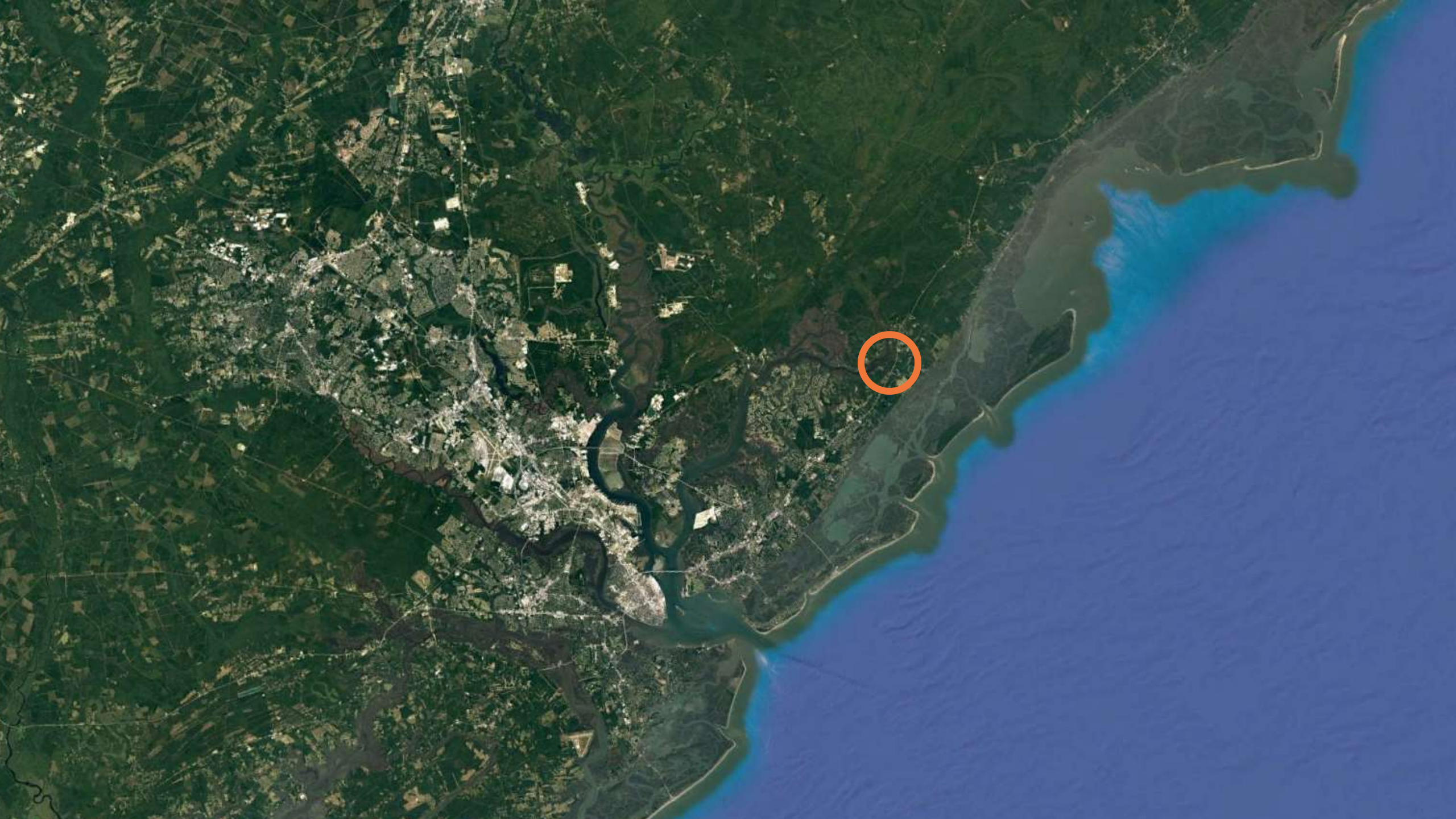
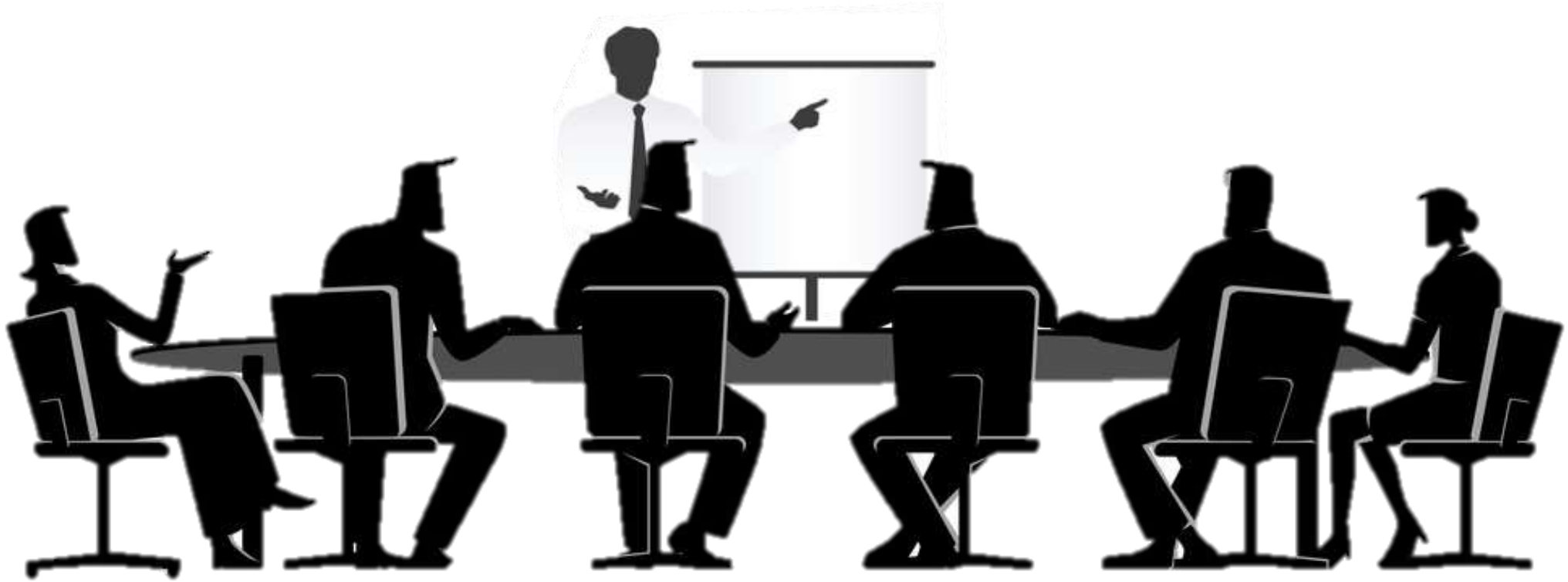
SLEUTHING

