



NORTH CAROLINA

Department of Transportation



Multimodal Innovations Webinar Series

November 12, 2020



- ✓ This session has been approved for 2 AICP CM Hours.
- ✓ The Reference Number is 9207860.
- ✓ Attendance is automatically recorded.

Multimodal Innovations Webinar Series



2020

Oct. 21

Wilson and Via launch RIDE – a new microtransit service
(recording is available)

Nov. 12

The Bicycle and Pedestrian Explosion in COVID: What is the data showing and how can we maintain it?

Dec. 15

Non-Motorized Policies and Programs – How are we doing and how do we compare with other states?

2021

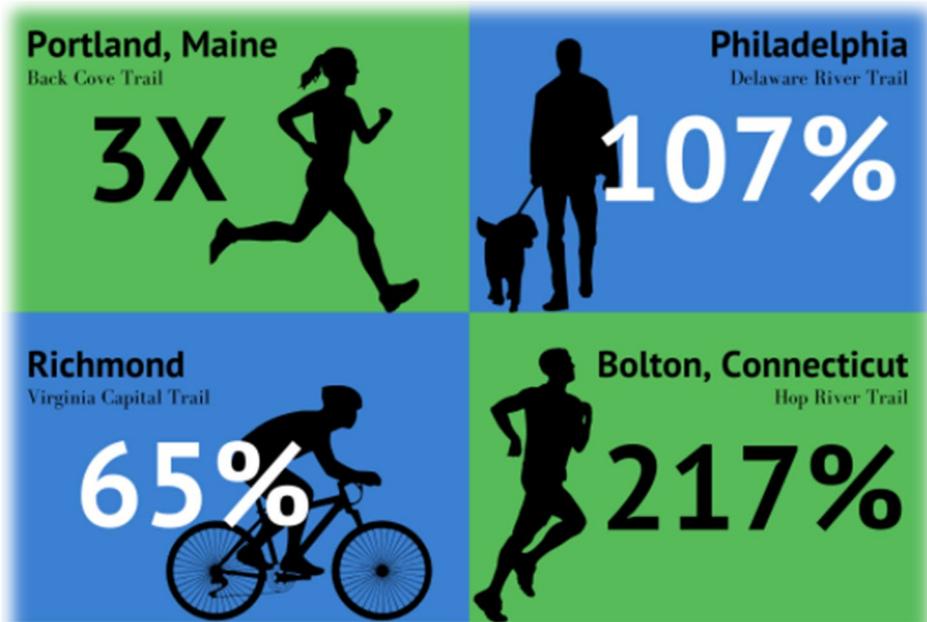
Jan. 26

S-Line: Leveraging new rail access and transit-oriented development to spur economic growth

Feb. 23

Charlotte Gateway Station: Learn how to develop an iconic multimodal station at any scale

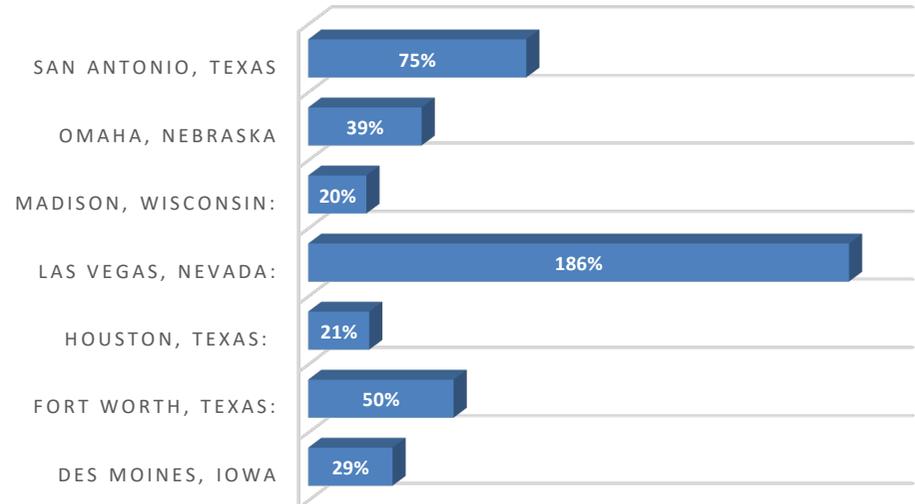
What we are seeing nationally?



Reported increase in trail use March 2019 to March 2020

East Coast Greenway Alliance | greenway.org

BCycle – Bike Sharing Systems



What we are hearing?



- *Charlotte Sees Bike Boom During Coronavirus Pandemic – Spectrum News, April 2020*
- *Cycling 'explosion': coronavirus fuels surge in US bike ridership – The Guardian, May 2020*
- *A survey of 932 U.S. adults, 9% of American adults say they rode a bike for the first time in a year, because of the pandemic. And a majority of those riders say they will continue riding after shelter-in-place orders are removed. – PeopleForBikes, June 2020*



What we are hearing?



- *Bicycles have enjoyed a boom during the pandemic. Will it last as car traffic resumes? – LA Times, June 2020*
- *Initiative closes off some streets in Durham to give residents more space outdoors – CBS17, October 2020*
- *67% of Austin voters cast ballots on November 2 supported Proposition B, a \$460 million active transportation bond meant to expand walking and biking networks throughout the city. – PeopleForBikes, November 2020*



Today's Speakers



- Blythe Carter Geiger & Brendan Kearns -
NC State – ITRE
- Haynes Bunn – Strava Metro
- Joe Michel, eBike Central



Impacts of COVID-19 on Bicycling and Walking in North Carolina

**Summary of Volume Trends
Observed by NC NMVDP
Counting Locations**

**Institute for Transportation Research and Education (ITRE)
Bicycle and Pedestrian Program**



NC STATE UNIVERSITY

November 12th, 2020



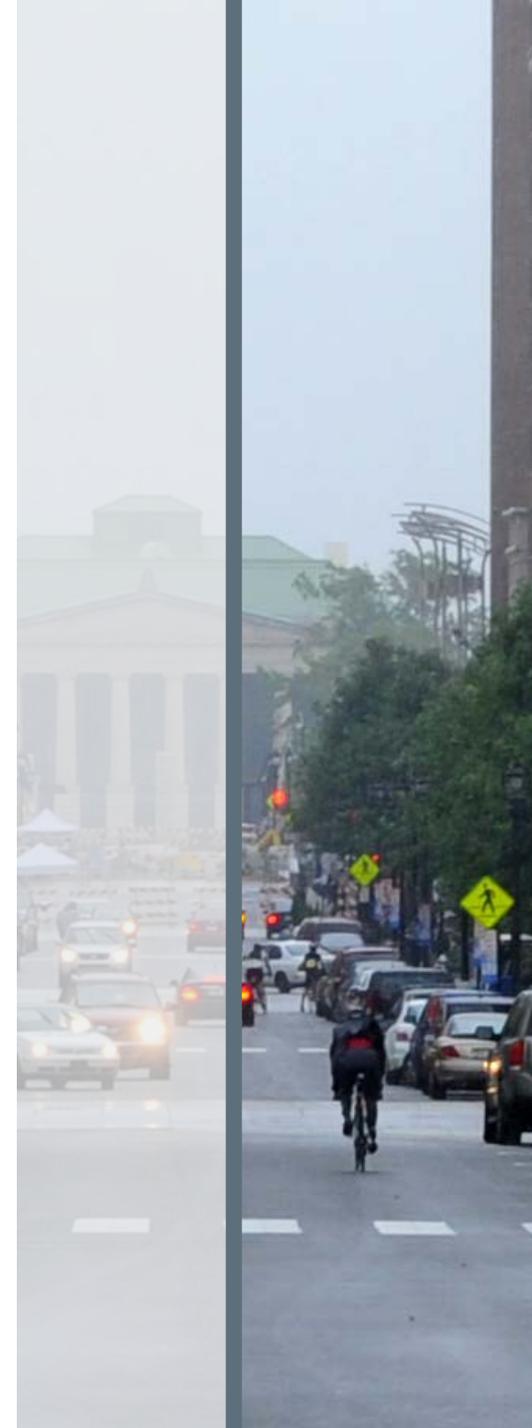


North Carolina's Non-Motorized Volume Data Program (NC NMVDP) is a research project to test a bicycle and pedestrian count protocol and replicate this methodology across the state.

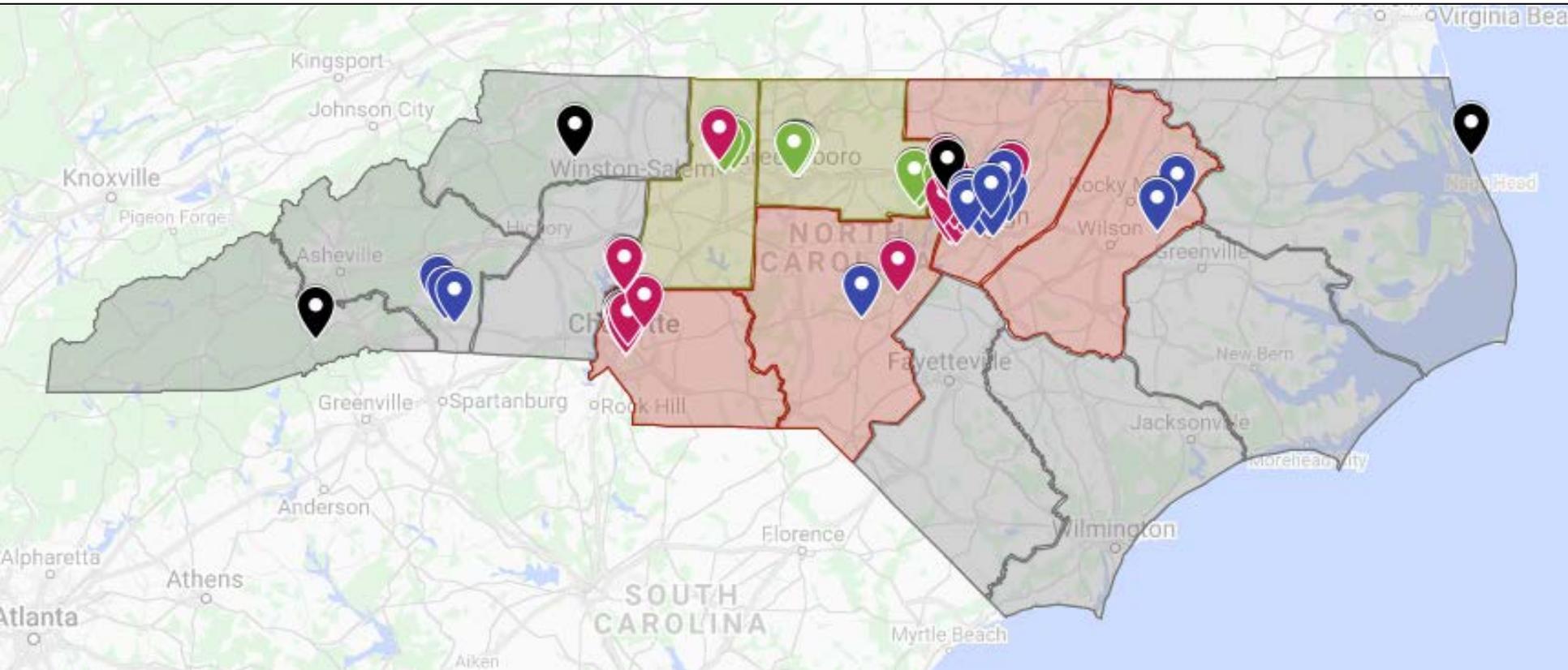


NCDOT Sponsored
Research Project

*What gets measured, gets done.
If you're not counted, you don't count!*



NC NMVDP Continuous Counter Locations



- *Data available from September 2014 to October 2020*
- *Data run through rigorous QA/QC process to identify counter malfunction*
- *A State of Emergency declaration in response to COVID-19 was implemented in North Carolina on **March 10, 2020***

