

3. Select either a *Basic* (recommended) or *Volume Only* study by using the TAB key and hitting DO when your selection is flashing.

4. Select a tube layout. Layouts L5 & L6 can be used to collect data for speed, class, gap and volume. The remaining layouts can provide only gap and volume data. TAB to your selection and press the DO key to select it.

5. Select whether or not to use a site code. Press DO with *Yes* flashing to enter one or press DO with *No* flashing to not use a site code. Site codes are not required.

6. Press DO with *Start* flashing to begin your study!

GEN4 CP-GPS MAY 2016

SERIAL NO.
1609

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MEMPHIS MPO BICYCLE AND PEDESTRIAN COUNTER PROGRAM

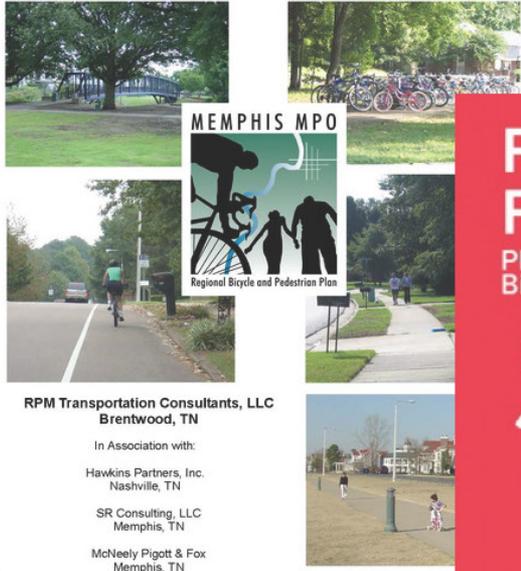
CONDUCTING BIKE AND PEDESTRIANS COUNTS, TO PLAN FOR THEM

TDOT MPO CONFERENCE

June 7, 2017

Memphis, TN

Final Report
Memphis MPO Regional
Bicycle and Pedestrian Plan
January, 2005



MEMPHIS MPO
Regional Bicycle and Pedestrian Plan

RPM Transportation Consultants, LLC
Brentwood, TN

In Association with:
Hawkins Partners, Inc.
Nashville, TN
SR Consulting, LLC
Memphis, TN
McNeely Pigott & Fox
Memphis, TN

Regional Bicycle & Pedestrian Plan

Plan Regional de Bicicletas y Peatones



Memphis MPO
METROPOLITAN PLANNING ORGANIZATION
Strengthening Regional Transportation



Memphis Urban Area Metropolitan Planning Organization

2012 TN APA Award

Regional Bicycle & Pedestrian Plan

Adopted December 15, 2011



2012 FHWA TPEA Award



Bicycle & Pedestrian Counts

How We Got Started?

- 2014 - Mid-South Household Travel Survey

Bicycle-Pedestrian Data Collection

Survey - 1,172 completed

Counts - Conducted at 40 locations across the region

2014 Regional Bicycle & Pedestrian Survey
We need your input!



- Survey Question: Factors that would encourage you to bike more:

Better maintenance of bicycle routes **7.0%**

More nearby locations to bicycle to (shopping, entertainment, daycare, etc.) **9.6%**

More off-street paths **14.1%**

Transit service improvements (e.g., more routes or more frequent buses) **1.4%**

Safer ways to cross freeways, major intersections, rivers (on bridges), etc. **6.1%**

More protected bicycle lanes with buffers **14.4%**

Bicycle safety classes or other safety education **0.9%**

Enhanced surroundings of bicycle routes such as more separation from road; better lighting; more signs; maps of bicycle routes; or better scenery **3.8%**

Wider shoulders or outside lanes on roadways **2.8%**

Better connectivity, including linkages between bicycle routes and no abrupt endings to bikeways **3.5%**

More dedicated bicycle lanes **7.2%**

Educating the driving public about driving safely around bicyclists **5.3%**

Installing showers/lockers at work **1.5%**

Reduced motor vehicle speeds or volumes **0.7%**

More or improved bicycle parking at key destinations **1.2%**

Stronger enforcement of motor vehicle violations **2.9%**

More support for bicycling from people that I associate with **0.6%**

Access to bicycles, such as with a bicycle sharing program **1.0%**

High gas or parking prices **1.2%**

None - I don't enjoy bicycling **3.2%**

None - My health prevents me from bicycling **1.2%**

None - I almost always need my car (for my job, carrying passengers, or other tasks) **5.3%**

Count Locations:

