- https://tableau.tamu.edu/t/TTI/views/HoustonBikePedVizBeta1_0/StationMap?iframeSizedToWindow=true&%3Aembed=y&%3AshowAppBanner=false&%3Adisplay_count=no&%3AshowVizHome=no

TxDOT Bicycle and Pedestrian Data Project

TxDOT Project 6927 Evaluation of Bicycle and Pedestrian Monitoring Equipment to Establish Collection Database and Methodologies for Estimating Non-Motorized Transportation

Robert J. Benz, P.E.

Texas A&M Transportation Institute

HGAC Bicycle and Pedestrian Subcommittee Meeting Update

July 19, 2018

Presentation Take Away

- TxDOT online visualization interface
  - TxDOT Maintained Database
  - Ability to take multiple count types (bike, ped, combined)
  - Multiple count intervals (15 and 60 minutes)
  - Multiple vendors formats
- Need agency assistance with gathering count data
- Standardized count and site information
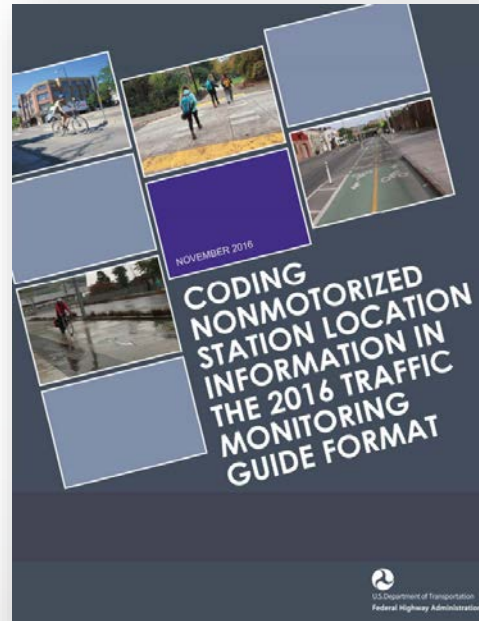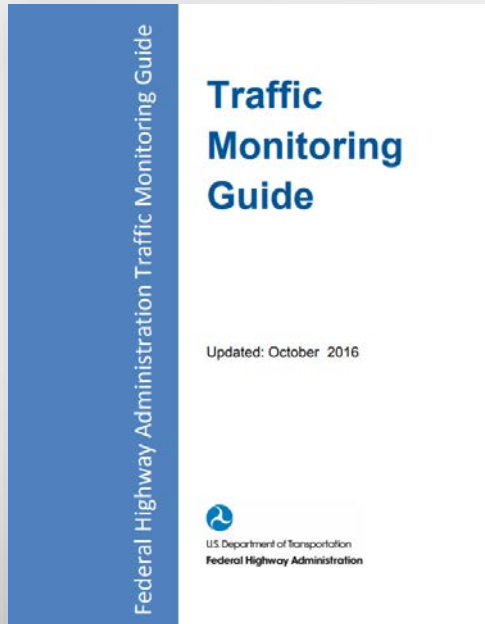
Project 0-6927 Objectives

- Recommend statewide monitoring process for pedestrians and bicyclists
  - Assess equipment, approaches, process in 2 TxDOT Districts
  - Evaluate crowdsourced data
- **Compile existing and project-collected data into consolidated database**
  - **Create sustainable process for city/MPO submittals**

Need for standardization

	A	B	C	D	E	F	G	
1	Location	Date	New Count	Weekend?	Day of Week	Error Values	Notes	
2	FM 2818 - West	Fri 2						
3	FM 2818 - West	Fri 2						
4	FM 2818 - West	Fri 2						
5	FM 2818 - West	Fri 2						
6	FM 2818 - West	Fri 2						
7	FM 2818 - West	Fri 2						
8	FM 2818 - West	Fri 2						
9	FM 2818 - West	Sat 2						
10	FM 2818 - West	Sat 2						
11	FM 2818 - West	Sat 2						
12	FM 2818 - West	Sat 2						
13	FM 2818 - West	Sat 2						
14	FM 2818 - West	Sat 2						
15	FM 2818 - West	Sat 2						
16	FM 2818 - West	Sat 2						
17	FM 2818 - West	Sat 2						
18	FM 2818 - West	Sat 2						
19	FM 2818 - West	Sat 2						
20	FM 2818 - West	Sat 2						
21	FM 2818 - West	Sat 2						
22	FM 2818 - West	Sat 2						
23	FM 2818 - West	Sat 2						
24	FM 2818 - West	Sat 2						
25	FM 2818 - West	Sat 2						
26	FM 2818 - West	Sat 25 Aug 2012 17:00	3	Weekend	Saturday			
27	FM 2818 - West	Sat 25 Aug 2012 18:00	0	Weekend	Saturday			
28	FM 2818 - West	Sat 25 Aug 2012 19:00	0	Weekend	Saturday			