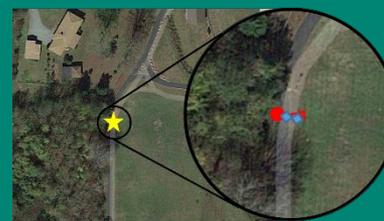
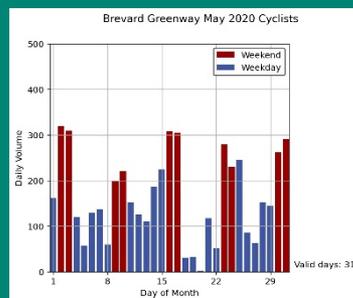
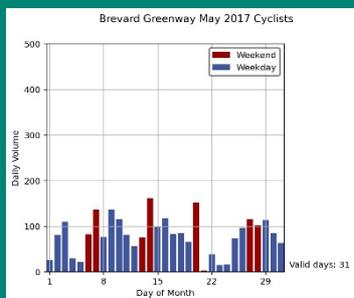


Changes in daily patterns indicate that **more people are taking recreational trips and less people are taking errands or commuting trips**

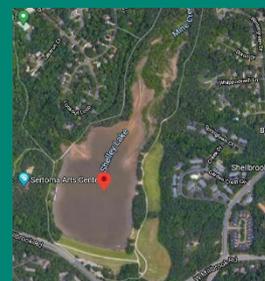
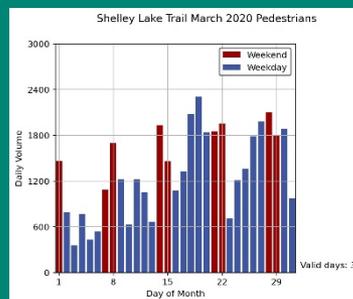
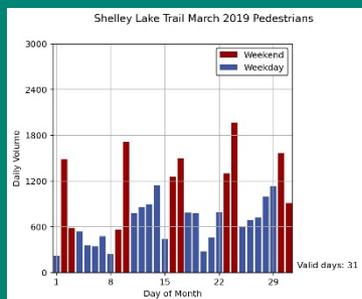




Recreational Trips

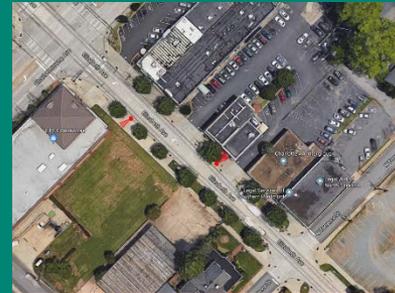
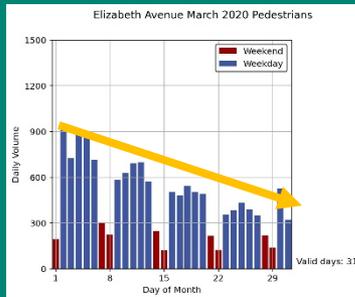
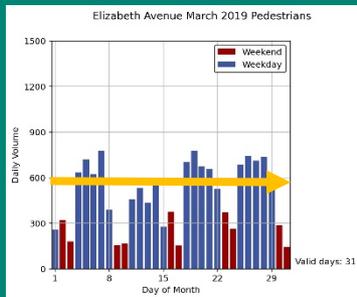


Increase on weekdays
Increase on weekends

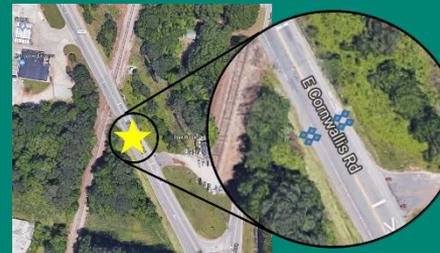
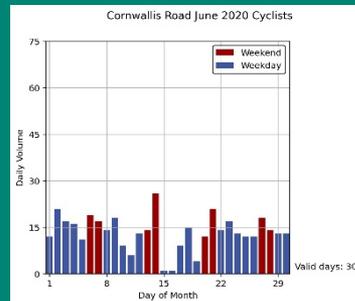
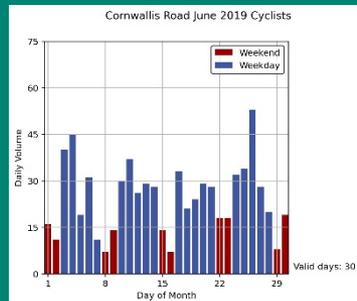


Increase on weekdays

Commercial & Commuting Trips



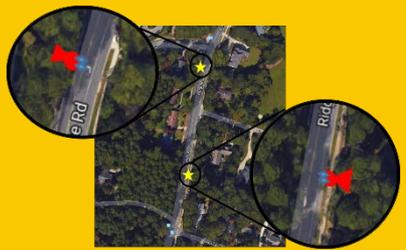
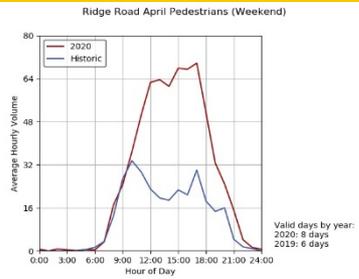
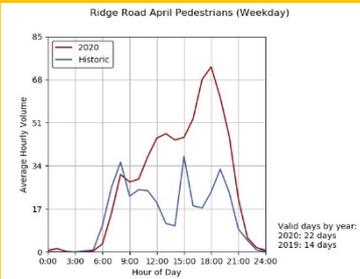
Decrease on weekdays
Decrease on weekends



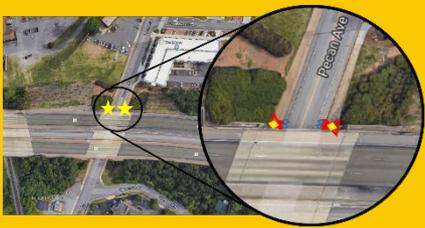
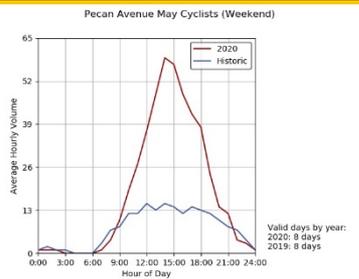
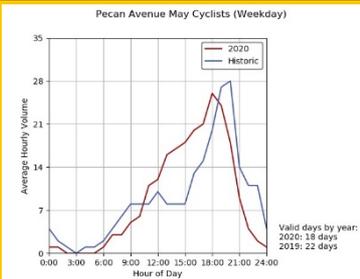
Decrease on weekdays
No change on weekends



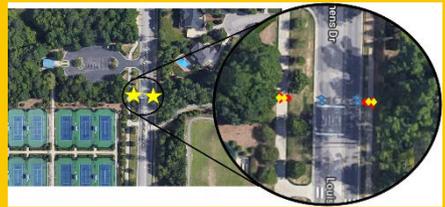
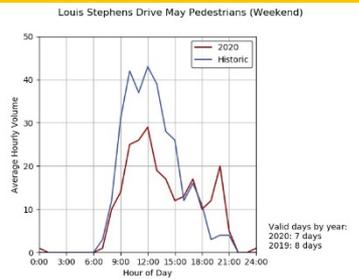
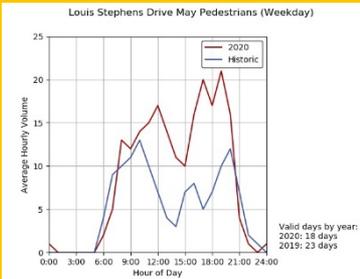
Changes in hourly volume patterns indicate context-dependent changes in trip purpose



Shift in hourly patterns
Increase in volumes on weekends
Increase in volumes on weekdays



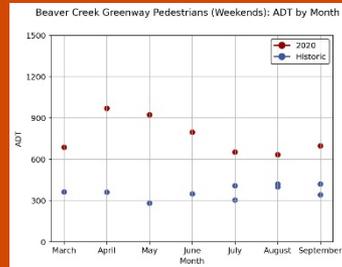
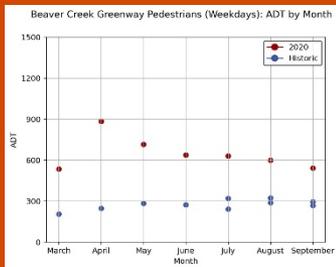
Increase in volumes on weekends



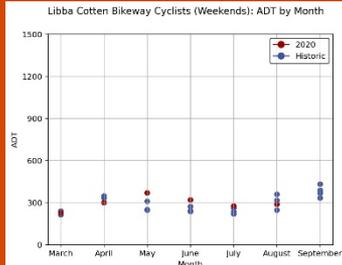
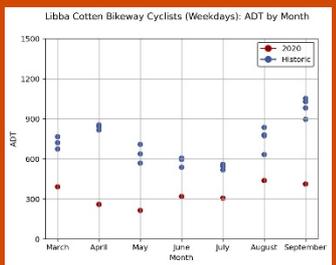
Increase in volumes on weekdays
Decrease in volumes on weekends



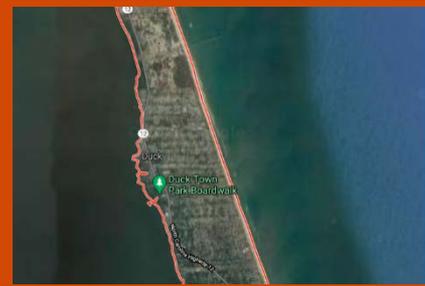
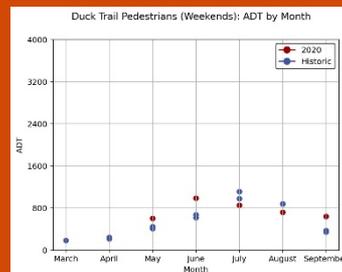
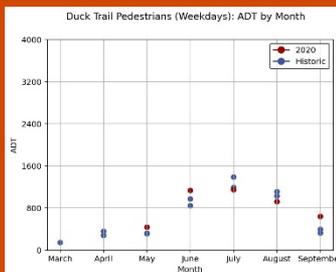
Changes in volume patterns **may continue**, although the **magnitude of these changes may decrease over time**



Initial large increase
Less increase over summer
Increase greater in fall



Continued weekday decrease
No change on weekends



Vacation season extended



Bicycling and walking volumes are **higher in certain areas and lower in others**



September 2020 Pedestrian MADT

Municipality	Station	Mode	Pre-2020	2020	MADT	Weekday	Weekend
Raleigh	Reedy Creek Trail on NCMA side of I-440 Ped Bridge	Ped	290	567	100%	58%	176%
Apex	Beaver Creek Greenway	Ped	312	582	89%	92%	84%
Raleigh	Neuse River Trail across from Buffalo Road Park	Ped	55	99	84%	59%	120%
Duck	Duck Trail	Ped	355	639	81%	79%	84%
Raleigh	House Creek Trail at Lake Boone Trail	Ped	131	211	65%	85%	41%
Winston-Salem	Salem Lake Greenway	Ped	512	796	60%	65%	56%
Raleigh	Neuse River Trail at Royal Forrest Drive	Ped	351	528	56%	45%	70%
Charlotte	Blue Line Trail	Ped	1890	2875	53%	61%	39%
Wake Forest	Main Street - Wake Forest	Ped	99	154	50%	42%	72%
Raleigh	Neuse River Greenway	Ped	332	478	49%	37%	65%
Raleigh	Mine Creek Trail at North Hills Drive	Ped	110	152	41%	47%	32%
Sanford	Endor Iron Furnace Greenway	Ped	133	181	35%	37%	29%
Winston-Salem	West End Boulevard	Ped	396	524	31%	28%	40%
Raleigh	Rocky Branch Trail at Dorothea Drive	Ped	109	139	25%	17%	49%
Apex	Olive Chapel Road	Ped	132	161	21%	22%	20%
Apex	Louis Stephens Drive	Ped	176	210	16%	35%	-9%
Wilkesboro	Yadkin River Greenway	Ped	239	279	16%	4%	53%
Raleigh	Ridge Road	Ped	367	425	14%	2%	53%
Apex	Salem Street	Ped	1570	1761	13%	-3%	40%
Durham	American Tobacco Trail at Highgate Road	Ped	367	393	9%	14%	2%
Davidson	Griffith Street	Ped	308	340	8%	-11%	89%
Brevard	Brevard Greenway	Ped	181	194	6%	0%	22%
Durham	Main Street - Durham	Ped	431	444	5%	38%	-29%
Carrboro	Old NC Highway 86	Ped	76	79	3%	-2%	15%
Raleigh	Crabtree Creek Trail at Crabtree Boulevard	Ped	37	35	-6%	-15%	15%
Greensboro	Walker Avenue	Ped	1078	922	-13%	-17%	-6%
Charlotte	Stonewall Street	Ped	290	221	-24%	-27%	-17%
Davidson	S Main Street	Ped	2080	1484	-26%	-35%	-12%
Carrboro	Libba Cotten Greenway	Ped	366	270	-28%	-32%	-16%
Winston-Salem	The Strollway	Ped	260	183	-30%	-36%	-13%
Raleigh	Hargett Street	Ped	366	233	-37%	-38%	-33%
Charlotte	University City Boulevard Sidepath	Ped	330	208	-38%	-42%	-15%
Raleigh	Cameron Street	Ped	1096	657	-40%	-44%	-31%
Greensboro	S Elm Street	Ped	3536	1873	-48%	-49%	-45%
Winston-Salem	W 4th Street	Ped	4519	2155	-52%	-47%	-59%
Greensboro	Spring Garden Street	Ped	1234	599	-53%	-58%	-25%
Raleigh	Hillsborough Street	Ped	1868	875	-54%	-60%	-26%
Charlotte	N Tryon Street	Ped	587	244	-58%	-63%	-45%
Charlotte	Elizabeth Avenue	Ped	507	161	-70%	-74%	-28%





