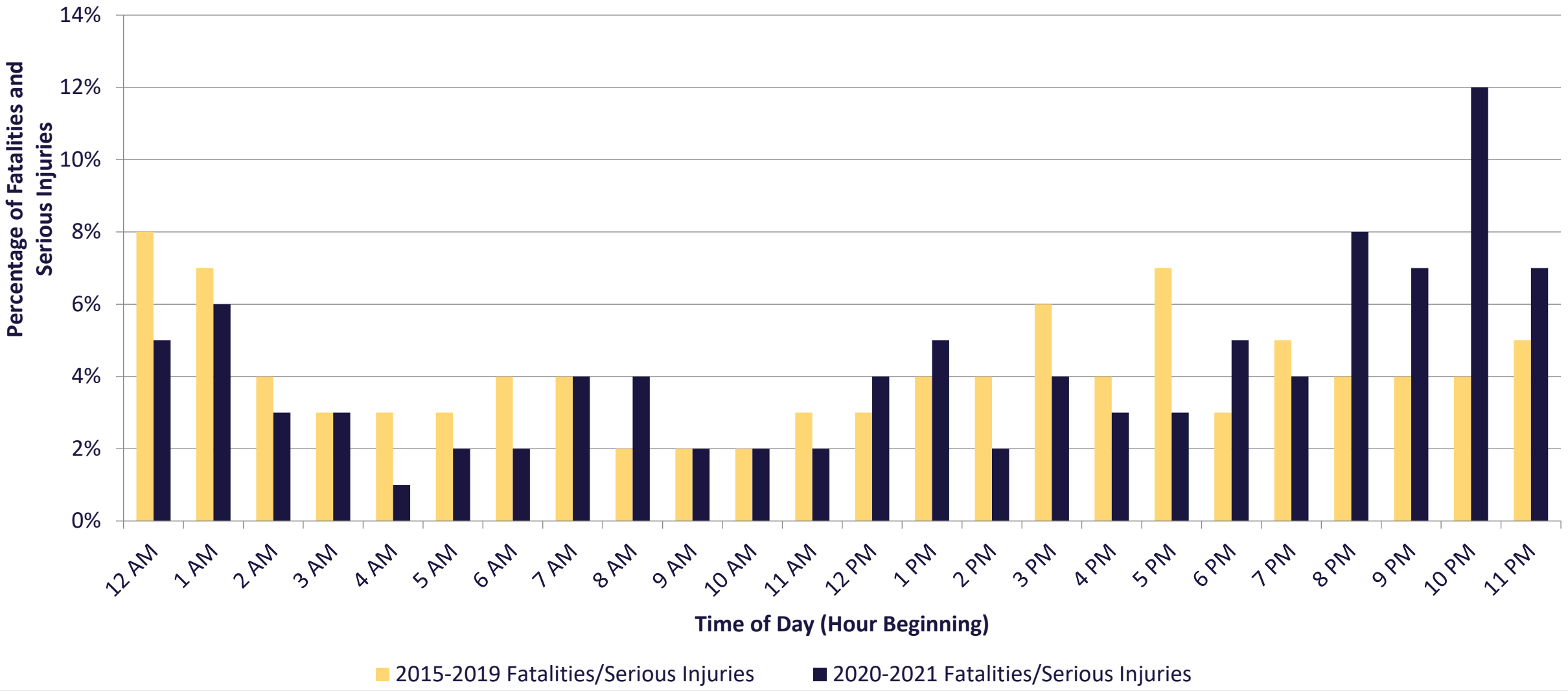




Roadway Departure: When?



Roadway Departure: When?



Roadway Departure: When?

2015-2019 Data

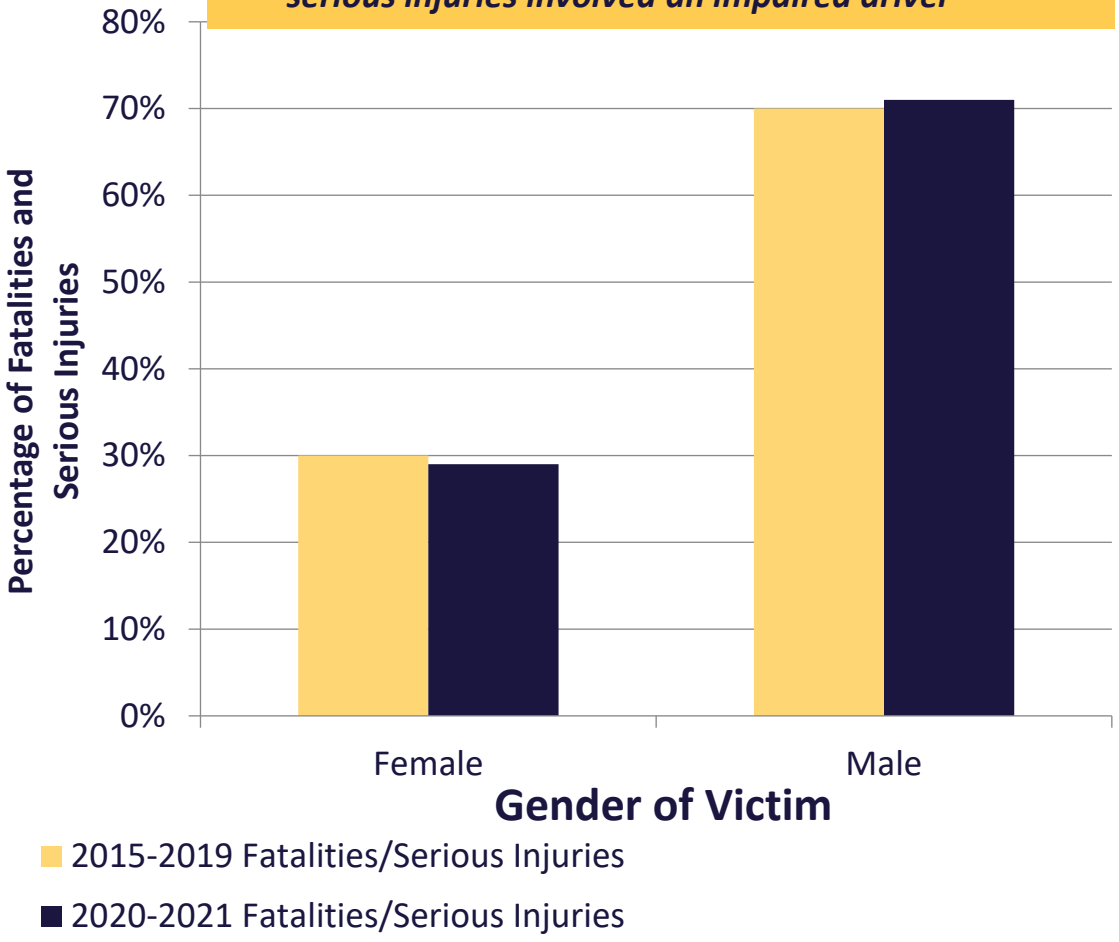
	12A	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12P	1P	2P	3P	4P	5P	6P	7P	8P	9P	10P	11P	Totals
Sunday	12	12	11	5	7	4	4	1	2	6	1	2	3	3	4	6	3	2	4	5	3	3	3	2	108
Monday	3	6	2	2	0	2	2	2	0	1	2	3	2	4	4	5	1	5	3	2	5	1	3	4	64
Tuesday	4	2	0	1	0	1	4	5	3	1	3	2	3	2	3	1	4	6	2	3	2	5	4	2	63
Wednesday	1	0	3	0	2	2	2	2	1	0	0	0	2	1	4	8	1	3	3	0	2	0	3	3	43
Thursday	4	6	2	0	1	2	2	5	2	3	4	1	3	3	1	4	3	8	3	4	3	2	1	1	68
Friday	10	8	2	1	1	4	5	4	3	1	0	5	3	7	4	2	2	7	1	5	3	8	3	9	98
Saturday	12	4	4	6	7	2	6	1	0	1	1	2	2	5	3	8	7	9	2	11	4	5	6	5	113
Totals	**46**	**38**	**24**	**15**	**18**	**17**	**25**	**20**	**11**	**13**	**11**	**15**	**18**	**25**	**23**	**34**	**21**	**40**	**18**	**30**	**22**	**24**	**23**	**26**	**557**

2020-2021 Data

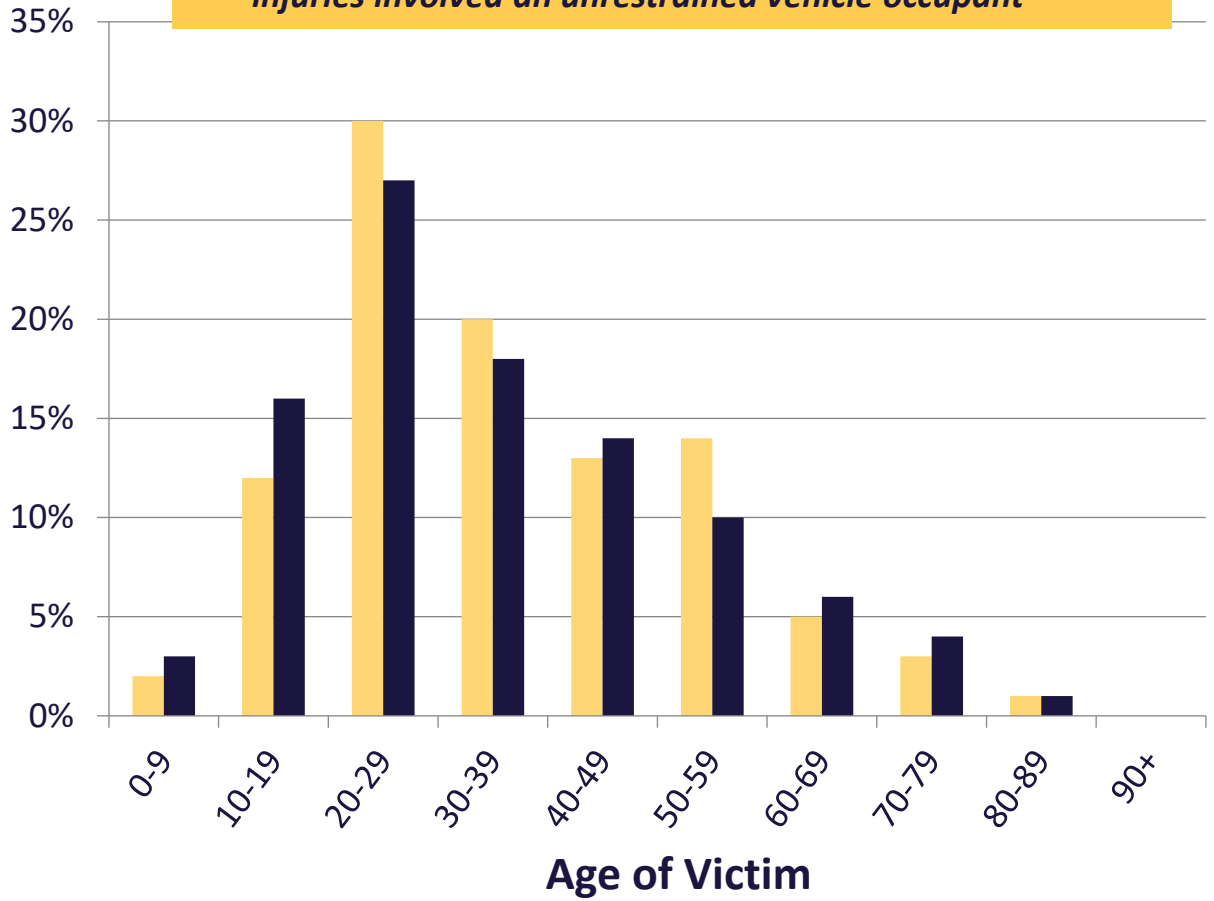
	12A	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12P	1P	2P	3P	4P	5P	6P	7P	8P	9P	10P	11P	Totals
Sunday	3	1	3	2	0	2	1	0	3	4	0	2	1	3	0	2	0	1	1	3	5	1	9	2	49
Monday	4	3	0	1	0	1	0	2	0	1	1	0	1	2	0	3	1	3	3	4	6	3	0	3	42
Tuesday	0	1	3	0	0	1	1	3	2	0	1	0	2	1	1	4	1	0	0	3	5	2	12	3	46
Wednesday	0	1	0	0	0	0	1	0	0	2	0	0	1	0	2	0	2	1	2	1	2	0	5	3	23
Thursday	1	3	1	2	0	2	2	1	1	0	3	1	1	7	1	0	3	1	1	0	1	5	1	3	41
Friday	3	4	2	2	0	0	0	6	1	0	0	1	6	0	0	2	1	2	6	1	0	2	2	2	43
Saturday	3	4	1	2	2	0	0	1	4	0	2	1	0	1	1	1	1	0	3	1	5	7	5	6	51
Totals	**14**	**17**	**10**	**9**	**2**	**6**	**5**	**13**	**11**	**7**	**7**	**5**	**12**	**14**	**5**	**12**	**9**	**8**	**16**	**13**	**24**	**20**	**34**	**22**	**295**

Roadway Departure: Who?