5 Steps to Create a Data Collection Program

Kyle James | BCDCOG
June 8, 2023



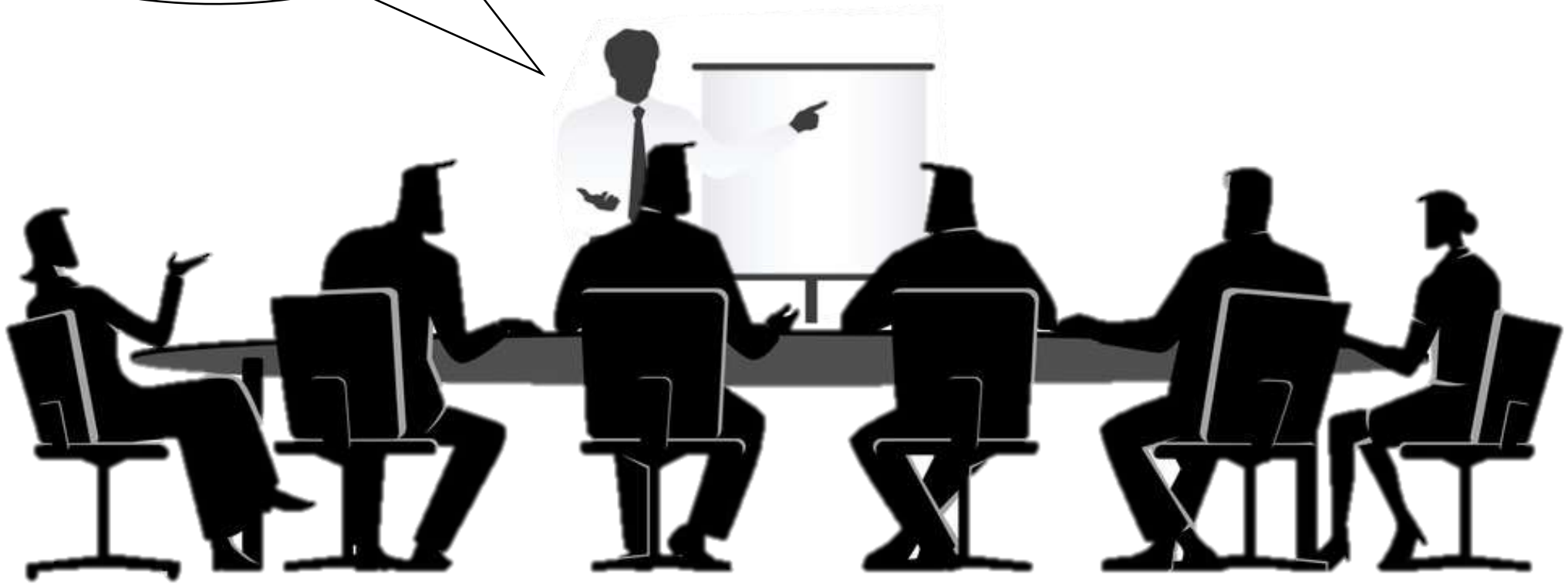

17
General Store
Restaurant
15 Mile Landing Rd
Seewee Rd
Dollar Store
17

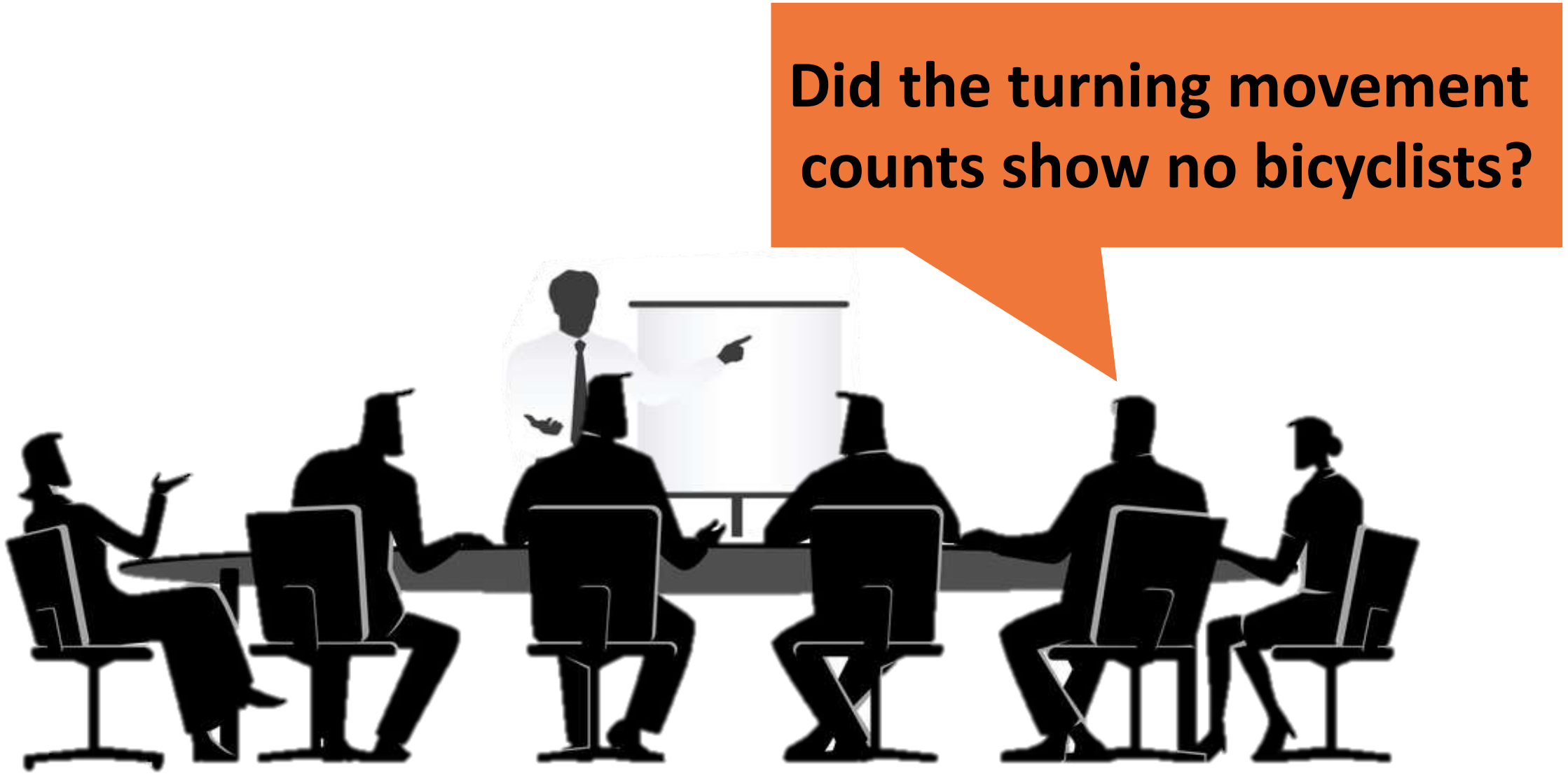



There are 15,000 vehicles/day.

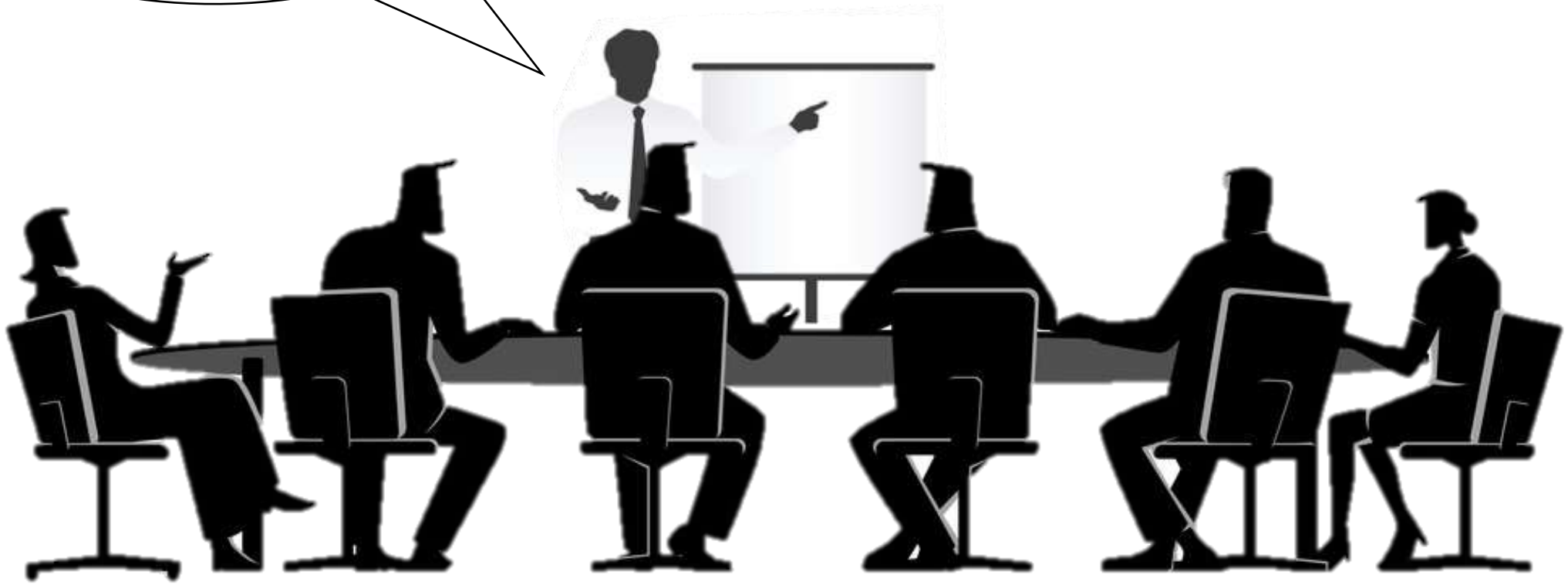

How many bicyclists?

There are no bicyclists at this location.




Did the turning movement counts show no bicyclists?

We didn’t collect data on bicyclists.
It’s a major highway.



Problem:

If it isn’t measured, it doesn’t count.

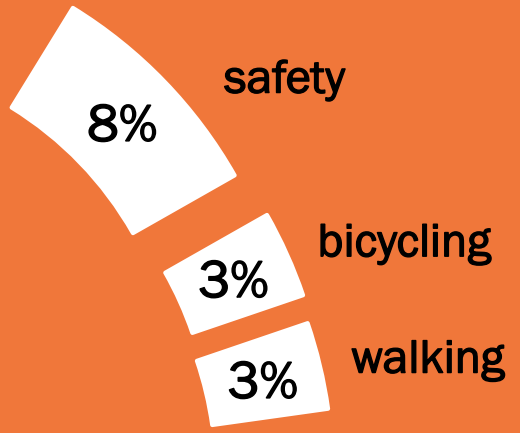
CHATS Long-range Transportation Plan (2040)