Across the Region: 40

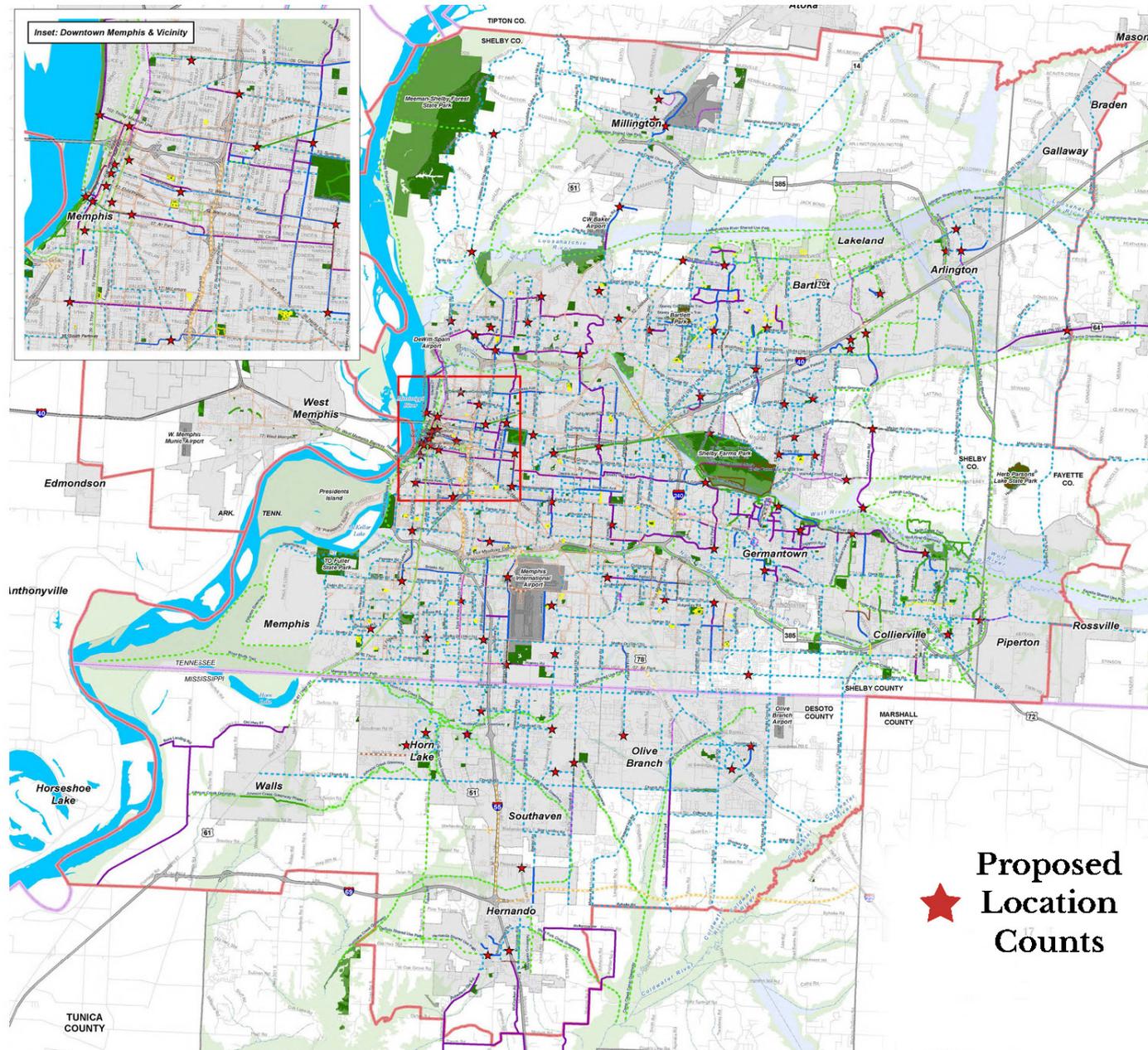
Broad Range of Locations:

- Existing Facilities
- Current TIP Projects
- Corridors in BPP
- Multiple Jurisdictions
- Mix Land Use Types
- Bike/Ped Traffic

Collection Summary:

Time of Year: April
Weather improved for outdoor activity

Time of Day: 12 Hour
Period: 7 am - 7 pm



FHWA Pilot Program



2015 - 1 of 10 MPO's selected Bicycle/Pedestrian Automated Count Pilot Program
No Formal Bicycle and Pedestrian Count Program in Place
\$20,000 Grant from FHWA to Purchase Counters (\$5,000 local match)