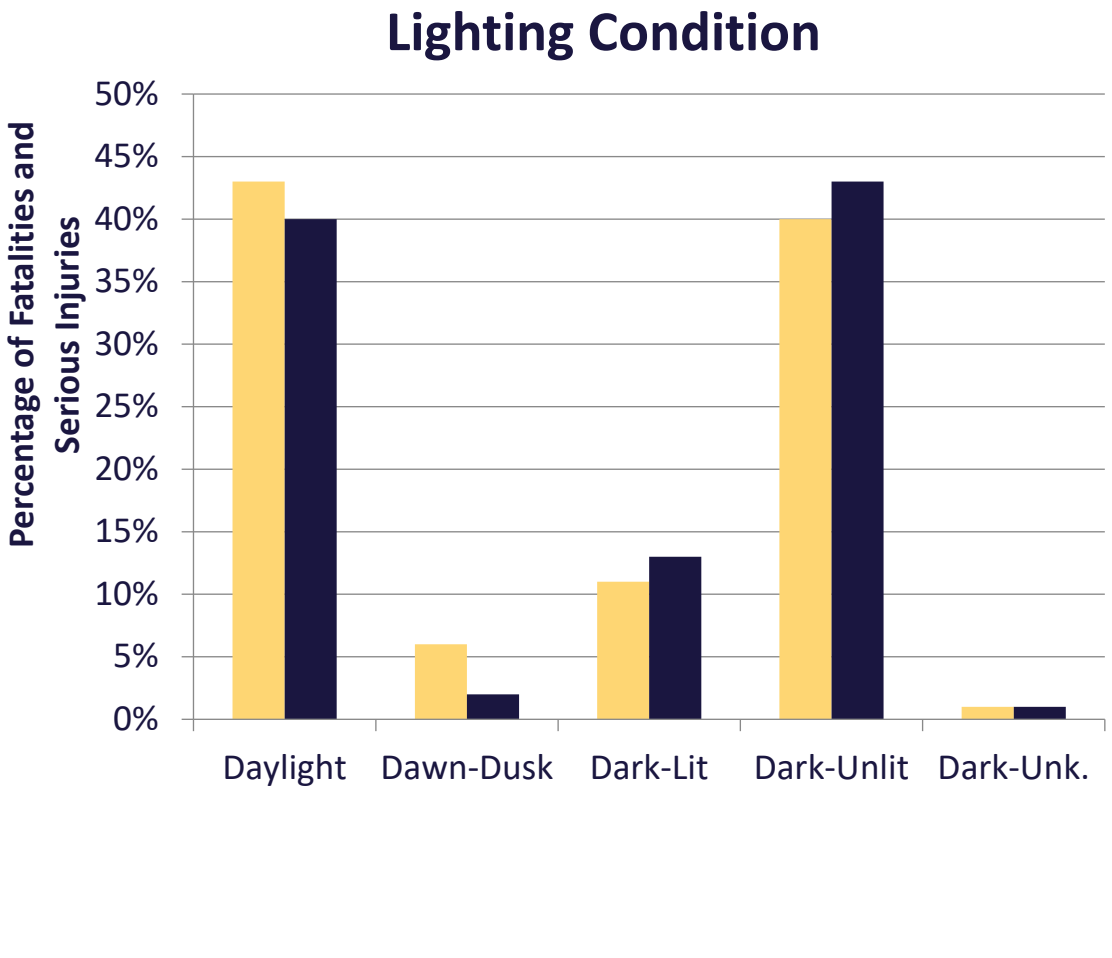
- *2015-2019: 38% of roadway departure fatalities & serious injuries involved an impaired driver*
- *2020-2021: 35% of roadway departure fatalities & serious injuries involved an impaired driver*

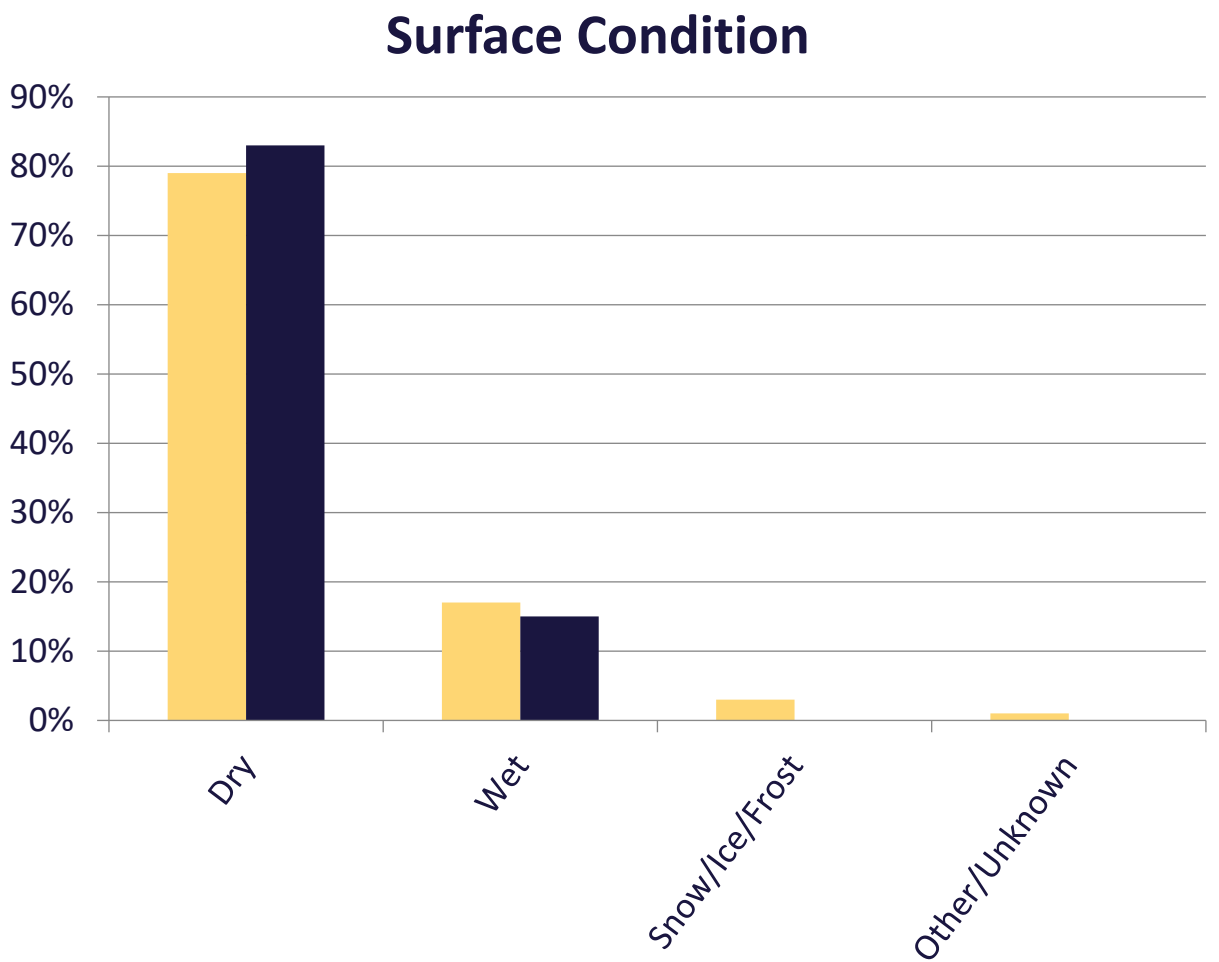


- *2015-2019: 30% of roadway departure fatalities & serious injuries involved an unrestrained vehicle occupant*
- *2020-2021: 30% of roadway departure fatalities & serious injuries involved an unrestrained vehicle occupant*

