



MOTORIZED TWO-WHEELER SAFETY TRENDS

Research, Implementation & Safety
Research On The Road 2023



DEFINITIONS AND METHODOLOGY

- All crash data sourced from NYPD
- Motorized Two-Wheelers
 - Anything on two-wheels that has a motor and is not a traditional Motor Vehicle (car, truck, van)
 - E-Bikes
 - Standup E-Scooters
 - E-mopeds no VIN (non-street legal mopeds)
 - Mopeds – under 150 CCs, gas & electric
 - Motorcycles – 150+ CCs, gas & electric
 - Mopeds + E-mopeds no VIN = “limited use motorcycles”
- Most analysis by year uses “year to date” periods
 - Jan 1 to Sept 30 from each year

MOTORIZED TWO-WHEELER SAFETY TRENDS

Take Aways

- Motorized two-wheelers fatalities up ~120% since 2014 (35 vs 78)
 - Every sub-set of motorized two-wheeler fatalities is also up
- Pedestrians and motorized two-wheelers now almost equal in share of fatalities (36% vs 38%)
- Traditional Bikes and Pedestrians on a gradual downward trend since 2017

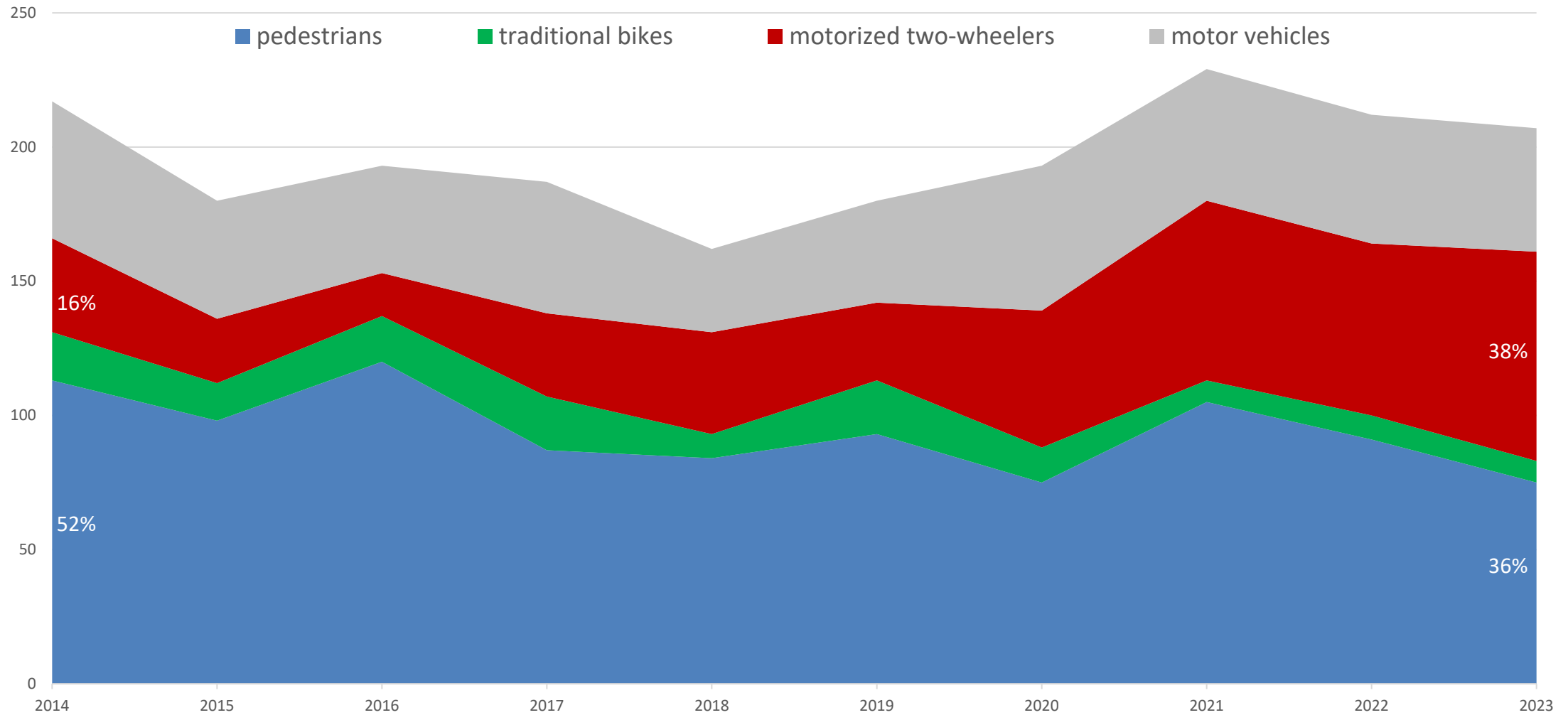
MOTORIZED TWO-WHEELER SAFETY TRENDS

Take Aways (cont.)

- Motorized two-wheeler injuries are rising twice as fast as fatalities (+350% vs +150%) since 2017
- Faster, heavier two-wheelers are more involved in severe and deadly crashes
- Red-light running and escaping automated enforcement a growing concern
- Context:
 - Traditional motor vehicle involved crashes of all modes still account for over 85% of fatalities
 - Bike ridership is at an all time high in NYC, with over 24,000 East River Bridge trips on an average in-season weekday