Lane #1 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
1.			Normal	Pres	No	

Lane #1 Basic Volume Data From: 14:00 - 05/02/2017   To: 13:59 - 06/13/2017

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
050217	T															6	4	2	3	27	17	13	5	8	0	85
050317	W	0	3	2	2	0	3	18	18	3	2	3	5	8	4	7	3	2	10	16	26	19	5	0	1	160
050417	T	1	2	0	0	0	0	9	14	2	7	15	6	1	3	9	6	4	0	33	50	37	2	0	3	204
050517	F	2	0	5	2	0	2	16	15	2	1	2	2	1	1	7	4	1	4	23	14	18	2	3	0	127
050617	S	1	4	0	1	1	0	3	9	64	192	195	143	24	5	1	2	5	3	6	11	7	2	0	0	679
050717	S	2	0	0	1	2	0	5	9	4	1	0	5	0	0	12	2	0	8	7	22	2	1	2	0	85
050817	M	0	1	0	1	0	0	9	20	10	8	1	5	1	2	5	0	1	3	7	15	13	4	0	1	107
050917	T	0	1	1	0	0	3	14	14	13	21	5	6	3	2	2	4	3	7	16	26	6	4	3	0	154
051017	W	1	1	1	1	0	0	12	6	9	40	5	6	3	3	6	4	2	8	8	22	3	6	1	0	148
051117	T	1	2	2	1	0	0	17	18	6	4	5	6	3	4	10	3	3	4	14	28	1	3	2	2	139
051217	F	0	1	0	0	0	0	17	10	22	32	20	64	0	5	9	3	0	0	2	19	1	7	4	1	217
051317	S	0	1	1	1	0	2	5	9	59	91	206	136	10	0	1	1	4	13	2	4	0	1	5	0	552

Use FHWA Guide to standardize

- FHWA Traffic Monitoring Guide, 2016

TMG Limitations

- TMG is submittal/exchange format, not storage format

TMG Limitations

- TMG does not include all attributes desired by TxDOT, such as
  - TxDOT District
  - City/Area
  - Site Name
  - Cardinal Travel Direction
  - Data Owner and Provider Contact Name, Email, Phone

TxDOT Count Database

- Uses same TMG data attributes, but…

- Adds extra data attributes

- Uses relational database structure rather than fixed-column text format

DRAFT - Count Station Location Attributes

#	Attribute Name	TxDOT Required?	TMG Required?	Maximum Length in TxDOT Database
1	State	Yes	Yes	Enumerated values
2	TxDOT District	Yes	N.A.	Enumerated values
3	County	Yes	Yes	Enumerated values
4	City/Area	Yes	N.A.	None
5	Station ID TMG	Yes	Yes	6 characters
6	Station Name	Yes	N.A.	None
7	Flow ID TxDOT	Yes	N.A.	14 characters
8	Station ID Agency	No	N.A.	None
9	Strava/OSM Segment Identifier	No	N.A.	None
10	Travel Direction	Yes	N.A.	Enumerated values
11	Functional Classification	Yes	Yes	Enumerated values
12	Direction of Route	Yes	Yes	Enumerated values
13	Location of Count Relative to Roadway	Yes	Yes	Enumerated values
14	Direction of Movement	Yes	Yes	Enumerated values
15	Facility Type	Yes	Yes	Enumerated values
16	Intersection	No	No	Enumerated values
17	Type of Count	Yes	Yes	Enumerated values
18	Method of Counting	Yes	Yes	Enumerated values
19	Type of Sensor	Yes	No	Enumerated values
20	Year of Data	Yes	Yes	4 characters
21	Factor Group 1	No	No	1 character
22	Factor Group 2	No	No	1 character
23	Factor Group 3	No	No	1 character
24	Factor Group 4	No	No	1 character
25	Factor Group 5	No	No	1 character
26	Primary Count Purpose	No	No	Enumerated values
27	Posted Speed Limit	No	No	2 characters
28	Year Station Established	Yes	Yes	4 characters
29	Year Station Discontinued	No	No	4 characters
30	National Highway System	No	No	Enumerated values
31	Latitude	Yes	Yes	None
32	Longitude	Yes	Yes	None
33	Posted Route Signing	No	No	Enumerated values
34	Posted Signed Route Number	No	No	8 characters