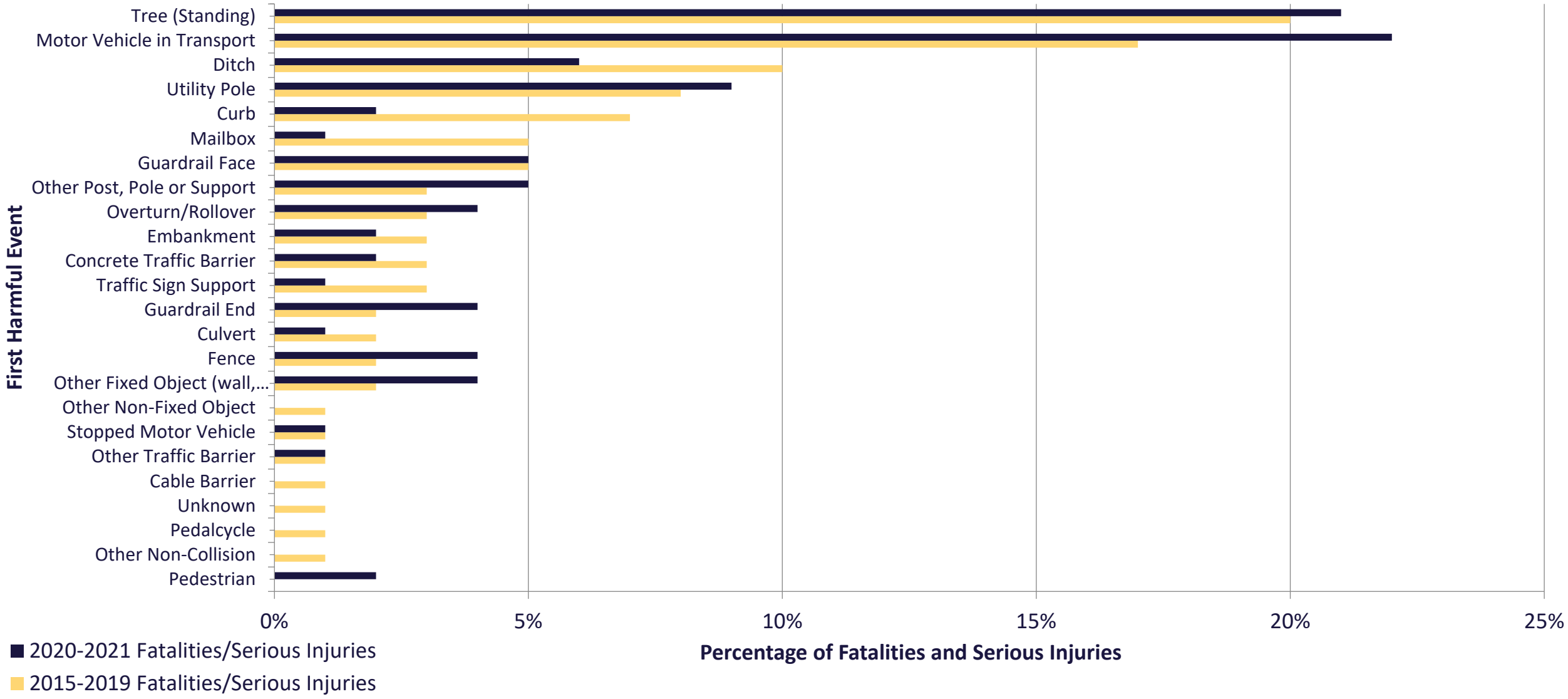


Roadway Departure: Crash Condition

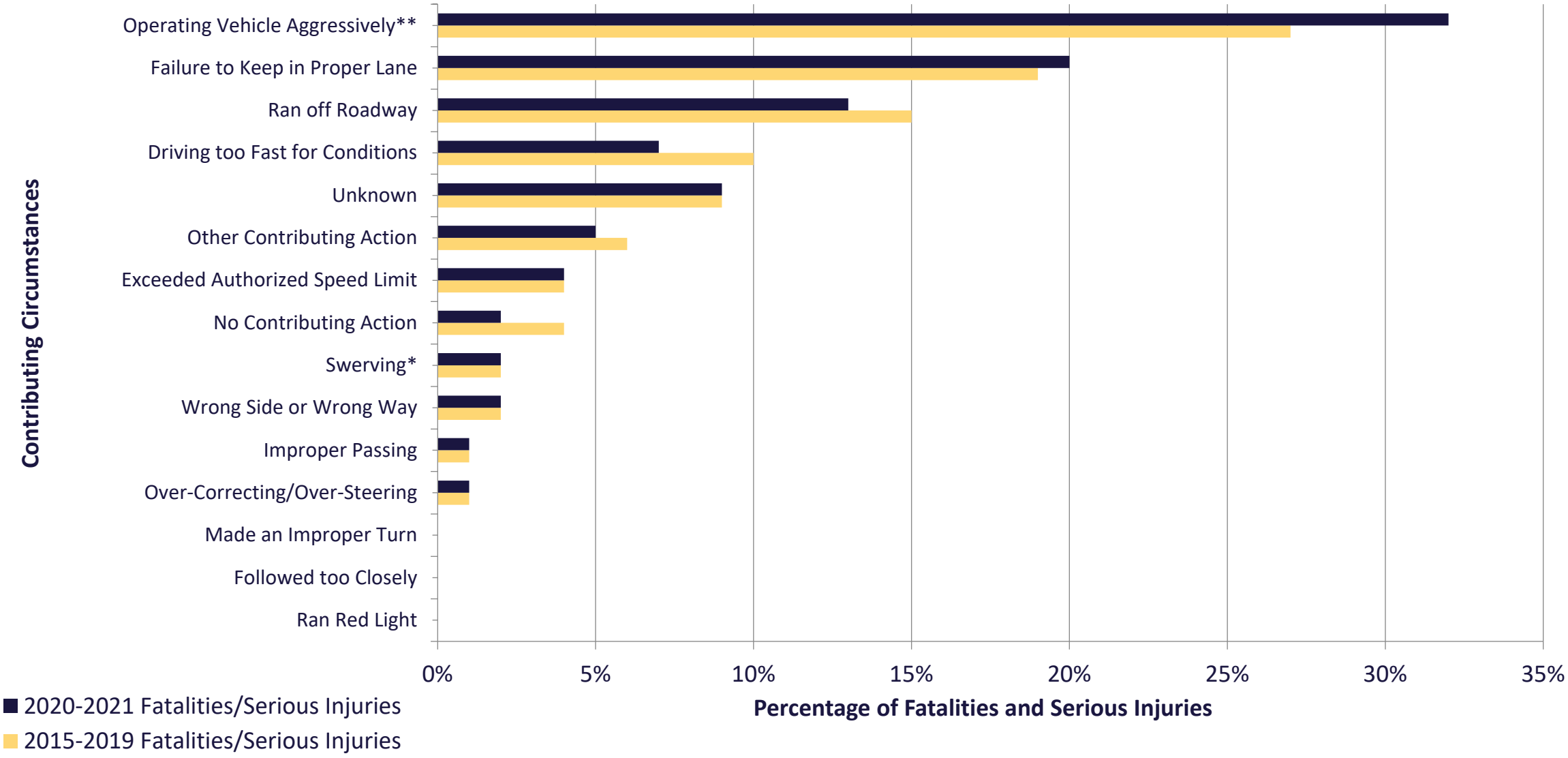




Roadway Departure: First Harmful Event

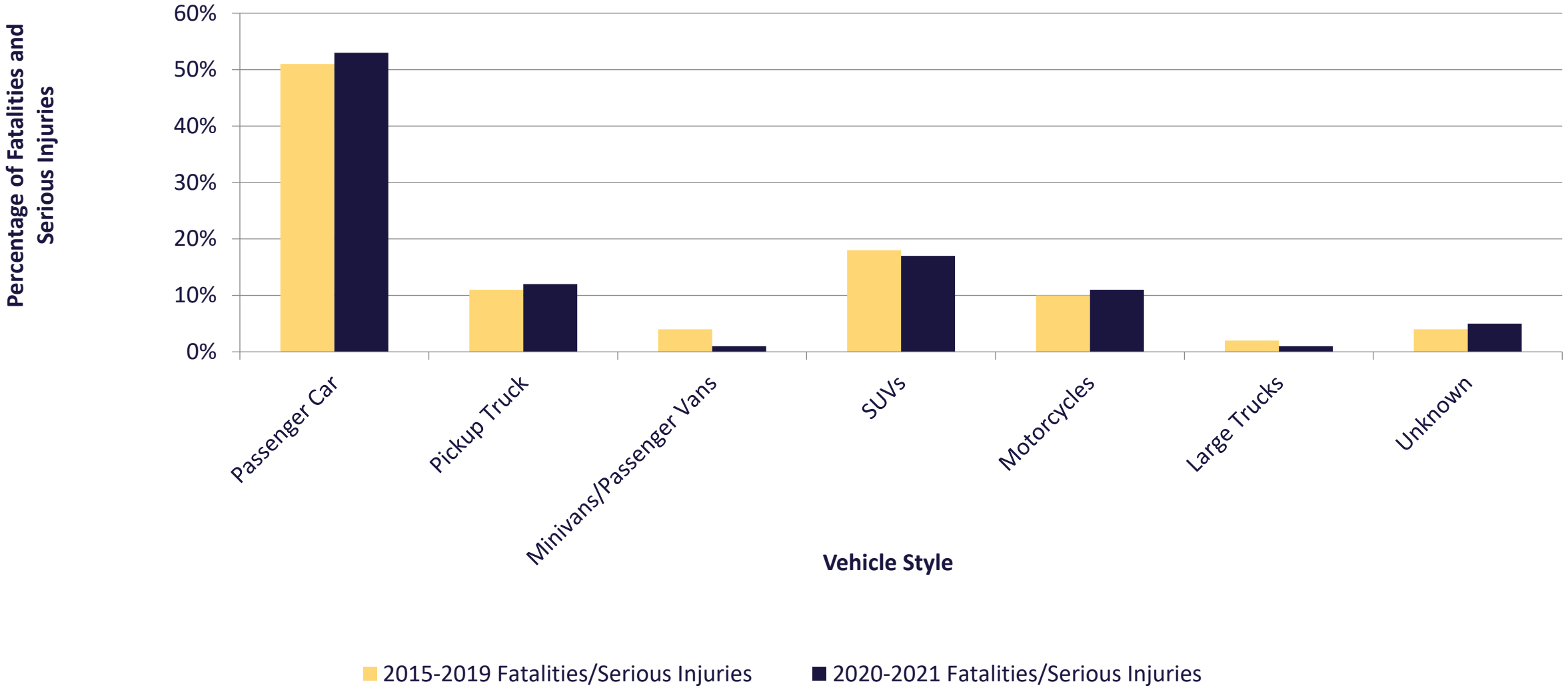


Roadway Departure:
Driver Contributing Circumstances of Departing Vehicle

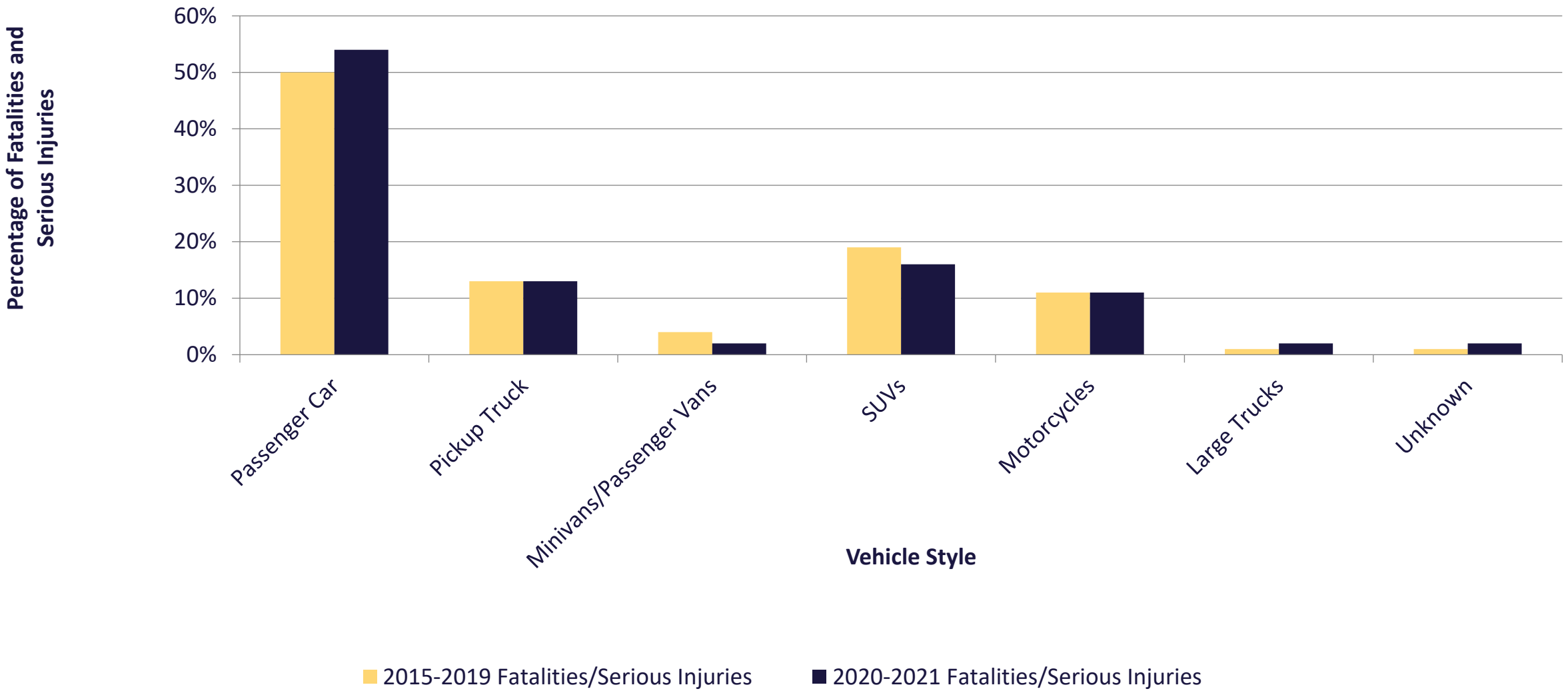


*Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc.
**Operating vehicle in erratic, careless, negligent, or aggressive manner