THE LONG-RANGE
TRANSPORTATION PLAN
executive summary
CHATS
LRTP
February 2019

Evaluation Criteria

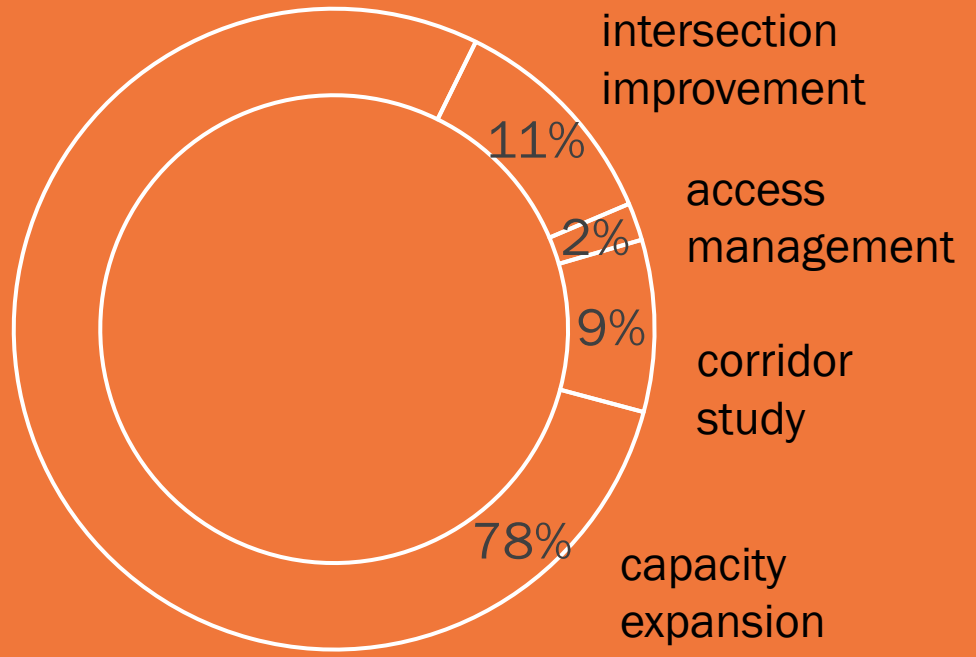
- equity/ environment: 8%
- safety: 8%
- bicycling: 3%
- walking: 3%
- congestion: 20%
- transit: 10%
- maintenance: 10%
- freight: 10%
- cost: 10%
- employment: 7%
- land suitability: 7%
- evacuation: 4%

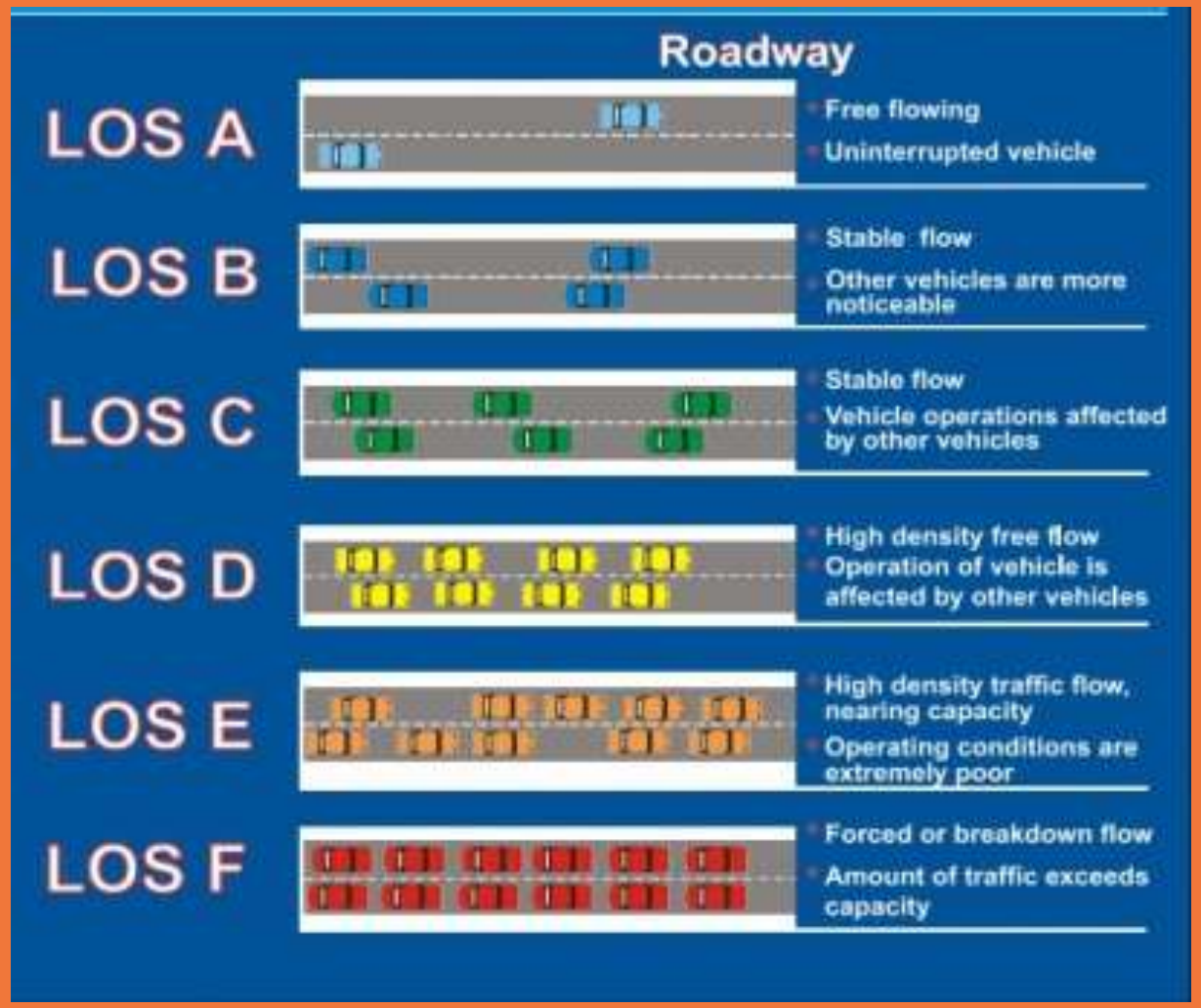
Evaluation Criteria



- # of crashes near proposed project
- Near an existing/ proposed bikeway
- Near an existing/ proposed walkway

Fiscally-Constrained Projects (2021-2030)





Source: MDOT

We've built an industry around measuring auto throughput and delay

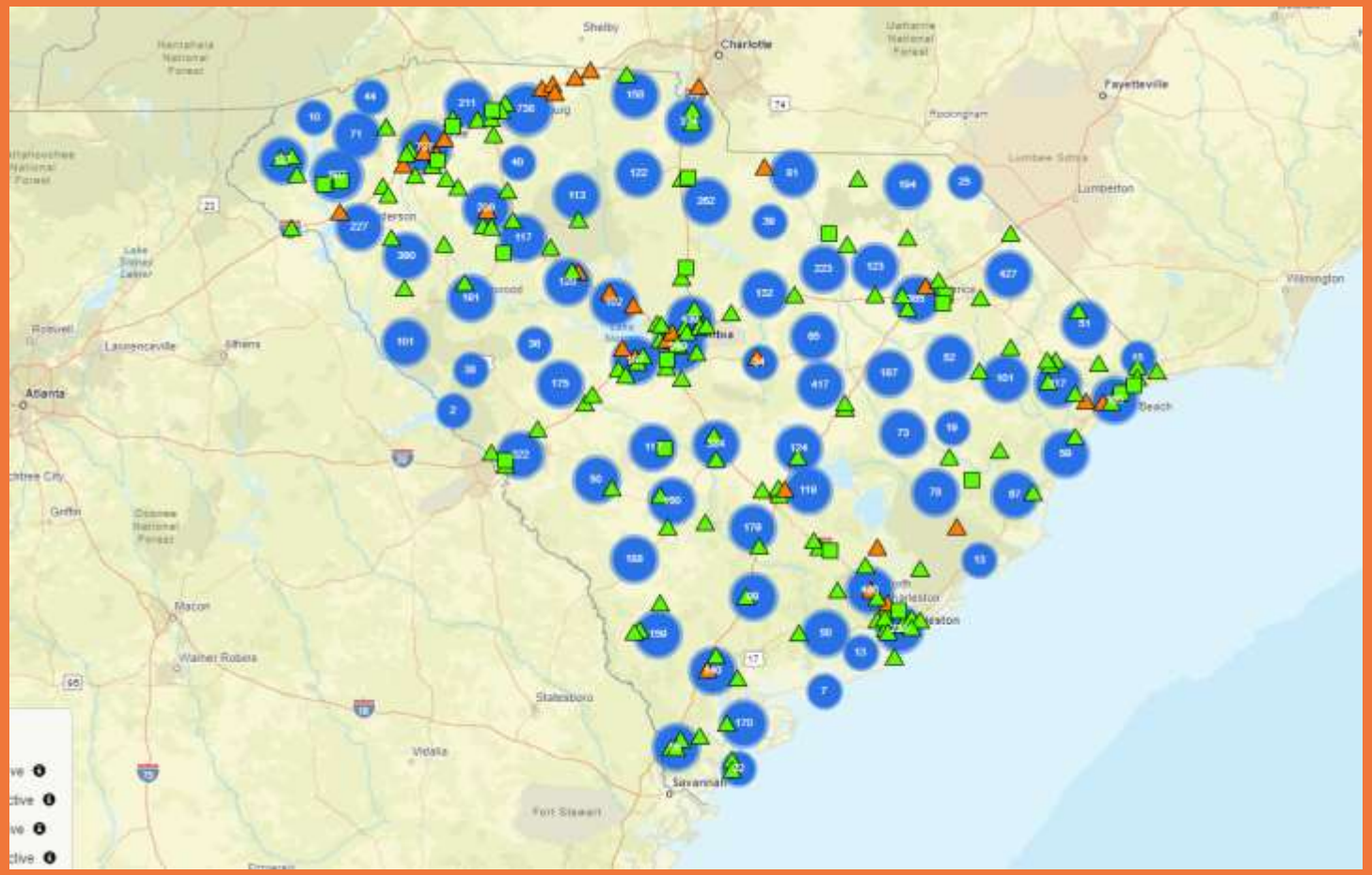
How many traffic count stations are in South Carolina?