Recreational Shared-Use Paths



Municipality	Station	Mode	Pre-2020	2020	MADT	Weekday	Weekend
Raleigh	Reedy Creek Trail on NCMA side of I-440 Bridge	Ped	290	567	100%	58%	176%
Apex	Beaver Creek Greenway	Ped	312	582	89%	92%	84%
Raleigh	Neuse River Trail across from Buffalo Road Park	Ped	55	99	84%	59%	120%
Duck	Duck Trail	Ped	355	639	81%	79%	84%
Raleigh	House Creek Trail at Lake Boone Trail	Ped	131	211	65%	85%	41%
Winston-Salem	Salem Lake Greenway	Ped	512	796	60%	65%	56%
Raleigh	Neuse River Trail at Royal Forrest Drive	Ped	351	528	56%	45%	70%
Charlotte	Blue Line Trail	Ped	1890	2875	53%	61%	39%
Wake Forest	Main Street - Wake Forest	Ped	99	154	50%	42%	72%
Raleigh	Neuse River Greenway	Ped	332	478	49%	37%	65%
Raleigh	Mine Creek Trail at North Hills Drive	Ped	110	152	41%	47%	32%
Sanford	Endor Iron Furnace Greenway	Ped	133	181	35%	37%	29%
Winston-Salem	West End Boulevard	Ped	396	524	31%	28%	40%
Raleigh	Rocky Branch Trail at Dorothea Drive	Ped	109	139	25%	17%	49%
Apex	Olive Chapel Road	Ped	132	161	21%	22%	20%
Apex	Louis Stephens Drive	Ped	176	210	16%	35%	-9%
Wilkesboro	Yadkin River Greenway	Ped	239	279	16%	4%	53%
Raleigh	Ridge Road	Ped	367	425	14%	2%	53%
Apex	Salem Street	Ped	1570	1761	13%	-3%	40%
Durham	American Tobacco Trail at Highgate Road	Ped	367	393	9%	14%	2%
Davidson	Griffith Street	Ped	308	340	8%	-11%	89%
Brevard	Brevard Greenway	Ped	181	194	6%	0%	22%
Durham	Main Street - Durham	Ped	431	444	5%	38%	-29%
Carrboro	Old NC Highway 86	Ped	76	79	3%	-2%	15%
Raleigh	Crabtree Creek Trail at Crabtree Boulevard	Ped	37	35	-6%	-15%	15%
Greensboro	Walker Avenue	Ped	1078	922	-13%	-17%	-6%
Charlotte	Stonewall Street	Ped	290	221	-24%	-17%	-17%
Davidson	S Main Street	Ped	2080	1484	-26%	-35%	-12%
Carrboro	Libba Cotten Greenway	Ped	366	270	-28%	-32%	-16%
Winston-Salem	The Strollway	Ped	260	183	-30%	-36%	-13%
Raleigh	Hargett Street	Ped	366	233	-37%	-38%	-33%
Charlotte	University City Boulevard Sidepath	Ped	330	208	-38%	-42%	-15%
Raleigh	Cameron Street	Ped	1096	657	-40%	-44%	-31%
Greensboro	S Elm Street	Ped	3536	1873	-48%	-49%	-45%
Winston-Salem	W 4th Street	Ped	4519	2155	-52%	-47%	-59%
Greensboro	Spring Garden Street	Ped	1234	599	-53%	-58%	-25%
Raleigh	Hillsborough Street	Ped	1868	875	-54%	-60%	-26%
Charlotte	N Tryon Street	Ped	587	244	-58%	-63%	-45%
Charlotte	Elizabeth Avenue	Ped	507	161	-70%	-74%	-28%





Residential Sidewalks



Municipality	Station	Mode	Pre-2020	2020	MADT	Weekday	Weekend
Raleigh	Reedy Creek Trail on NCMA side of I-440 Bridge	Ped	290	567	100%	58%	176%
Apex	Beaver Creek Greenway	Ped	312	582	89%	92%	84%
Raleigh	Neuse River Trail across from Buffalo Road Park	Ped	55	99	84%	59%	120%
Duck	Duck Trail	Ped	355	639	81%	79%	84%
Raleigh	House Creek Trail at Lake Boone Trail	Ped	131	211	65%	85%	41%
Winston-Salem	Salem Lake Greenway	Ped	512	796	60%	65%	56%
Raleigh	Neuse River Trail at Royal Forrest Drive	Ped	351	528	56%	45%	70%
Charlotte	Blue Line Trail	Ped	1890	2875	53%	61%	39%
Wake Forest	Main Street - Wake Forest	Ped	99	154	50%	42%	72%
Raleigh	Neuse River Greenway	Ped	332	478	49%	37%	65%
Raleigh	Mine Creek Trail at North Hills Drive	Ped	110	152	41%	47%	32%
Sanford	Endor Iron Furnace Greenway	Ped	133	181	35%	37%	29%
Winston-Salem	West End Boulevard	Ped	396	524	31%	28%	40%
Raleigh	Rocky Branch Trail at Dorothea Drive	Ped	109	139	25%	17%	49%
Apex	Olive Chapel Road	Ped	132	161	21%	22%	20%
Apex	Louis Stephens Drive	Ped	176	210	16%	35%	-9%
Wilkesboro	Yadkin River Greenway	Ped	239	279	16%	4%	53%
Raleigh	Ridge Road	Ped	367	425	14%	2%	53%
Apex	Salem Street	Ped	1570	1761	13%	-3%	40%
Durham	American Tobacco Trail at Highgate Road	Ped	367	393	9%	14%	2%
Davidson	Griffith Street	Ped	308	340	8%	-11%	89%
Brevard	Brevard Greenway	Ped	181	194	6%	0%	22%
Durham	Main Street - Durham	Ped	431	444	5%	38%	-29%
Carboro	Old NC Highway 86	Ped	76	79	3%	-2%	15%
Raleigh	Crabtree Creek Trail at Crabtree Boulevard	Ped	37	35	-6%	-15%	15%
Greensboro	Walker Avenue	Ped	1078	922	-13%	-17%	-6%
Charlotte	Stonewall Street	Ped	290	221	-24%	-27%	-17%
Davidson	S Main Street	Ped	2080	1484	-26%	-35%	-12%
Carboro	Libba Cotten Greenway	Ped	366	270	-28%	-32%	-16%
Winston-Salem	The Strollway	Ped	260	183	-30%	-36%	-13%
Raleigh	Hargett Street	Ped	366	233	-37%	-38%	-33%
Charlotte	University City Boulevard Sidepath	Ped	330	208	-38%	-42%	-15%
Raleigh	Cameron Street	Ped	1096	657	-40%	-44%	-31%
Greensboro	S Elm Street	Ped	3536	1873	-48%	-49%	-45%
Winston-Salem	W 4th Street	Ped	4519	2155	-52%	-47%	-59%
Greensboro	Spring Garden Street	Ped	1234	599	-53%	-58%	-25%
Raleigh	Hillsborough Street	Ped	1868	875	-54%	-60%	-26%
Charlotte	N Tryon Street	Ped	587	244	-58%	-63%	-45%
Charlotte	Elizabeth Avenue	Ped	507	161	-70%	-74%	-28%



Business Districts



Municipality	Station	Mode	Pre-2020	2020	MADT	Weekday	Weekend
Raleigh	Reedy Creek Trail on NCMA side of I-440 Bridge	Ped	290	567	100%	58%	176%
Apex	Beaver Creek Greenway	Ped	312	582	89%	92%	84%
Raleigh	Neuse River Trail across from Buffalo Road Park	Ped	55	99	84%	59%	120%
Duck	Duck Trail	Ped	355	639	81%	79%	84%
Raleigh	House Creek Trail at Lake Boone Trail	Ped	131	211	65%	85%	41%
Winston-Salem	Salem Lake Greenway	Ped	512	796	60%	65%	56%
Raleigh	Neuse River Trail at Royal Forrest Drive	Ped	351	528	56%	45%	70%
Charlotte	Blue Line Trail	Ped	1890	2875	53%	61%	39%
Wake Forest	Main Street - Wake Forest	Ped	99	154	50%	42%	72%
Raleigh	Neuse River Greenway	Ped	332	478	49%	37%	65%
Raleigh	Mine Creek Trail at North Hills Drive	Ped	110	152	41%	47%	32%
Sanford	Endor Iron Furnace Greenway	Ped	133	181	35%	37%	29%
Winston-Salem	West End Boulevard	Ped	396	524	31%	28%	40%
Raleigh	Rocky Branch Trail at Dorothea Drive	Ped	109	139	25%	17%	49%
Apex	Olive Chapel Road	Ped	132	161	21%	22%	20%
Apex	Louis Stephens Drive	Ped	176	210	16%	35%	-9%
Wilkesboro	Yadkin River Greenway	Ped	239	279	16%	4%	53%
Raleigh	Ridge Road	Ped	367	425	14%	2%	53%
Apex	Salem Street	Ped	1570	1761	13%	-3%	40%
Durham	American Tobacco Trail at Highgate Road	Ped	367	393	9%	14%	2%
Davidson	Griffith Street	Ped	308	340	8%	-11%	89%
Brevard	Brevard Greenway	Ped	181	194	6%	0%	22%
Durham	Main Street - Durham	Ped	431	444	5%	38%	-29%
Carrboro	Old NC Highway 86	Ped	76	79	3%	-2%	15%
Raleigh	Crabtree Creek Trail at Crabtree Boulevard	Ped	37	35	-6%	-15%	15%
Greensboro	Walker Avenue	Ped	1078	922	-13%	-17%	-6%
Charlotte	Stonewall Street	Ped	290	221	-24%	-27%	-17%
Davidson	S Main Street	Ped	2080	1484	-26%	-35%	-12%
Carrboro	Libba Cotten Greenway	Ped	366	270	-28%	-32%	-16%
Winston-Salem	The Strollway	Ped	260	183	-30%	-36%	-13%
Raleigh	Hargett Street	Ped	366	233	-37%	-38%	-33%
Charlotte	University City Boulevard Sidepath	Ped	330	208	-38%	-42%	-15%
Raleigh	Cameron Street	Ped	1096	657	-40%	-44%	-31%
Greensboro	S Elm Street	Ped	3536	1873	-48%	-49%	-45%
Winston-Salem	W 4th Street	Ped	4519	2155	-52%	-47%	-59%
Greensboro	Spring Garden Street	Ped	1234	599	-53%	-58%	-25%
Raleigh	Hillsborough Street	Ped	1868	875	-54%	-60%	-26%
Charlotte	N Tryon Street	Ped	587	244	-58%	-63%	-45%
Charlotte	Elizabeth Avenue	Ped	507	161	-70%	-74%	-28%