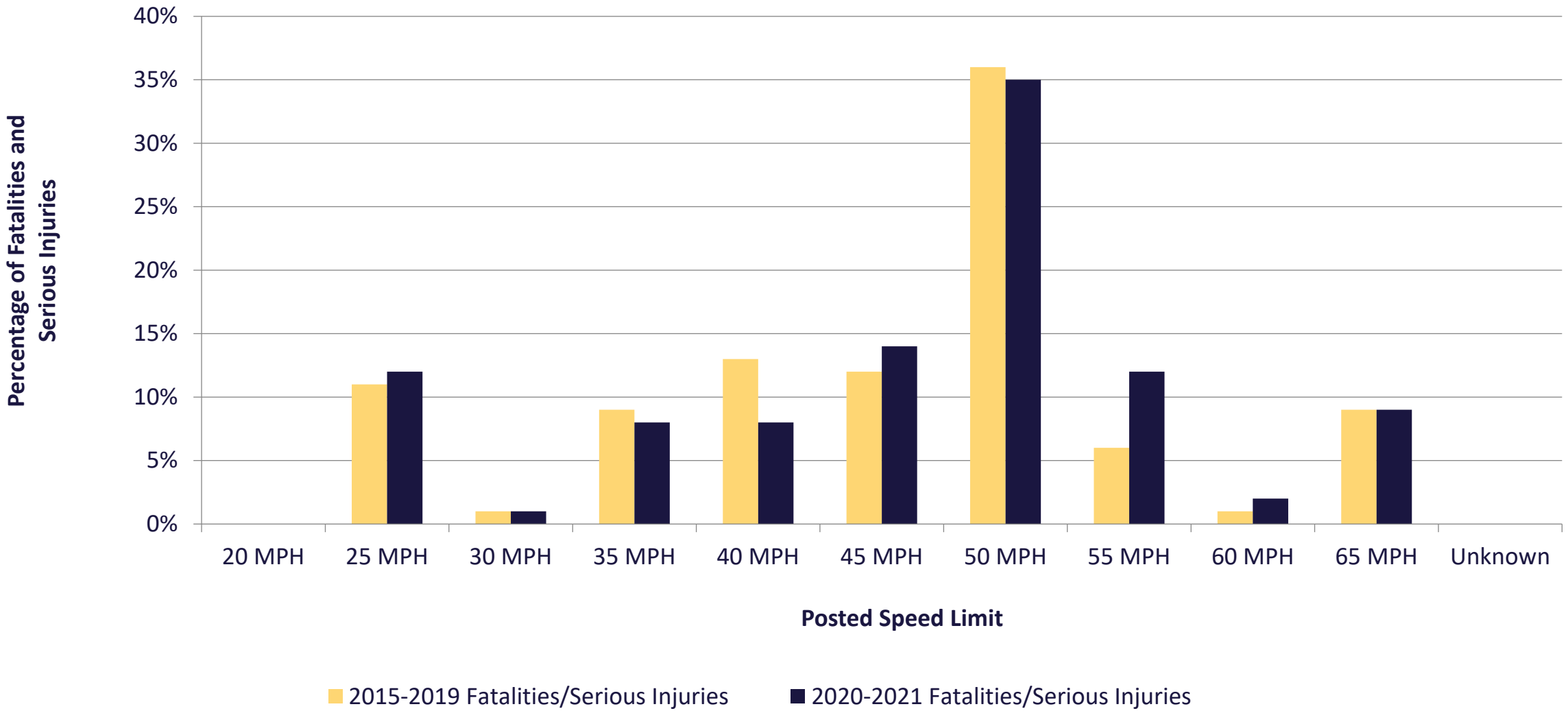
Roadway Departure:
Vehicle Style of Fatal and Seriously Injured Persons



Roadway Departure:
Vehicle Style of Vehicle Departing the Roadway



Roadway Departure: Roadway Posted Speed Limit



Roadway Departure Trends

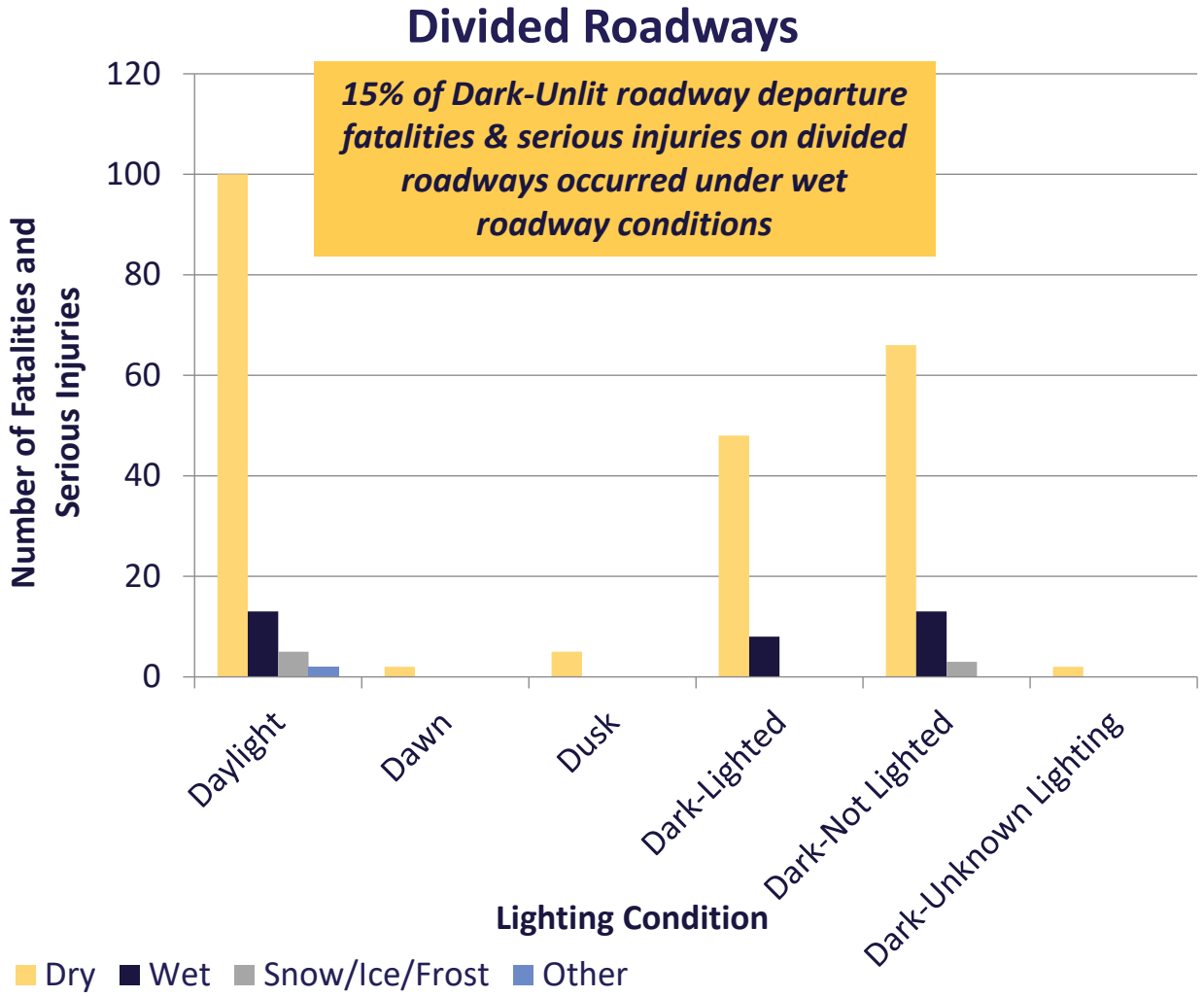
Divided Roadways vs. Undivided Roadways

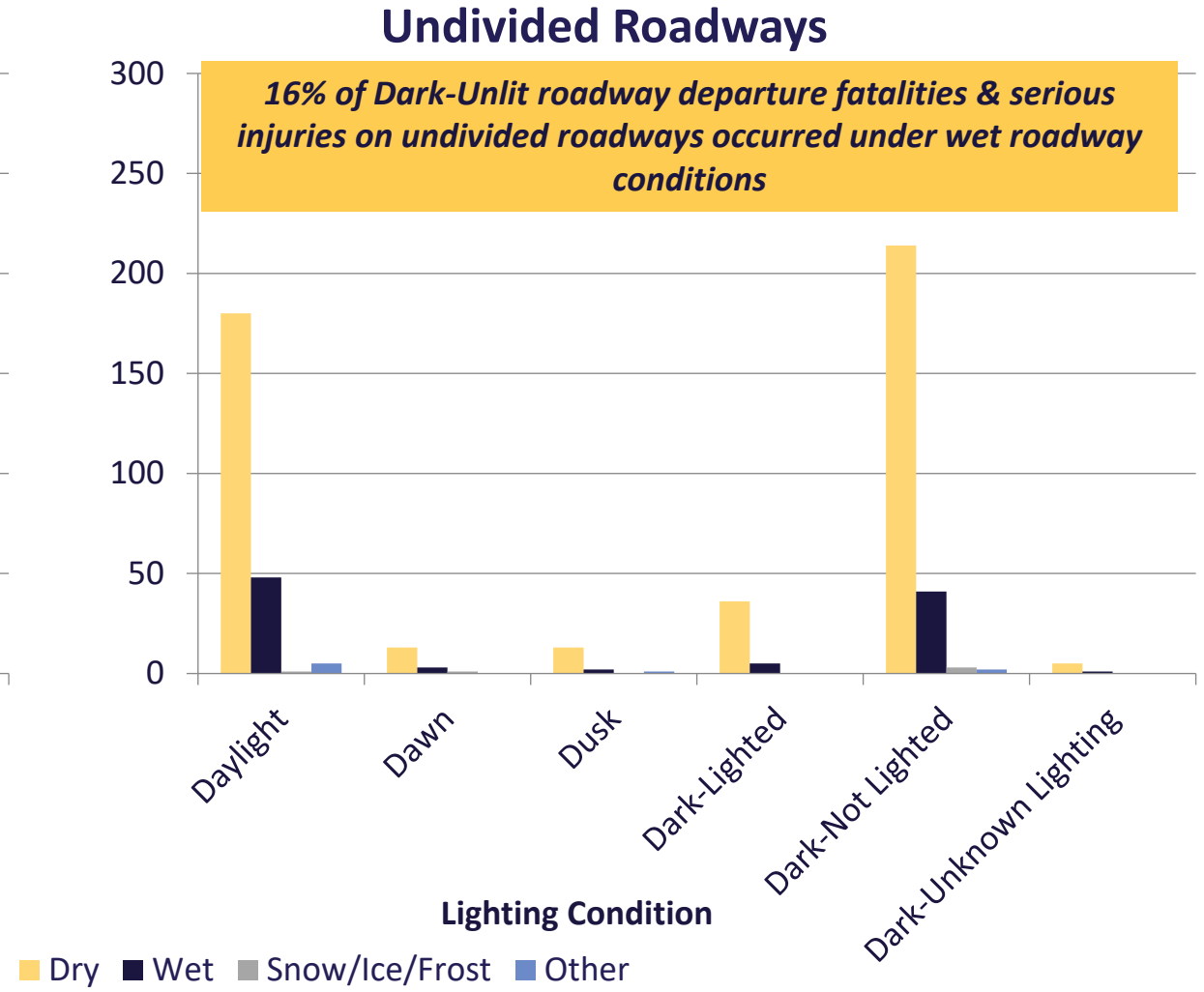
Roadway Departure Trends:
Divided Roadways vs. Undivided Roadways