A. 500

B. 1,500

C. 5,000

D. 7,500



SCDOT monitored

~11,500

short-term stations

+ 170

continuous stations

in 2022

Source: SCDOT

If it costs approximately $23/hour to process motor vehicle TMCs, how much more is it to include bike/ped counts?

A. $2.00/hour

B. $5.00/hour

C. $7.50/hour

D. $12.00/hour

Agenda

1. End Game
2. Resources
3. Equipment
4. Site Selection
5. Reporting

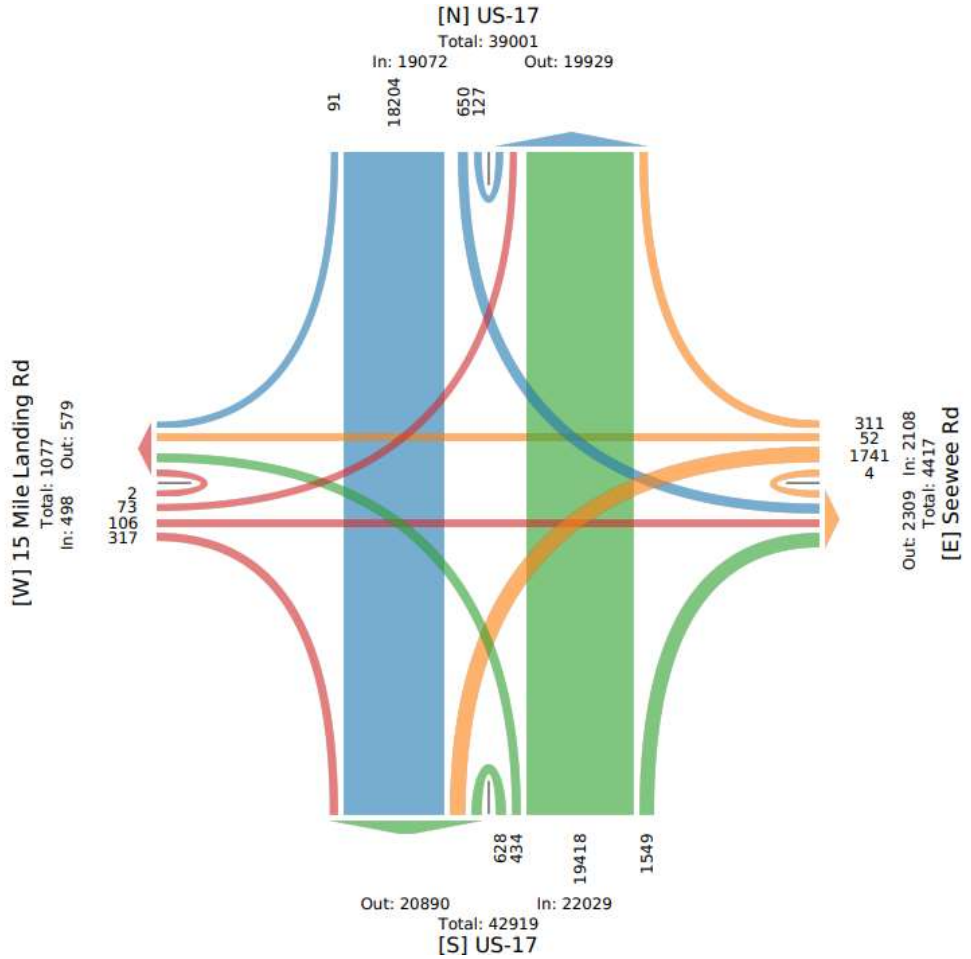
Recap

5 Steps to Create a Data Collection Program

- What do we want to know?
- What data already exists? + What constraints are we facing?
- How should we collect data?
- When and were should we collect data?
- Who can access the data?

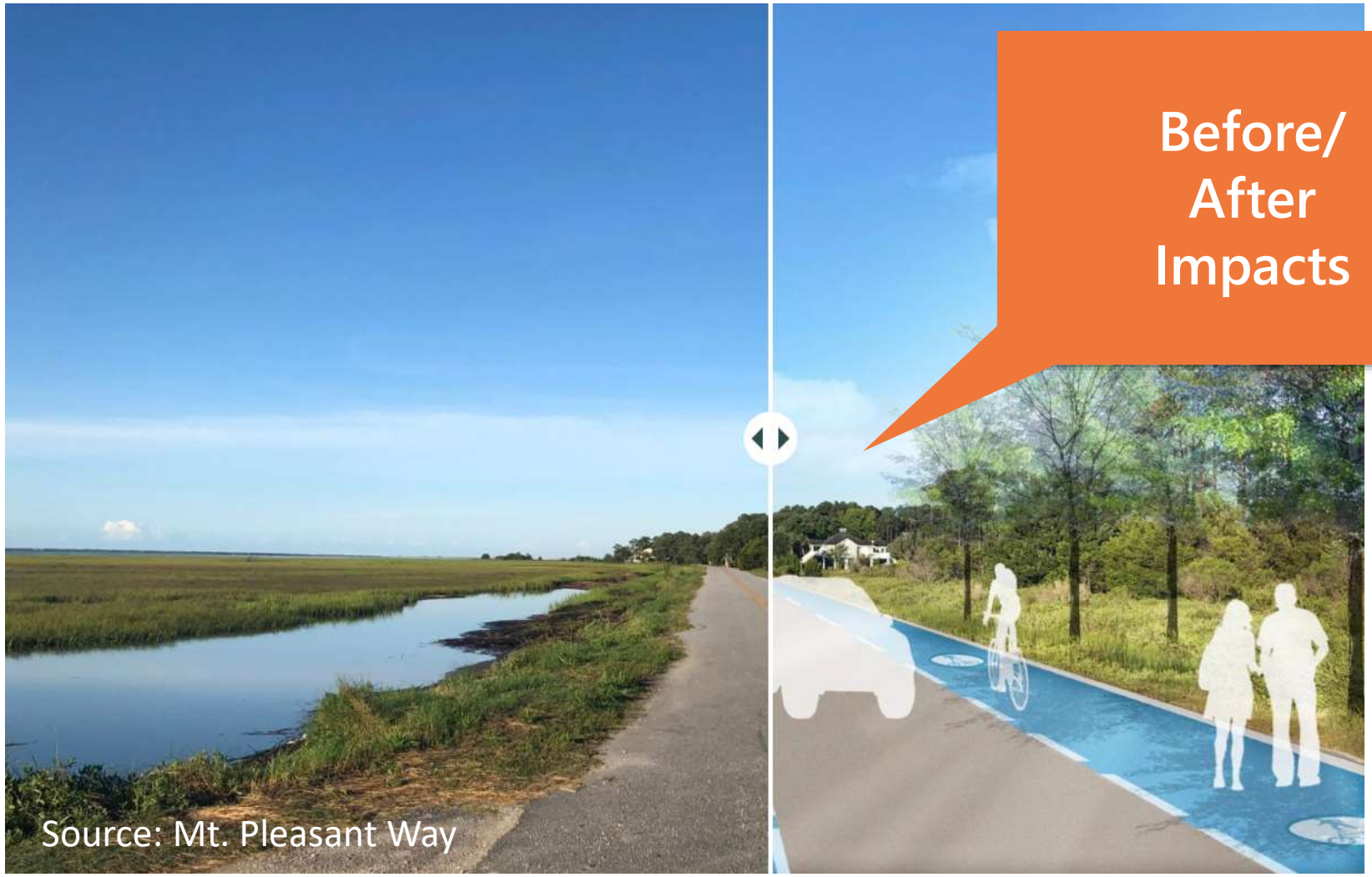
5 Steps to Create a Data Collection Program

What do we want to know?