FATALITY TRENDS BY MODE

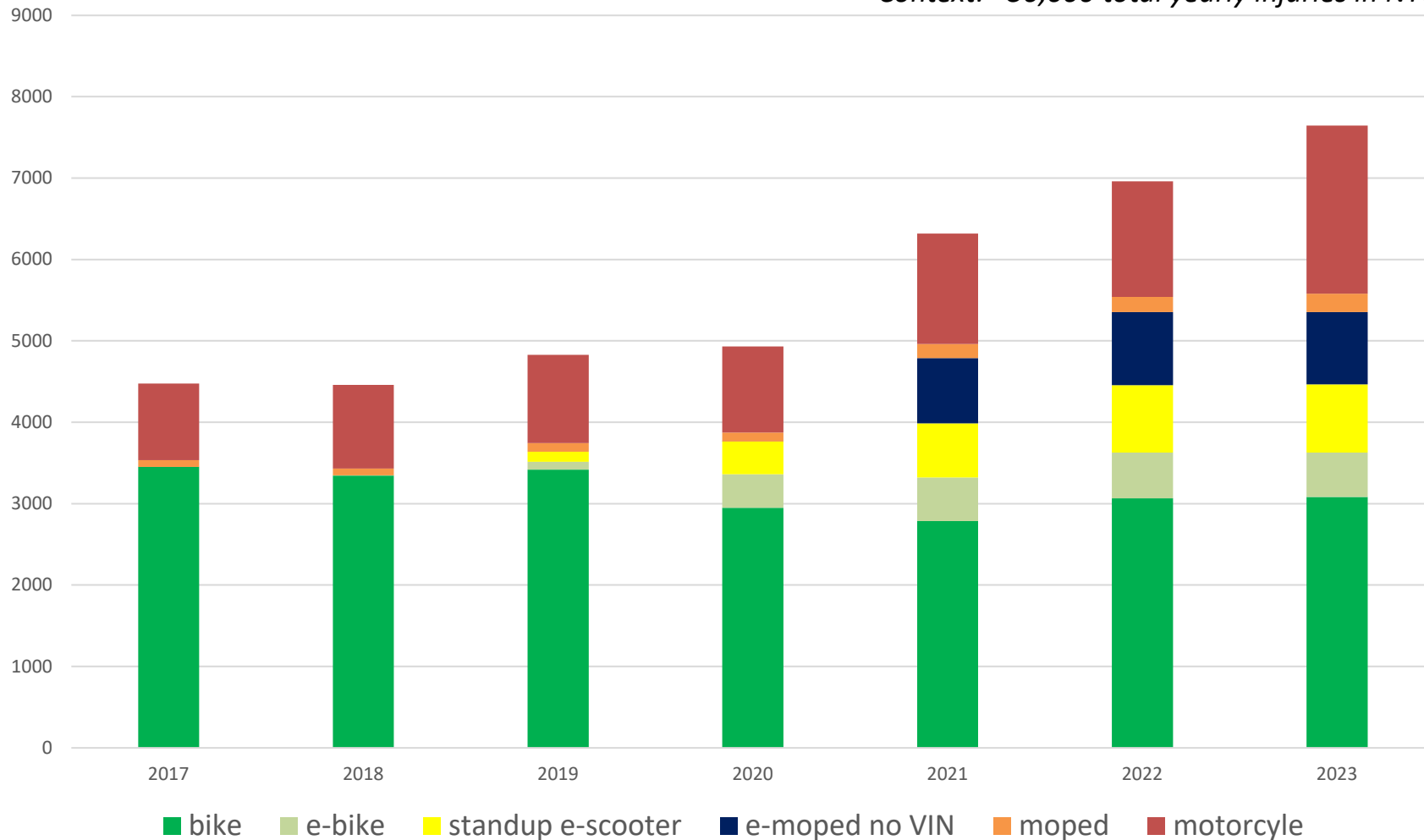
YTD 1/1 - 10/29



BIKES & MOTORIZED TWO-WHEELERS

Injuries YTD 1/1-9/30

Context: ~50,000 total yearly injuries in NYC

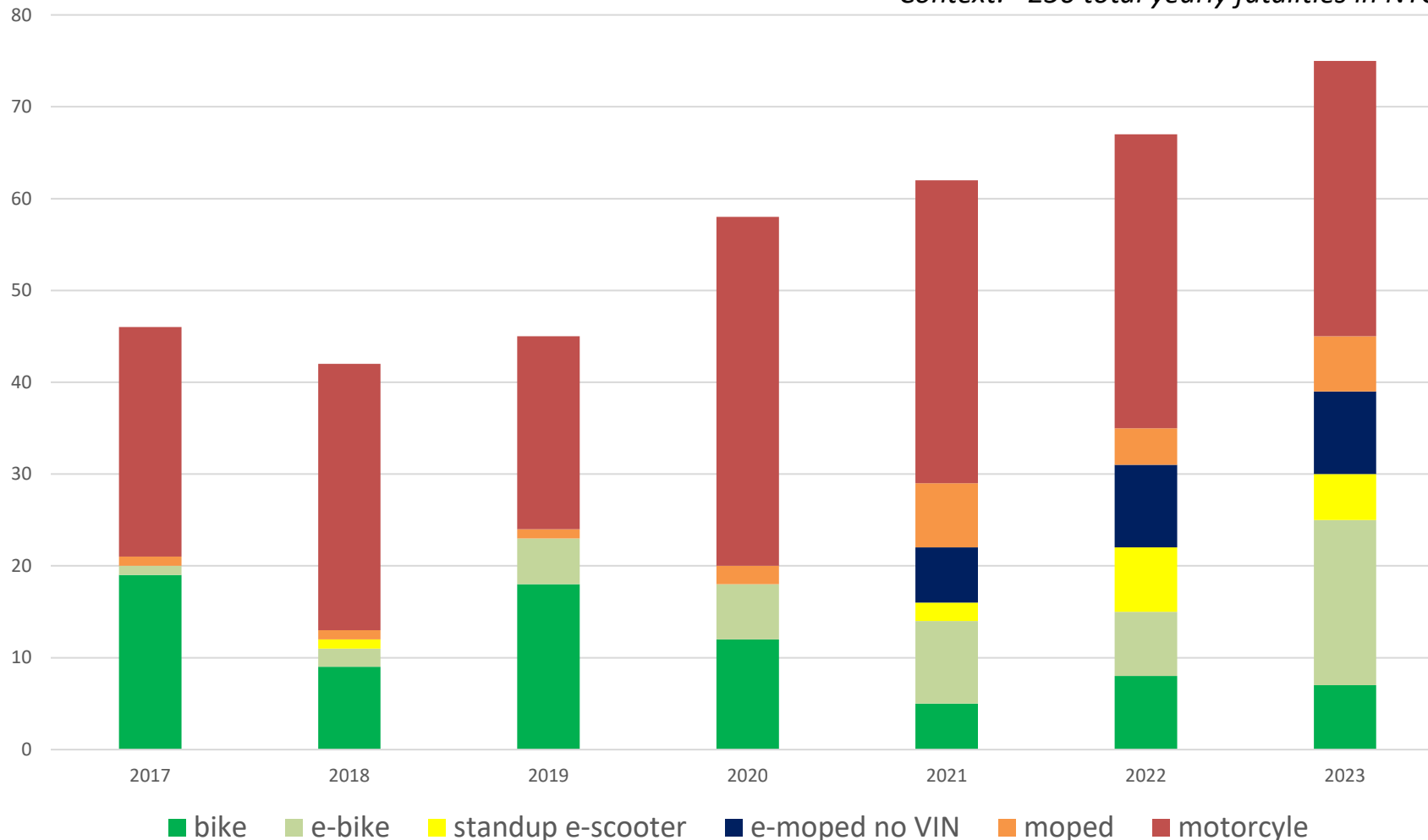


- Traditional bikes down slightly since 2017
- E-bikes flat since 2021
- Standup e-scooter growing steadily, larger than e-bike
- Traditional and limited use motorcycles up ~200% since 2017
- **Motorized Two-Wheelers up ~350% since 2017** (now ~10% of total injuries)

BIKES & MOTORIZED TWO-WHEELERS

Fatalities YTD 1/1-9/30

Context: ~250 total yearly fatalities in NYC



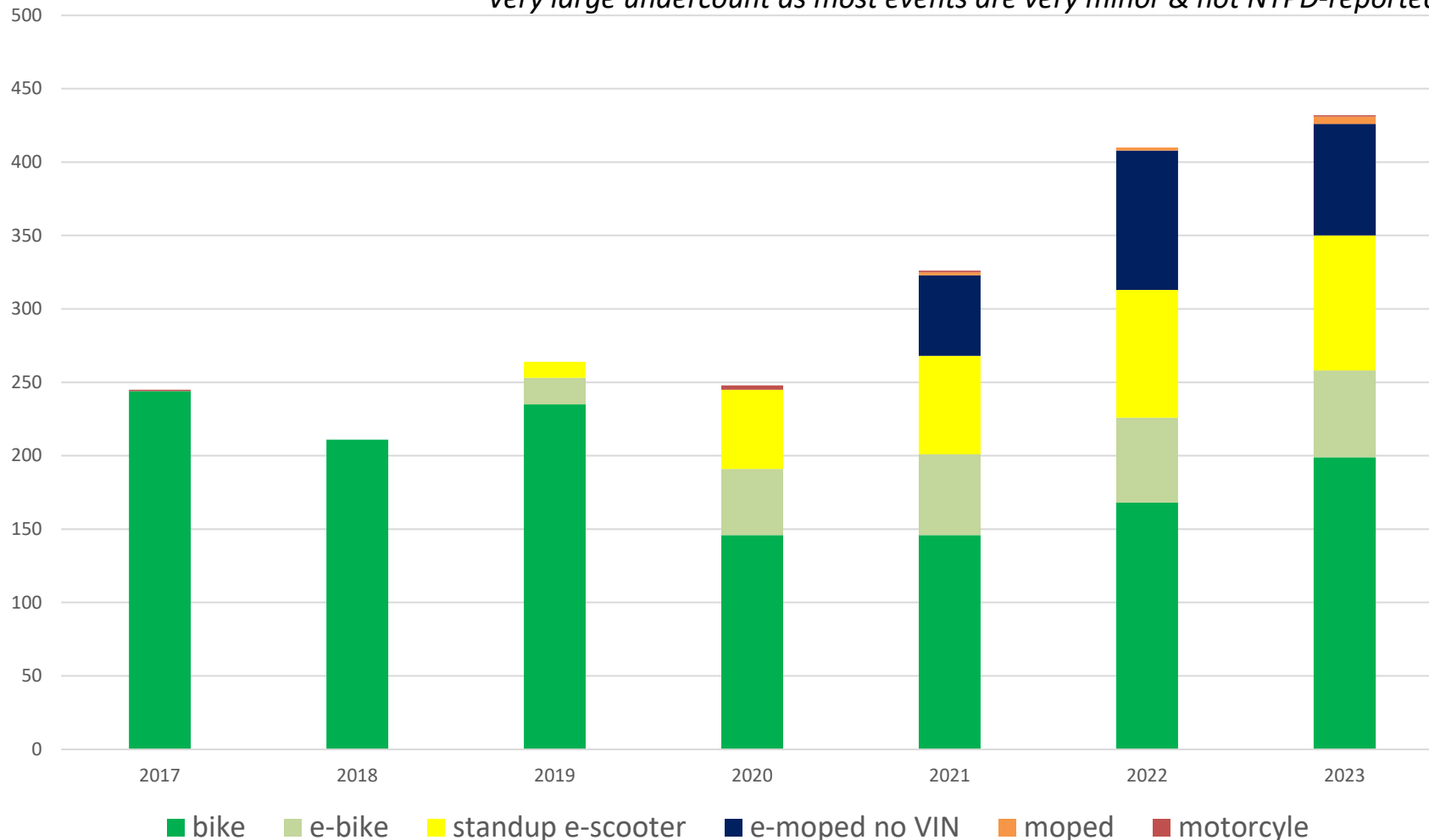
- Traditional bikes down ~60% since 2017
- E-bikes up very sharply, but small numbers (1-2 vs 7-18, 2017/2018 vs 2022/2023)
- Standup e-scooter up sharply, but very small numbers (0-1 vs 5-7, 2017/2018 vs 2022/2023)
- Traditional and limited use motorcycles up ~75% since 2017
- **Motorized Two-Wheelers up ~150% since 2017**

PEDESTRIANS STRUCK BY TWO-WHEELERS

Injuries YTD 1/1-9/30

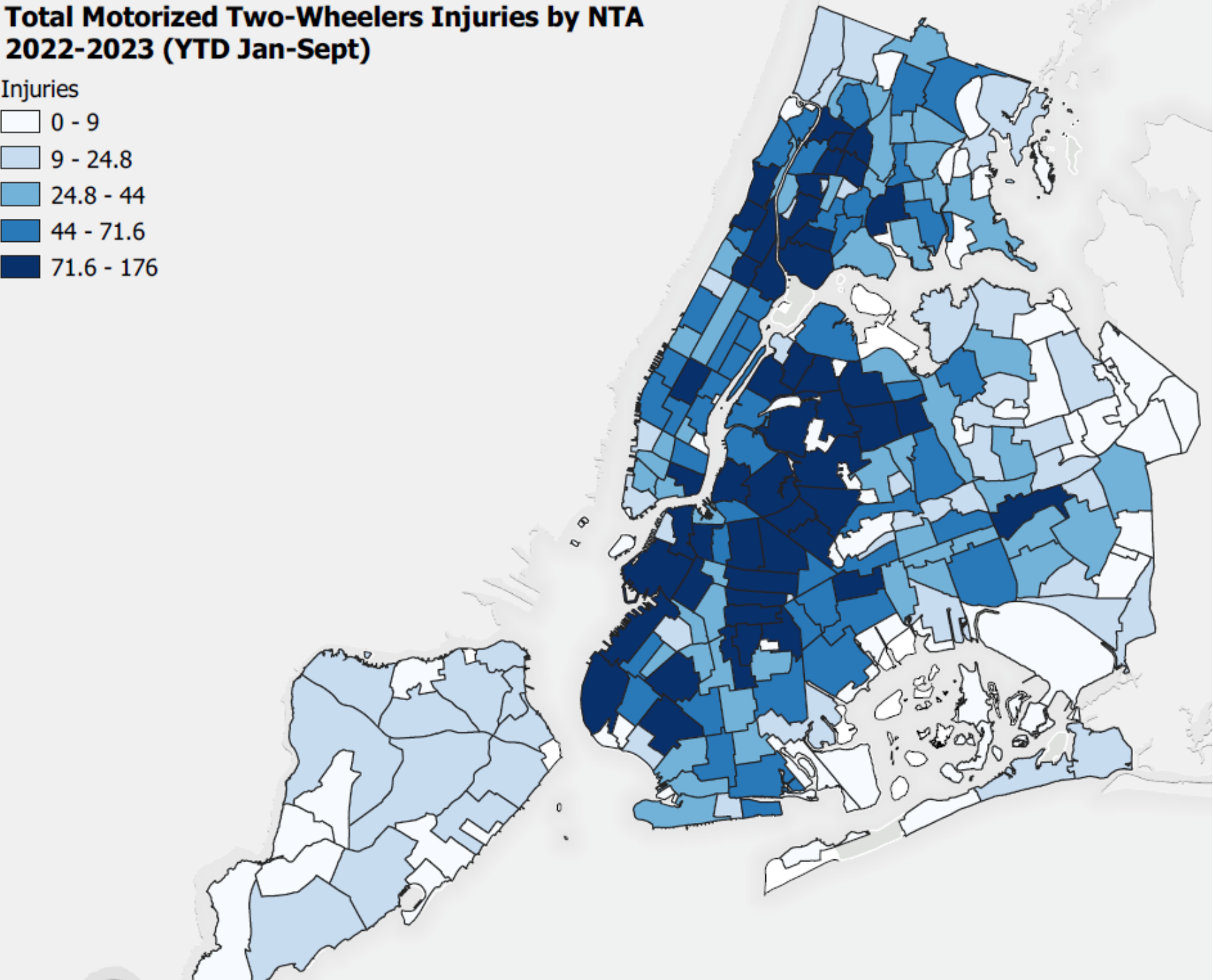
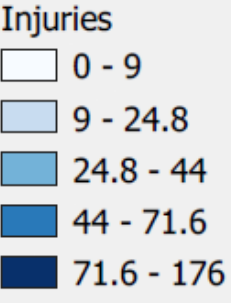
*Context: ~50,000 total yearly injuries in NYC
Represents less than 1% of total*