- Compared roadway departure crash factors on divided roadways and undivided roadways
  - Looking for trends specific to each roadway type
  - Focus on potential solutions that could be implemented systemically
- Summary of analysis:
  - In 2020 and 2021, more roadway departure crashes occurred on divided roadways compared to undivided roadways
    - 2015-2019: 73% undivided vs. 27% divided
    - 2020-2021: 62% undivided vs. **38% divided**
  - On undivided roadways, 46% of roadway departure fatalities and serious injuries occur under dark/unlit conditions. On divided roadways, 31% occur under dark/unlit conditions.
    - More information presented in subsequent slides
  - Roadway departure fatalities and serious injuries are more likely to occur on urban divided roadways or on rural undivided roadways
  - Impaired driving is more prevalent on undivided roadways than divided roadways
  - Striking a fixed object is more prevalent on undivided roadways than divided roadways
  - Roadway departures on curved sections of roadway are more prevalent on undivided roadways than divided roadways

Roadway Departure Trends:
Divided Roadways vs. Undivided Roadways

Lighting Conditions vs. Surface Conditions

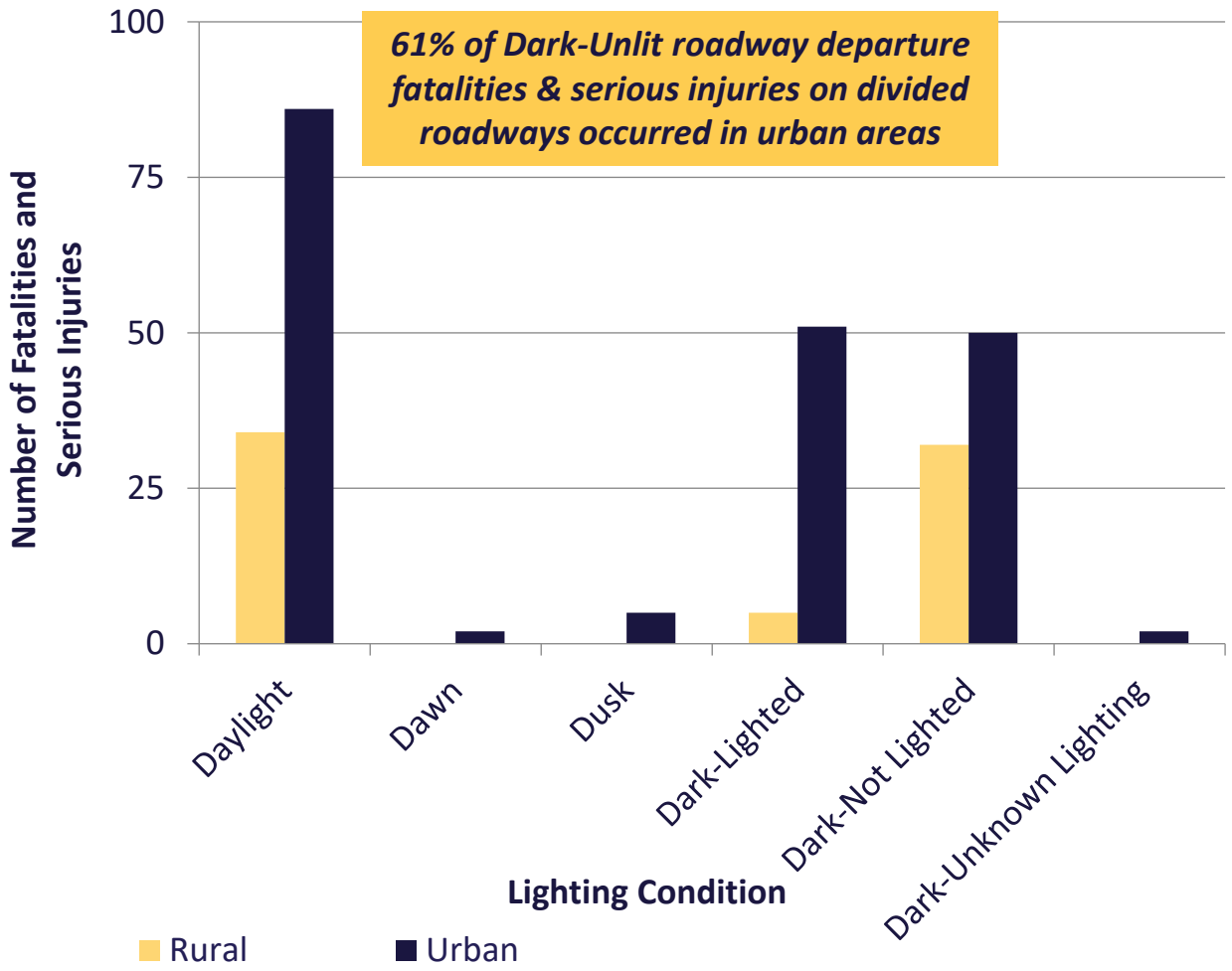




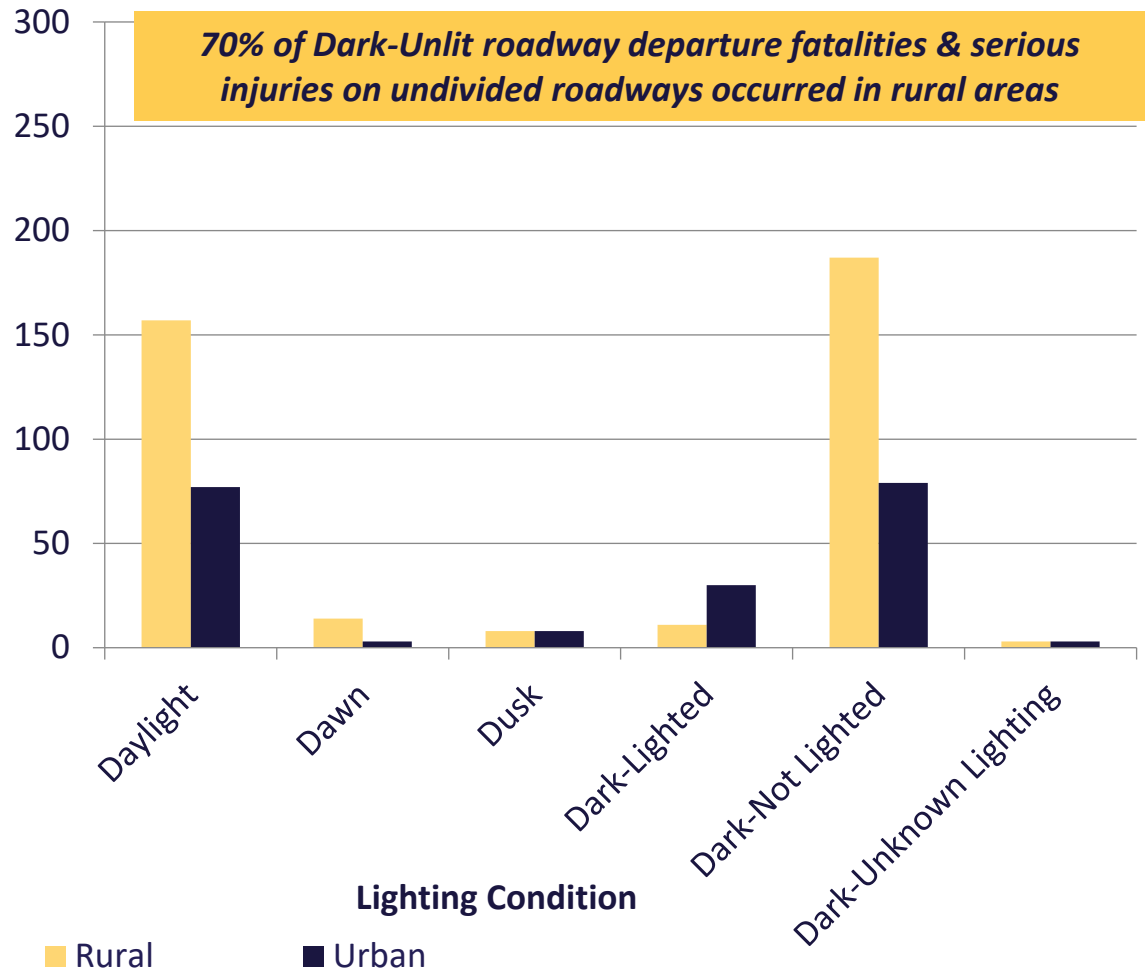
Roadway Departure Trends:
Divided Roadways vs. Undivided Roadways