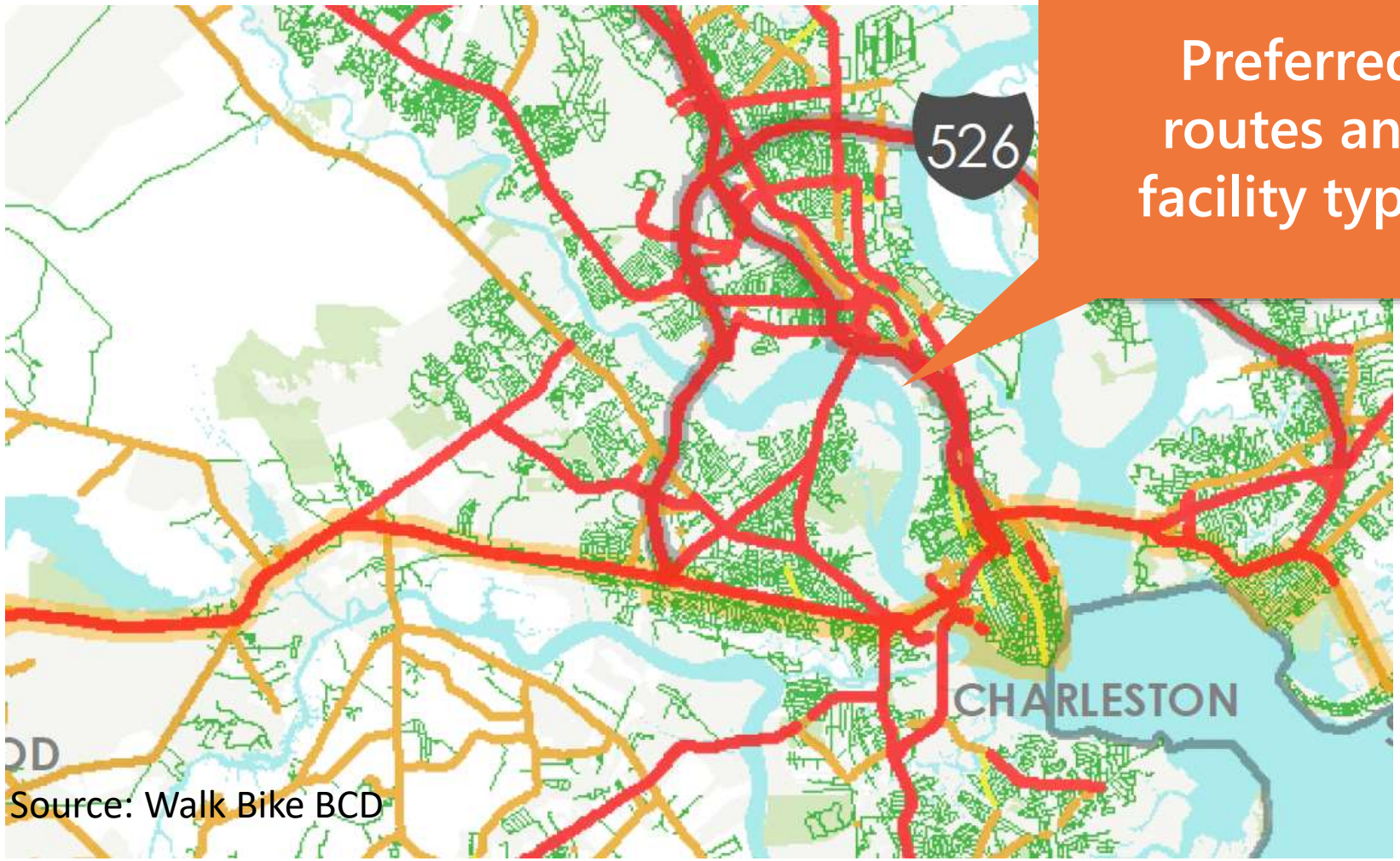
5 Steps to Create a Data Collection Program

What do we want to know?



5 Steps to Create a Data Collection Program

What do we want to know?



Preferred routes and facility types

Source: Walk Bike BCD

5 Steps to Create a Data Collection Program

What do we want to know?

Source: Mooneerams

5 Steps to Create a Data Collection Program

What do we want to know?

Economic impacts + cost/benefits

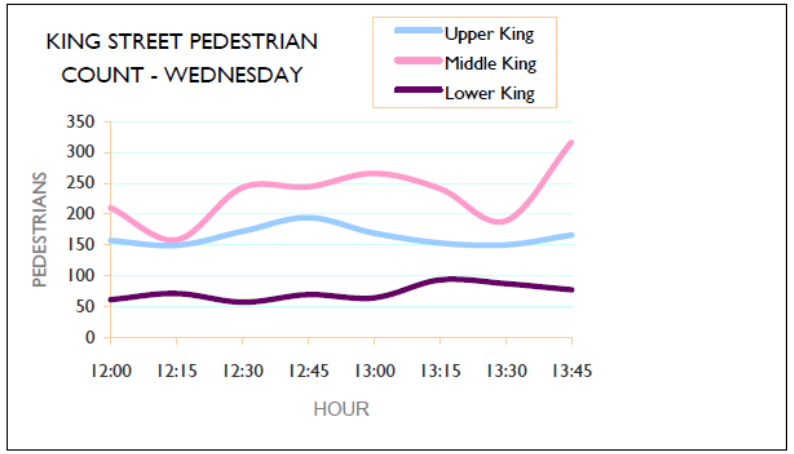
Source: East Cooper Land Trust

5 Steps to Create a Data Collection Program

What data already exists?

Pedestrian Count Totals
King Street
Wednesday, September 22, 2010

HOUR	Upper King	Middle King	Lower King
12:00	157	210	61
12:15	149	158	71
12:30	172	243	57
12:45	194	244	69
13:00	169	266	64
13:15	153	241	93
13:30	150	189	87
13:45	166	317	77
TOTAL	1310	1868	579



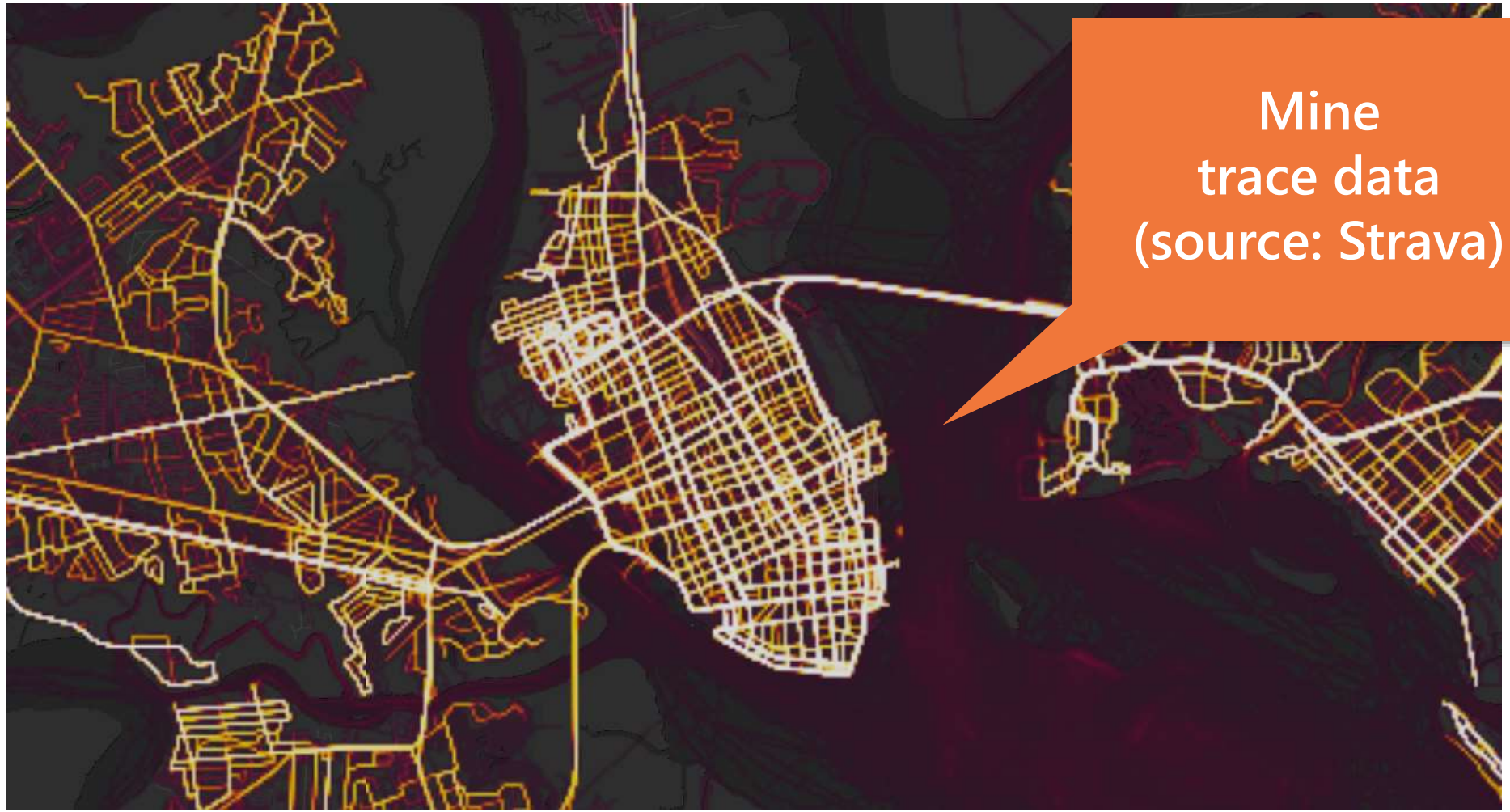
Mine historic count data

5 Steps to Create a Data Collection Program

What data already exists?

5 Steps to Create a Data Collection Program

What data already exists?