#	Attribute Name	TxDOT Required?	TMG Required?	Maximum Length in TxDOT Database
35	LRS Route ID	No	No	60 characters
36	LRS Location Point	No	No	8 characters
37	Station Location	No	No	50 characters
38	Other Notes	No	No	51 characters
39	Owner Agency	Yes	N.A.	None
40	Owner Name	Yes	N.A.	None
41	Owner Phone	Yes	N.A.	12 characters
42	Owner Email	Yes	N.A.	None
43	Provider Agency	Yes	N.A.	None
44	Provider Name	Yes	N.A.	None
45	Provider Phone	Yes	N.A.	12 characters
46	Provider Email	Yes	N.A.	None
47	Requester Agency	No	N.A.	None
48	Requester Name	No	N.A.	None
49	Requester Phone	No	N.A.	12 characters
50	Requester Email	No	N.A.	None
51	Mounting Object	No	N.A.	None
52	Surrounding Land Uses	No	N.A.	Enumerated values
53	Nonmotorized Facility Width	No	N.A.	None
54	Nonmotorized Facility Buffer Width	No	N.A.	None
55	Street Width	No	N.A.	Enumerated values
56	Parking	No	N.A.	Enumerated values
57	Pavement Type	No	N.A.	Enumerated values
58	Pavement Condition	No	N.A.	Enumerated values
59	ADA Ramps	No	N.A.	Enumerated values
60	Street Lighting	No	N.A.	Enumerated values
61	Street Traffic Volume (ADT)	No	N.A.	None
62	Transit	No	N.A.	Enumerated values
63	Shade	No	N.A.	Enumerated values
64	Vendor	No	N.A.	None