Pedestrian Counter Technology

Range of Technology For Pedestrians

1. Video Detection: Camera Detection

Video Technology installed at an intersection
Configure zones to detect between different sized objects and
avoids zones where pedestrian are unlikely to be
Data retrieved manually or uploaded automatically via Wi-Fi

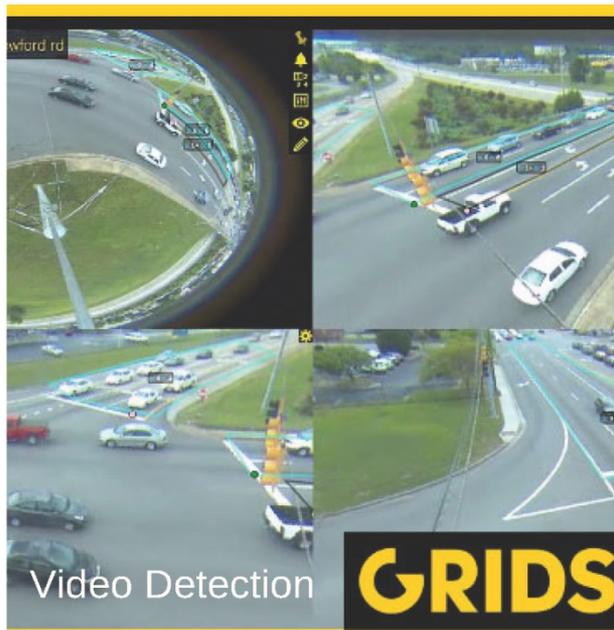
2. Passive Infrared Counters

Detect changes in energy (i.e. temperature, heat)
Multi-Purpose systems that can be used pedestrians or
bicyclists (cannot distinguish between people using the two
modes)

**8 out of 10 MPOs for
Pilot Program selected
the passive infrared
counters**



**Eco-Counters or TRAFx
Manufacturers**



Passive Infrared

TAKING PEDESTRIAN COUNTS

- Detect pedestrians and cyclists by infrared radiation heated pattern
- Passive infrared sensor placed on one side of the facility
- Widely used and tested
- The devices are deployed horizontally (causes challenges with groups of pedestrians)

Advantages

- **Movable and easy to install**
- **Can be used with a bicycle only count technology**
- **Battery Powered**
- **May store data onsite or wirelessly**

Drawbacks

- **Cannot be used in mixed vehicle locations**
- **Are prone to error due to changes in background (sun reflection)**

Passive Infrared Counters

Configure:

Prior to Installation (Docking Station)

Install:

Mount on Light Pole, Tree, etc.

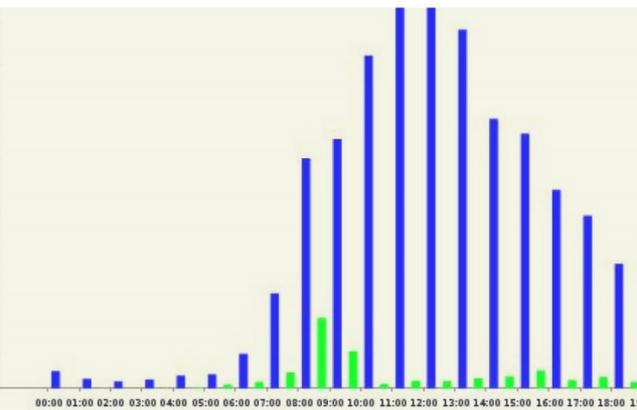
Position Direction across Sidewalk

Collect/Analyze:

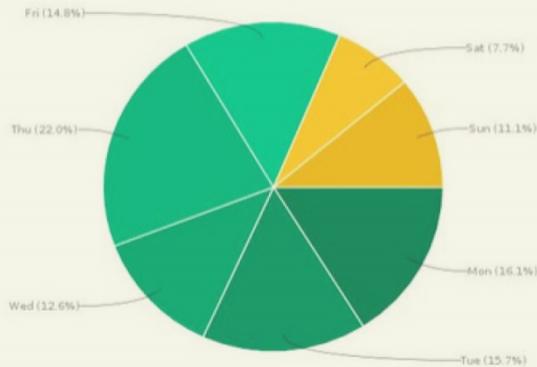
Data through Software Program (TRAFx)



