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Texas Department of Public Safety

Texas Highway Patrol

Commercial Vehicle Enforcement

Reducing Accidents Through Technology

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Texas Highway Patrol utilizes data analytic technology in the identification of threats and prevention of accidents.

Agenda:

- Introduction
- Data Collection
  - Passive
  - Active
- Data Analytic Technology: Crash Data
- Speed Survey Device Technology
- Conclusion

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Introduction

The public's safety should be the true inclination for all law enforcement. Maintaining welfare for all, can look very different from one setting to the next. Unfortunately, Law Enforcement is in a reactionary situation and is only able to uphold the peace when notified. As technology advances, new hurdles arise for law enforcement and the judicial system; however, technology can offer a reprieve to Law Enforcement through notification speed, communication, intelligence gathering/storage, and detection.

The Texas Department of Public Safety's, Texas Highway Patrol (THP) is dedicated to the safety for all in Texas and strives to implement technology at every turn. Technology has enabled THP to better understand/identify threats or safety concerns in many applications, to include the reduction and prevention of accidents. Data analytic technology enables THP to allocate resources, identify threats, recognize trends, and predict future obstacles.

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Intelligence/Evidence Based Policing
Using Data

Passive Collection

- **Crash/Enforcement Data**
  (what occurred)
  - Time of Day/Day of Week
  - Severity
  - Weather Conditions
  - Causative Factors, i.e. Alcohol
  - Location/area
    - street, county, region, state
  - Crash Frequencies
  - Historical

Active Collection

- **Roadside Data Collector**
  (what is happening)
  - Traffic Volume
    - Time of Day/Day of Week
  - Direction
  - Speeds
    - Mean/Median/Mode
  - Variables, i.e. presence of patrol vehicle

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CMV-Involved Crashes 2019-2020

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CMV-Involved Crashes in 1B06