Green cells indicate attributes required by both TMG and TxDOT.
Blue cells indicate attributes required only by TxDOT.
Uncolored cells indicate attributes that are not required by either TMG or TxDOT.
N.A. indicates that this attribute is not required by TMG, nor is it included in the TMG data dictionary.
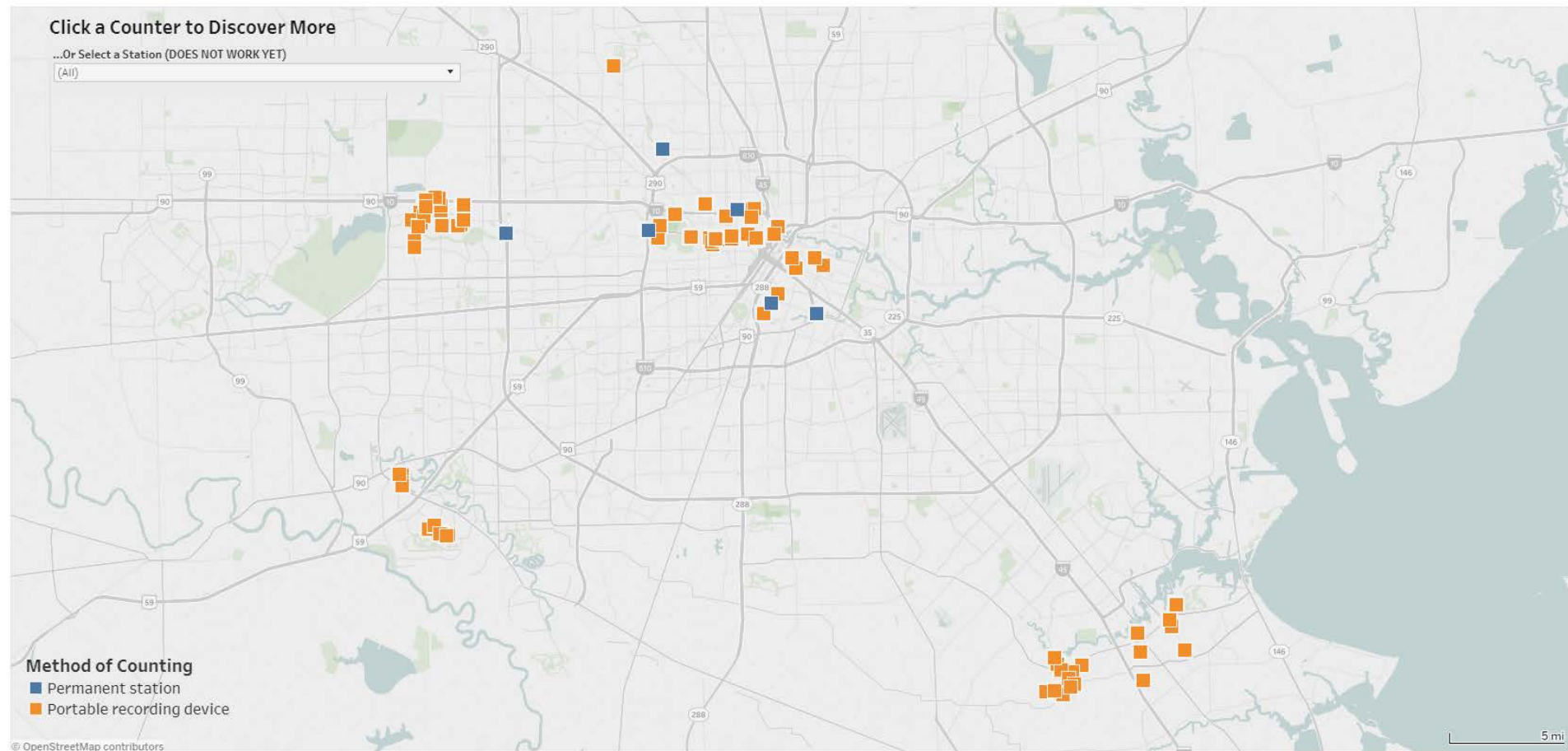
DRAFT - Count Data Attributes

Column #	Attribute Name	TxDOT Required?	TMG Required?	Maximum Length in TxDOT Database
1	Station ID TMG	Yes	Yes	6 characters
2	Station Name	Yes	N.A.	None
3	Flow ID TxDOT	Yes	N.A.	17 characters
4	Station ID Agency	No	N.A.	None
5	Travel Direction	Yes	N.A.	Enumerated values
6	Type of Count	Yes	Yes	Enumerated values
7	Helmet Use	No	No	Enumerated values
8	Gender	No	No	Enumerated values
9	Age	No	No	Enumerated values
10	Precipitation	No	No	Enumerated values
11	High Temp	No	No	3 characters
12	Low Temp	No	No	3 characters
13	Date	Yes	N.A.	MM/DD/YY
14	Start Time	Yes	Yes	HH:MM AM/PM
15	Count Interval	Yes	Yes	Enumerated values
16	Count	Yes	Yes	None
Green cells indicate attributes required by both TMG and TxDOT.				
Blue cells indicate attributes required only by TxDOT.				
Uncolored cells indicate attributes that are not required by either TMG or TxDOT.				
N.A. indicates that this attribute is not required by TMG, nor is it included in the TMG data dictionary.				

Heights Trail @ 5 1/2 Street

© OpenStreetMap contributors
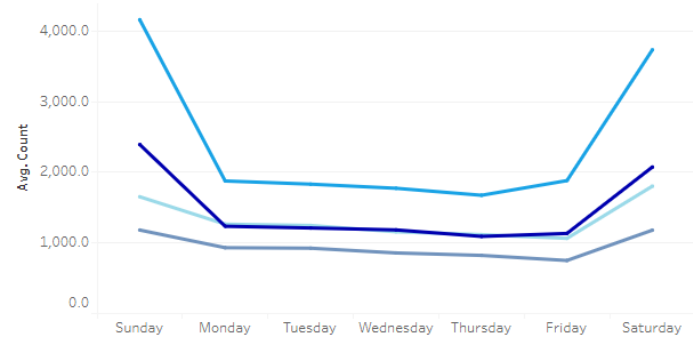
Counter Information