Lighting Conditions vs. Area Type

Divided Roadways

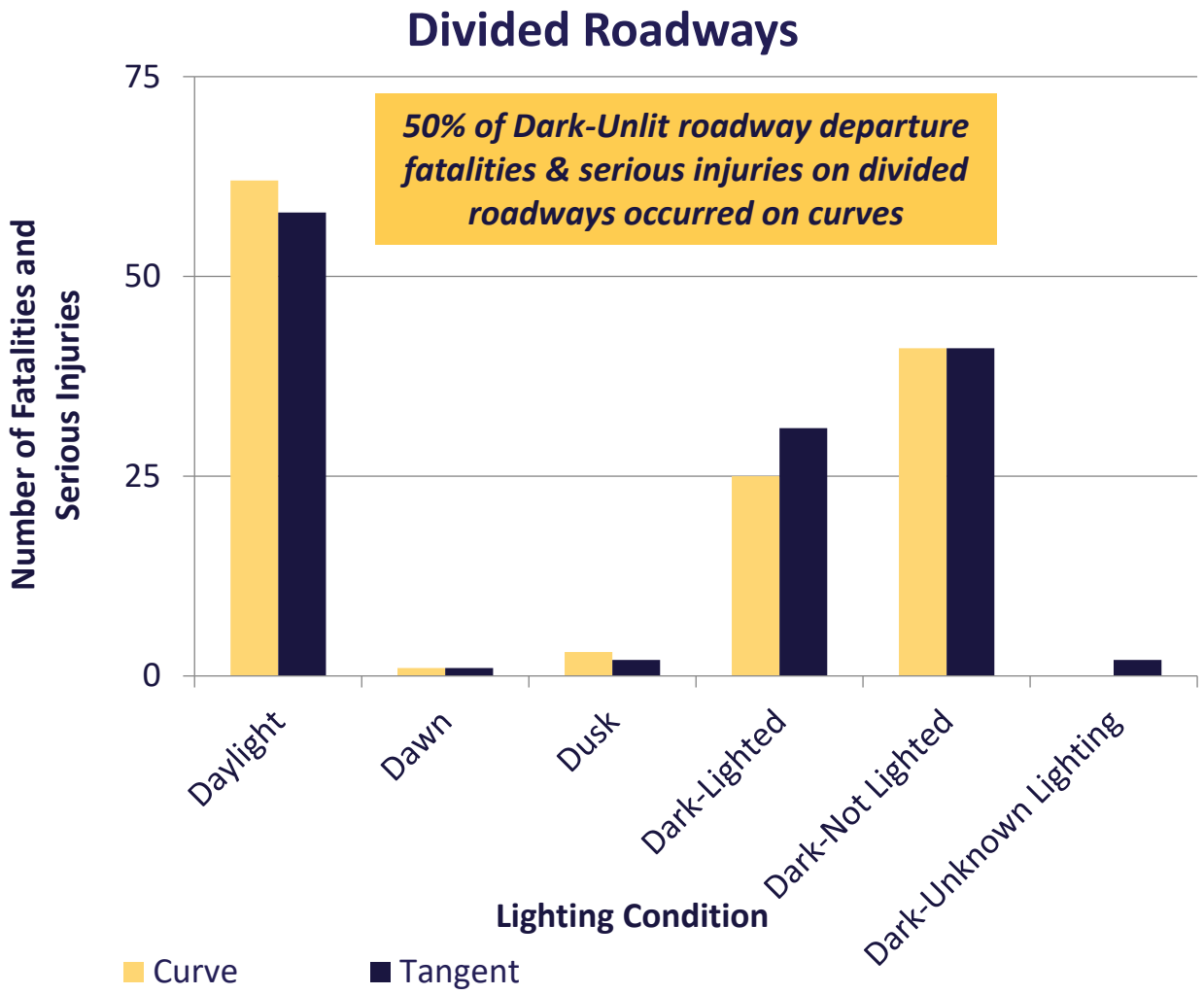


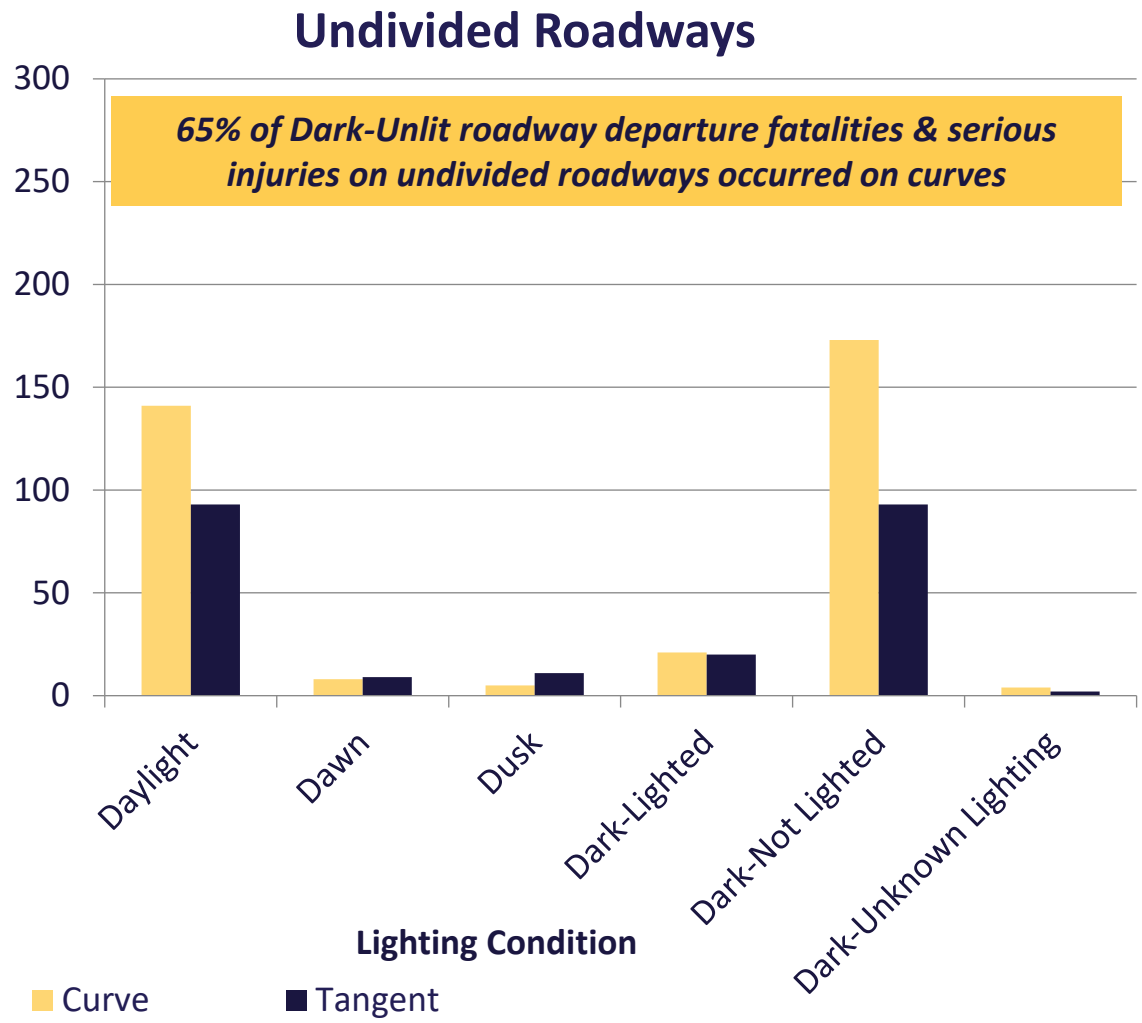
Undivided Roadways



Roadway Departure Trends:
Divided Roadways vs. Undivided Roadways

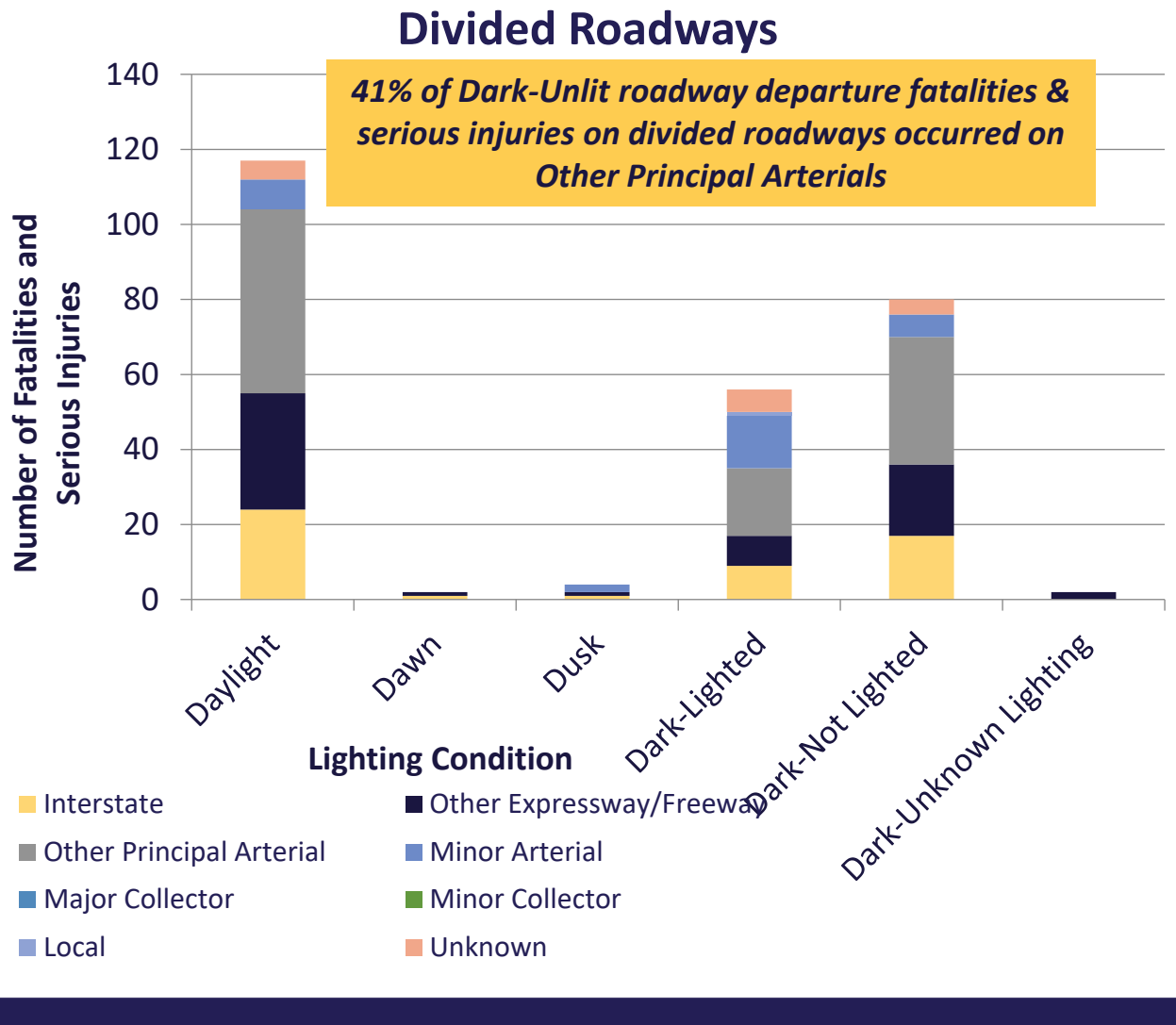
Lighting Conditions vs. Roadway Geometry