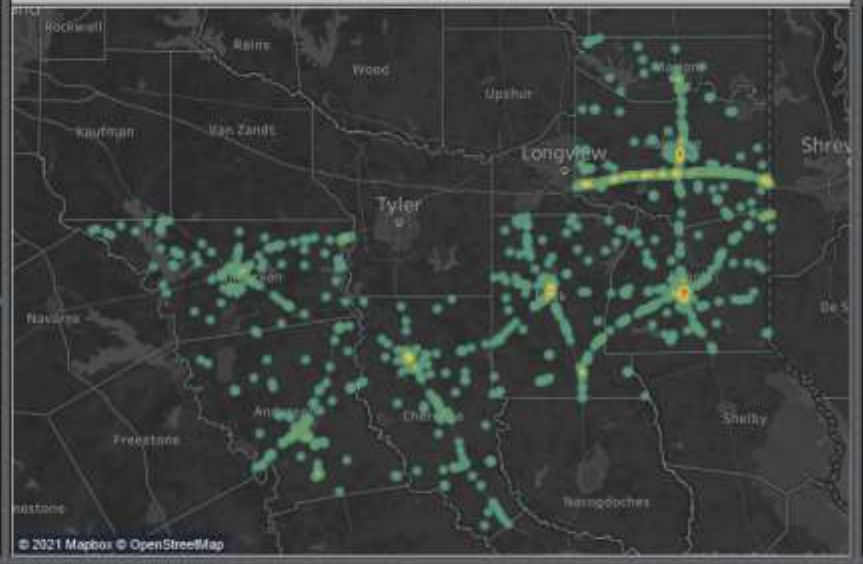
DPS & OLE Data

Crash Severity

Top 5 Roadways

IH20	167
US79	141
US59	139
US69	47
US259	42

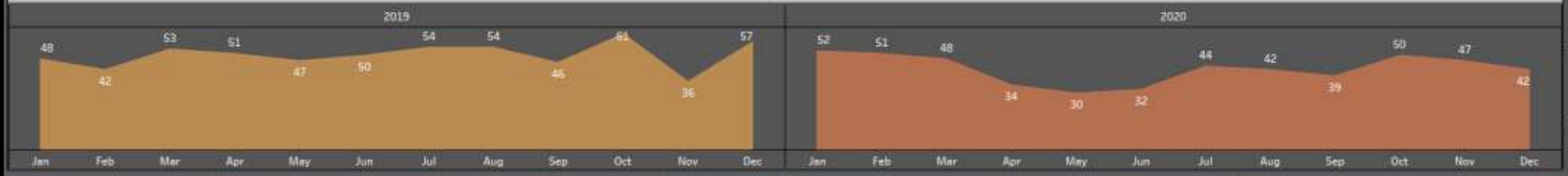
Crash Density Map



Day of Week & Segment of Day

	Sun	Mon	Tue	Wed	Thr	Fri	Sat	Total
12am - 3am	7	7	6	6	7	8	5	46
3am - 6am	3	9	7	9	20	13	2	63
6am - 9am	6	31	40	32	27	32	13	181
9am - 12pm	19	43	48	52	46	41	24	273
12pm - 3pm	6	25	30	21	28	28	15	153
3pm - 6pm	17	37	54	41	42	30	21	242
6pm - 9pm	5	27	13	16	20	15	11	107
9pm - 12am	5	9	4	5	5	12	5	45
Total	68	188	202	182	195	179	96	1,110

Crashes by Year & Month



(All)

Year

Month

Day of Week

Segment of Day

DPS or OLE

Agency

Alcohol-Involved

Hazmat

Hazmat Released

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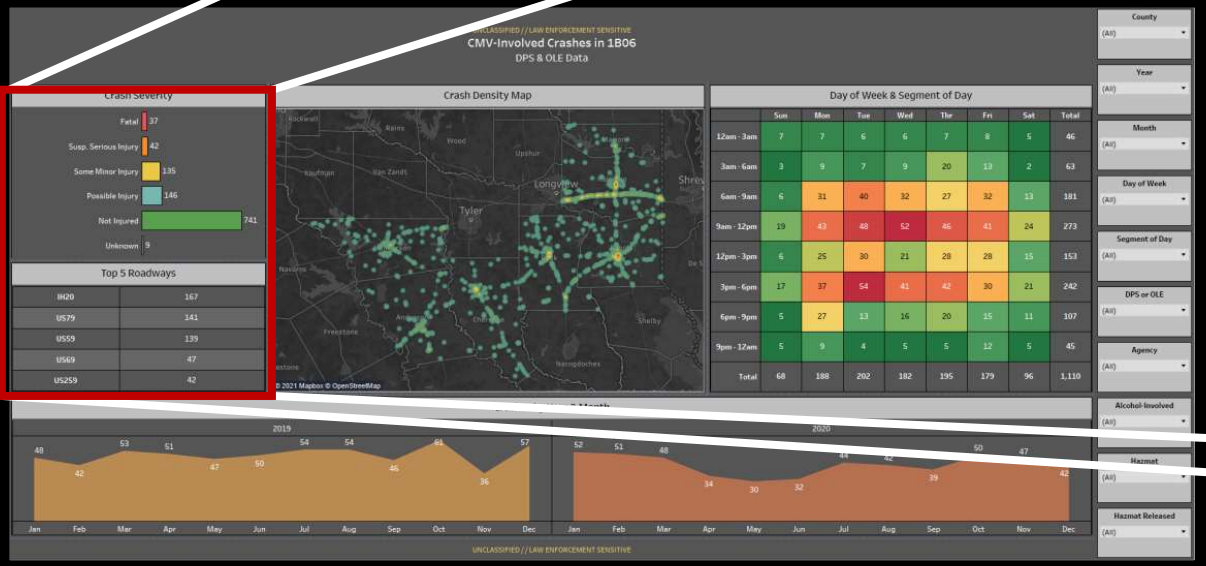
Crash Severity and roadways with most accidents in 2019 and 2020.



Crash Severity

Fatal	37
Susp. Serious Injury	42
Some Minor Injury	135
Possible Injury	146
Not Injured	741
Unknown	9