University Commute Corridors



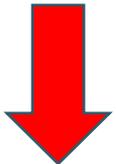
Municipality	Station	Mode	Pre-2020	2020	MADT	Weekday	Weekend
Raleigh	Reedy Creek Trail on NCMA side of I-440 Bridge	Ped	290	567	100%	58%	176%
Apex	Beaver Creek Greenway	Ped	312	582	89%	92%	84%
Raleigh	Neuse River Trail across from Buffalo Road Park	Ped	55	99	84%	59%	120%
Duck	Duck Trail	Ped	355	639	81%	79%	84%
Raleigh	House Creek Trail at Lake Boone Trail	Ped	131	211	65%	85%	41%
Winston-Salem	Salem Lake Greenway	Ped	512	796	60%	65%	56%
Raleigh	Neuse River Trail at Royal Forrest Drive	Ped	351	528	56%	45%	70%
Charlotte	Blue Line Trail	Ped	1890	2875	53%	61%	39%
Wake Forest	Main Street - Wake Forest	Ped	99	154	50%	42%	72%
Raleigh	Neuse River Greenway	Ped	332	478	49%	37%	65%
Raleigh	Mine Creek Trail at North Hills Drive	Ped	110	152	41%	47%	32%
Sanford	Endor Iron Furnace Greenway	Ped	133	181	35%	37%	29%
Winston-Salem	West End Boulevard	Ped	396	524	31%	28%	40%
Raleigh	Rocky Branch Trail at Dorothea Drive	Ped	109	139	25%	17%	49%
Apex	Olive Chapel Road	Ped	132	161	21%	22%	20%
Apex	Louis Stephens Drive	Ped	176	210	16%	35%	-9%
Wilkesboro	Yadkin River Greenway	Ped	239	279	16%	4%	53%
Raleigh	Ridge Road	Ped	367	425	14%	2%	53%
Apex	Salem Street	Ped	1570	1761	13%	-3%	40%
Durham	American Tobacco Trail at Highgate Road	Ped	367	393	9%	14%	2%
Davidson	Griffith Street	Ped	308	340	8%	-11%	89%
Brevard	Brevard Greenway	Ped	181	194	6%	0%	22%
Durham	Main Street - Durham	Ped	431	444	5%	38%	-29%
Carboro	Old NC Highway 86	Ped	76	79	3%	-2%	15%
Raleigh	Crabtree Creek Trail at Crabtree Boulevard	Ped	37	35	-6%	-15%	15%
Greensboro	Walker Avenue	Ped	1078	922	-13%	-17%	-6%
Charlotte	Stonewall Street	Ped	290	221	-24%	-27%	-17%
Davidson	S Main Street	Ped	2080	1484	-26%	-35%	-12%
Carboro	Libba Cotten Greenway	Ped	366	270	-28%	-32%	-16%
Winston-Salem	The Strollway	Ped	260	183	-30%	-36%	-13%
Raleigh	Hargett Street	Ped	366	233	-37%	-38%	-33%
Charlotte	University City Boulevard Sidepath	Ped	330	208	-38%	-42%	-15%
Raleigh	Cameron Street	Ped	1096	657	-40%	-44%	-31%
Greensboro	S Elm Street	Ped	3536	1873	-48%	-49%	-45%
Winston-Salem	W 4th Street	Ped	4519	2155	-52%	-47%	-59%
Greensboro	Spring Garden Street	Ped	1234	599	-53%	-58%	-25%
Raleigh	Hillsborough Street	Ped	1868	875	-54%	-60%	-26%
Charlotte	N Tryon Street	Ped	587	244	-58%	-63%	-45%
Charlotte	Elizabeth Avenue	Ped	507	161	-70%	-74%	-28%



Downtown Access Points



Municipality	Station	Mode	Pre-2020	2020	MADT	Weekday	Weekend
Raleigh	Reedy Creek Trail on NCMA side of I-440 Bridge	Ped	290	567	100%	58%	176%
Apex	Beaver Creek Greenway	Ped	312	582	89%	92%	84%
Raleigh	Neuse River Trail across from Buffalo Road Park	Ped	55	99	84%	59%	120%
Duck	Duck Trail	Ped	355	639	81%	79%	84%
Raleigh	House Creek Trail at Lake Boone Trail	Ped	131	211	65%	85%	41%
Winston-Salem	Salem Lake Greenway	Ped	512	796	60%	65%	56%
Raleigh	Neuse River Trail at Royal Forrest Drive	Ped	351	528	56%	45%	70%
Charlotte	Blue Line Trail	Ped	1890	2875	53%	61%	39%
Wake Forest	Main Street - Wake Forest	Ped	99	154	50%	42%	72%
Raleigh	Neuse River Greenway	Ped	332	478	49%	37%	65%
Raleigh	Mine Creek Trail at North Hills Drive	Ped	110	152	41%	47%	32%
Sanford	Endor Iron Furnace Greenway	Ped	133	181	35%	37%	29%
Winston-Salem	West End Boulevard	Ped	396	524	31%	28%	40%
Raleigh	Rocky Branch Trail at Dorothea Drive	Ped	109	139	25%	17%	49%
Apex	Olive Chapel Road	Ped	132	161	21%	22%	20%
Apex	Louis Stephens Drive	Ped	176	210	16%	35%	-9%
Wilkesboro	Yadkin River Greenway	Ped	239	279	16%	4%	53%
Raleigh	Ridge Road	Ped	367	425	14%	2%	53%
Apex	Salem Street	Ped	1570	1761	13%	-3%	40%
Durham	American Tobacco Trail at Highgate Road	Ped	367	393	9%	14%	2%
Davidson	Griffith Street	Ped	308	340	8%	-11%	89%
Brevard	Brevard Greenway	Ped	181	194	6%	0%	22%
Durham	Main Street - Durham	Ped	431	444	5%	38%	-29%
Carrboro	Old NC Highway 86	Ped	76	79	3%	-2%	15%
Raleigh	Crabtree Creek Trail at Crabtree Boulevard	Ped	37	35	-6%	-15%	15%
Greensboro	Walker Avenue	Ped	1078	922	-13%	-17%	-6%
Charlotte	Stonewall Street	Ped	290	221	-24%	-27%	-17%
Davidson	S Main Street	Ped	2080	1484	-26%	-35%	-12%
Carrboro	Libba Cotten Greenway	Ped	366	270	-28%	-32%	-16%
Winston-Salem	The Strollway	Ped	260	183	-30%	-36%	-13%
Raleigh	Hargett Street	Ped	366	233	-37%	-38%	-33%
Charlotte	University City Boulevard Sidepath	Ped	330	208	-38%	-42%	-15%
Raleigh	Cameron Street	Ped	1096	657	-40%	-44%	-31%
Greensboro	S Elm Street	Ped	3536	1873	-48%	-49%	-45%
Winston-Salem	W 4th Street	Ped	4519	2155	-52%	-47%	-59%
Greensboro	Spring Garden Street	Ped	1234	599	-53%	-58%	-25%
Raleigh	Hillsborough Street	Ped	1868	875	-54%	-60%	-26%
Charlotte	N Tryon Street	Ped	587	244	-58%	-63%	-45%
Charlotte	Elizabeth Avenue	Ped	507	161	-70%	-74%	-28%



September 2020 Bicycle MADT

Municipality	Station	Mode	Pre-2020	2020	% +/-	Weekday	Weekend
Winston-Salem	West End Boulevard	Bike	29	87	200%	199%	203%
Apex	Beaver Creek Greenway	Bike	48	115	138%	171%	96%
Wilkesboro	Yadkin River Greenway	Bike	54	124	127%	100%	178%
Raleigh	Crabtree Creek Trail at Crabtree Boulevard	Bike	41	91	122%	90%	152%
Brevard	Brevard Greenway	Bike	95	168	76%	61%	98%
Raleigh	Reedy Creek Trail on NCMA side of I-440 Ped Bridge	Bike	179	309	73%	57%	94%
Durham	American Tobacco Trail at Highgate Road	Bike	324	555	71%	65%	77%
Raleigh	House Creek Trail at Lake Boone Trail	Bike	109	185	70%	57%	89%
Raleigh	Neuse River Trail at Royal Forrest Drive	Bike	395	654	65%	54%	81%
Raleigh	Shelley Lake Trail on the east side of Shelley Lake	Bike	103	167	62%	59%	66%
Raleigh	Neuse River Greenway	Bike	379	612	62%	53%	73%
Raleigh	Neuse River Trail across from Buffalo Road Park	Bike	369	556	51%	49%	52%
Duck	Duck Trail	Bike	262	355	35%	41%	25%
Greensboro	Walker Avenue	Bike	31	37	21%	12%	45%
Cary	New Hope Church Road	Bike	45	52	16%	17%	16%
Raleigh	Mine Creek Trail at North Hills Drive	Bike	117	127	8%	10%	6%
Winston-Salem	Salem Lake Greenway	Bike	199	209	5%	-3%	15%
Sanford	Endor Iron Furnace Greenway	Bike	14	15	3%	16%	-9%
Raleigh	Rocky Branch Trail at Dorothea Drive	Bike	110	104	-5%	-19%	24%
Durham	Main Street - Durham	Bike	191	181	-5%	-18%	41%
Charlotte	Selwyn Avenue	Bike	54	50	-6%	-21%	11%
Charlotte	Stonewall Street	Bike	44	35	-20%	-28%	-3%
Greensboro	S Elm Street	Bike	95	57	-40%	-46%	-27%
Winston-Salem	The Strollway	Bike	20	11	-42%	-46%	-34%
Durham	Cornwallis Road	Bike	20	12	-43%	-63%	65%
Greensboro	Spring Garden Street	Bike	160	91	-43%	-49%	-20%
Carrboro	Libba Cotten Greenway	Bike	817	383	-53%	-59%	-17%
Charlotte	University City Boulevard Sidepath	Bike	87	19	-78%	-81%	-57%



Recreational Shared-Use Paths



Municipality	Station	Mode	Pre-2020	2020	% +/-	Weekday	Weekend
Winston-Salem	West End Boulevard	Bike	29	87	200%	199%	203%
Apex	Beaver Creek Greenway	Bike	48	115	138%	171%	96%
Wilkesboro	Yadkin River Greenway	Bike	54	124	127%	100%	178%
Raleigh	Crabtree Creek Trail at Crabtree Boulevard	Bike	41	91	122%	90%	152%
Brevard	Brevard Greenway	Bike	95	168	76%	61%	98%
Raleigh	Reedy Creek Trail on NCMA side of I-440 Ped Bridge	Bike	179	309	73%	57%	94%
Durham	American Tobacco Trail at Highgate Road	Bike	324	555	71%	65%	77%
Raleigh	House Creek Trail at Lake Boone Trail	Bike	109	185	70%	57%	89%
Raleigh	Neuse River Trail at Royal Forrest Drive	Bike	395	654	65%	54%	81%
Raleigh	Shelley Lake Trail on the east side of Shelley Lake	Bike	103	167	62%	59%	66%
Raleigh	Neuse River Greenway	Bike	379	612	62%	53%	73%
Raleigh	Neuse River Trail across from Buffalo Road Park	Bike	369	556	51%	49%	52%
Duck	Duck Trail	Bike	262	355	35%	41%	25%
Greensboro	Walker Avenue	Bike	31	37	21%	12%	45%
Cary	New Hope Church Road	Bike	45	52	16%	17%	16%
Raleigh	Mine Creek Trail at North Hills Drive	Bike	117	127	8%	10%	6%
Winston-Salem	Salem Lake Greenway	Bike	199	209	5%	-3%	15%
Sanford	Endor Iron Furnace Greenway	Bike	14	15	3%	16%	-9%
Raleigh	Rocky Branch Trail at Dorothea Drive	Bike	110	104	-5%	-19%	24%
Durham	Main Street - Durham	Bike	191	181	-5%	-18%	41%
Charlotte	Selwyn Avenue	Bike	54	50	-6%	-21%	11%
Charlotte	Stonewall Street	Bike	44	35	-20%	-28%	-3%
Greensboro	S Elm Street	Bike	95	57	-40%	-46%	-27%
Winston-Salem	The Strollway	Bike	20	11	-42%	-46%	-34%
Durham	Cornwallis Road	Bike	20	12	-43%	-63%	65%
Greensboro	Spring Garden Street	Bike	160	91	-43%	-49%	-20%
Carrboro	Libba Cotten Greenway	Bike	817	383	-53%	-59%	-17%
Charlotte	University City Boulevard Sidepath	Bike	87	19	-78%	-81%	-57%