Very large undercount as most events are very minor & not NYPD-reported



- Bikes + e-bikes flat since 2017
 - Traditional bikes down ~20%, but still largest share
 - E-bikes up ~200%
- Standup e-scooter up ~800% since 2019
- E-moped no VIN up very sharply (0 vs 76)
- Motorcycles not an issue
- **Motorized Two-Wheelers up ~700% from 2019, larger share than traditional Bikes**

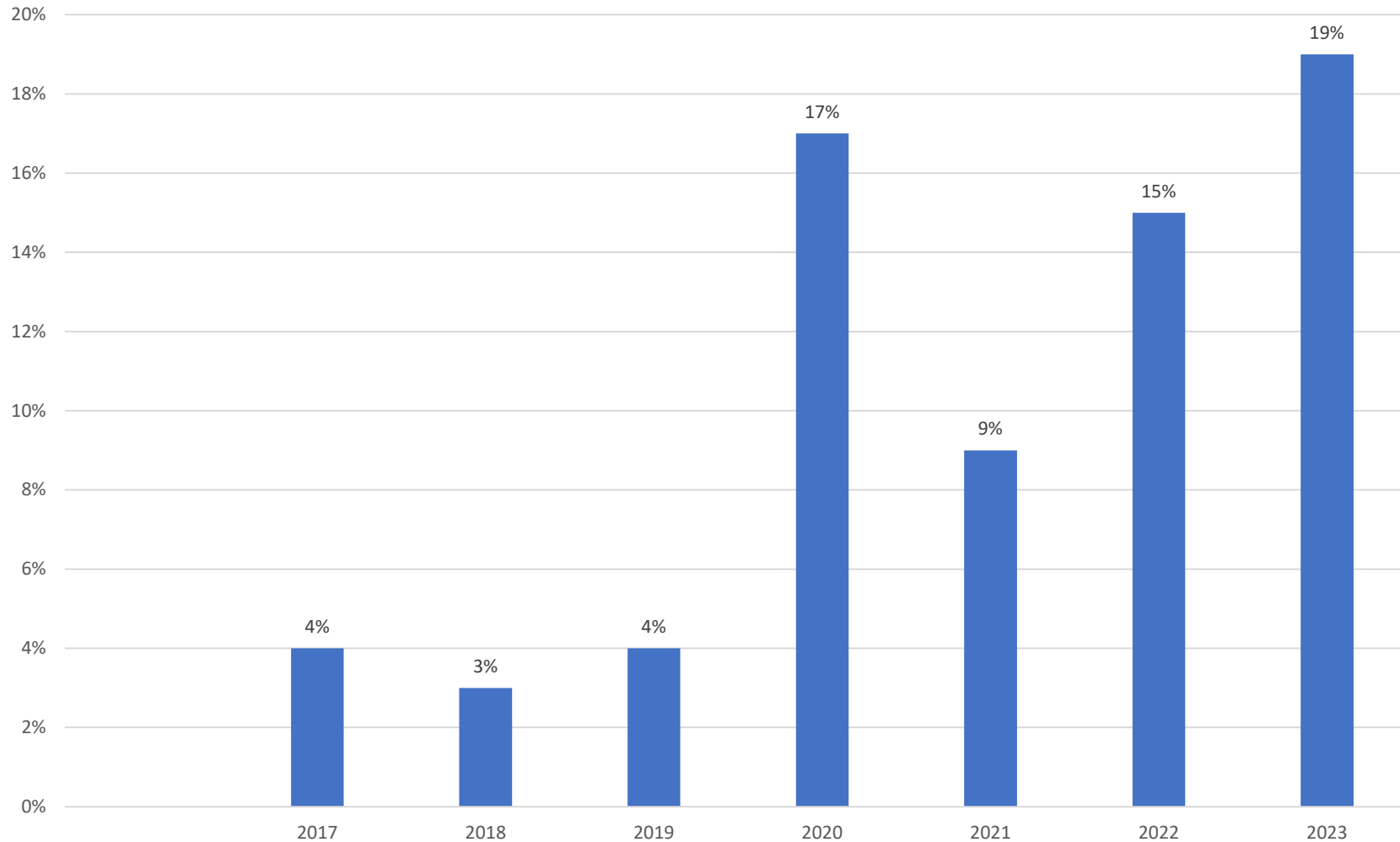
Total Motorized Two-Wheelers Injuries by NTA 2022-2023 (YTD Jan-Sept)



MOTORIZED TWO-WHEELERS

Disobey Signal Fatalities (2023 is YTD 10/19/23)

Disobey Signal % of Motorized 2-Wheelers Fatalities

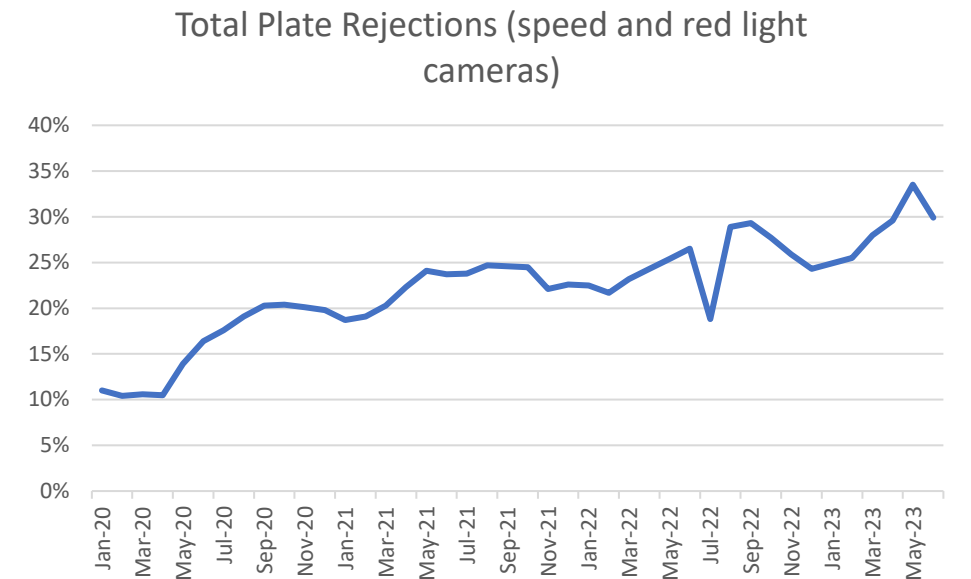
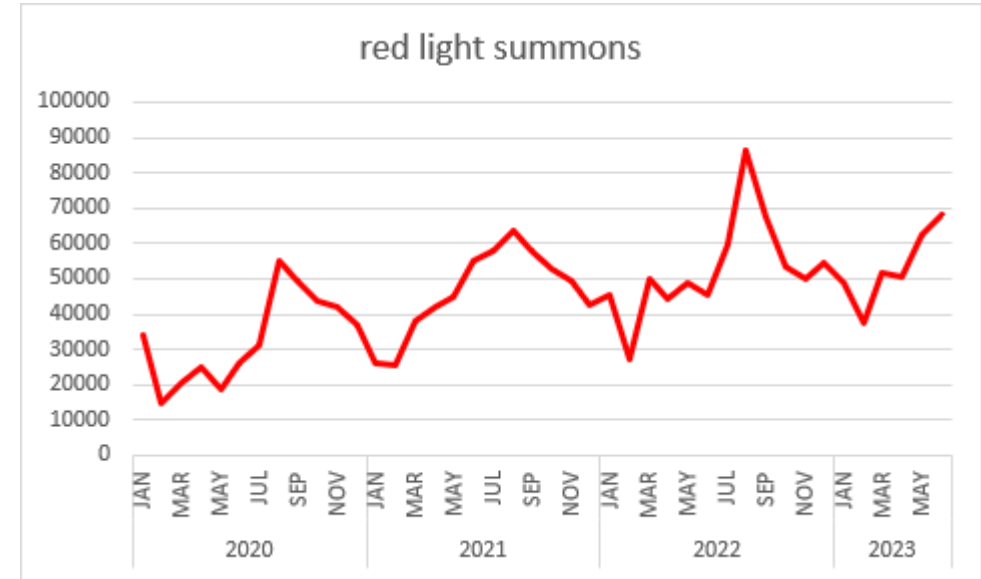


- Does not include stop-sign running
- 2023: 19% (13 out of 68) motorized two-wheeler fatalities were disobey signal
- Context: motor vehicle % is ~5%

DOT AUTOMATED ENFORCEMENT

Speed and Red Light Cameras

- Red Light Camera violations and Plate Rejections both up ~125% since 2020
- 85% of vehicles “beating” DOT cameras are motorized two-wheelers without license plates, including e-bikes, scooters, motorcycles



THANK YOU!