5 Steps to Create a Data Collection Program

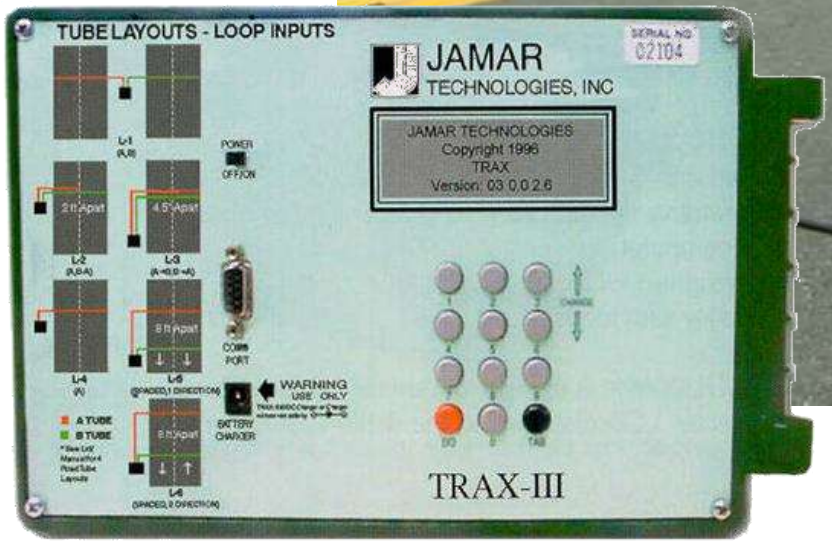
What constraints are we facing?

- Budget: $38,000/year (PL federal funds)
  - Capital equipment costs
  - Data processing costs
  - Maintenance and fees
  - Upfront staff time
  - Ongoing staff time
    - 1 hour/week – planner
    - 4 hours/week – intern
    - 2 hours/month – GIS

For entire bike/ped implementation program

How should we collect data?

5 Steps to Create a Data Collection Program



Source: FHWA

Source: Jalopnik

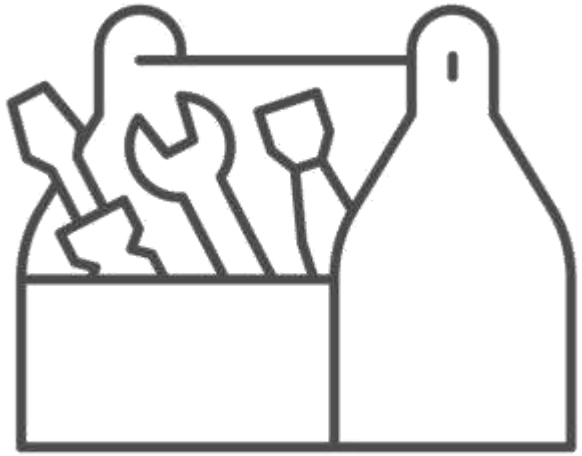
5 Steps to Create a Data Collection Program

How should we collect data?

Source: Active Allen County

5 Steps to Create a Data Collection Program

How should we collect data?



Primary

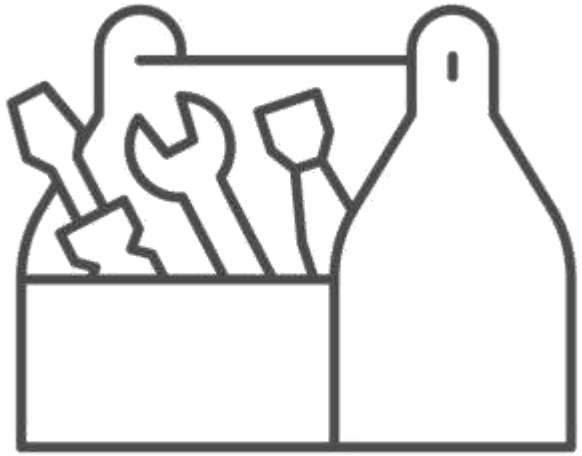
- Ability to Move
- Accuracy
- Multiple Modes
- Time Constraint

Secondary

- Playback + Validation
- Weather Resistance
- Durability
- Customer Support
- Battery Life
- Privacy/ Conspicuousness
- Lighting Constraints

5 Steps to Create a Data Collection Program

How should we collect data?

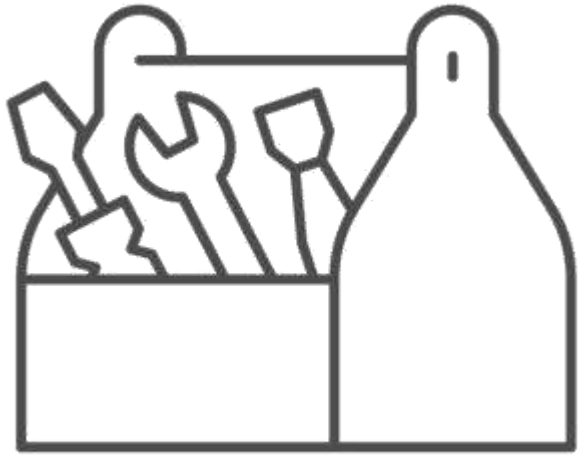


Ability to Move

In-field/Intercept	~~Piezoelectric~~
Video (Manual)	~~Radio Beams~~
Video (Auto)	Radar
Pneumatic Tube	~~Laser Scanner~~
Infrared (Passive)	~~Pressure/Acoustic Pad~~
Infrared (Active)	~~Fiberoptic Pressure Sensor~~
Inductive Loop	~~Magnetometer~~

5 Steps to Create a Data Collection Program

How should we collect data?



Accuracy

In-field/Intercept	~~Piezoelectric~~
Video (Manual)	~~Radio Beams~~
Video (Auto)	~~Radar~~
Pneumatic Tube	~~Laser Scanner~~
~~Infrared (Passive)~~	~~Pressure/Acoustic Pad~~
Infrared (Active)	~~Fiberoptic Pressure Sensor~~
Inductive Loop	~~Magnetometer~~

Source: *NCHRP Web Only 229*, p.6

5 Steps to Create a Data Collection Program

How should we collect data?

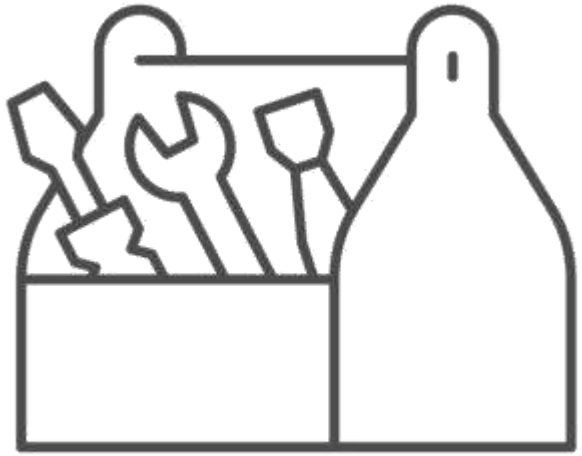
Table S-2. Counting Technology Key Findings: Combined Results from Phases 1 and 2

	Technology	Mode	Research Phase	APD	AAPD	WAPD	*r*	N	Average Hourly Volume
	Passive infrared	C	1, 2	−3.5%	22.5%	−9.5%	0.938	398	258
	Product A	C	1	8.7%	22.2%	−1.6%	0.949	244	279
	Product B	C	1	−26.0%	26.4%	−27.0%	0.982	115	263
	Product C	C	2	−13.5%	13.5%	−13.6%	0.988	39	113
	Active infrared	C	1	−6.6%	7.3%	−7.6%	0.998	34	327
*	Thermal imaging camera	B, P	2	5.5%	22.5%	2.7%	0.912	28	101
	Bicycle-specific tubes	B	1	−19.8%	22.2%	−17.1%	0.979	262	167
	Product A	B	1	−9.5%	10.8%	−11.1%	0.993	172	203
	Product B	B	2	−69.1%	69.1%	−59.6%	0.841	47	117
	Product C	B	2	−7.3%	16.6%	−9.4%	0.920	43	76
	Standard tubes	B	2	−15.2%	17.1%	−17.9%	0.936	17	62
	Radar	B, P	1	22.7%	27.8%	14.2%	0.918	31	72
*	Surface inductive loops	B	1	3.8%	10.5%	4.8%	0.959	136	155
*	Embedded inductive loops	B	1	0.3%	7.6%	−3.1%	0.997	29	145
	Surface inductive loops (facility counts)	B	1	139.5%	159.7%	−11.5%	0.971	136	183
	Embedded inductive loops (facility counts)	B	1	−10.8%	49.6%	−35.3%	0.980	66	186
*	Piezoelectric strips	B	1, 2	−4.0%	4.5%	−4.1%	0.995	120	105
	Product A	B	1, 2	−3.4%	3.7%	−3.4%	0.997	81	112
	Product B	B	2	−5.2%	6.1%	−5.8%	0.994	39	91
	Radio beam	C	1	−9.6%	9.7%	-11.1%	0.991	56	321

Source: *NCHRP Web Only 229*, p.6

5 Steps to Create a Data Collection Program

How should we collect data?



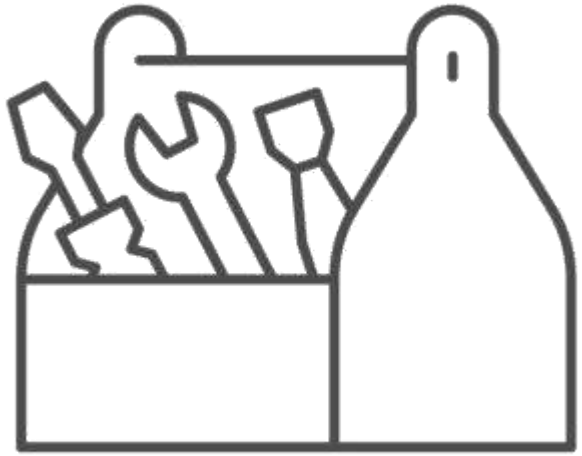
Multiple Modes

- In-field/Intercept
- Video (Manual)
- Video (Auto)
- Pneumatic Tube
- Infrared (Passive)
- Infrared (Active)
- Inductive Loop

~~Piezoelectric~~
~~Radio Beams~~
~~Radar~~
~~Laser Scanner~~
~~Pressure/Acoustic Pad~~
~~Fiberoptic Pressure Sensor~~
~~Magnetometer~~

5 Steps to Create a Data Collection Program

How should we collect data?