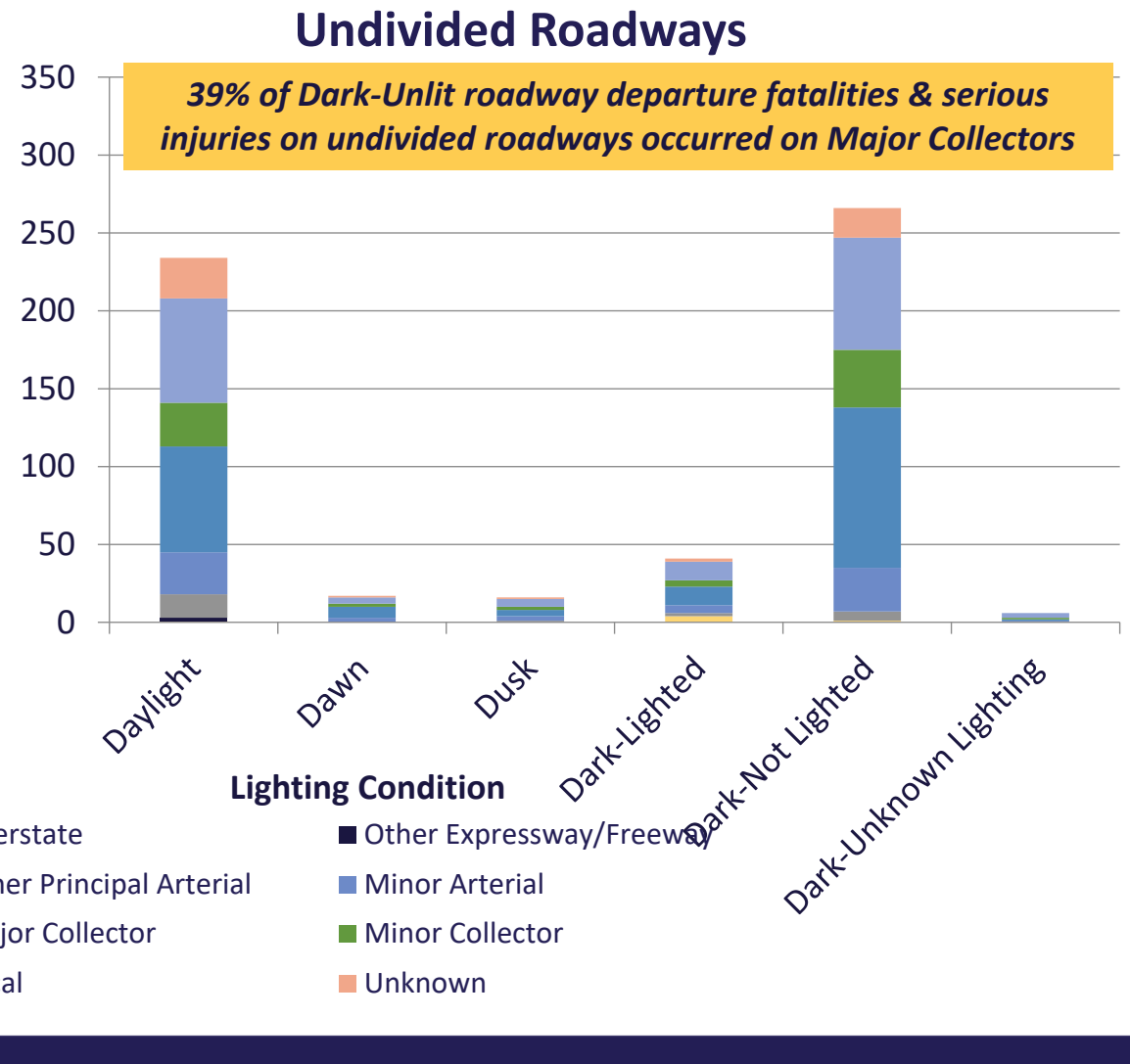




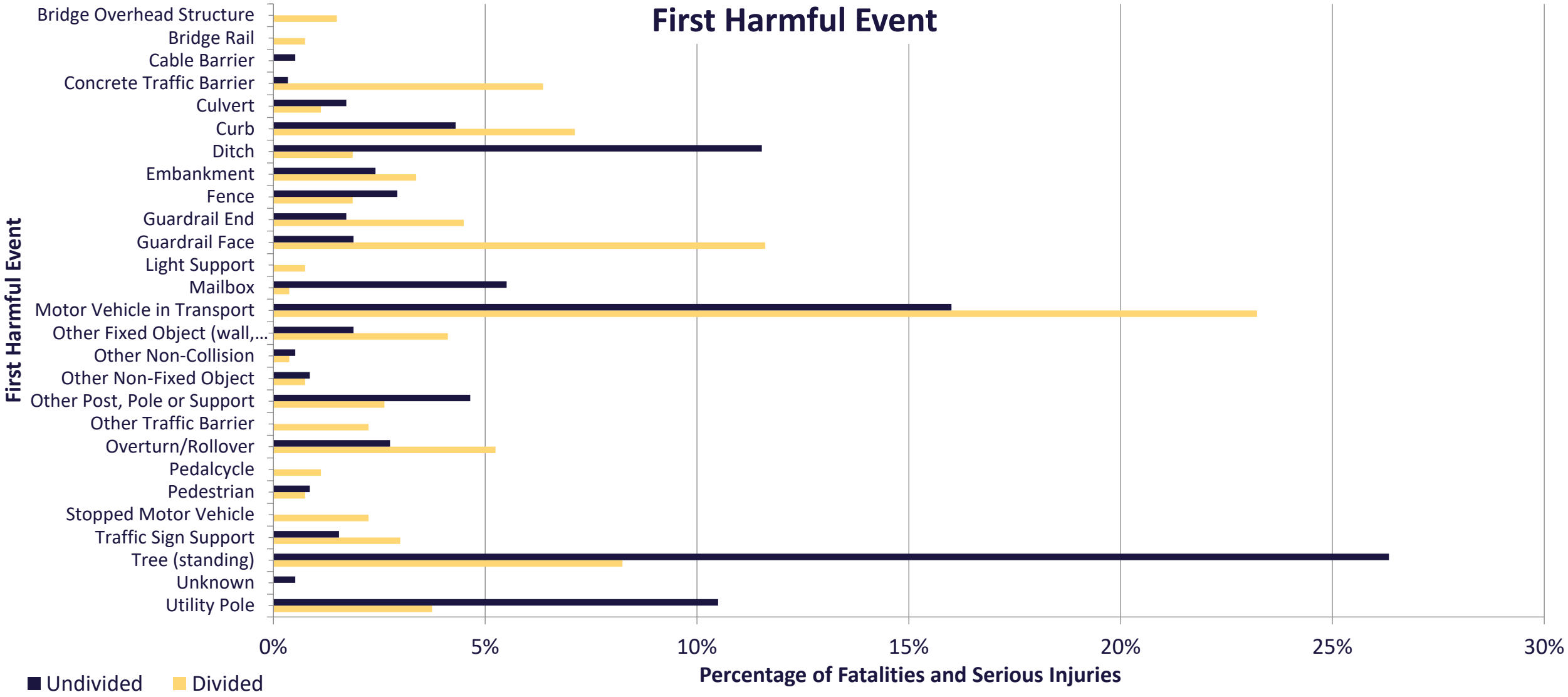
Roadway Departure Trends:
Divided Roadways vs. Undivided Roadways

Lighting Conditions vs. Functional Classification





Roadway Departure Trends:
Divided Roadways vs. Undivided Roadways



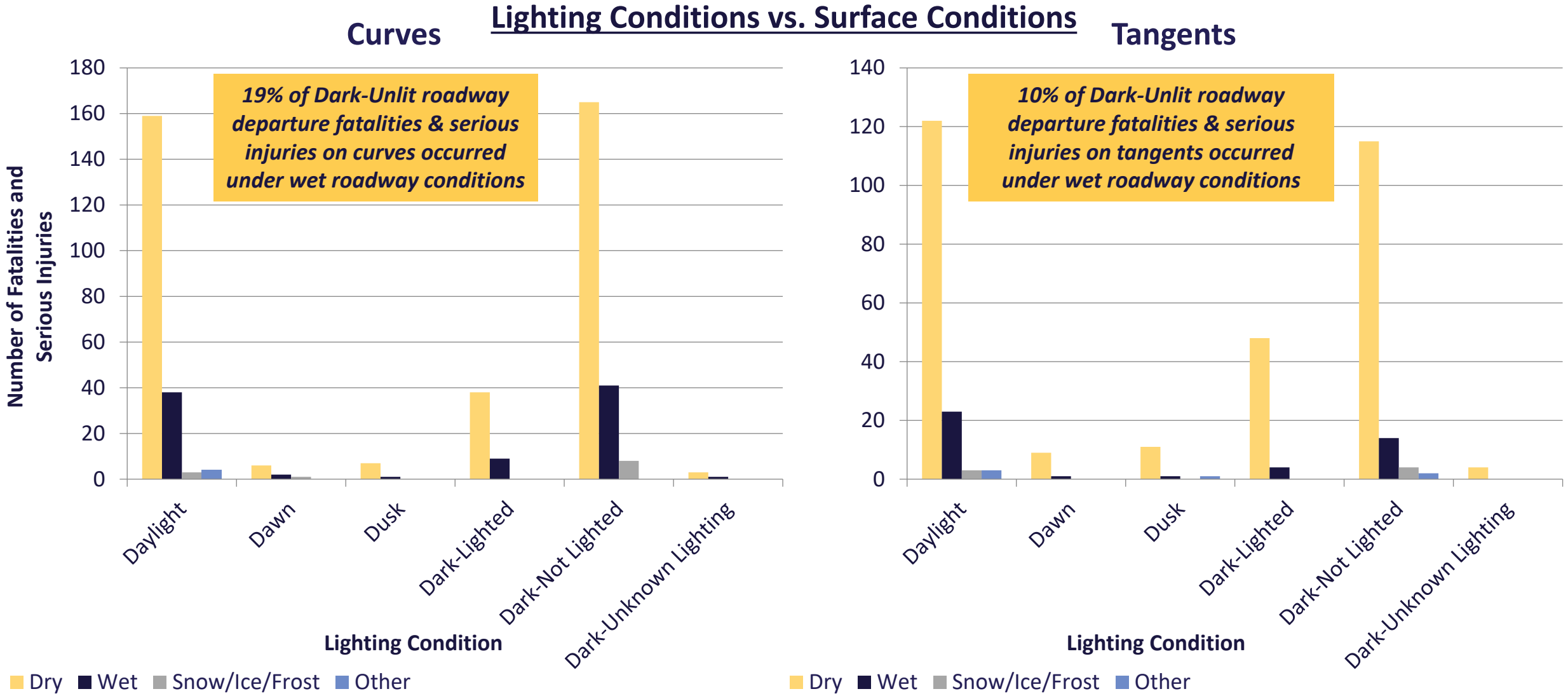
Roadway Departure Trends

Curves vs. Tangents

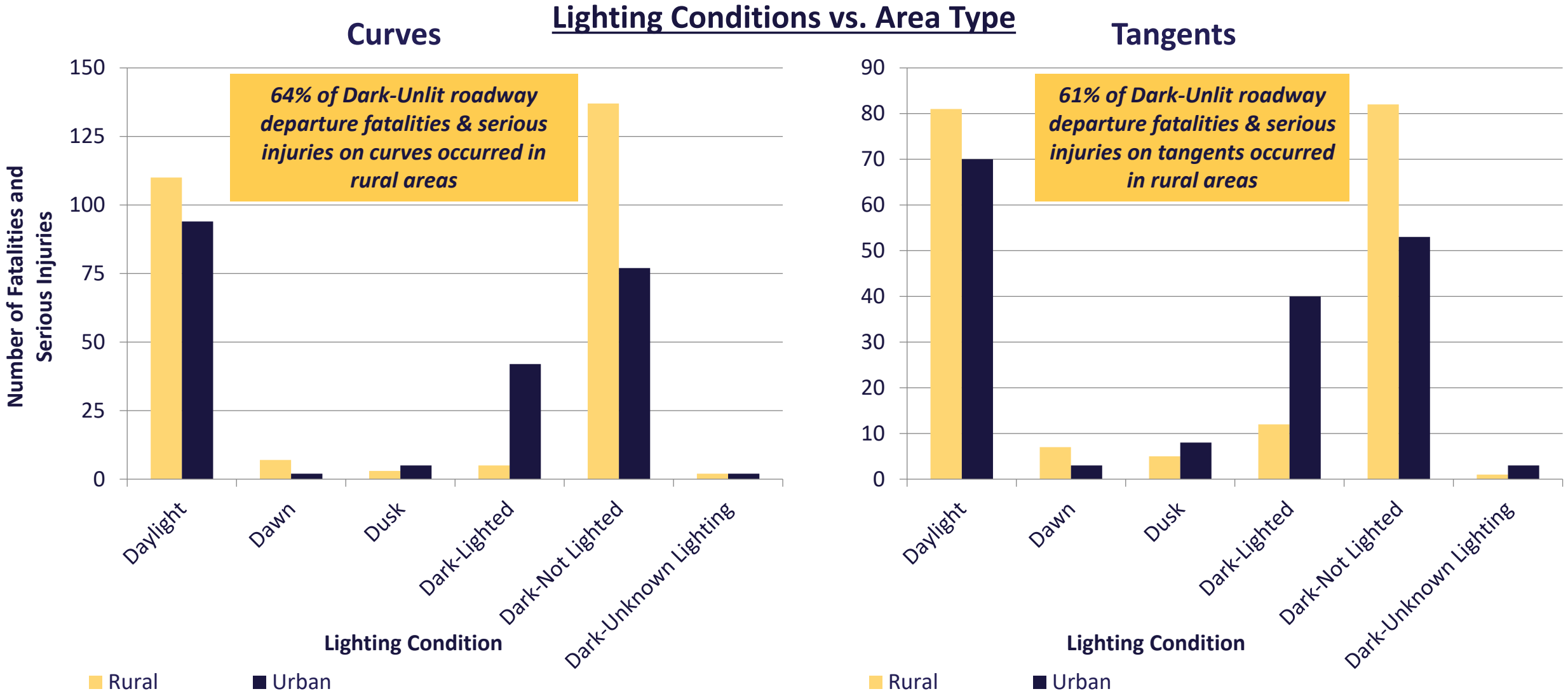
Roadway Departure Trends:
Curves vs. Tangents