Questions?

VISION ZERO **Building a Safer City**



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APPENDIX

METHODOLOGY

- Year to data analysis was used to include 2023
- Any vehicle with a VIN in FORMS was coded using that method
- If no VIN, the vehicle stayed in the NYPD designated mode
- After a crash, NYPD runs the plate through NYSPIN, which auto-populates the field in the crash data with the VIN. If there is no plate, then the VIN # should be manually entered by the cop
- Camera plate rejections use definitions in below table, excluding “non-events”:

PLATE - NO PLATE/TEMPORARY PLATE	Rejection
PLATE/VEHICLE OBSTRUCTED	Rejection
EMT/FIRE	Non-Event
DMV - NO MATCHES OR RECORDS	Rejection (could have been an NOL)
SPEED CAN NOT BE VERIFIED	Rejection (could have become an NOL)
NO VEHICLE PRESENT	Non-Event
POLICE DEPARTMENT VEHICLE	Non-Event
OTHER	We don't use this category any longer
LIGHTING: FLASH DID NOT TRIGGER - REAR	Rejection (could have been an NOL)
CROSS LANE TRIGGER - NO EVENT	Non-Event

MVO-INVOLVED FATALITIES BY MODE

as of 10/30/2023				
YR	mode	Fatalities involving Motor Vehicle	Fatalities (Total)	(%)
2023	PD	72	75	96.0
2023	BI	19	26	73.1
2023	MO	31	44	70.5
2023	DR	27	27	100.0
2023	PS	19	20	95.0
2023	OM	9	15	60.0
2023	Total	177	207	85.5

~30% single vehicle fatalities for motorized two wheelers

DISOBEY SIGNAL

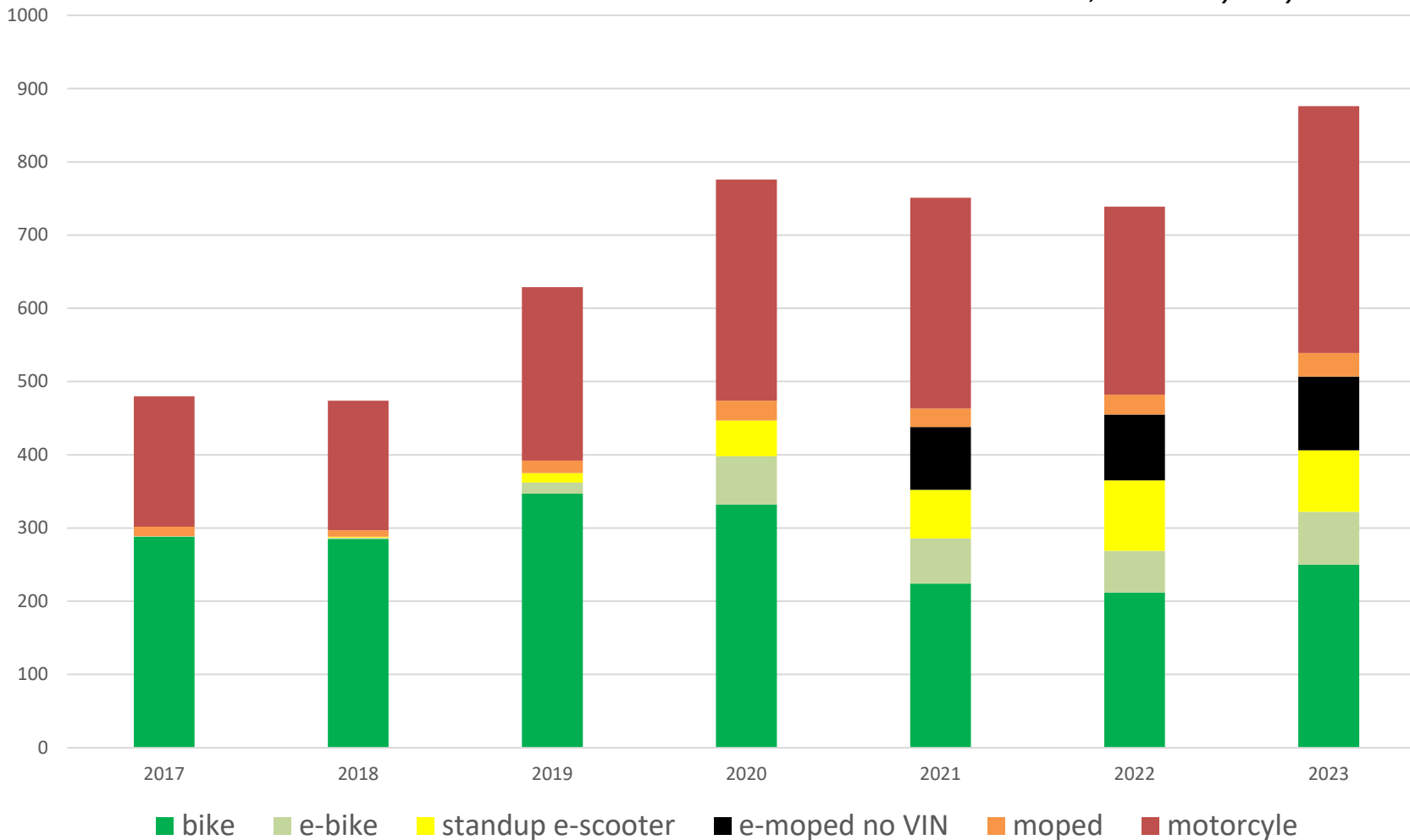
Fatalities YTD 1/1-9/30

YR*	Disobey Signal Fatalis									All Fatalis									% Disobey Signal		
	Traditional Bicycle	Motorized 2-Wheelers							MVO	Traditional Bicycle	Motorized 2-Wheelers							MVO	Motorized Two Wheelers minus Motorcycles	Motorized 2-Wheelers	MVO
		EBIKE	E-Bike no pedals	Escooter	Moped	Motorcycle	Total minus Motorcycles	Total			EBIKE	E-Bike no pedals	Escooter	Moped	Motorcycle	Total minus Motorcycles	Total				
2017	7	1	0	0	0	0	1	1	4	19	1	0	0	1	25	2	27	45	50%	4%	9%
2018	2	0	0	1	0	0	1	1	1	9	2	2	1	1	27	6	33	29	17%	3%	3%
2019	6	1	0	0	0	0	1	1	1	18	5	0	0	1	21	6	27	35	17%	4%	3%
2020	3	1	0	0	1	6	2	8	4	12	6	0	0	5	35	11	46	46	18%	17%	9%
2021	0	0	1	1	0	3	2	5	3	5	9	6	2	8	32	25	57	45	8%	9%	7%
2022	1	2	1	1	1	4	5	9	3	8	7	9	7	4	32	27	59	44	19%	15%	7%
2023	1	1	2	2	1	7	6	13	2	7	18	8	5	5	32	36	68	43	17%	19%	5%

BIKES & MOTORIZED TWO-WHEELERS

Killed or Severely Injured (KSI) YTD 1/1-9/30

Context: ~3,500 total yearly KSI in NYC

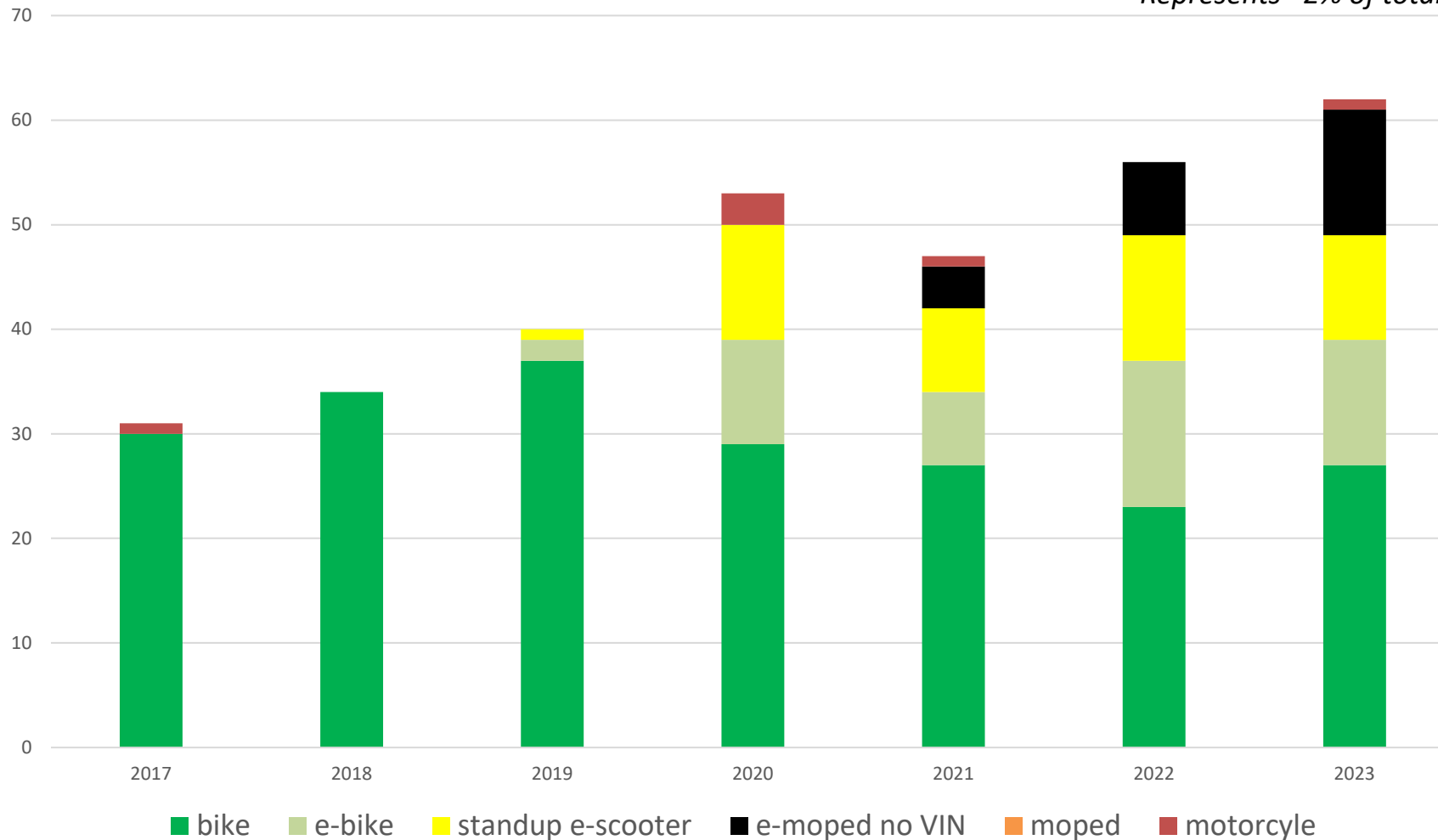


- Traditional bikes down since 2017
- E-bikes flat since 2020
- Standup e-scooter growing steadily
- Traditional and limited use motorcycles up ~300% since 2017
- **Motorized Two-Wheelers up ~230% since 2017**