TRAFx Software



HOURS OF THE DAY



DAYS OF THE WEEK



Bicycle Counter Technology

Range of Technology For Bicyclists

1. Micro-Radar Sensors

- Pavement embedded bicycle counters for bicycle lanes
- Detects bicycle through the disruption of an electromagnetic field
- Flexibility to be portable or permanently installed
- Loops are capable of distinguishing bicyclists from vehicles
- Data is retrieved on-site or at a remote, centralized location

2. Pneumatic Tubes

- Two rubber tubes stretched across the right-of-way
- Pulses of air pass through to a detector which detects the vehicle axle and classifies the type
- Captures direction

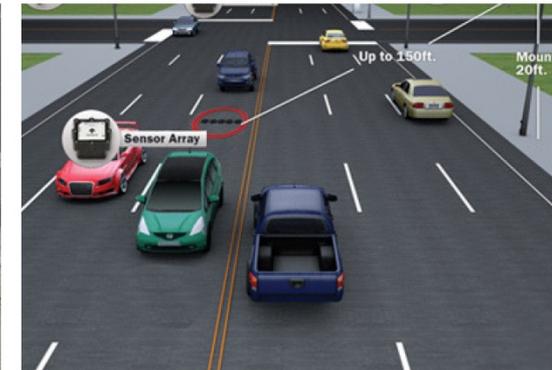
1 MPO selected Microradar sensors and 8 MPOs selected Pneumatic tubes

JAMAR Technologies,
Eco-Counters, and Senys Networks

Pneumatic Tubing



MicroRadar Senses



Pneumatic Counters

- Two rubber tubes are stretched across the ROW and record when bicycles pass
- Bicycle or other vehicles pass over the tubes, pulses of air pass through to a detector which deduces the vehicles axle spacing

Advantages:

- More familiar technology, portable, easy to install

Drawbacks:

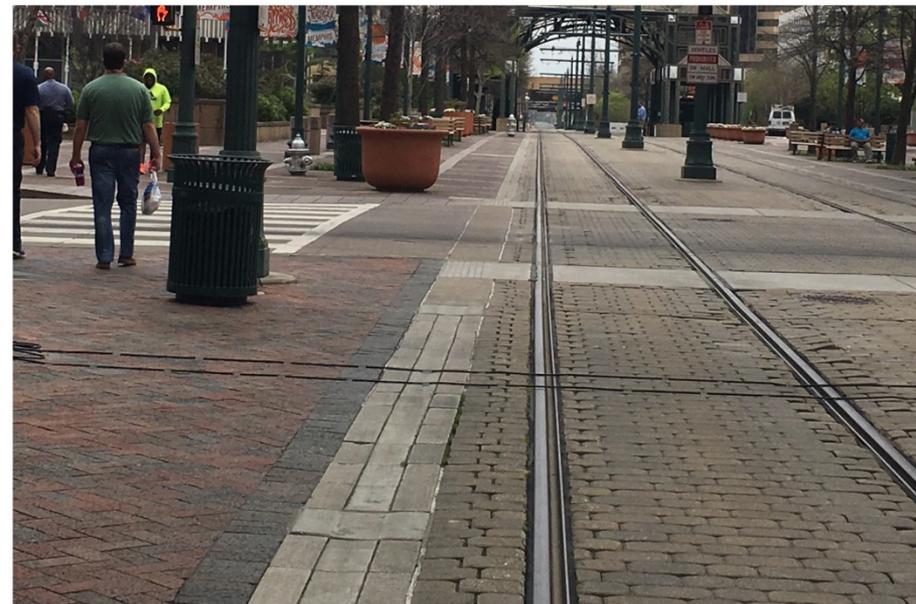
Wear and tear, periodic field visits (check tape), tape or tubing will deteriorate under high bicycle or vehicular traffic; on-site data downloading.