Count Type: Permanent station
Functional Class: Urban: Trail or Shared Use Path
Facilitiy Type: Trail not associated with a roadway
Sensor(s) Used:

Sensor: Inductive loop
Sensor: Passive infrared

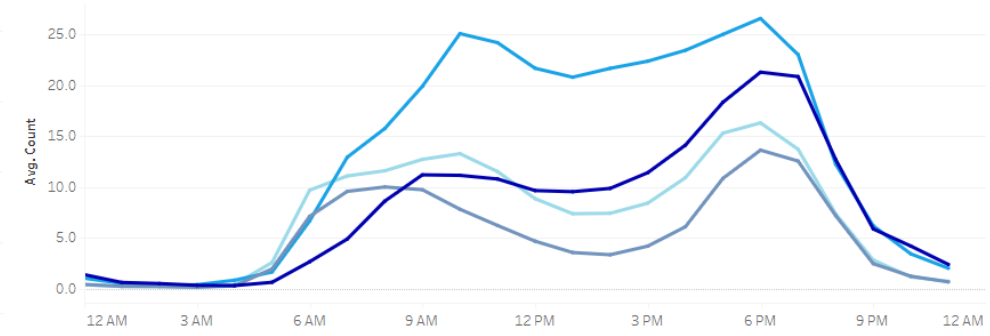**Use the zoom feature to look at finer-grained data.**

Filter the Date Using the Slider
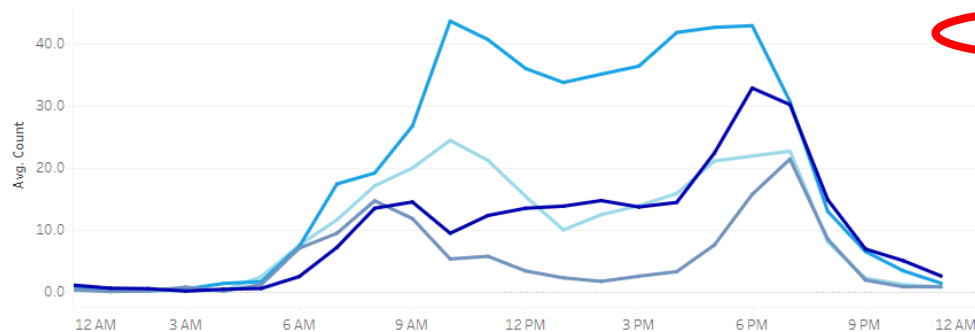
January 23, 2013   November 8, 2017

Actual Count axis: 2000, 1500, 1000, 500, 0

Mar 1, 13   Jul 1, 13   Nov 1, 13   Mar 1, 14   Jul 1, 14   Nov 1, 14   Mar 1, 15   Jul 1, 15   Nov 1, 15   Mar 1, 16   Jul 1, 16   Nov 1, 16   Mar 1, 17   Jul 1, 17

Day of Week Average

Avg. Count: 4,000.0, 3,000.0, 2,000.0, 1,000.0, 0.0

Sunday   Monday   Tuesday   Wednesday   Thursday   Friday   Saturday

Time of Day Average

Avg. Count: 25.0, 20.0, 15.0, 10.0, 5.0, 0.0

12 AM   3 AM   6 AM   9 AM   12 PM   3 PM   6 PM   9 PM   12 AM
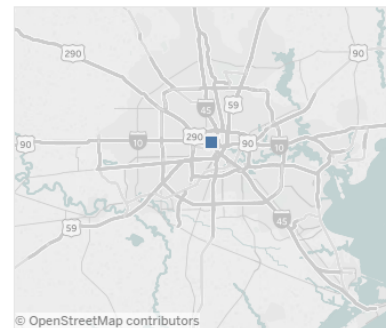
Type of Count
(All)

Travel Direction
(All)

Legend: Direction & Type
- NB, Bicycles only
- NB, Pedestrians only
- SB, Bicycles only
- SB, Pedestrians only

Undo   Redo   Revert   Refresh   Pause   Share   Download   Full Screen

Heights Trail @ 5 1/2 Street

Counter Information

Count Type: Permanent station
Functional Class: Urban: Trail or Shared Use Path
Facilitiy Type: Trail not associated with a roadway
Sensor(s) Used:

Sensor: Inductive loop
Sensor: Passive infrared

Use the zoom feature to look at finer-grained data.