PEDESTRIANS STRUCK BY TWO-WHEELERS

Killed or Severely Injured YTD 1/1-9/30

*Context: ~3,500 total yearly KSI in NYC
Represents ~2% of total*



- Bikes + e-bikes flat since 2017
 - Traditional bikes down ~20%
 - E-bikes up ~200%
- Standup e-scooter flat since 2020
- E-moped no VIN up very sharply (0 vs 12)
- Motorcycles not an issue
- **Motorized Two-Wheelers up sharply since 2017, larger share than traditional Bikes** (0 vs 35), (35 vs 27)

BIKES STRUCK BY TWO-WHEELERS

Killed or Severely Injured (KSI) YTD 1/1-9/30

Context: ~3,500 total yearly KSI in NYC
Represents less than ~1% of total



- Extremely low overall numbers
- Motorcycles not an issue
- Traditional bikes still the largest share

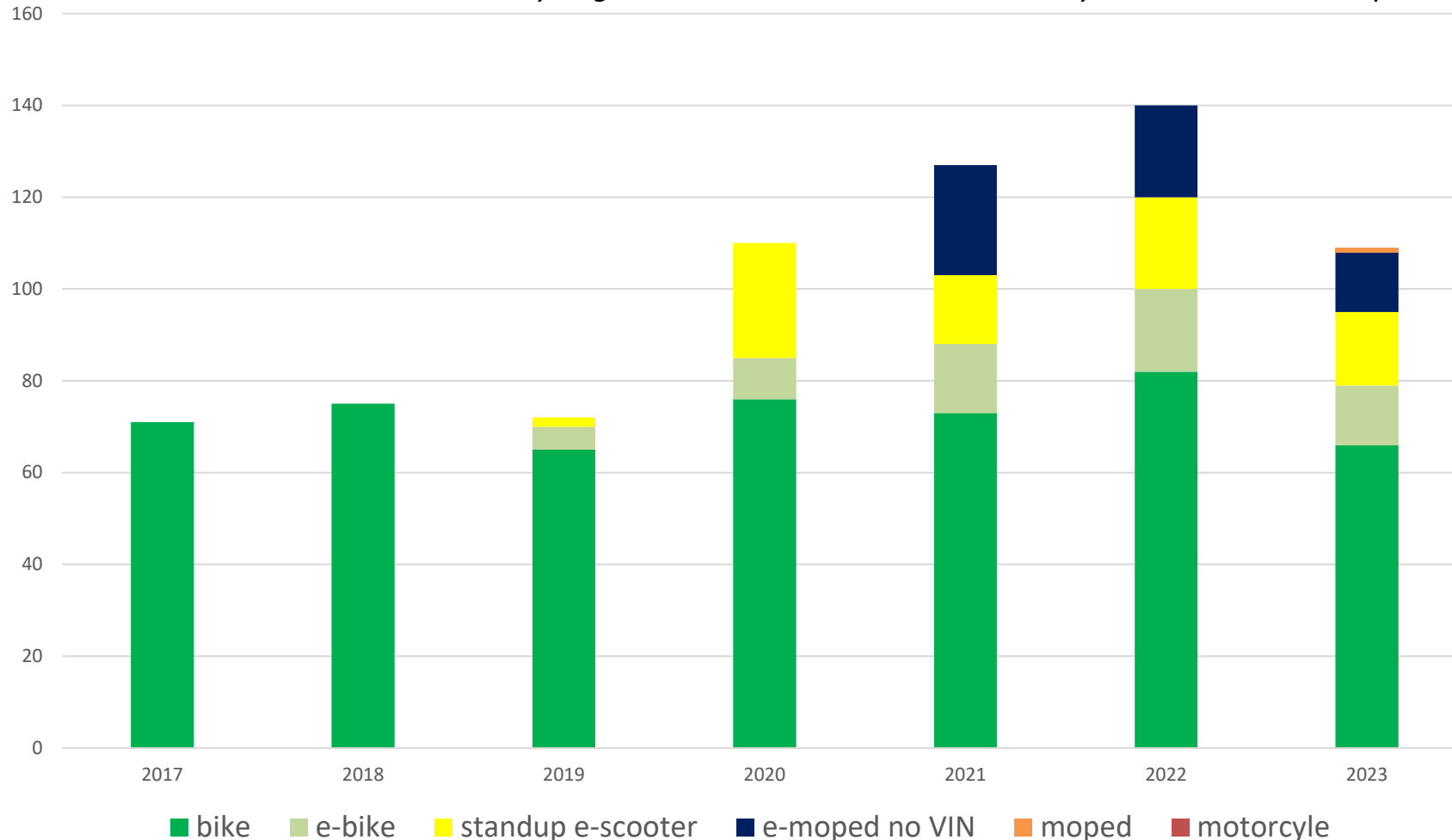
NOTE: Does not include single-vehicle crashes

BIKES STRUCK BY TWO-WHEELERS

Injuries YTD 1/1-9/30

Context: ~50,000 total yearly injuries in NYC
Represents less than 1% of total

Very large undercount as most events are very minor & not NYPD-reported



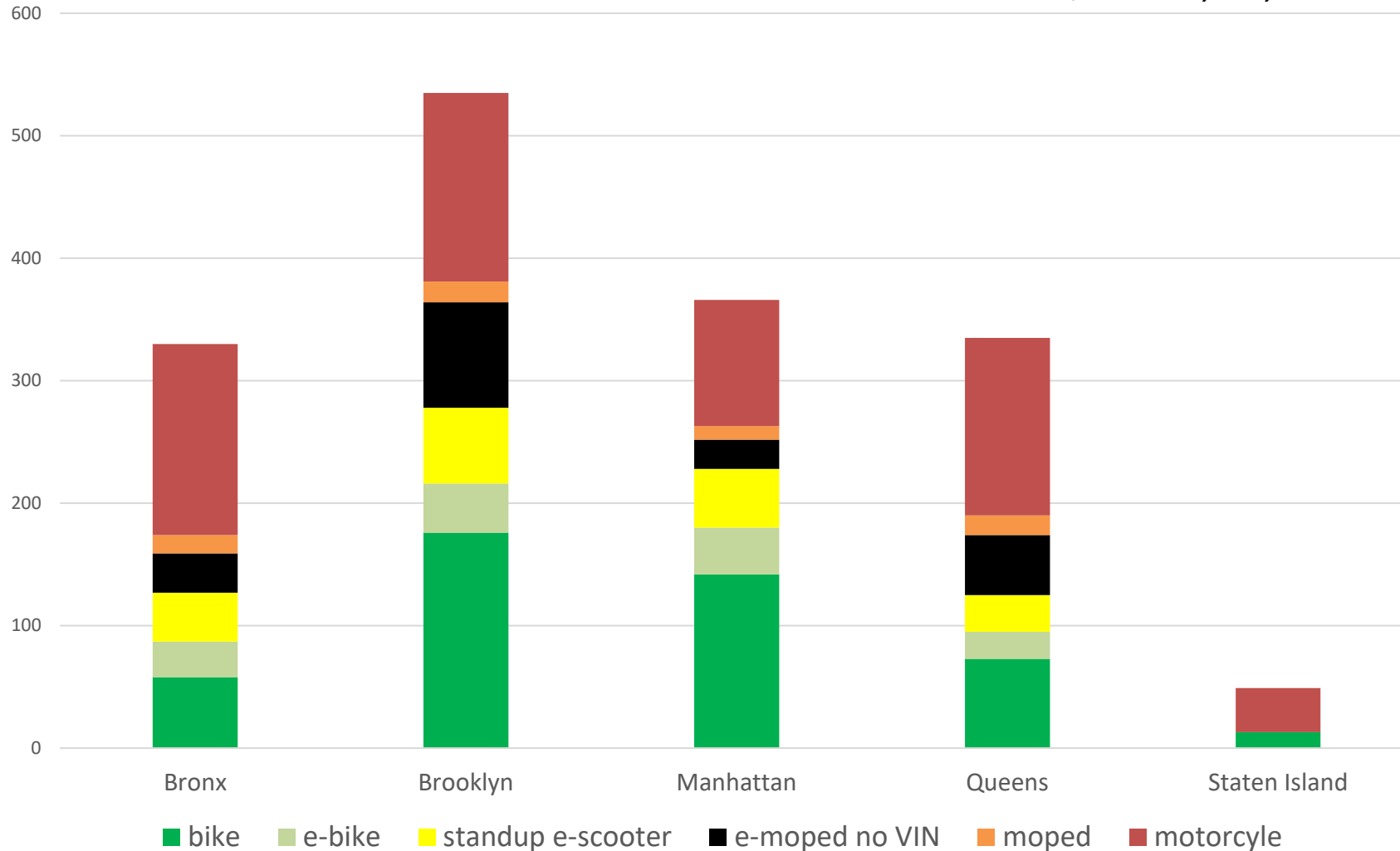
- Bikes + e-bikes up slightly since 2017, bikes still largest share
- Standup e-scooter up ~700% since 2019
- E-moped no VIN up very sharply (0 vs 13)
- Traditional bikes still the largest share
- Motorcycles not an issue
- **Motorized Two-Wheelers up ~500% from 2019**