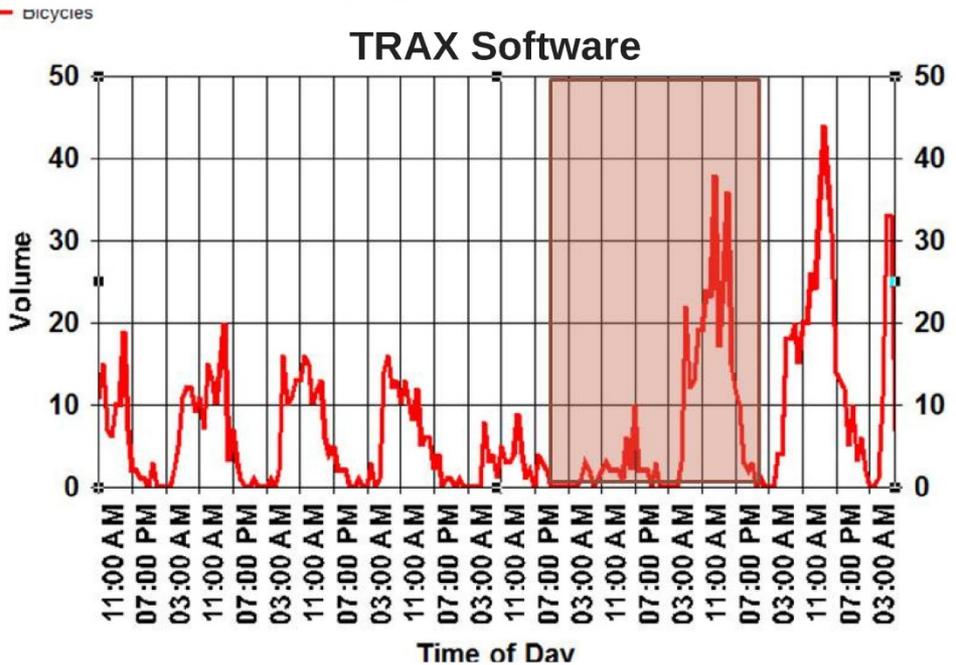
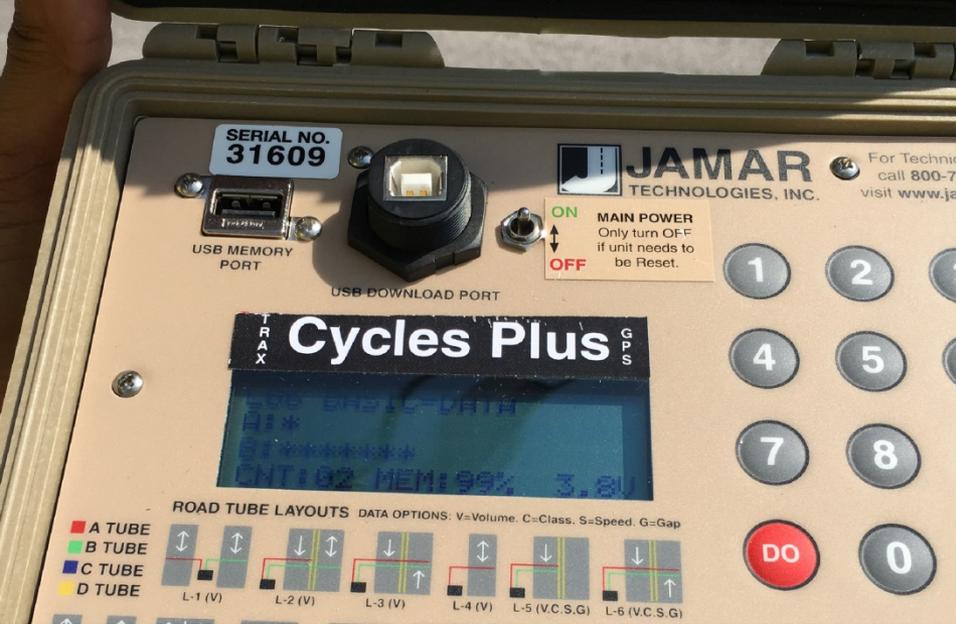
Best Installation:

- Paved Surface and above freezing weather

Count Duration:

- One day to several months





PNEUMATIC COUNTERS

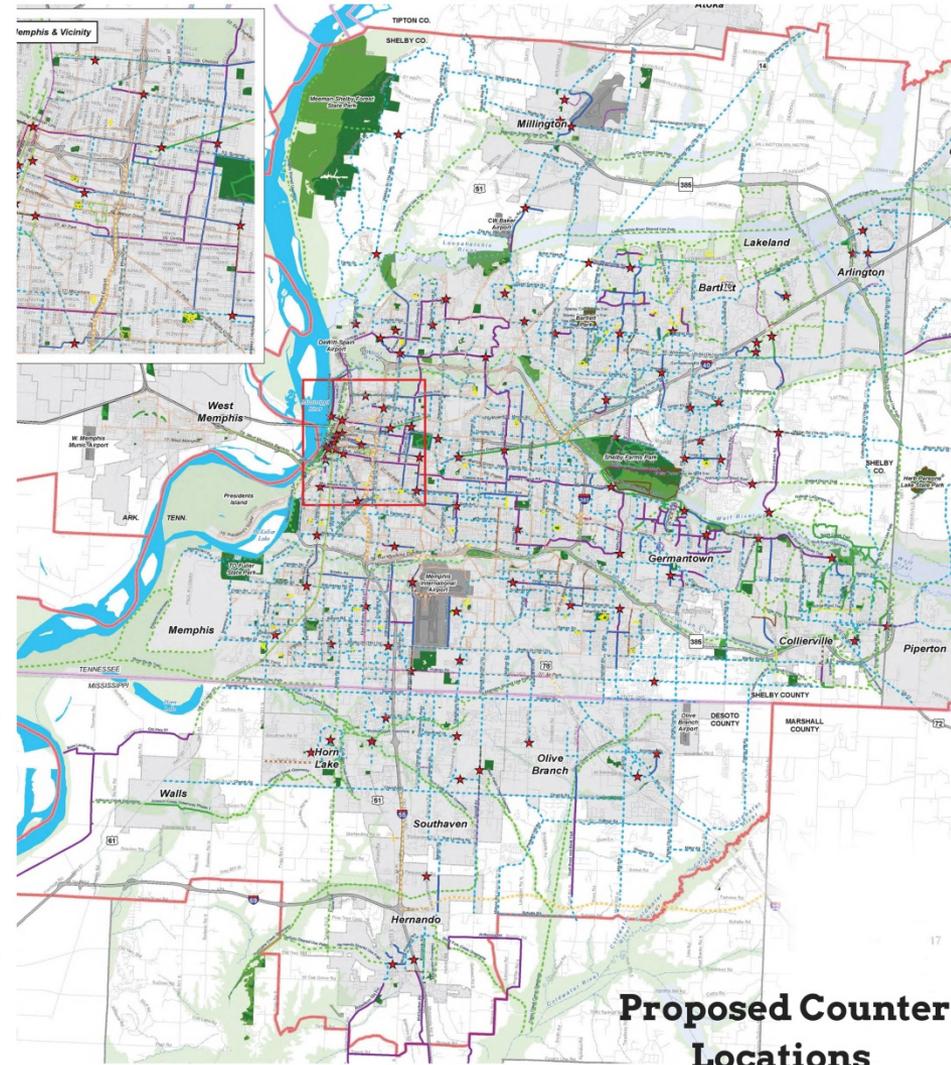
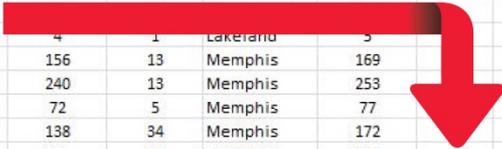
- **CONFIGURE:**
 - Set-up Prior to Installation
- **INSTALL:**
 - Tubes (40-60' length), 2' Apart
 - Chain, Locks, Tape
 - Mid-Week Check
- **COLLECT/ANALYZE DATA**

Test Period (Infrared & Pneumatic Counters)

Selection of Locations

Location #	Location	Pedestrian Count	Bicycle Count	Jurisdiction	Count Combined	Ranking	
0		114	6	Hernando	120		
1		12	1	Olive Branch	13		
2	Chesterfield Dr/McCord Dr/Rasco Rd	288	0	Southaven	288	8	(near So
3		4	1	Southaven	5		
4		0	0	Piperton	0		
5		15	1	Memphis	16		
6		8	6	Arlington	14		
7		38	9	Bartlett	47		
8		0	0	Bartlett	0		
9		72	26	Collierville	98		
10		104	9	Germantown	113		
11							
12		4	1	Lakeland	5		
13		156	13	Memphis	169		
14		240	13	Memphis	253		
15		72	5	Memphis	77		
16		138	34	Memphis	172		
17		95	34	Memphis	129		
18	Tillman/SF Greenline	146	114	Memphis	260	10	end of S
19	Cooper St/Madison Ave	319	64	Memphis	383	6	end of B
20	Dunlap St/Jefferson Ave	1262	37	Memphis	1299	2	(SCHD/N
21	Semmes St/Park Ave	294	33	Memphis	327	7	Bike Lar
22		167	52	Memphis	219		
23		53	0	Memphis	53		
24		193	6	Memphis	199		
25		25	4	Memphis	29		
26		68	20	Memphis	88		
27	SF Greenline/Mullins Station Rd	24	249	Memphis	273	9	Shared-l
28	Humphreys Blvd/Shady Grove Rd	320	77	Memphis	397	5	Bike Lar
29		227	10	Memphis	237		
30		200	11	Memphis	211		
31		162	7	Memphis	169		
32		114	2	Memphis	116		
33		100	8	Memphis	108		
34		52	6	Memphis	58		
35		34	11	Millington	45		
36	Main St/GE Patterson Ave	534	23	Memphis	557	4	(MATA C
37	Riverside Dr/ South of Beale St	770	37	Memphis	807	3	(previou
38	Main St/Adams Ave	2280	87	Memphis	2367	1	(City Hal
39		169	27	Memphis	196		
Total		9005	1124		10129		
Average		225.125	28.1				