Filter the Date Using the Slider

April 1, 2017
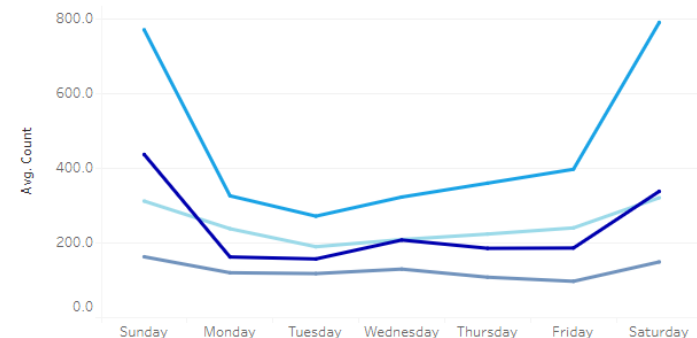
April 30, 2017

Type of Count
(All)

Travel Direction
(All)
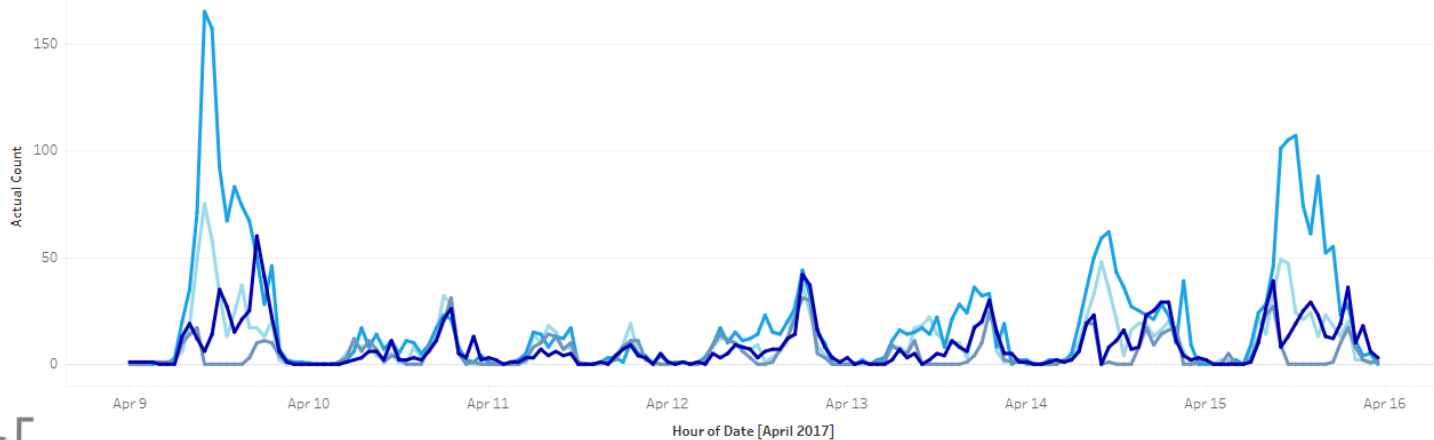
Day of Week Average

Time of Day Average

Legend: Direction & Type
- NB, Bicycles only
- NB, Pedestrians only
- SB, Bicycles only
- SB, Pedestrians only

Undo | Redo | Revert | Refresh | Pause

Share | Download | Full Screen

Heights Trail @ 5 1/2 Street

© OpenStreetMap contributors
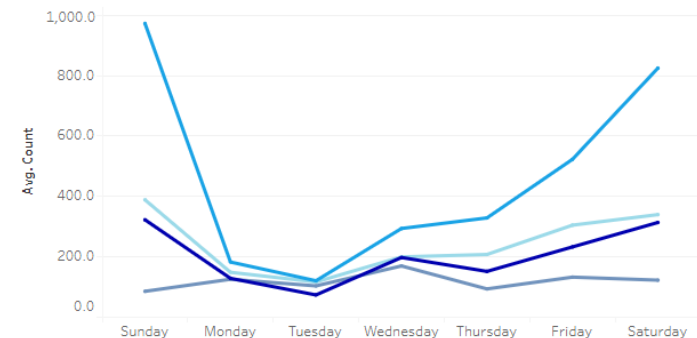
Counter Information