- Compared roadway departure crash factors on curved sections of roadway and tangent (straight) sections of roadway
  - Looking for trends specific to each geometry type
  - Focus on potential solutions that could be implemented systemically
- Summary of analysis:
  - On curve sections of roadway, 19% of roadway departure fatalities and serious injuries occur under wet surface conditions. On tangent sections, 12% occur under wet surface conditions
  - On curve sections of roadway, 44% of roadway departure fatalities and serious injuries occur under dark/unlit conditions. On tangent sections, 37% occur under dark/unlit conditions
  - Impaired driving is more prevalent on tangent sections than on curved sections
  - Roadway departures on curved sections of roadway are more prevalent on undivided roadways than divided roadways
  - Motorcycles are more likely to be involved in roadway departures on curves compared to tangent sections

Roadway Departure Trends:
Curves vs. Tangent



Roadway Departure Trends:
Curves vs. Tangents



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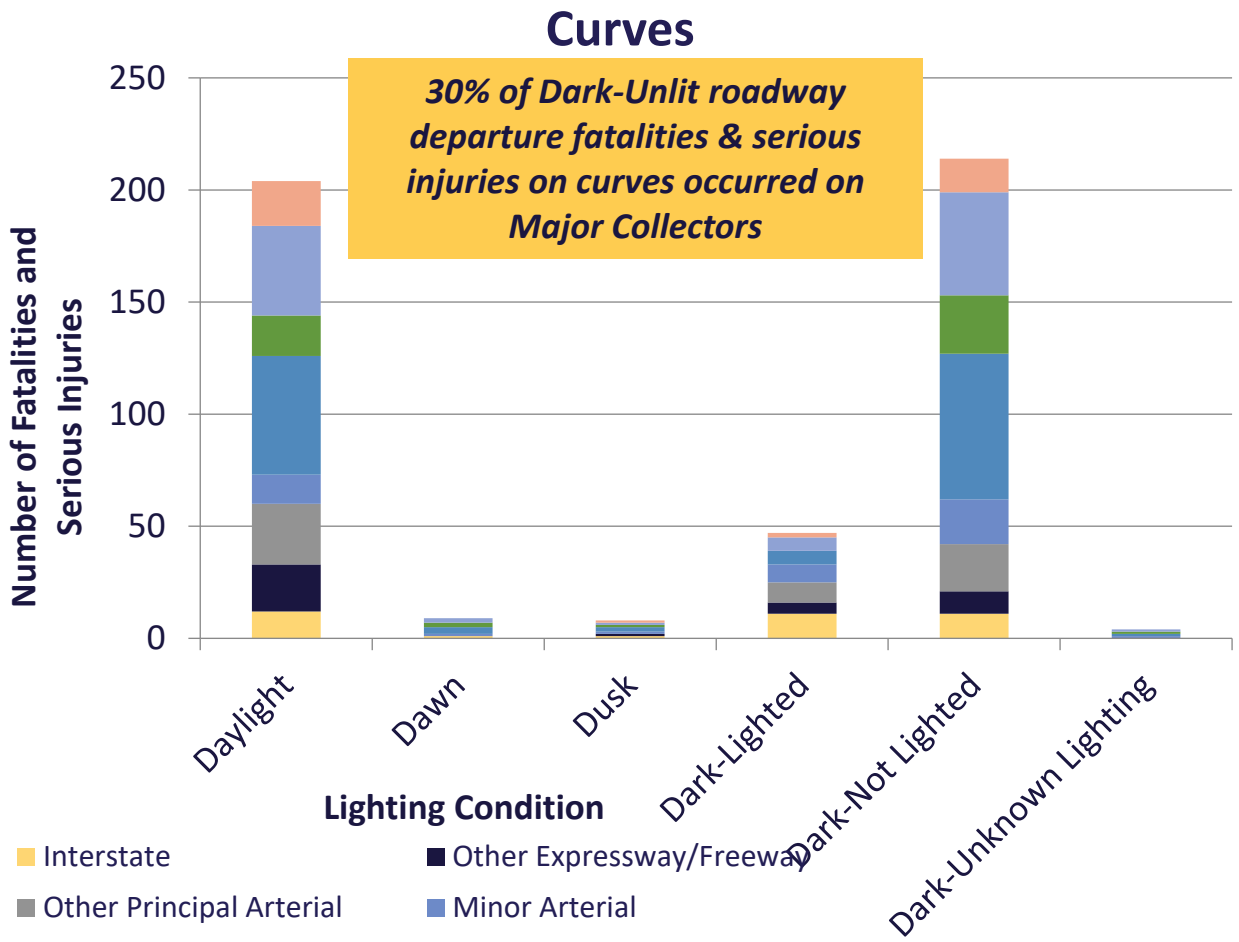
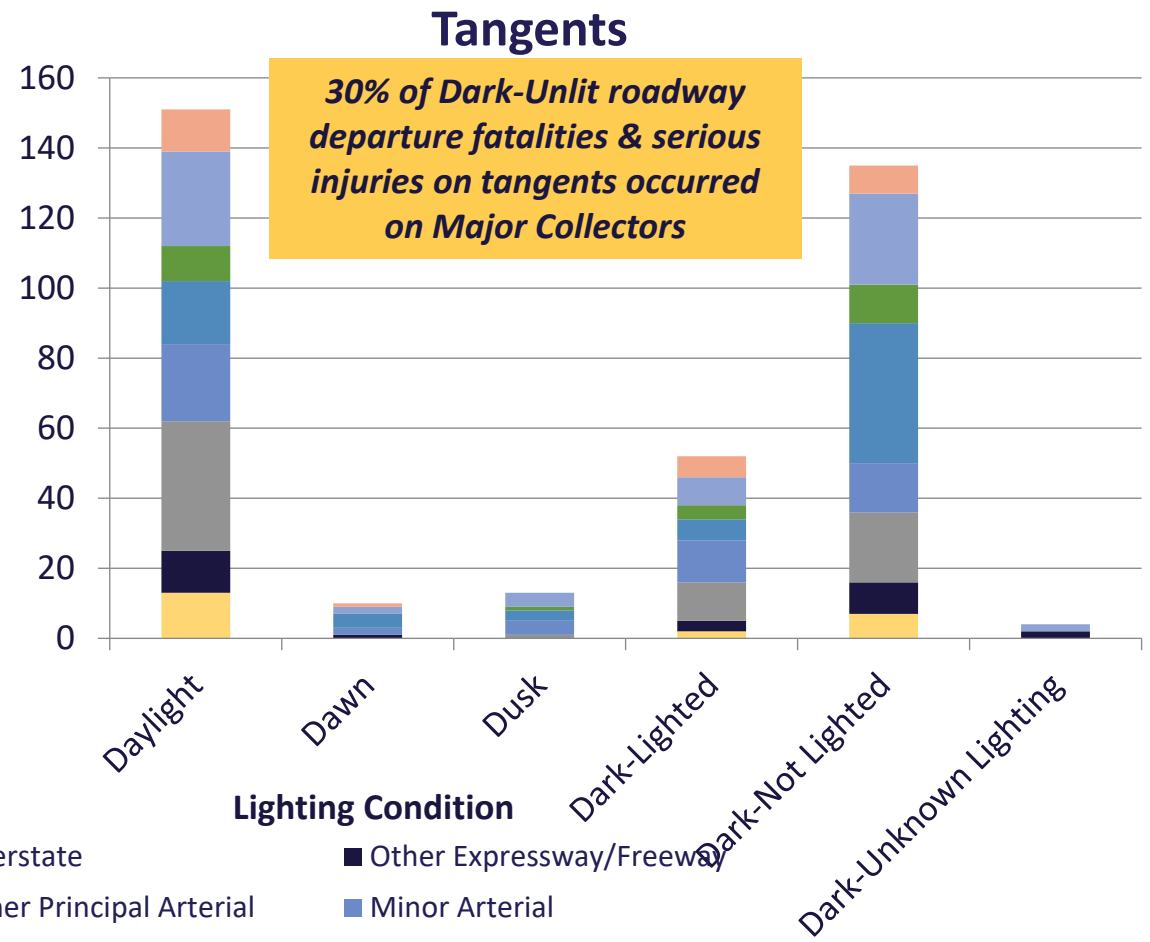
Curves vs. Tangents

Lighting Conditions vs. Functional Classification





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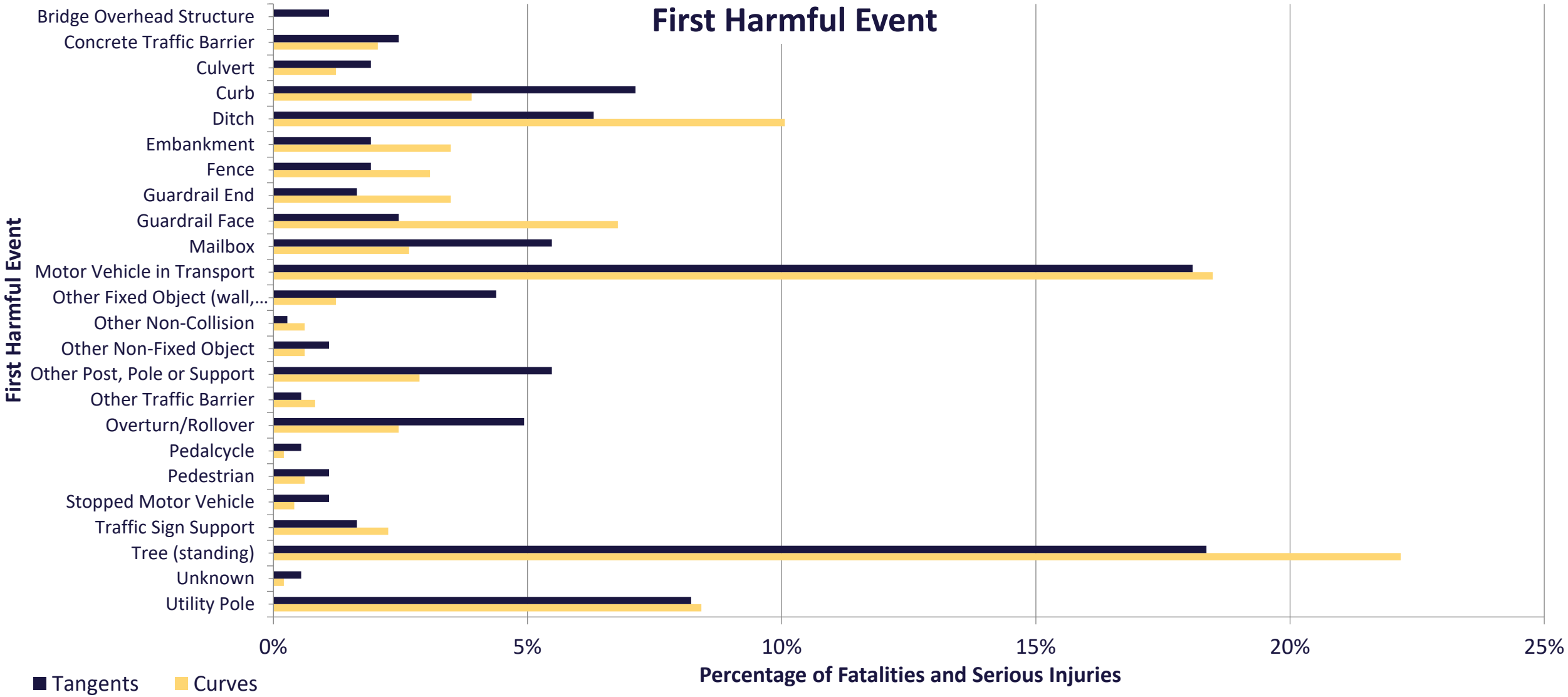

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