Top 5 Roadways

IH20	167
US79	141
US59	139
US69	47
US259	42

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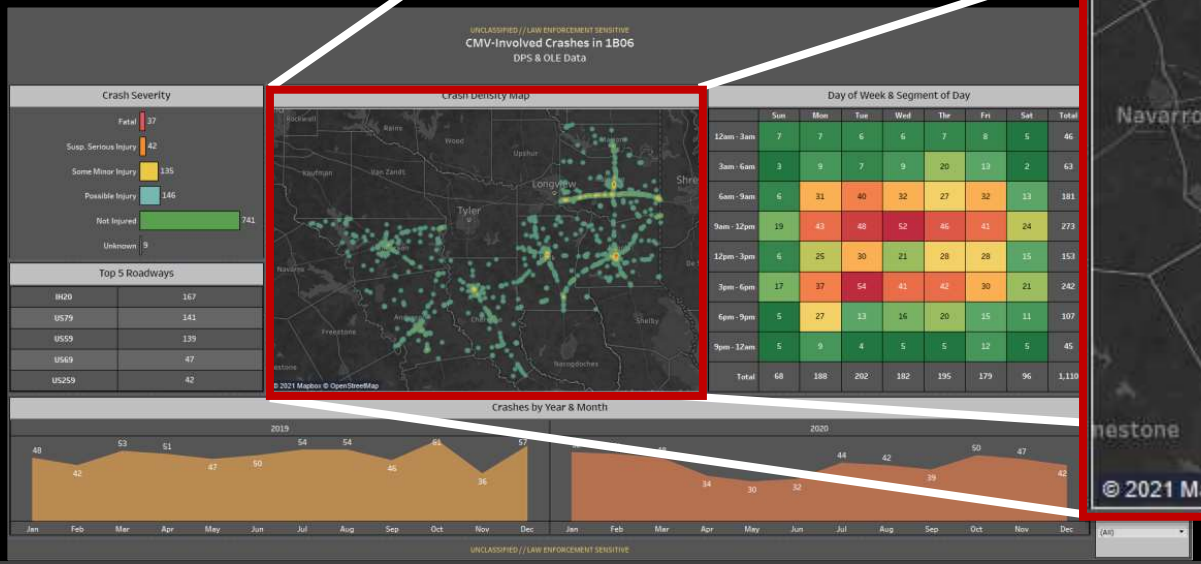
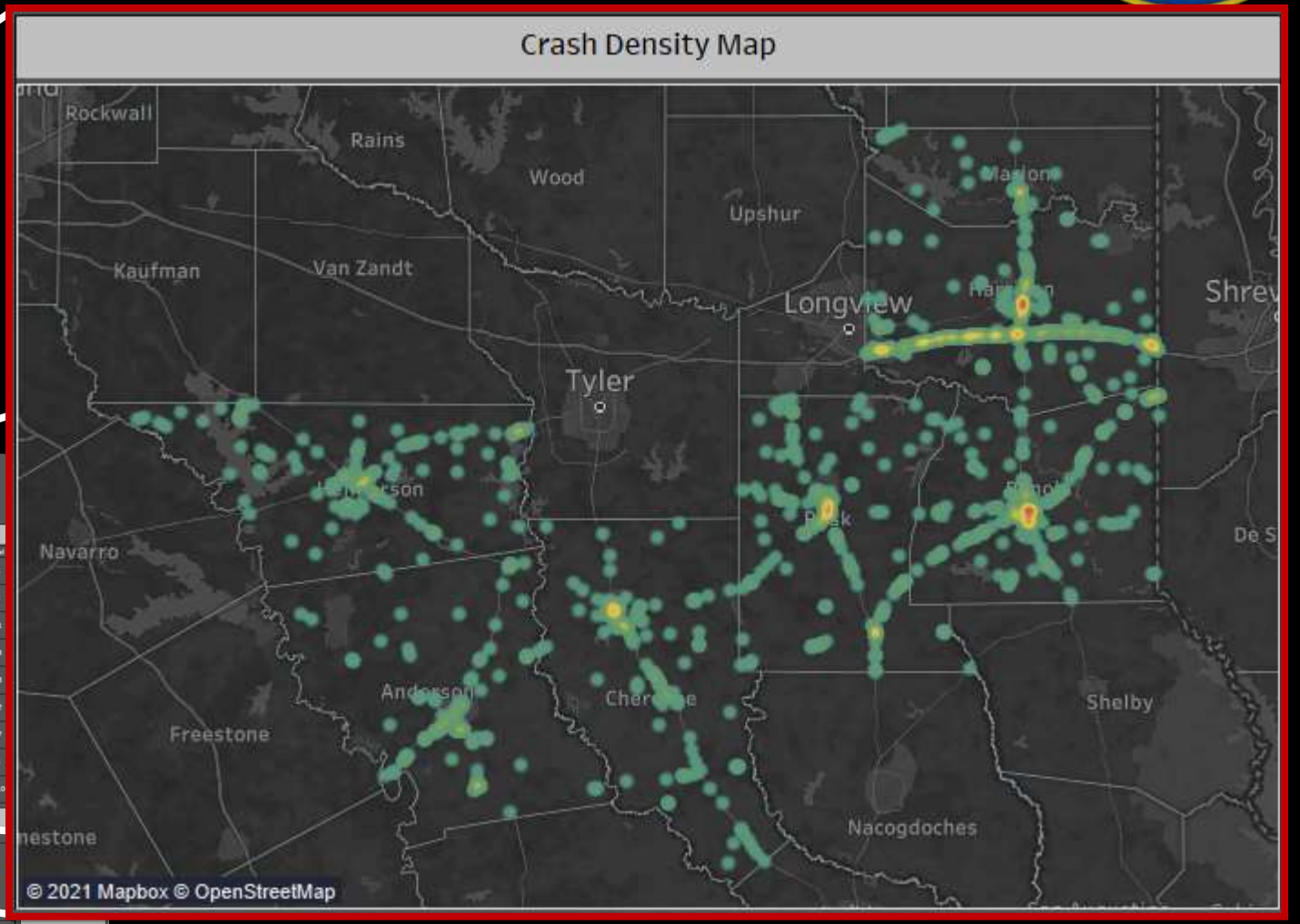
Heat Map indicating where crashes have occurred in 2019 and 2020.