Time Constraint

- ~~In-field/Intercept~~
- ~~Video (Manual)~~
- Video (Auto)
- ~~Pneumatic Tube~~
- Infrared (Passive)
- Infrared (Active)
- Inductive Loop

- ~~Piezoelectric~~
- ~~Radio Beams~~
- ~~Radar~~
- ~~Laser Scanner~~
- ~~Pressure/Acoustic Pad~~
- ~~Fiberoptic Pressure Sensor~~
- ~~Magnetometer~~

5 Steps to Create a Data Collection Program

How should we collect data?

$4,395/unit
+ processing charges

Portable Video

Playback + Validation

Weather Resistance

Durability

Customer Support

Battery Life

Privacy/ Conspicuousness

~~Lighting Constraints~~

5 Steps to Create a Data Collection Program

How should we collect data?

$5,450/unit
+ $420 annual fee

Permanent Active Infrared
+ Inductive Loop

~~Playback + Validation~~

Weather Resistance

Durability

Customer Support

Battery Life

Privacy/ Conspicuousness

Lighting Constraints

5 Steps to Create a Data Collection Program

How should we collect data?

Source: EcoCounter

5 Steps to Create a Data Collection Program

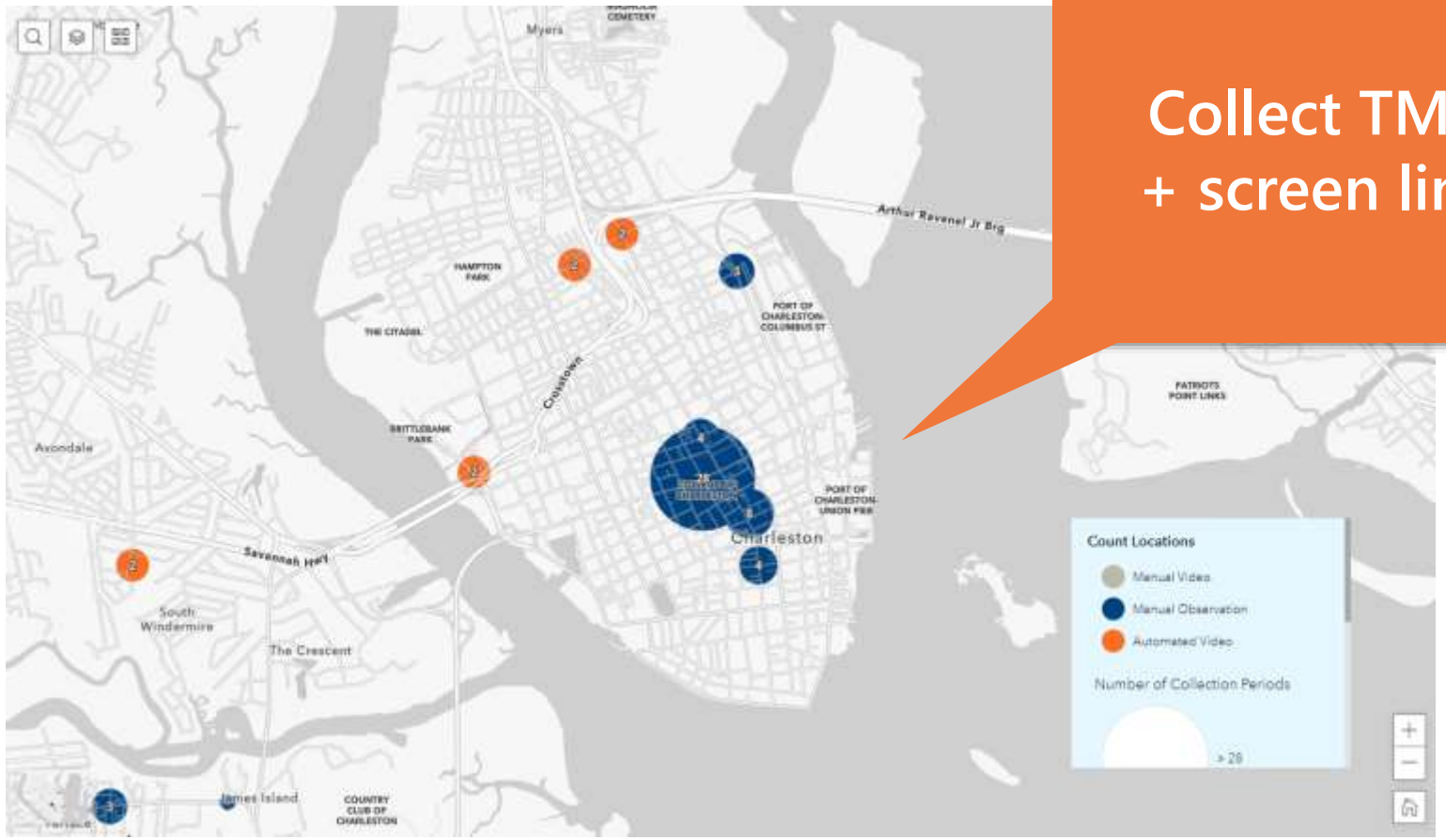
When and where should we collect data?

Low-hanging Fruit

- Examples of great facilities
- Locations with future projects
- Safety concerns
- Repeat locations
- Constrain to budget

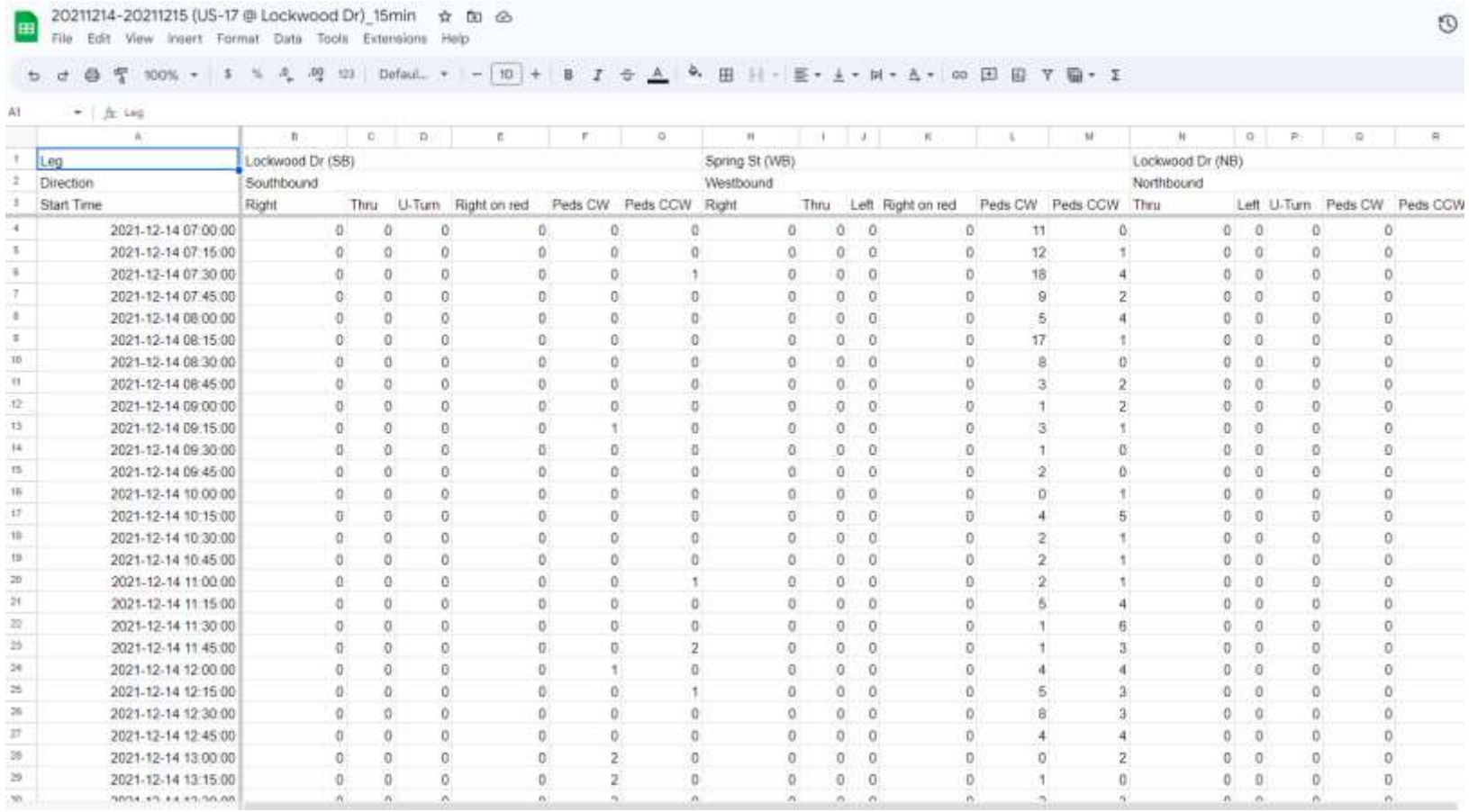
5 Steps to Create a Data Collection Program

When and where should we collect data?