NOTE: Does not include single-vehicle crashes

BIKES & MOTORIZED TWO-WHEELERS

Killed or Severely Injured (KSI) by Borough 2022-2023 YTD 1/1 - 9/30

Context: ~3,500 total yearly KSI in NYC

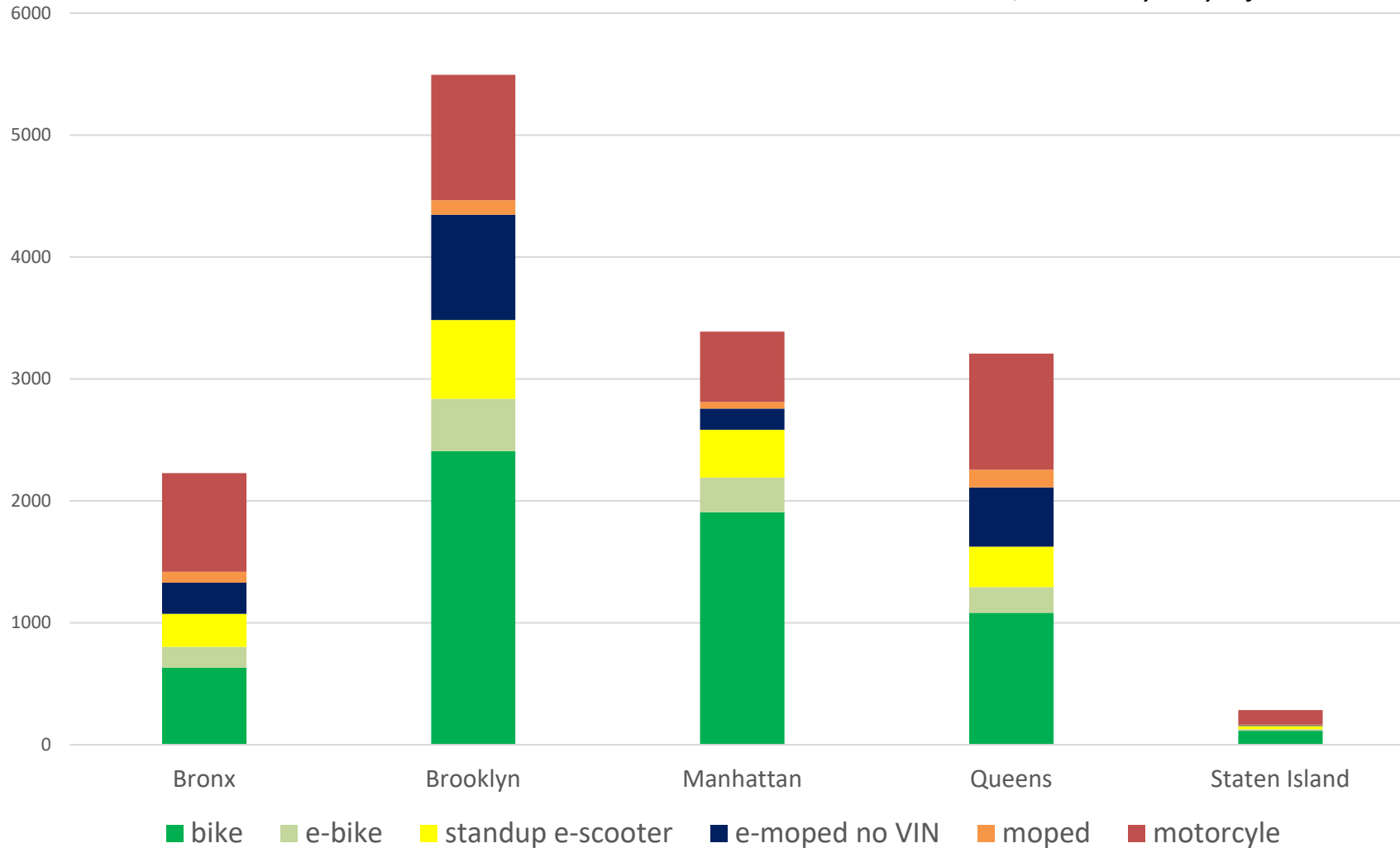


- Brooklyn higher in total and in traditional bikes and motorized two-wheelers
- Bronx share of KSI > injury share