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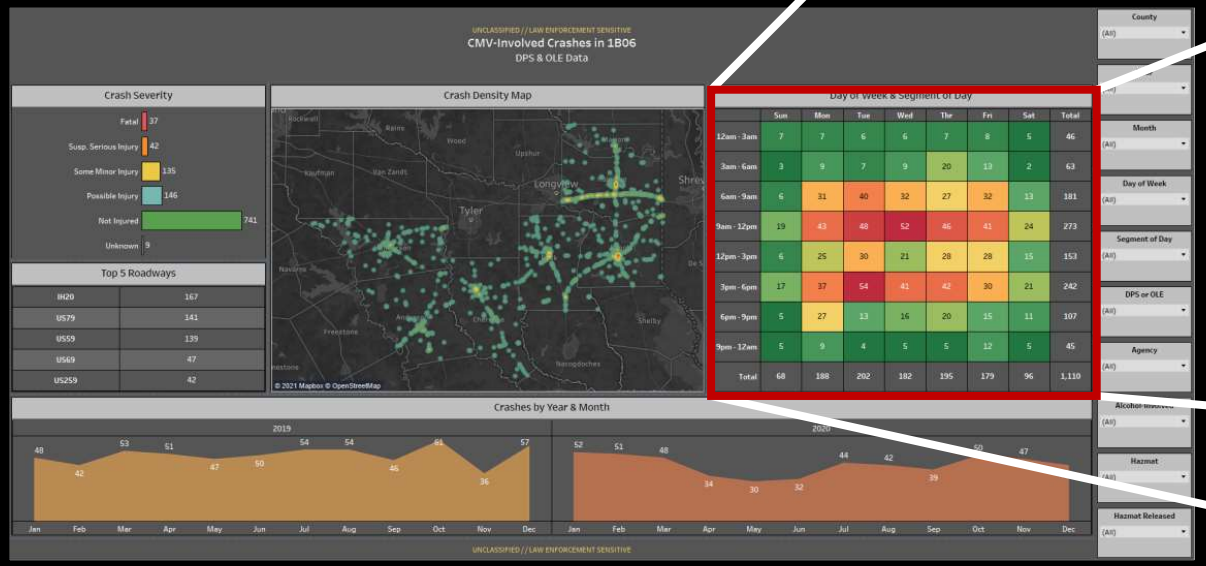
Segment of day and day of week of crashes in 2019 and 2020.



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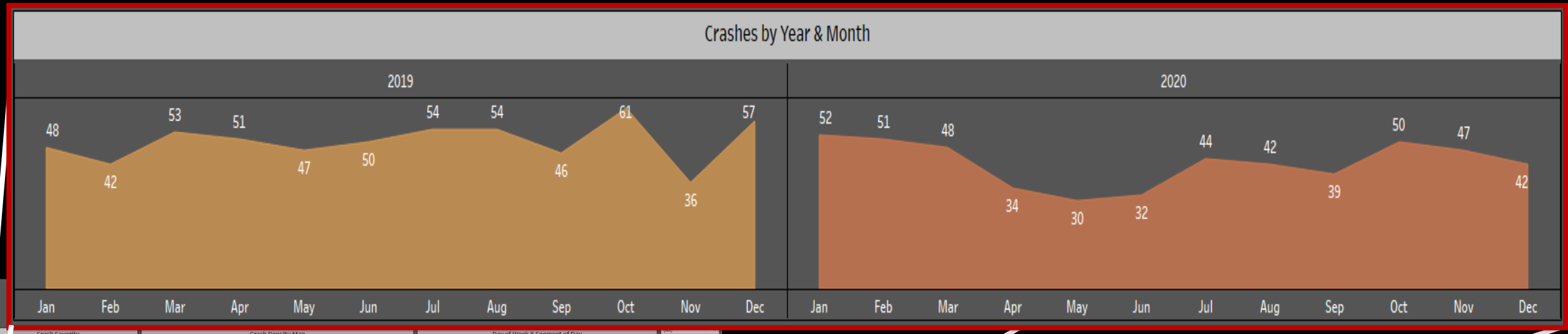

Area Chart of crashes by month in 2019 and 2020.