Residential/Suburban Roadways



Municipality	Station	Mode	Pre-2020	2020	% +/-	Weekday	Weekend
Winston-Salem	West End Boulevard	Bike	29	87	200%	199%	203%
Apex	Beaver Creek Greenway	Bike	48	115	138%	171%	96%
Wilkesboro	Yadkin River Greenway	Bike	54	124	127%	100%	178%
Raleigh	Crabtree Creek Trail at Crabtree Boulevard	Bike	41	91	122%	90%	152%
Brevard	Brevard Greenway	Bike	95	168	76%	61%	98%
Raleigh	Reedy Creek Trail on NCMA side of I-440 Ped Bridge	Bike	179	309	73%	57%	94%
Durham	American Tobacco Trail at Highgate Road	Bike	324	555	71%	65%	77%
Raleigh	House Creek Trail at Lake Boone Trail	Bike	109	185	70%	57%	89%
Raleigh	Neuse River Trail at Royal Forrest Drive	Bike	395	654	65%	54%	81%
Raleigh	Shelley Lake Trail on the east side of Shelley Lake	Bike	103	167	62%	59%	66%
Raleigh	Neuse River Greenway	Bike	379	612	62%	53%	73%
Raleigh	Neuse River Trail across from Buffalo Road Park	Bike	369	556	51%	49%	52%
Duck	Duck Trail	Bike	262	355	35%	41%	25%
Greensboro	Walker Avenue	Bike	31	37	21%	12%	45%
Cary	New Hope Church Road	Bike	45	52	16%	17%	16%
Raleigh	Mine Creek Trail at North Hills Drive	Bike	117	127	8%	10%	6%
Winston-Salem	Salem Lake Greenway	Bike	199	209	5%	-3%	15%
Sanford	Endor Iron Furnace Greenway	Bike	14	15	3%	16%	-9%
Raleigh	Rocky Branch Trail at Dorothea Drive	Bike	110	104	-5%	-19%	24%
Durham	Main Street - Durham	Bike	191	181	-5%	-18%	41%
Charlotte	Selwyn Avenue	Bike	54	50	-6%	-21%	11%
Charlotte	Stonewall Street	Bike	44	35	-20%	-28%	-3%
Greensboro	S Elm Street	Bike	95	57	-40%	-46%	-27%
Winston-Salem	The Strollway	Bike	20	11	-42%	-46%	-34%
Durham	Cornwallis Road	Bike	20	12	-43%	-63%	65%
Greensboro	Spring Garden Street	Bike	160	91	-43%	-49%	-20%
Carrboro	Libba Cotten Greenway	Bike	817	383	-53%	-59%	-17%
Charlotte	University City Boulevard Sidepath	Bike	87	19	-78%	-81%	-57%





Downtown Access Points & Business Districts



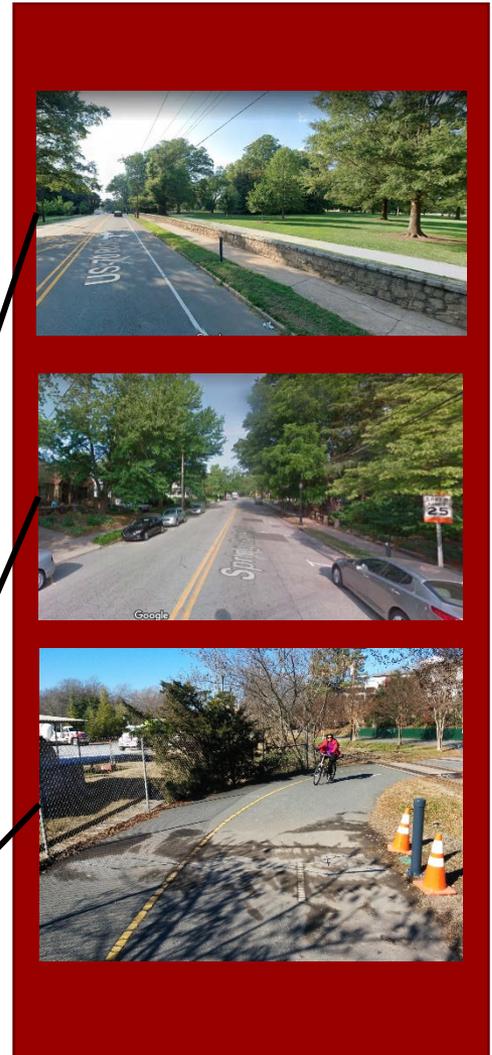
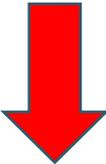
Municipality	Station	Mode	Pre-2020	2020	% +/-	Weekday	Weekend
Winston-Salem	West End Boulevard	Bike	29	87	200%	199%	203%
Apex	Beaver Creek Greenway	Bike	48	115	138%	171%	96%
Wilkesboro	Yadkin River Greenway	Bike	54	124	127%	100%	178%
Raleigh	Crabtree Creek Trail at Crabtree Boulevard	Bike	41	91	122%	90%	152%
Brevard	Brevard Greenway	Bike	95	168	76%	61%	98%
Raleigh	Reedy Creek Trail on NCMA side of I-440 Ped Bridge	Bike	179	309	73%	57%	94%
Durham	American Tobacco Trail at Highgate Road	Bike	324	555	71%	65%	77%
Raleigh	House Creek Trail at Lake Boone Trail	Bike	109	185	70%	57%	89%
Raleigh	Neuse River Trail at Royal Forrest Drive	Bike	395	654	65%	54%	81%
Raleigh	Shelley Lake Trail on the east side of Shelley Lake	Bike	103	167	62%	59%	66%
Raleigh	Neuse River Greenway	Bike	379	612	62%	53%	73%
Raleigh	Neuse River Trail across from Buffalo Road Park	Bike	369	556	51%	49%	52%
Duck	Duck Trail	Bike	262	355	35%	41%	25%
Greensboro	Walker Avenue	Bike	31	37	21%	12%	45%
Cary	New Hope Church Road	Bike	45	52	16%	17%	16%
Raleigh	Mine Creek Trail at North Hills Drive	Bike	117	127	8%	10%	6%
Winston-Salem	Salem Lake Greenway	Bike	199	209	5%	-3%	15%
Sanford	Endor Iron Furnace Greenway	Bike	14	15	3%	16%	-9%
Raleigh	Rocky Branch Trail at Dorothea Drive	Bike	110	104	-5%	-19%	24%
Durham	Main Street - Durham	Bike	191	181	-5%	-18%	41%
Charlotte	Selwyn Avenue	Bike	54	50	-6%	-21%	11%
Charlotte	Stonewall Street	Bike	44	35	-20%	-28%	-3%
Greensboro	S Elm Street	Bike	95	57	-40%	-46%	-27%
Winston-Salem	The Strollway	Bike	20	11	-42%	-46%	-34%
Durham	Cornwallis Road	Bike	20	12	-43%	-63%	65%
Greensboro	Spring Garden Street	Bike	160	91	-43%	-49%	-20%
Carrboro	Libba Cotten Greenway	Bike	817	383	-53%	-59%	-17%
Charlotte	University City Boulevard Sidepath	Bike	87	19	-78%	-81%	-57%



University Commute Corridors



Municipality	Station	Mode	Pre-2020	2020	% +/-	Weekday	Weekend
Winston-Salem	West End Boulevard	Bike	29	87	200%	199%	203%
Apex	Beaver Creek Greenway	Bike	48	115	138%	171%	96%
Wilkesboro	Yadkin River Greenway	Bike	54	124	127%	100%	178%
Raleigh	Crabtree Creek Trail at Crabtree Boulevard	Bike	41	91	122%	90%	152%
Brevard	Brevard Greenway	Bike	95	168	76%	61%	98%
Raleigh	Reedy Creek Trail on NCMA side of I-440	Bike	179	309	73%	57%	94%
Durham	American Tobacco Trail at Highgate Road	Bike	324	555	71%	65%	77%
Raleigh	House Creek Trail at Lake Boone Trail	Bike	109	185	70%	57%	89%
Raleigh	Neuse River Trail at Royal Forrest Drive	Bike	395	654	65%	54%	81%
Raleigh	Shelley Lake Trail on the east side of Shelley Lake	Bike	103	167	62%	59%	66%
Raleigh	Neuse River Greenway	Bike	379	612	62%	53%	73%
Raleigh	Neuse River Trail across from Buffalo Road Park	Bike	369	556	51%	49%	52%
Duck	Duck Trail	Bike	262	355	35%	41%	25%
Greensboro	Walker Avenue	Bike	31	37	21%	12%	45%
Cary	New Hope Church Road	Bike	45	52	16%	17%	16%
Raleigh	Mine Creek Trail at North Hills Drive	Bike	117	127	8%	10%	6%
Winston-Salem	Salem Lake Greenway	Bike	199	209	5%	-3%	15%
Sanford	Endor Iron Furnace Greenway	Bike	14	15	3%	16%	-9%
Raleigh	Rocky Branch Trail at Dorothea Drive	Bike	110	104	-5%	-19%	24%
Durham	Main Street - Durham	Bike	191	181	-5%	-18%	41%
Charlotte	Selwyn Avenue	Bike	54	50	-6%	-21%	11%
Charlotte	Stonewall Street	Bike	44	35	-20%	-28%	-3%
Greensboro	S Elm Street	Bike	95	57	-40%	-46%	-27%
Winston-Salem	The Strollway	Bike	20	11	-42%	-46%	-34%
Durham	Cornwallis Road	Bike	20	12	-43%	-63%	65%
Greensboro	Spring Garden Street	Bike	160	91	-43%	-49%	-20%
Carrboro	Libba Cotten Greenway	Bike	817	383	-53%	-59%	-17%
Charlotte	University City Boulevard Sidepath	Bike	87	19	-78%	-81%	-57%





Discussion

- Who are the people new to using these facilities? Who are the people who no longer use these facilities?
- Will these trends continue?
- Are communities investing in active transportation facilities as a result of COVID-19 impacts?
- How will the changes in temporal patterns affect non-motorized traffic monitoring practices?



Hello, North Carolina

STRAVA | METRO

Haynes Bunn

Senior Customer Success GIS Engineer

01

**About
Strava.**

ABOUT STRAVA.

Strava is the home of your **active life**.

Strava's mission.

Connect athletes to what motivates them and help them find their personal best.

Strava's vision.

Be the record of the world's athletic activities and the technology that makes every effort count.



Our users upload recreational and commute activities via **smartphone, watch, fitness device, or a computer.**



STRAVA NUMBERS.

The world's largest active transportation dataset.

70⁺_M

 Members

4⁺_B

 Activities

02

**Metro's
mission.**

We believe **big data is the future
of active transportation planning
& evaluation.**

OUR MISSION.

To **empower communities**
to make active transportation
accessible, efficient and
safe for everyone.



Access to Metro is free to qualified organizations around the world who are working to improve human-powered transportation.

03

Metroview.

Thanks.