5 Steps to Create a Data Collection Program

Who can access the data?



20211214-20211215 (US-17 @ Lockwood Dr)_15min

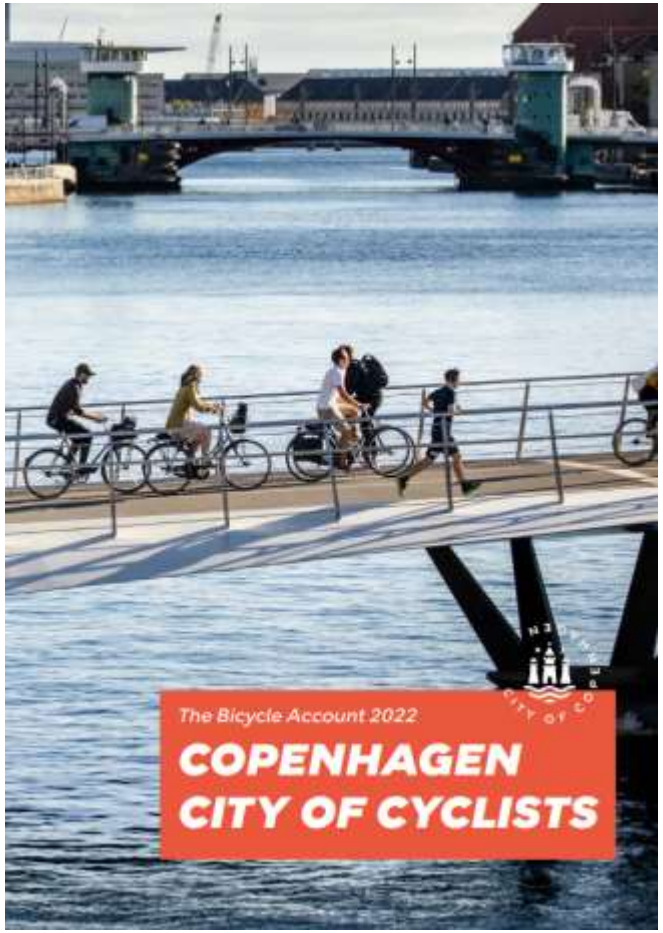
File Edit View Insert Format Data Tools Extensions Help

Leg	Lockwood Dr (SB)						Spring St (WB)						Lockwood Dr (NB)				
Direction	Southbound						Westbound						Northbound				
Start Time	Right	Thru	U-Turn	Right on red	Peds CW	Peds CCW	Right	Thru	Left	Right on red	Peds CW	Peds CCW	Thru	Left	U-Turn	Peds CW	Peds CCW
2021-12-14 07:00:00	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	
2021-12-14 07:15:00	0	0	0	0	0	0	0	0	0	0	12	1	0	0	0	0	
2021-12-14 07:30:00	0	0	0	0	0	1	0	0	0	0	16	4	0	0	0	0	
2021-12-14 07:45:00	0	0	0	0	0	0	0	0	0	0	9	2	0	0	0	0	
2021-12-14 08:00:00	0	0	0	0	0	0	0	0	0	0	5	4	0	0	0	0	
2021-12-14 08:15:00	0	0	0	0	0	0	0	0	0	0	17	1	0	0	0	0	
2021-12-14 08:30:00	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	
2021-12-14 08:45:00	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	
2021-12-14 09:00:00	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	
2021-12-14 09:15:00	0	0	0	0	1	0	0	0	0	0	3	1	0	0	0	0	
2021-12-14 09:30:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
2021-12-14 09:45:00	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	
2021-12-14 10:00:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
2021-12-14 10:15:00	0	0	0	0	0	0	0	0	0	0	4	5	0	0	0	0	
2021-12-14 10:30:00	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	
2021-12-14 10:45:00	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	
2021-12-14 11:00:00	0	0	0	0	0	1	0	0	0	0	2	1	0	0	0	0	
2021-12-14 11:15:00	0	0	0	0	0	0	0	0	0	0	5	4	0	0	0	0	
2021-12-14 11:30:00	0	0	0	0	0	0	0	0	0	0	1	6	0	0	0	0	
2021-12-14 11:45:00	0	0	0	0	0	2	0	0	0	0	1	3	0	0	0	0	
2021-12-14 12:00:00	0	0	0	0	1	0	0	0	0	0	4	4	0	0	0	0	
2021-12-14 12:15:00	0	0	0	0	0	1	0	0	0	0	5	3	0	0	0	0	
2021-12-14 12:30:00	0	0	0	0	0	0	0	0	0	0	8	3	0	0	0	0	
2021-12-14 12:45:00	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	
2021-12-14 13:00:00	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	
2021-12-14 13:15:00	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	

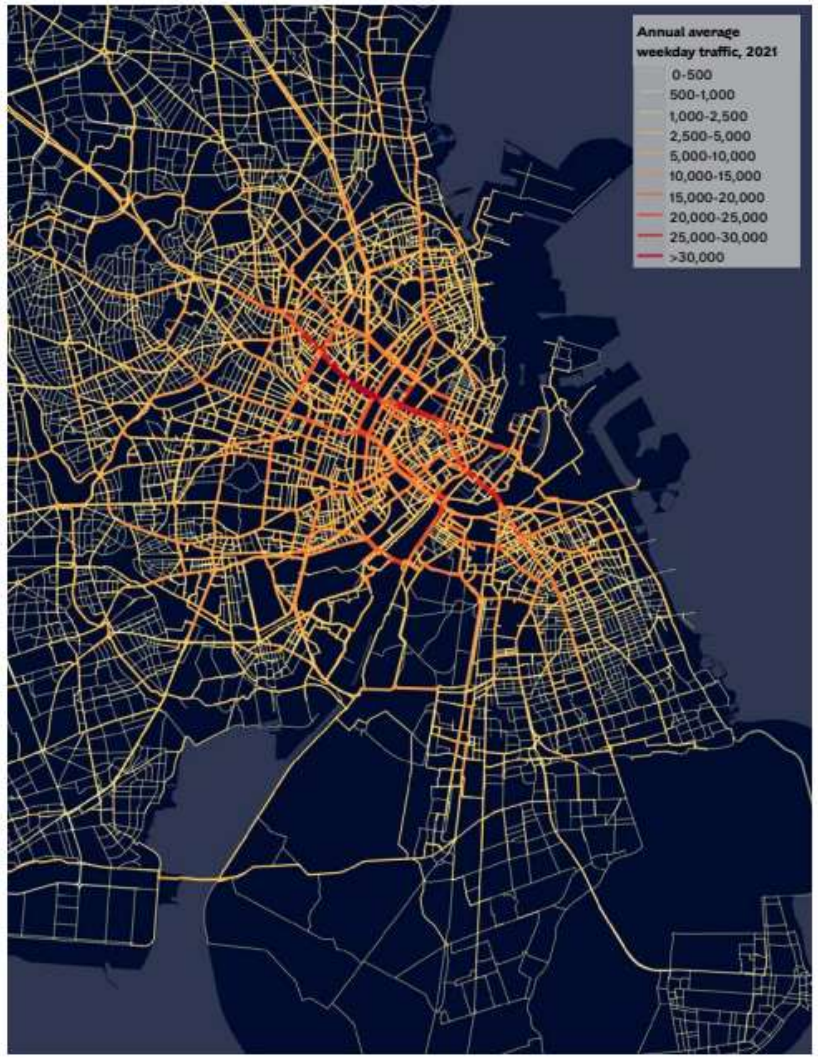
Source: [BCDCOG]

5 Steps to Create a Data Collection Program

Who can access the data?



Source: Itera



5 Steps to Create a Data Collection Program

Who can access the data?

MODE	ELEMENT	LEVEL OF SERVICE A					F
Pedestrians (PLOS)	Segments	*High level of comfort*					*Low level of comfort*
	Intersections	*Short delay, high level of comfort, low risk*					*Long delay, low level of comfort, high risk*
Bicycles (BLOS)	Segments	*High level of comfort*					*Low level of comfort*
	Intersections	*Low level of risk / stress*					*High level of risk / stress*
Trucks (TkLOS)	Segments	*Unimpeded movement*					*Impeded movement*
	Intersections	*Unimpeded movement / short delay*					*Impeded movement / long delay*
Transit (TLOS)	Segments	*High level of reliability*					*Low level of reliability*
	Intersections	*Short delay*					*Long delay*
Vehicles (LOS)	Intersections	*Low lane utilization*					*High lane utilization*

Source: Parsons

5 Steps to Create a Data Collection Program

- First understand the analyses that you want to complete.
- Mine existing data + set-aside funding.
- You get what you pay for.
- Start small and focus on low-hanging fruit.
- You'll be surprised how many people will want to contribute to your program if you make the data open source.

5 Steps to Create a Data Collection Program

If it isn't measured, it doesn't count.

5 Steps to Create a Data Collection Program

Kyle James

Regional Planner

BCD Council of Governments

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843-529-0402