Ranking Sheet to determine high traffic counter locations



Proposed Counter Locations
(East Memphis)

Selection of Locations

Counters Placed in Three Locations for One Week Testing Period

DETERMINING COUNTER TEST LOCATIONS:

Considered a number of factors:

Facility type, volume, location, adjacent land uses

Input from local stakeholders:

Memphis MPO Active Transportation Committee (ATAC)

Same Time of Year as Counts Done in 2014
(compare data)



Main and Adams (Downtown)



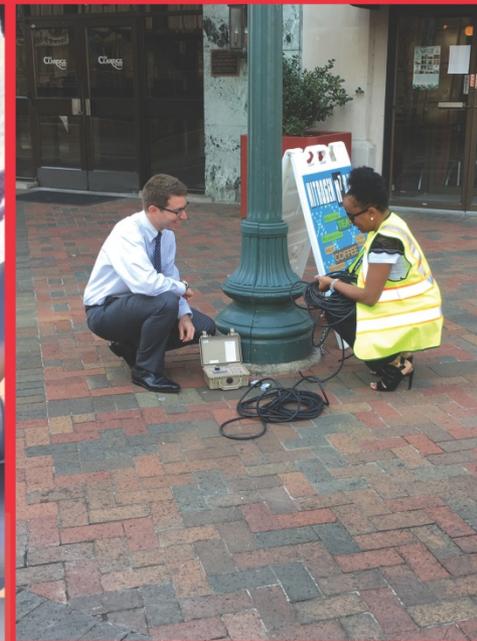
Dunlap and Jefferson
(Medical District)



Humphreys and Shady Grove
(East Memphis)