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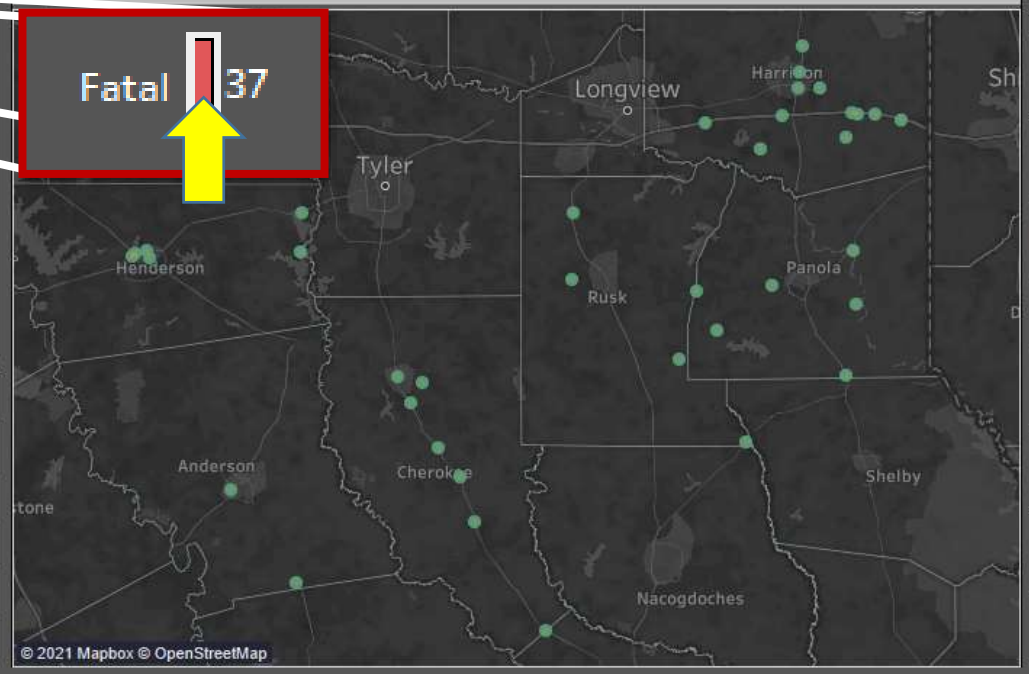
Crash Severity

Top 5 Roadways

IH20	6
US69	5
US59	5
US79	4
US259	1

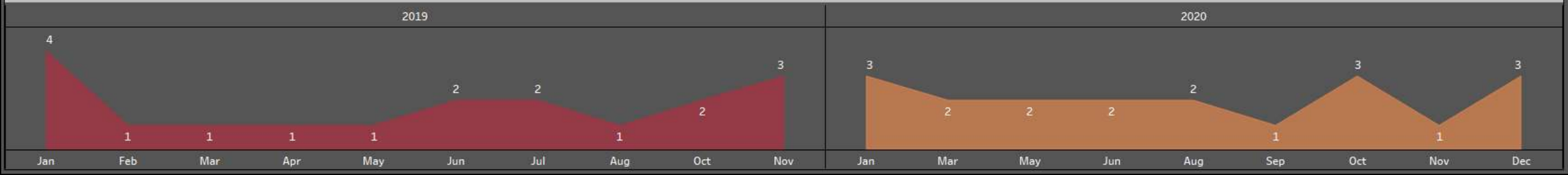
Crash Density Map



Day of Week & Segment of Day

	Sun	Mon	Tue	Wed	Thr	Fri	Total
3am - 6am		1	2		1	2	6
6am - 9am			1	1		1	3
9am - 12pm		3	1	2	1		7
12pm - 3pm			1		1	2	4
3pm - 6pm	3		3	2	2	3	13
6pm - 9pm		2		1			3
9pm - 12am		1					1
Total	3	7	8	6	5	8	37