BIKES & MOTORIZED TWO-WHEELERS

Injuries by Borough 2022-2023 YTD 1/1 - 9/30

Context: ~50,000 total yearly injuries in NYC

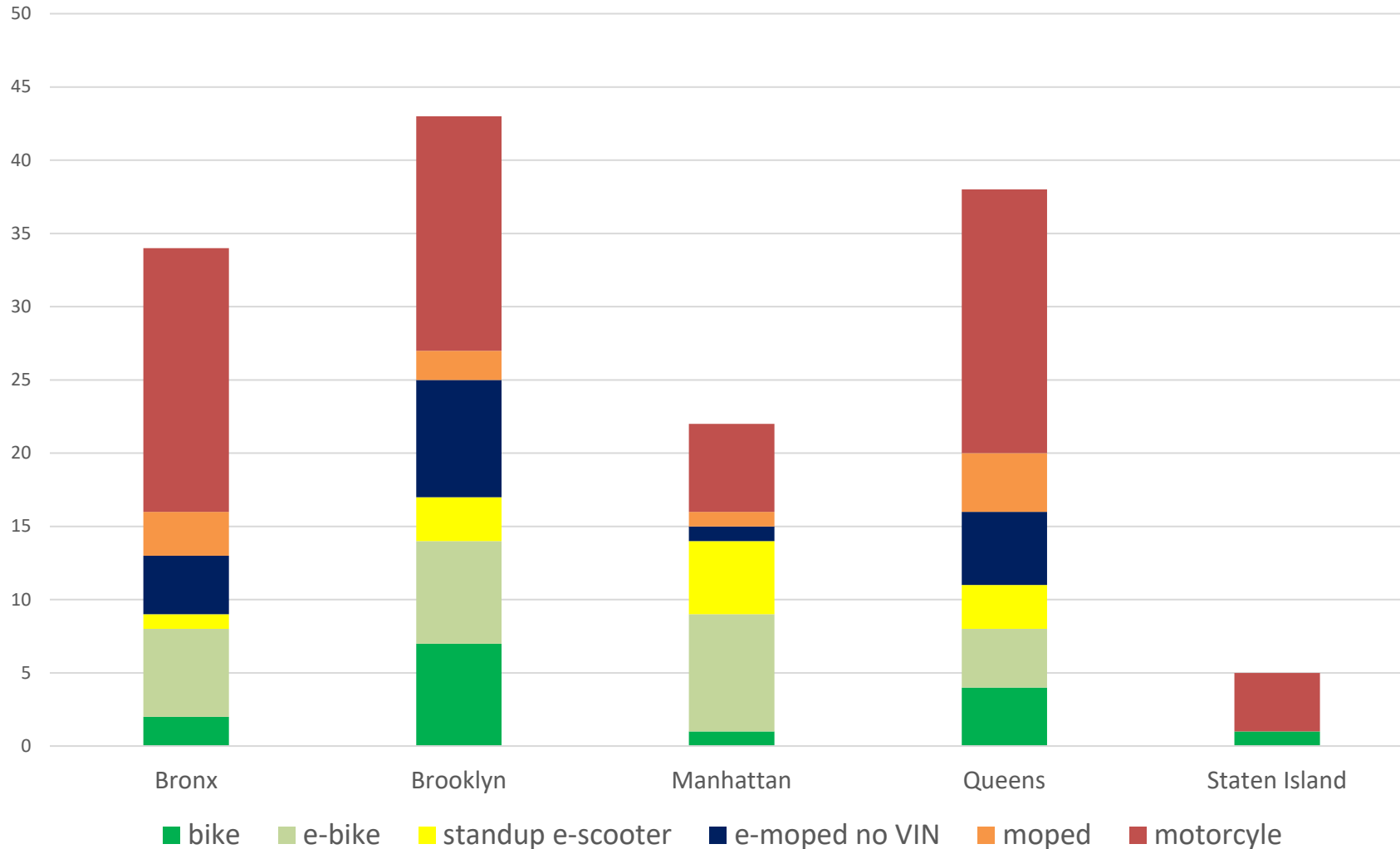


- Brooklyn higher in total and in traditional bikes and motorized two-wheelers

BIKES & MOTORIZED TWO-WHEELERS

Fatalities by Borough 2022-2023 YTD 1/1 - 9/30

Context: ~250 total yearly fatalities in NYC



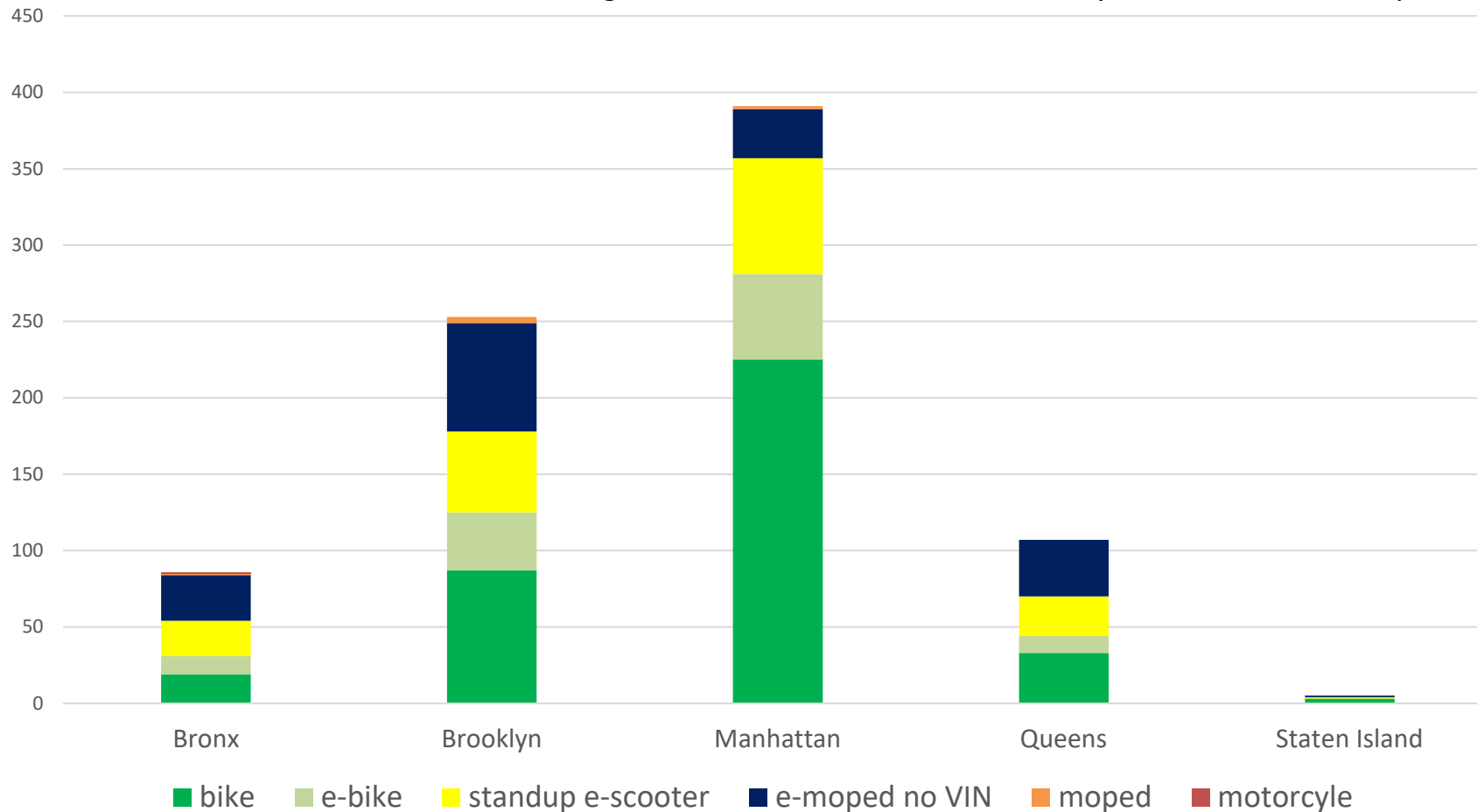
- Bronx & Queens much higher share of fatalities vs injuries
- Manhattan lower share of fatalities vs injuries

PEDESTRIANS STRUCK BY TWO-WHEELERS

Injuries by Borough 2022-2023 YTD 1/1 - 9/30

Context: ~50,000 total yearly injuries in NYC
Represents less than 1% of total

Large undercount as most events are very minor & not NYPD-reported



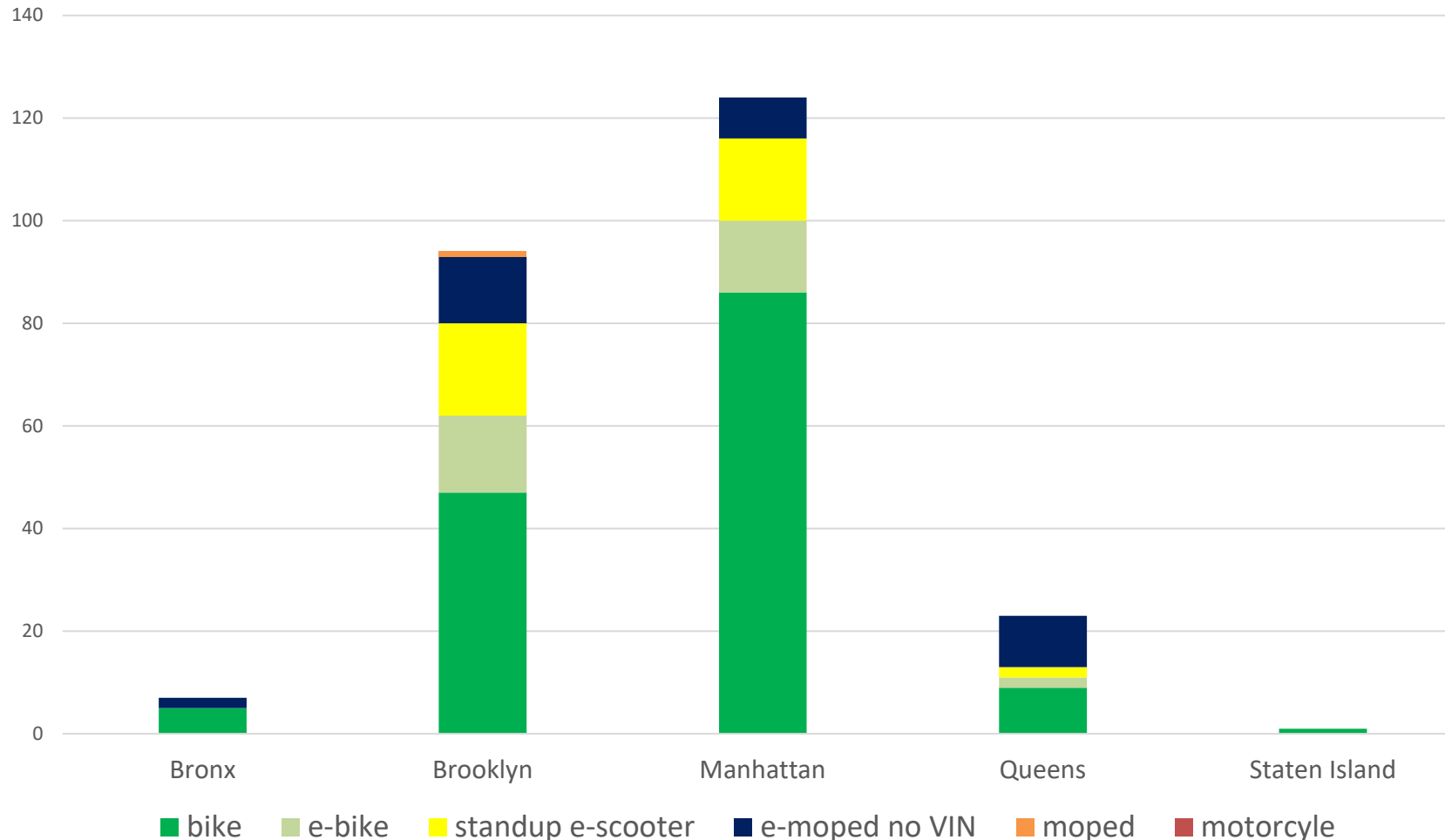
- Manhattan highest
- Traditional bikes largest share in Manhattan
- Brooklyn and Manhattan similar for motorized two-wheelers

BIKES STRUCK BY TWO-WHEELERS

Injuries by Borough 2022-2023 YTD 1/1 - 9/30

Context: ~50,000 total yearly injuries in NYC
Represents less than 1% of total

Large undercount as most events are very minor & not NYPD-reported



- Manhattan highest overall
- Traditional bikes largest share in Manhattan
- Brooklyn highest for motorized two-wheelers

NOTE: Does not include single-vehicle crashes

Motorcycle Injuries by NTA 2022-2023 (YTD Jan-Sept)