STRAVA | METRO

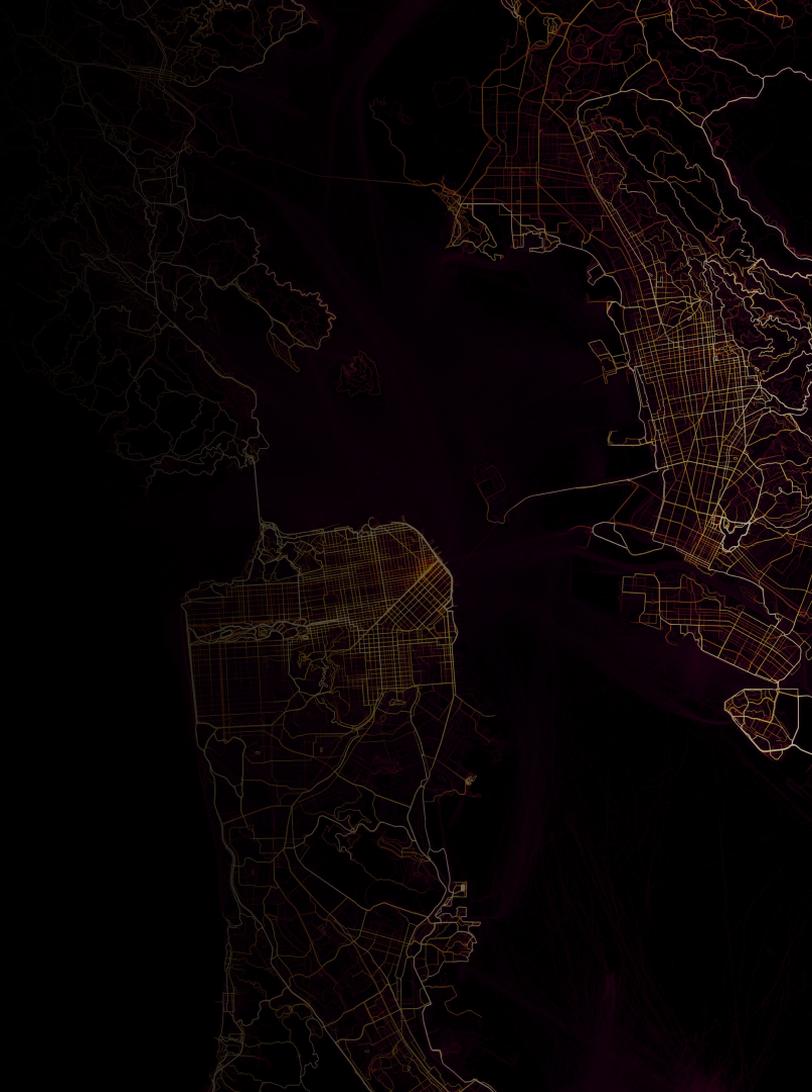
NOV 2020

Haynes Bunn

Senior Customer Success GIS Engineer

haynes@strava.com

metro.strava.com



ELECTRIC BICYCLING IN NC

eBike Central's Perspective



OUTLINE

- eBike Central
- What are Electric Bicycles?
- E-Bike Laws & Categories
- E-Bike Usage - NITC Study
- Bicycle Usage during the Pandemic
- E-Bike Share Programs
- DOT Focus on Bicycles
- Trends with E-Bikes





- **eBike Central is an exclusive electric bicycle (e-Bike) dealer** specializing in premium brand eBikes for Road, Off Road, Compact, Cargo, City and Commuting transportation.
- **Locations in Charlotte and Greensboro NC**
- **Market is primarily the Southeast US.**



WHAT ARE ELECTRIC BICYCLES?

- **Electric Motor provides Variable Pedal Assistance** with 30-50 mile range.
- **Developed in Europe/Asia and Trending in North America:** Numerous Manufacturers; Variety of Models; Support different uses.
- **New Mode of Transportation** that could substantially improve efficiency in the transportation system if adopted, especially if they substitute for car use.
- **Enhances the Role of the Bicycle**, especially for errands and commuting.
- **Increasingly integral part of transportation network and trail system.**
- **Allows new categories of riders to participate in bicycling** (i.e. physical limitations, older adults and people in geographically challenging areas).

E-BIKE LAWS

E-Bikes are defined by Three Classes under Federal Law:

- **Class 1:** pedal-assist only to a maximum assisted speed of 20 mph.
- **Class 2:** pedal-assist only to a maximum assisted speed of 20 mph, Throttle option.
- **Class 3:** pedal-assist only to a maximum assisted speed of 28 mph.

All classes limit the motor's power to one horsepower or 750 Watts.

Where to ride?

- Treated as a Bicycle and not a Motorized Vehicle.
- Streets, Greenways and Off Road Trails with Limitations.
- National Parks recognize E-Bikes as Bicycles with designated areas to ride.

E-BIKE CATEGORIES

Compact/Folding



Urban/City



Off Road



Cargo/Utility



E-BIKE USAGE - NITC STUDY

National Institute for Transportation and Communities (NITC) Study - 2018; 1,796 survey respondents.

- Reduce the riding effort for Health, Fitness and Recreation.
- Replace car trips and make commuting easier.
- Carry Cargo, Children and Keeping up with Other Riders.
- Feel safer riding an e-bike than they do a standard bicycle.
- Can take longer routes to utilize lower volume or more comfortable streets.
- Can maintain higher speeds to eliminate speed differentials of cars.
- Focus on the 'Ride' and not 'Riding'.