Count Type: Permanent station
Functional Class: Urban: Trail or Shared Use Path
Facilitiy Type: Trail not associated with a roadway
Sensor(s) Used:
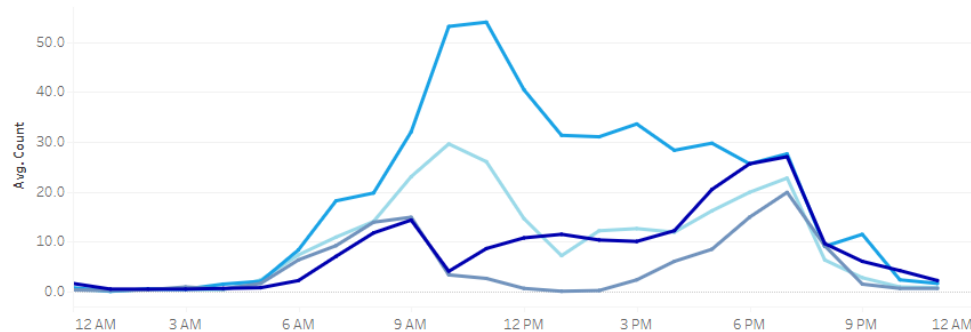
Sensor: Inductive loop
Sensor: Passive infrared

Use the zoom feature to look
at finer-grained data.

Filter the Date Using the Slider

April 9, 2017   April 15, 2017

Actual Count vs *Hour of Date [April 2017]* — Apr 9 through Apr 16

Day of Week Average

Avg. Count by Day of Week: Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday

Time of Day Average

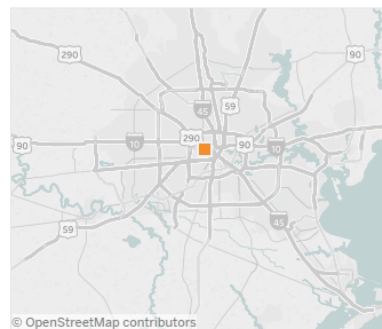Avg. Count by Time of Day: 12 AM, 3 AM, 6 AM, 9 AM, 12 PM, 3 PM, 6 PM, 9 PM, 12 AM

Type of Count
(All)

Travel Direction
(All)

Legend: Direction & Type
NB, Bicycles only
NB, Pedestrians only
SB, Bicycles only
SB, Pedestrians only

← Undo   → Redo   ⟵ Revert   Refresh   ⏸ Pause   Share   Download   Full Screen

Buffalo Bayou South Bank: Lost Lake

© OpenStreetMap contributors
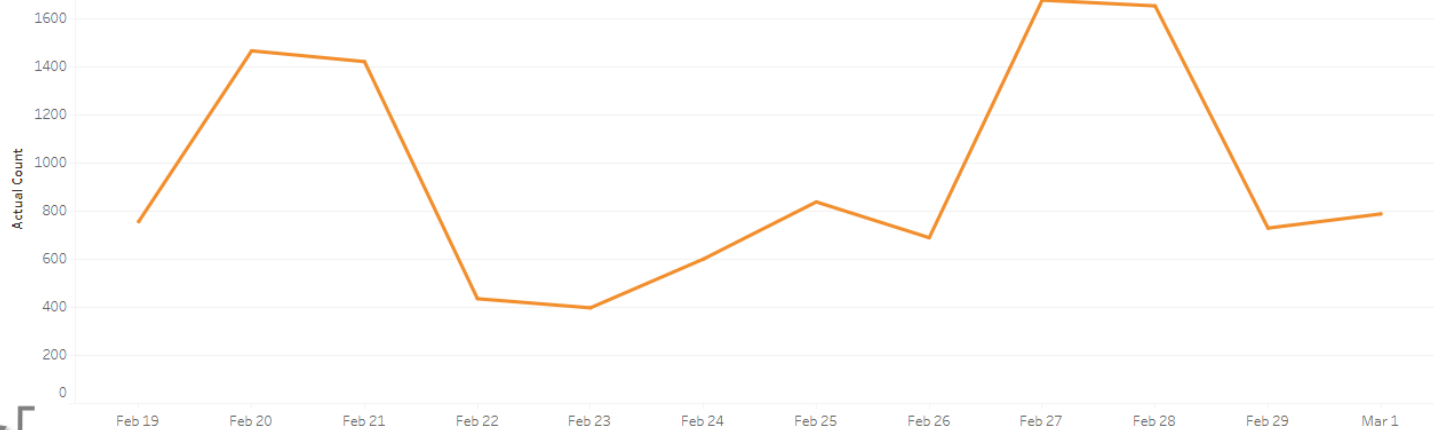
Counter Information