Crashes by Year & Month



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Active Collection

Time of Day & Day of Week of Vehicle Detection

					Thu	Fri	Sat	Total
					91	170	230	1,083
					90	49	136	720
					62	43	87	624
					157	97	122	1,023
					449	416	296	3,697
					1,482	1,449	657	11,337
					3,616	3,172	1,539	23,395
					4,306	4,031	2,362	27,421
					3,975	3,669	3,696	26,989
					3,442	4,211	3,982	27,595
					3,928	4,166	4,907	29,740
11:00	4,137	4,710	4,450	4,853	4,128	4,526	5,193	31,997
12:00	4,433	4,854	5,011	4,384	4,295	4,971	5,459	33,407
13:00	4,394	5,192	5,000	3,836	4,556	4,843	5,896	33,717
14:00	4,779	6,174	6,322	4,377	5,133	5,412	5,571	37,768
15:00	4,698	6,639	7,057	5,199	5,446	5,891	5,692	40,622
16:00	4,479	6,945	7,213	5,925	6,423	6,385	5,529	42,899
17:00	4,061	6,768	6,323	5,639	6,042	6,460	5,272	40,565
18:00	3,554	4,931	4,897	3,894	4,274	4,925	3,942	30,417
19:00	2,542	2,846	2,593	2,871	2,763	3,011	3,155	19,781
20:00	1,521	1,889	1,567	1,669	1,975	2,524	2,104	13,249
21:00	803	1,267	1,001	879	1,065	1,488	1,740	8,243
22:00	371	482	429	378	508	834	980	3,982
23:00	132	217	365	209	190	493	578	2,184
Total	51,561	77,804	81,437	70,896	68,396	73,236	69,125	492,455

Median MPH per Hour

Analyst Notes:

FM 920 in Peaster, TX
Posted Speed: 45 MPH

Speed Survey:
Period Active: 2/12/2021 - 3/24/2021
Max Detectable Speed: 120 MPH
Min Detectable Speed: 20 MPH

Median MPH per Day

Week: (All)

Day of Week: (All)

Hour of Day: (All)

Vehicle Detected: (All)

Direction: (All)

Speed (Range): 20 – 120

Speed (above/below): (All)

Speed (%): (All)

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Time of Day & Day of Week of Vehicle Detection	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
0:00	136	40	72	64	37	63	97	509
1:00	93	41	42	32	35	21	58	322
2:00	42	44	89	61	23	19	38	316
3:00	29	70	116	154	91	51	57	568
4:00	55	453	429	485	255	181	107	1,965
5:00	240	1,156	1,475	1,191	815	757	284	5,918
6:00	374	2,026	2,433	2,277	1,648	1,616	714	11,088
7:00	713	2,334	2,629	2,343	1,947	2,107	1,452	13,525
8:00	1,006	2,372	2,403	2,255	1,873	2,018	1,794	13,721
9:00	1,509	1,920	2,507	2,152	1,725	2,052	2,251	14,116
10:00	1,837	1,971	2,513	2,092	1,835	2,004	2,417	14,669
11:00	2,154	2,281	2,264	2,316	1,933	2,117	2,551	15,616
12:00	1,953	2,286	2,277	2,007	2,022	2,190	2,597	15,332
13:00	1,943	2,451	2,004	1,678	2,002	2,366	2,278	14,722
14:00	2,064	2,699	2,227	1,899	2,032	2,166	2,384	15,471
15:00	2,190	2,711	2,673	2,293	2,315	2,283	2,706	17,171
16:00	2,148	2,753	2,671	2,342	2,456	2,451	2,418	17,239
17:00	1,742	2,640	1,894	2,058	2,422	2,513	2,523	15,792
18:00	1,752	2,125	1,657	1,610	1,583	1,894	1,781	12,402
19:00	1,096	1,221	826	1,251	1,081	1,280	1,334	8,089
20:00	704	728	567	543	682	977	911	5,112
21:00	326	600	361	353	422	594	592	3,248
22:00	179	193	138	125	217	352	420	1,624
23:00	54	51	156	85	67	194	278	885
Total	24,339	35,166	34,423	31,666	29,518	32,266	32,042	219,420

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Conclusion

Technological advances in Artificial Intelligence (AI) vehicle development/implementation (self-driving), road construction, communication and GPS will likely help in the reduction of accidents. These advances will inevitably lead to unforeseen challenges for law enforcement but will also provide further avenues for data collection, analysis and course correction. Data Analytic Technology enables the Texas Highway Patrol to effectively allocate resources, identify threats, recognize trends, and predict future obstacles to reduce accidents and save lives.

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Questions?

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Contact Information

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