E-BIKE USAGE - NITC STUDY

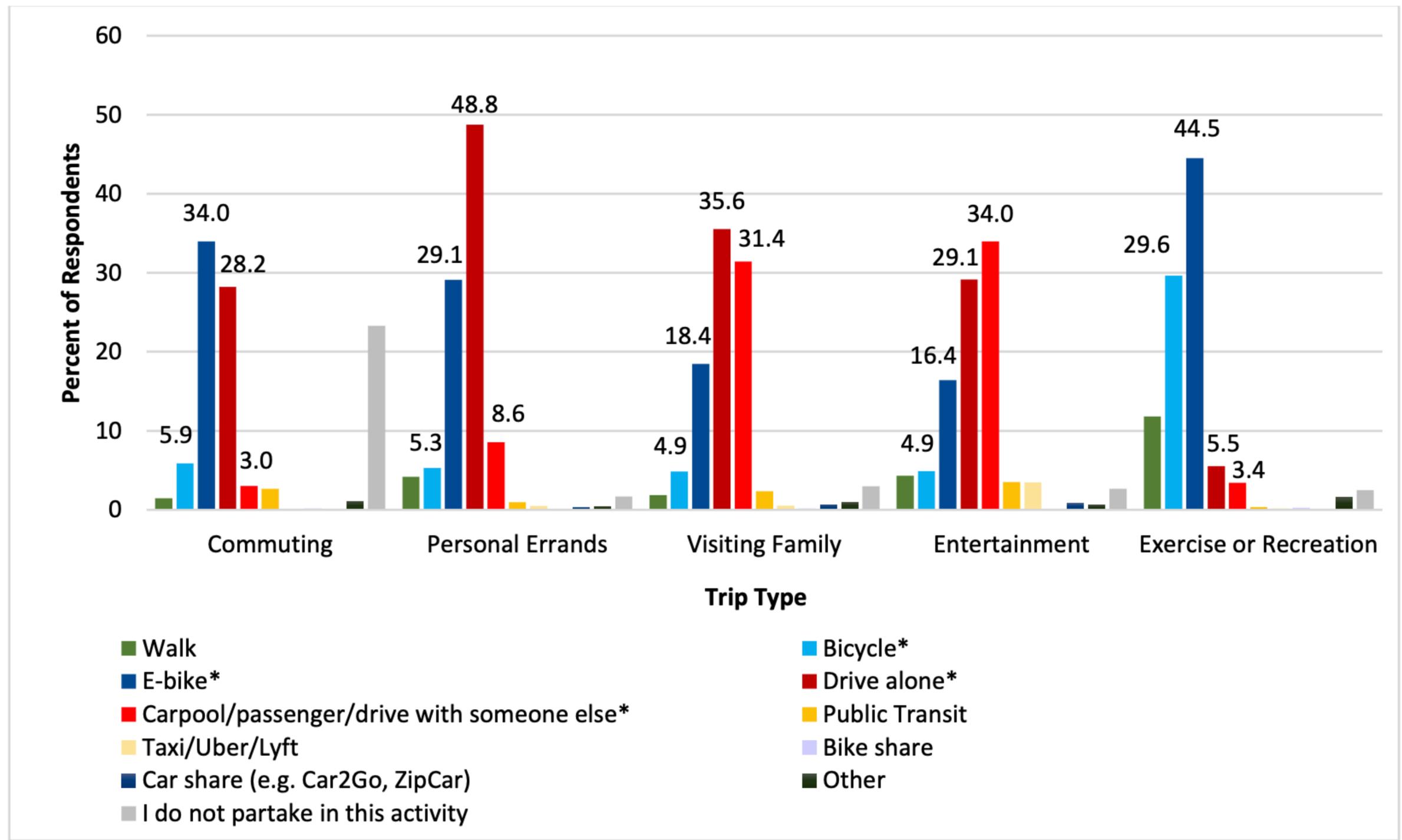


Figure 3.2: Mode Used for Various Trip Types Made by Respondents

E-BIKE USAGE - NITC STUDY

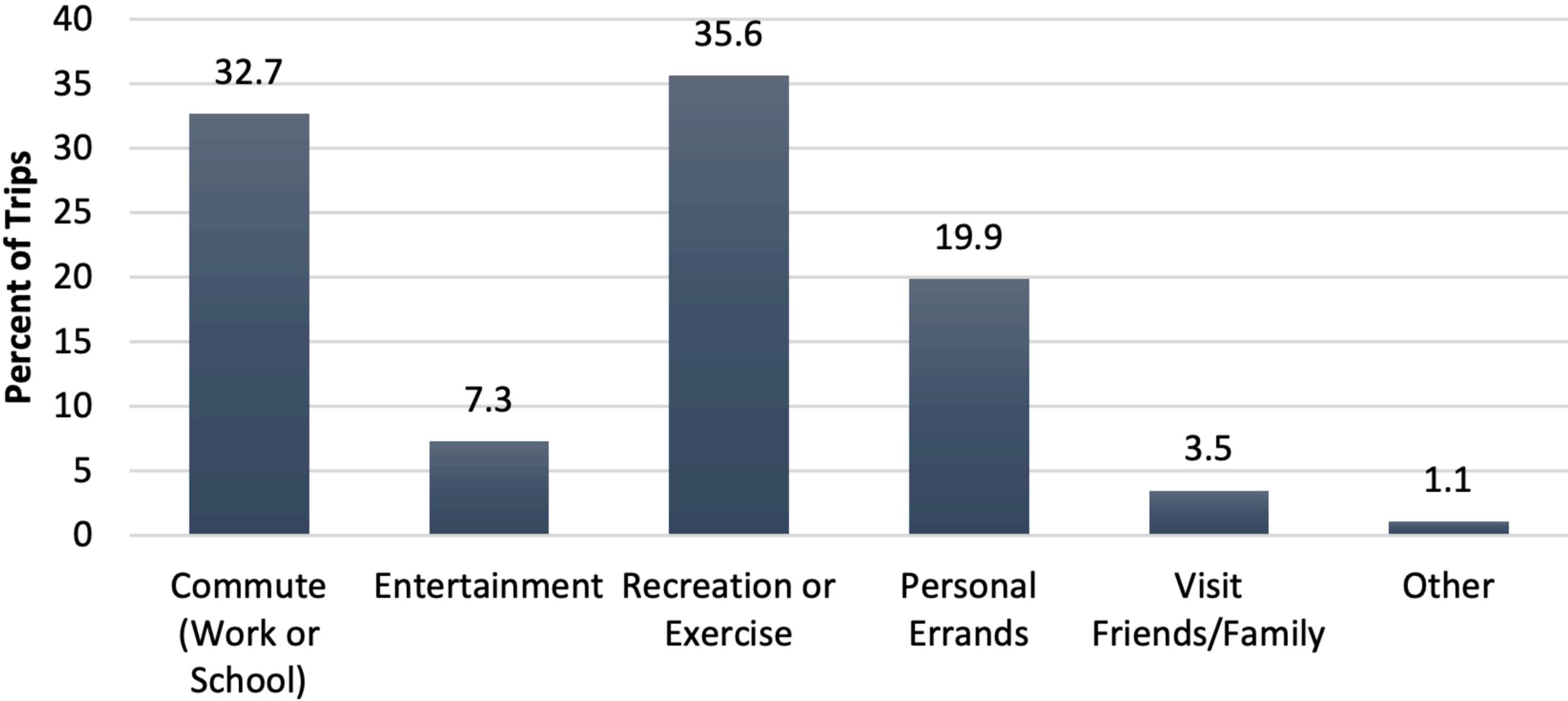
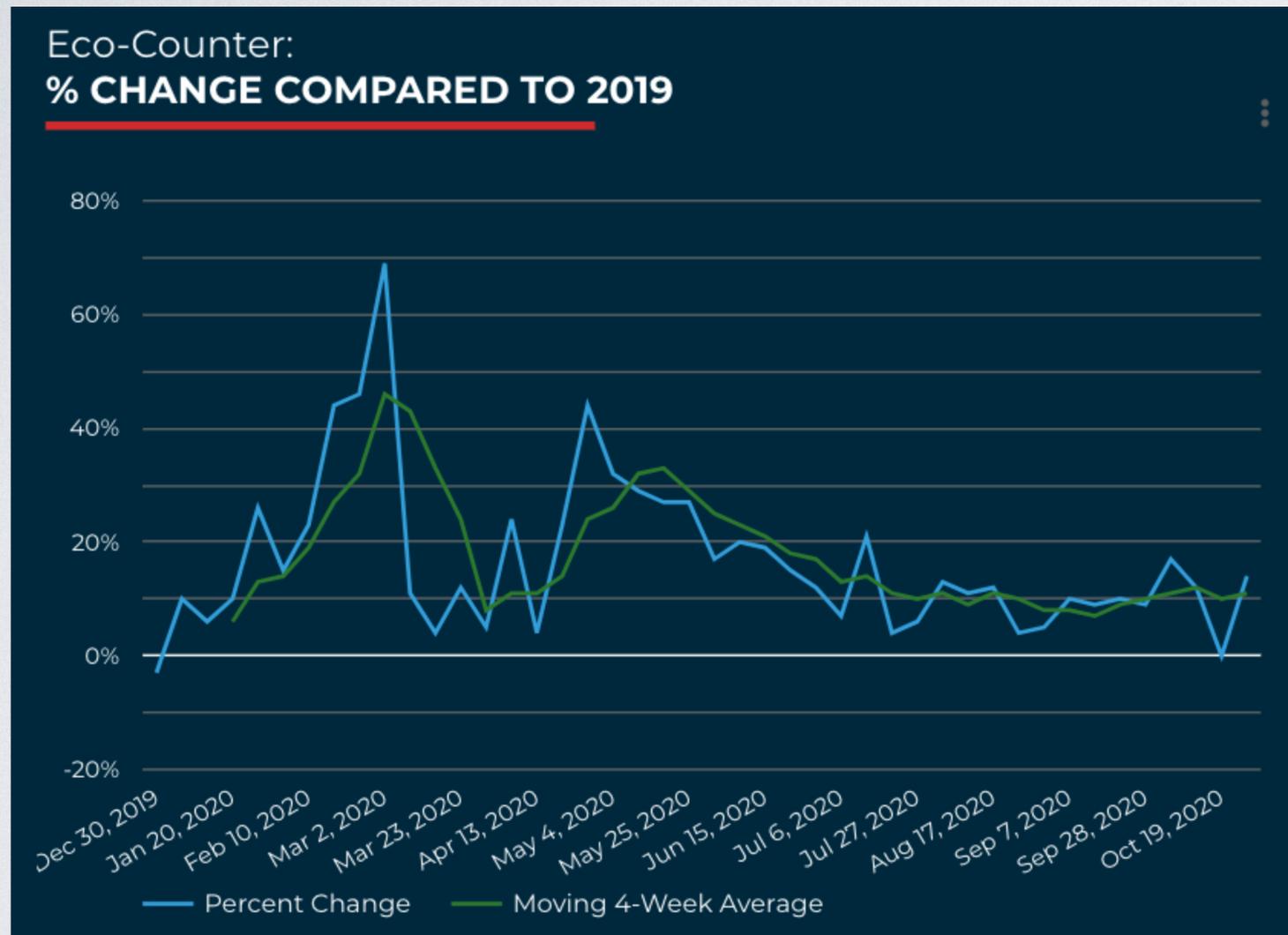
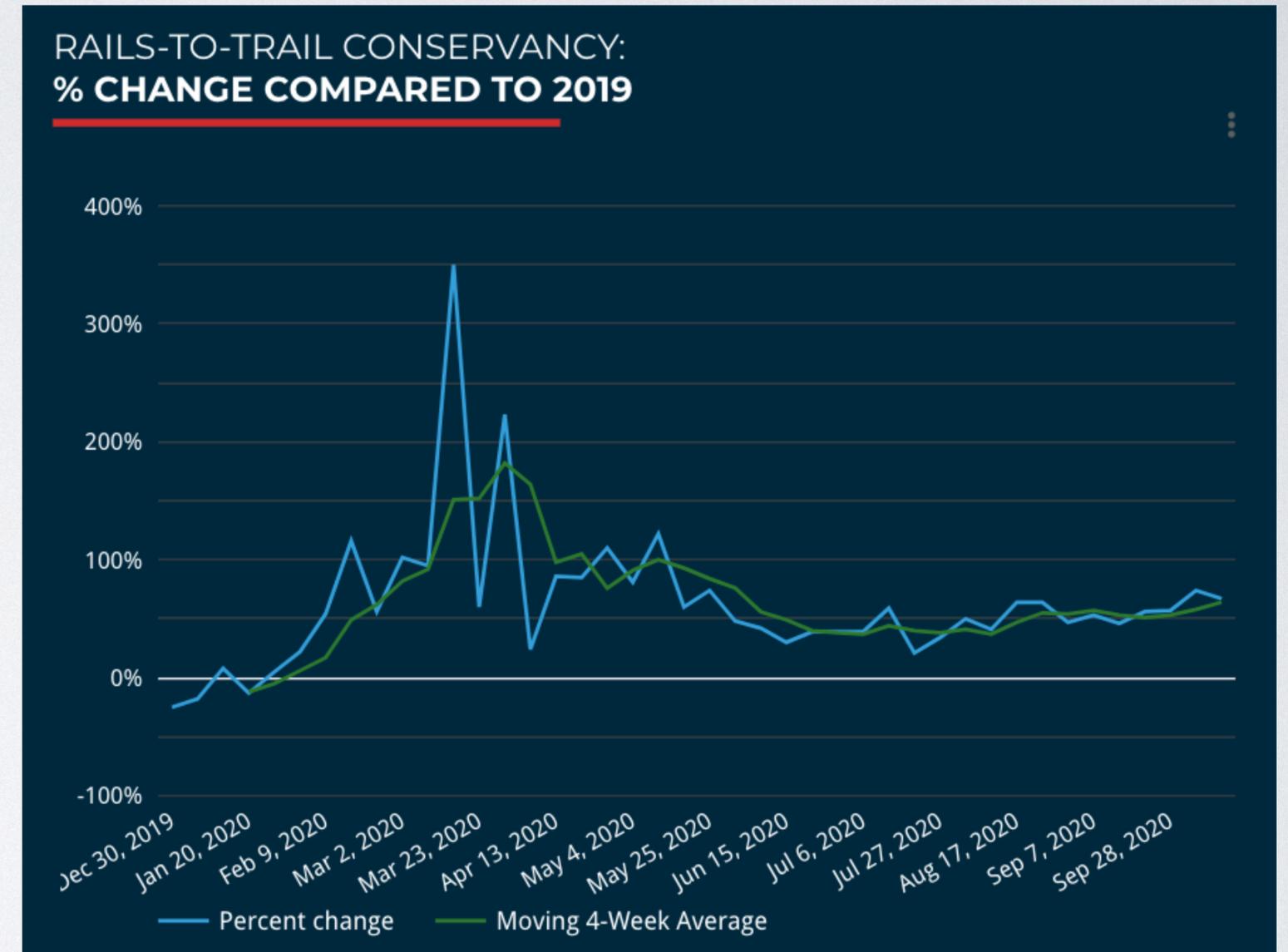


Figure 3.8: Percentages of Trip Types, Based on Respondents Three Most Recent E-bike Trips

BICYCLE USAGE - 2020 VS 2019

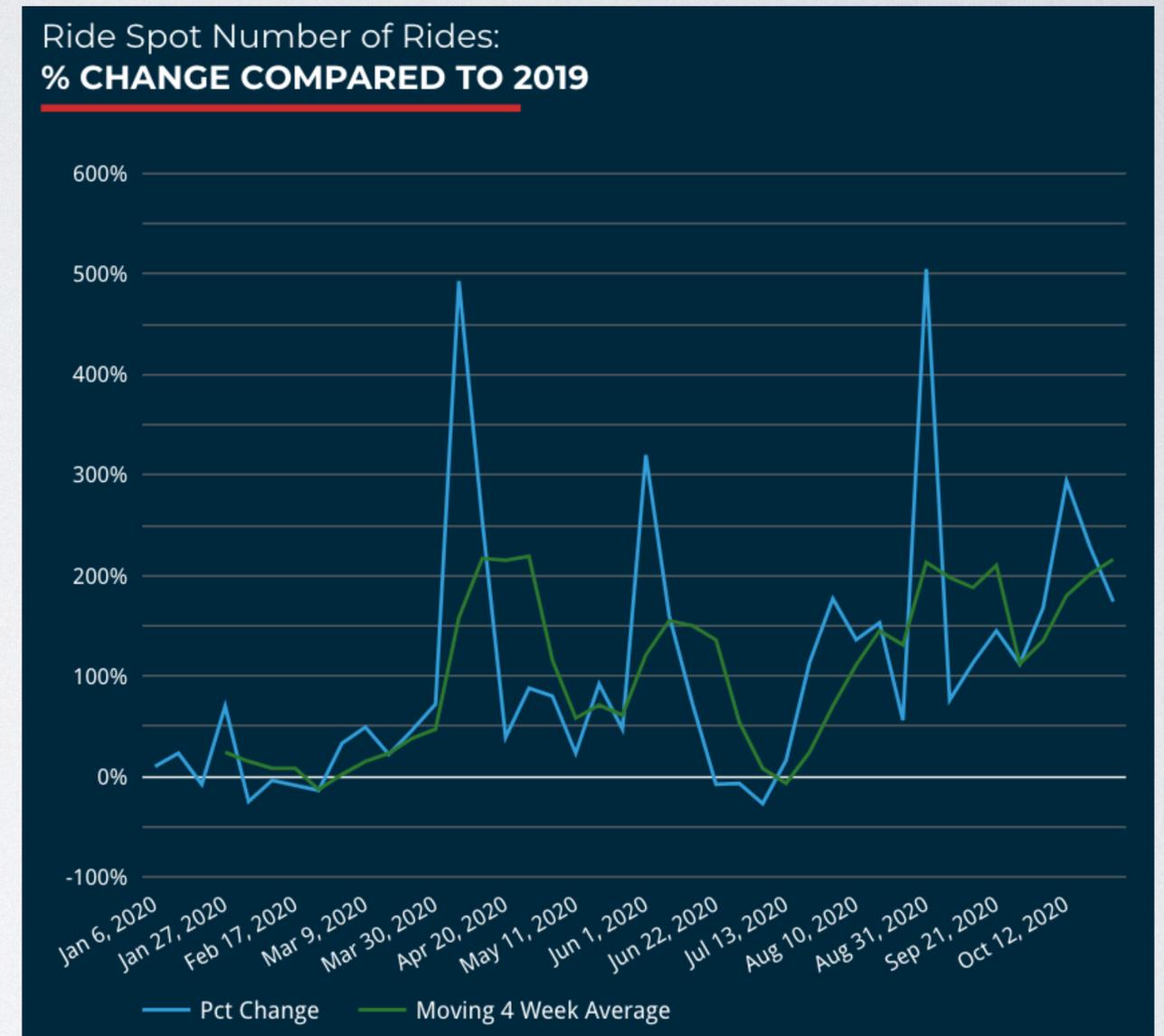
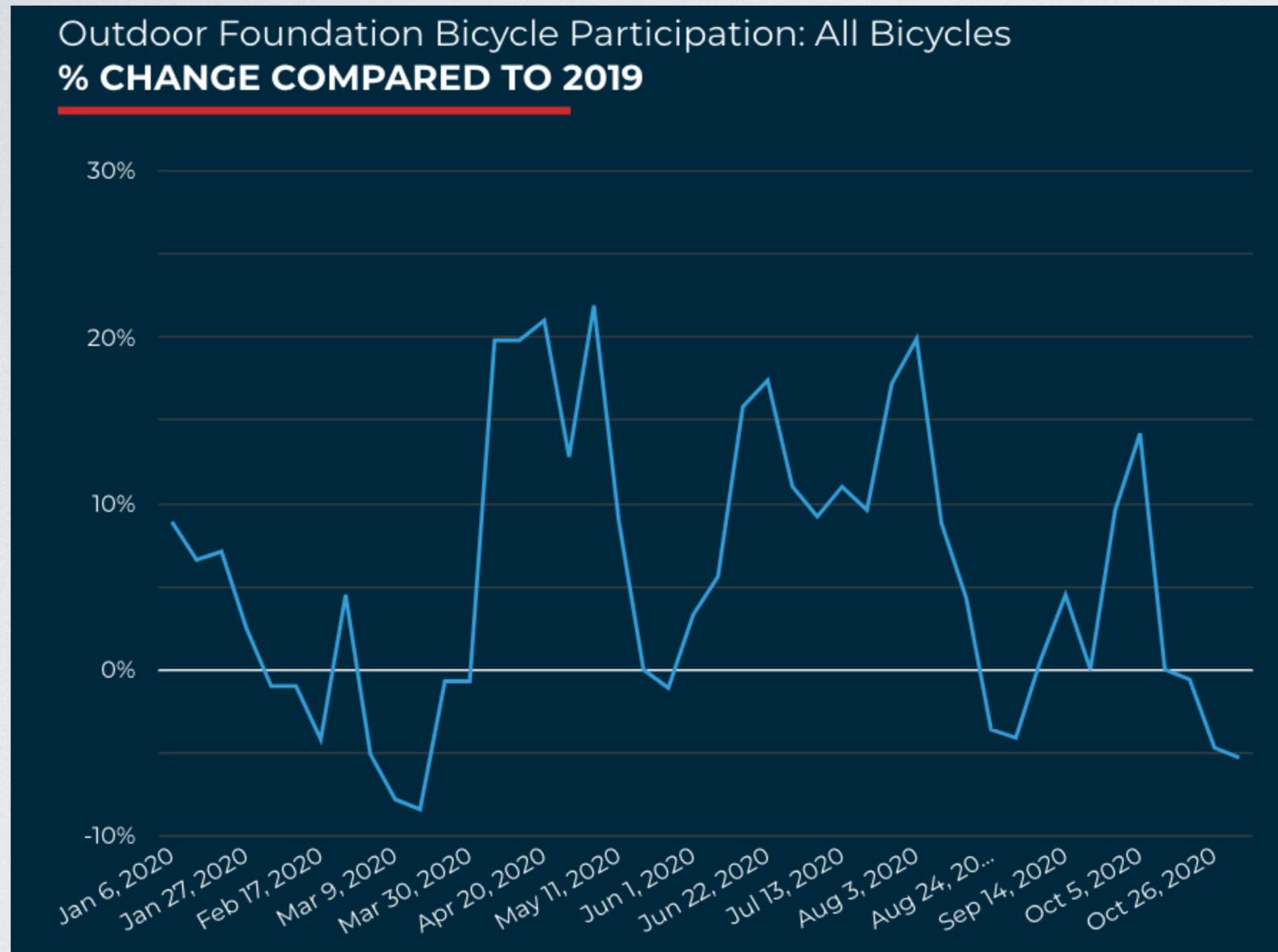