Count Type: Portable recording device
Functional Class: Urban: Principal Arterial -Other
Facilitiy Type: Sidewalk
Sensor(s) Used:

Sensor: Passive infrared

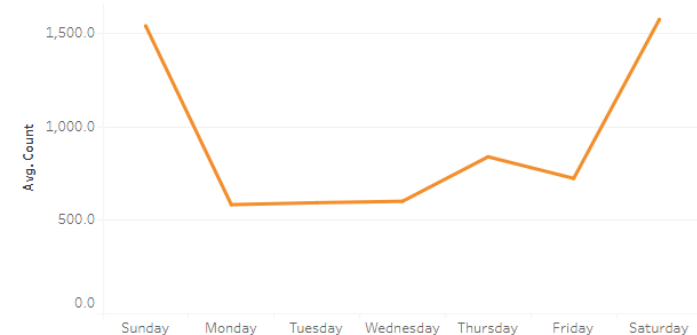Use the zoom feature to look at finer-grained data.
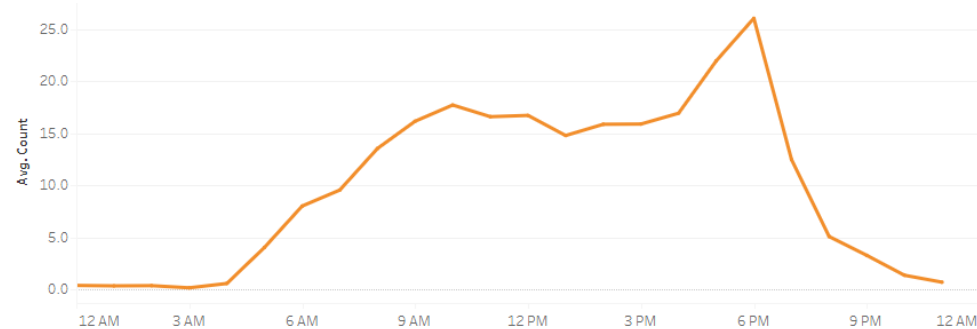
Filter the Date Using the Slider
January 23, 2013   November 8, 2017

Actual Count

Feb 19   Feb 20   Feb 21   Feb 22   Feb 23   Feb 24   Feb 25   Feb 26   Feb 27   Feb 28   Feb 29   Mar 1

Day of Week Average

Avg. Count

Sunday   Monday   Tuesday   Wednesday   Thursday   Friday   Saturday

Time of Day Average

Avg. Count

12 AM   3 AM   6 AM   9 AM   12 PM   3 PM   6 PM   9 PM   12 AM

Type of Count
All nonmotorized traffic

Travel Direction
All

Legend: Direction & Type
All, All nonmotorized traffic

Undo   Redo   Revert   Refresh   Pause   Share   Download   Full Screen

TxDOT Bicycle and Pedestrian Data Project

TxDOT Project 6927 Evaluation of Bicycle and Pedestrian Monitoring Equipment to Establish Collection Database and Methodologies for Estimating Non-Motorized Transportation

Questions

Submittal of Data

R-Benz@tamu.edu

713-613-9218

Robert J. Benz, P.E.

Texas A&M Transportation Institute

HGAC Bicycle and Pedestrian Subcommittee Meeting Update

July 19, 2018