Injuries

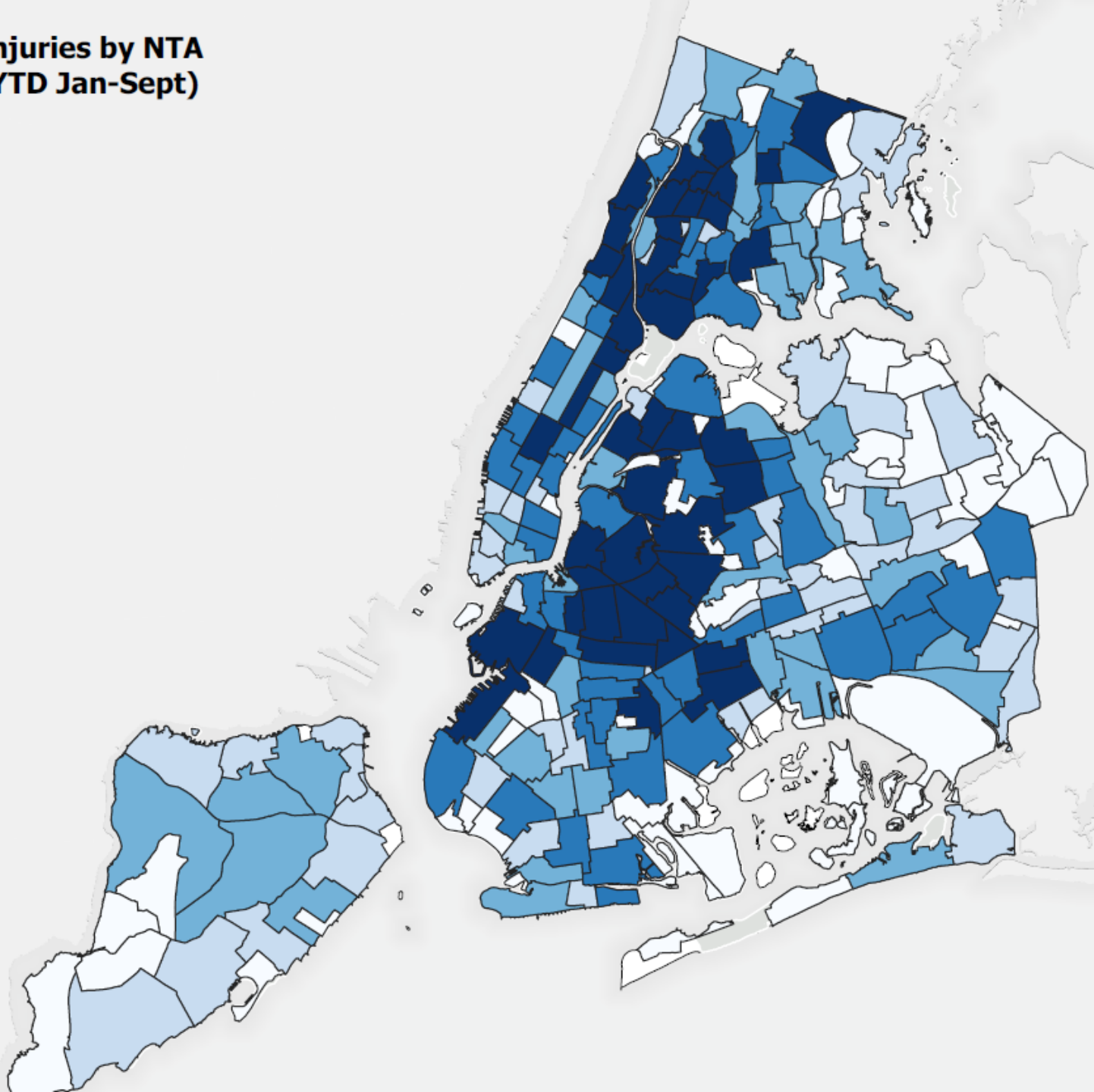
0 - 4

4 - 9

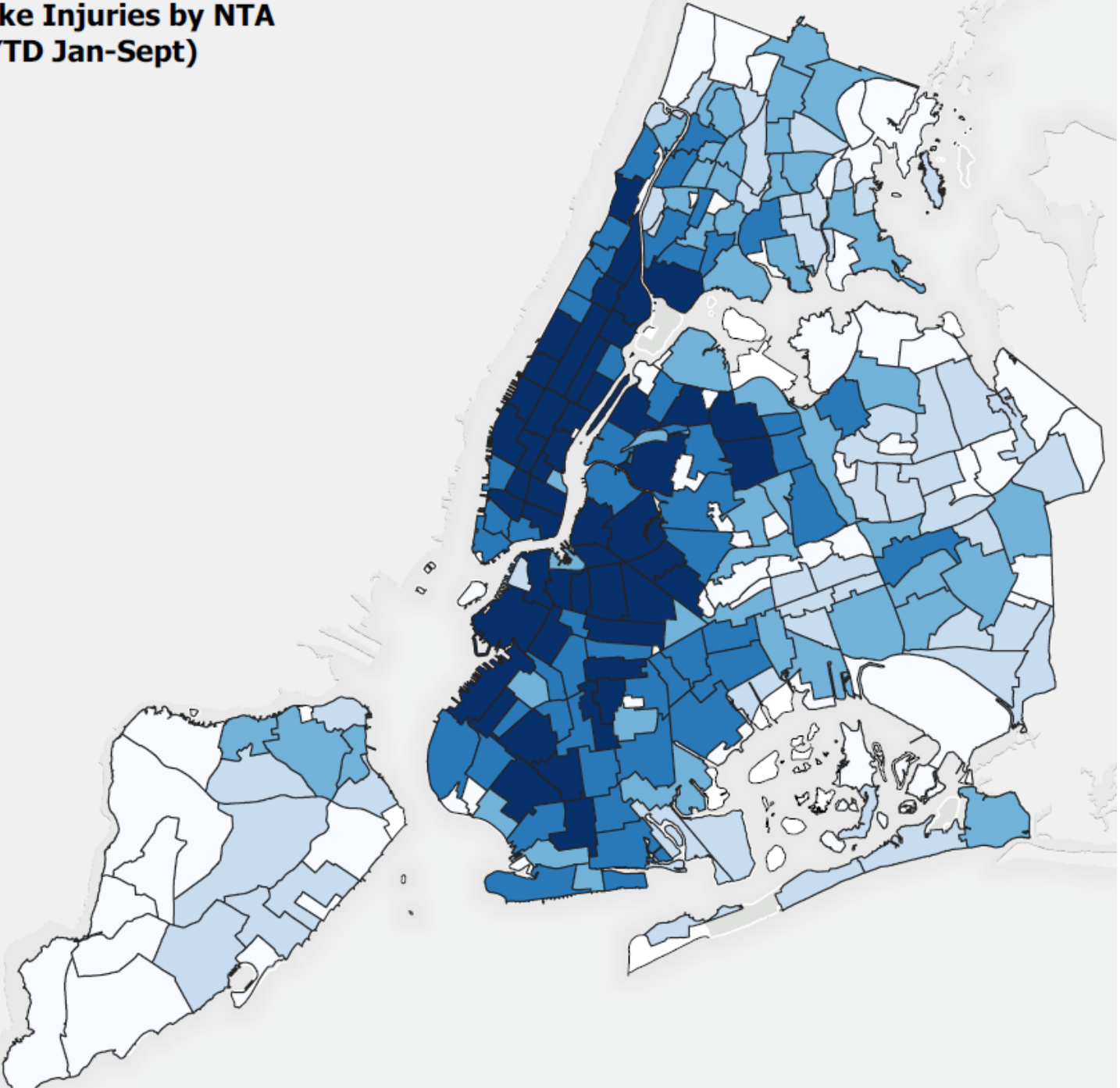
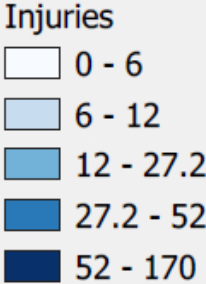
9 - 16

16 - 26

26 - 70

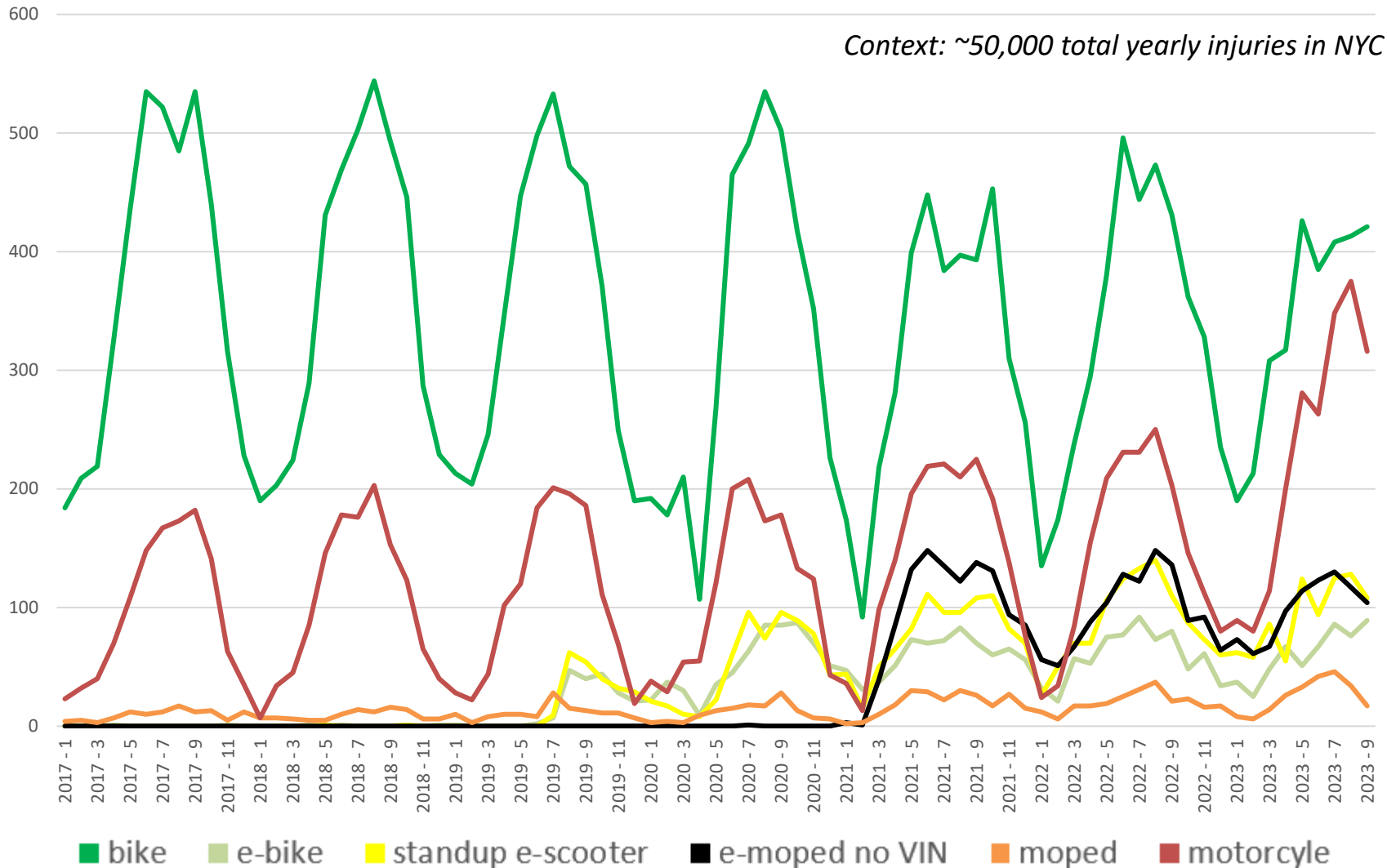


Traditional Bike Injuries by NTA 2022-2023 (YTD Jan-Sept)



BIKES & MOTORIZED TWO-WHEELERS

Injuries by Season 1/2017 – 09/2023



- All two-wheelers have similar seasonal variation
- Motorcycles have the most extreme seasonal pattern

NOTES

- Single vehicle crashes
- Shared mobility crashes (standup e-scooter and CitiBike)
- Comparisons to citibike data?
- Asylum seekers



Bikes & Motorized Two-Wheelers

Annual Crash Trends



Pedestrians and Bikes struck by Two-Wheelers

Annual Crash Trends



Bikes & Motorized Two-Wheelers

by Geography



Bikes & Motorized Two-Wheelers

Other Findings