• **Number of bike trips taking place in urban areas**



• **% change in the number of bicycle trips** recorded by 14 bicycle-specific counters located on rail-trails across the U.S.

BICYCLE USAGE - 2020 VS 2019



• **Weekly estimates of ages 6+ who participate in recreational bicycling**

• **change in the number of bike rides and bike riders** recorded in *Ride Spot*

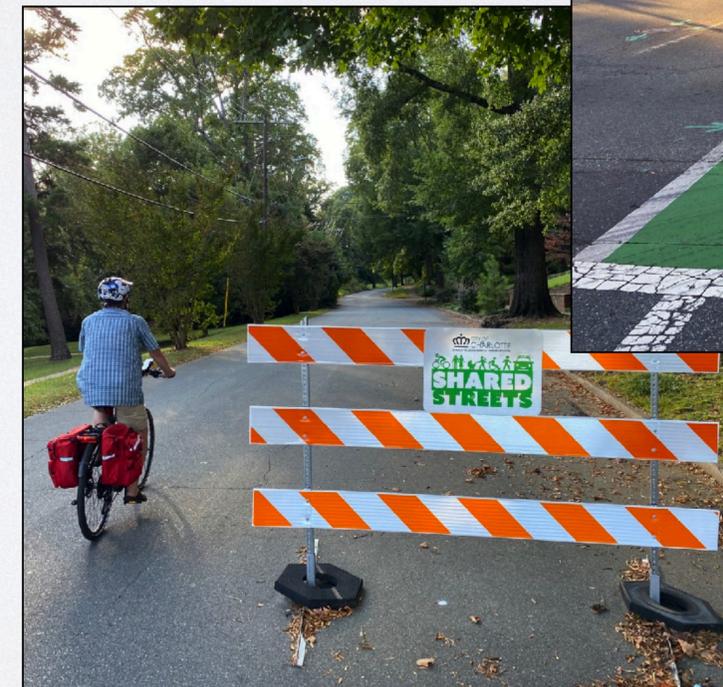
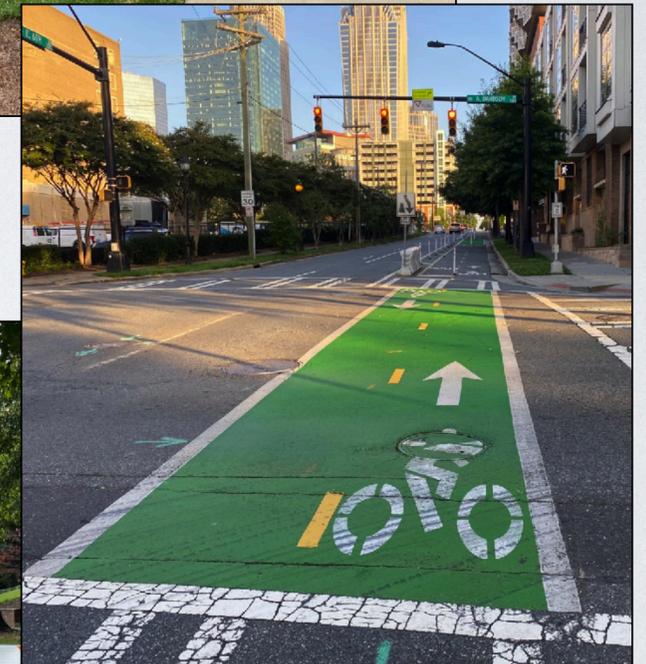
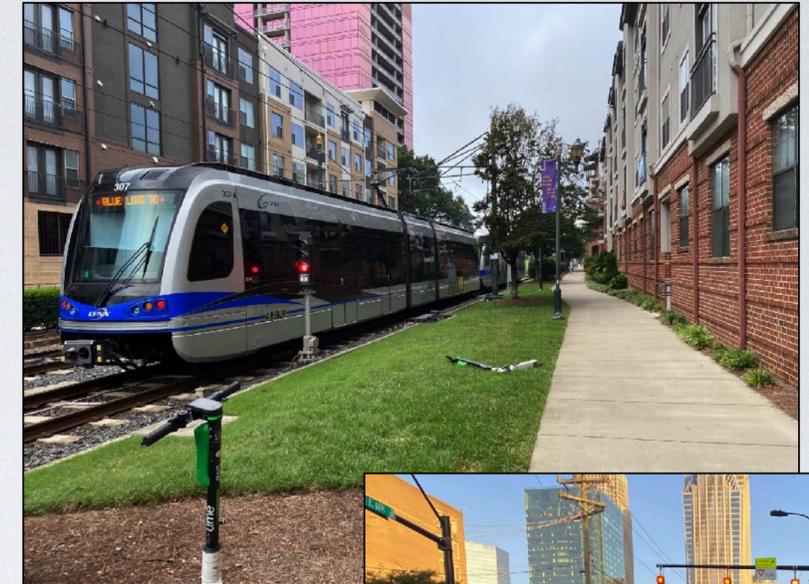
E-BIKE SHARE PROGRAMS

- Electric Bike Share programs have had mixed results, constant improvement.
- Scooters and Bike Share programs thrive in dense urban population areas.
- Parking Challenges and Cost of Car Ownership support Share Programs.
- Multi-modal transportation options support each other, bikes/trains/buses/cars.
 - First & Last Mile Solutions to Bus/Train.
- Riders enjoy riding with others as an experience.
- E-Bike Share Programs build awareness and support Ownership, Bicycle Advocacy and Policy Changes.



INFRASTRUCTURE IN N.C.

- **Greenways** - every major city has projects in progress.
- **Shared Streets Initiative** - major cities are testing and adopting this approach.
- **Protected Bike Lanes** - larger cities see benefits of committing street space.
- **Bus/Bike Lanes** - dedicated lanes for buses and bicycles.
- **Trail Access** - off road or e-Mountain Bikes are allowed on certain trails, but more are needed.



DOT PROJECTS IN N.C.

- **Statewide Pedestrian & Bicycle Plan was passed in 2013 but the goals** to improve Mobility, Safety, Health, the Economy and the Environment:
 - **Have been left unfunded** at the state level.
 - **Restricted to utilizing federal money** for projects.
 - **Left to local municipalities to fund at a unequal rate** across urban and rural areas.
- **NCDOT funded projects have been vastly limited since 2013 and the Interconnectedness of its facilities is lacking.**
 - <https://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=f03c2cabd13949d0918a4024a440acda>

DEVELOPING INFRASTRUCTURE

- **Left to Local Organizers to Plan, Design and Build in the absence of State Level Funding** for Greenway, Protected Lane and Trail projects.
- **Improvements are Incremental, Inconsistent and Unsubstantial** due to the lack of Complete Streets integration into NCDOT codification.
- **NC has left the integration as an Unfunded Mandate.**
- **NC has the second largest roadway network in the nation but only ranks 22nd for cycling.**

E-BIKE TRENDS

- E-Bikes and other **personal mobility technologies are creating a more diverse transportation profile** (E-Bikes, Scooters, other e-mobility).
- E-Bike's **growing popularity in cities require greater focus on support** for their specific needs.
- Increasingly, **Older and Younger Residents are finding ways to leave the car behind to Live, Learn and Earn without driving.**
- Residents are **attracted to cities that support Healthy Living.**
- Ridership would **grow dramatically with Safer Riding.**



N.C. CAN INNOVATE

State funding and renewing the Statewide Pedestrian & Bicycle Plan to support:

MORE **Connected Greenways**

MORE **Protected Bike Lanes**

MORE **Off Road Trail Access**

MORE **Education**

Ridership will significantly increase when it is safer to ride, not competing with cars.

END

Pedal Farther, Faster on an eBike!

Joe Michel

Owner, eBike Central

888 876 6473 ext 701

joe@ebikecentral.net

ebikecentral.net

INFRASTRUCTURE ADENDUM

- NC is the second largest roadway network in the nation but only ranks 22nd for cycling
- In some of the largest cities like Charlotte, congestion makes the ranks of the 24th most congested city. (<https://inrix.com/scorecard-city/?city=Charlotte%2C%20NC&index=127>) with last mile speeds at 15mph. Raleigh ranks 54th and the last mile speeds are 22mph (<https://inrix.com/scorecard-city/?city=Raleigh%2C%20NC&index=425>)
- Due to the lack of complete streets integration into NCDOT codification, incremental improvements are inconsistent and unsubstantial.
- NCDOT has left active transportation projects out of competitive funding to fulfill its commitment to provide safe, usable roads for all users by not prioritizing projects in the STI over toll road and highway projects.
- On road, off road, greenway and protected facilities within and along roadway right of ways have been left for the most part to local bodies to plan, design and build.
- Since 2013, the NCGA has limited the state from funding any stand alone bicycle or pedestrian projects, thereby limiting all opportunity for critical infrastructure improvements at the local or state level.
- NC has made strides to plan for the future but, has left this as an unfunded mandate. (https://bikeleague.org/sites/default/files/BFS%20Report%20Card_2019_NorthCarolina.pdf) In the most recent Bike League Scorecard, NC gets a C in infrastructure, a D+ in education and enforcement and a C in policies and programs. So plenty of room to improve.
- Since the active transportation users cross over into every segment, NC also has two of the top 100 house districts in the nation for pedestrian fatalities (<https://smartgrowthamerica.org/dangerous-by-design/>). 59th and 99th for District 9 and 12 respectively.

RESOURCES

“A North American Survey of Electric Bicycle Owners”, National Institute for Transportation and Communities (NITC), March 2018

“BUSINESS INTELLIGENCE HUB: RIDERSHIP TRENDS”, People for Bikes, <https://peopleforbikes.org/business-intelligence-hub/>, November, 2020.

BIKEWALKNC, Terry Lansdell, Director.