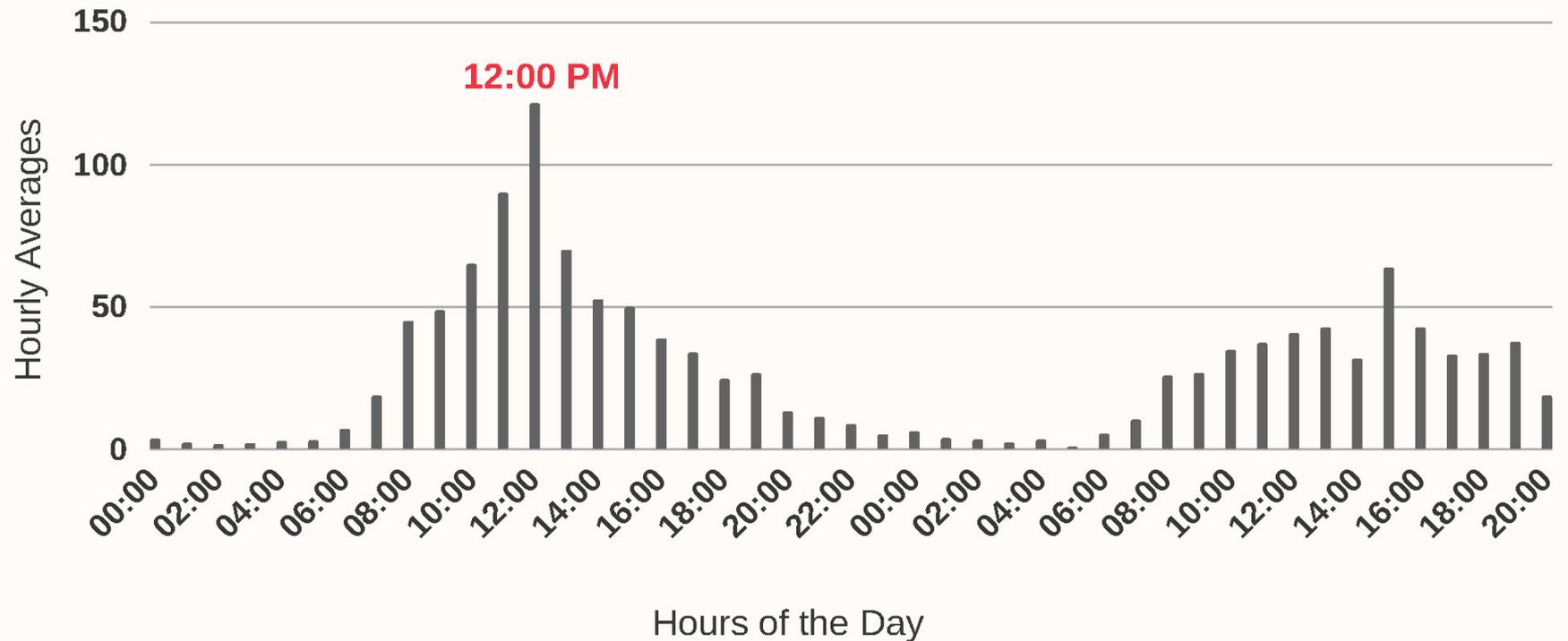
Test Location: Main & Adams

MAIN ST. AND ADAMS AVE.



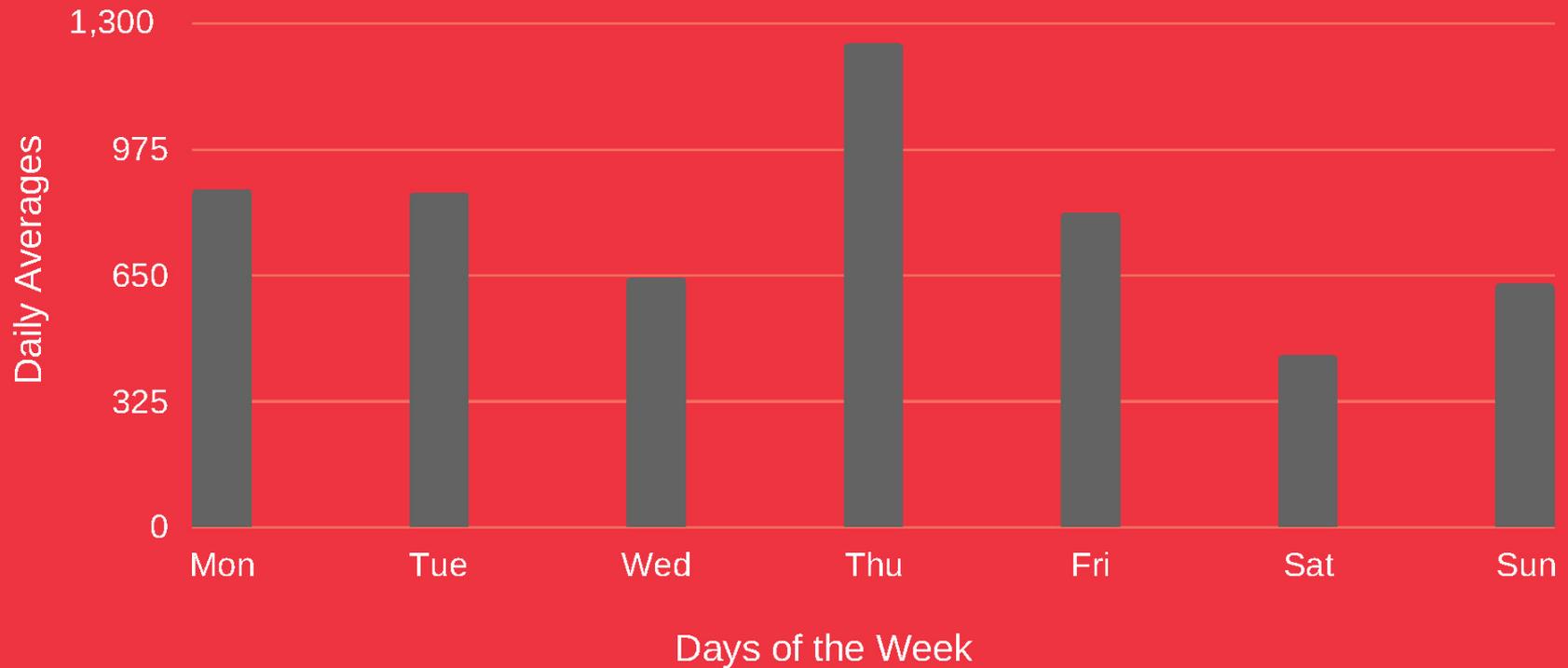
HOURS OF THE DAY

Infrared Counter



DAYS OF THE WEEK

Infrared Counter





785

Avg. Daily Traffic

SUMMARY FOR PEDESTRIANS

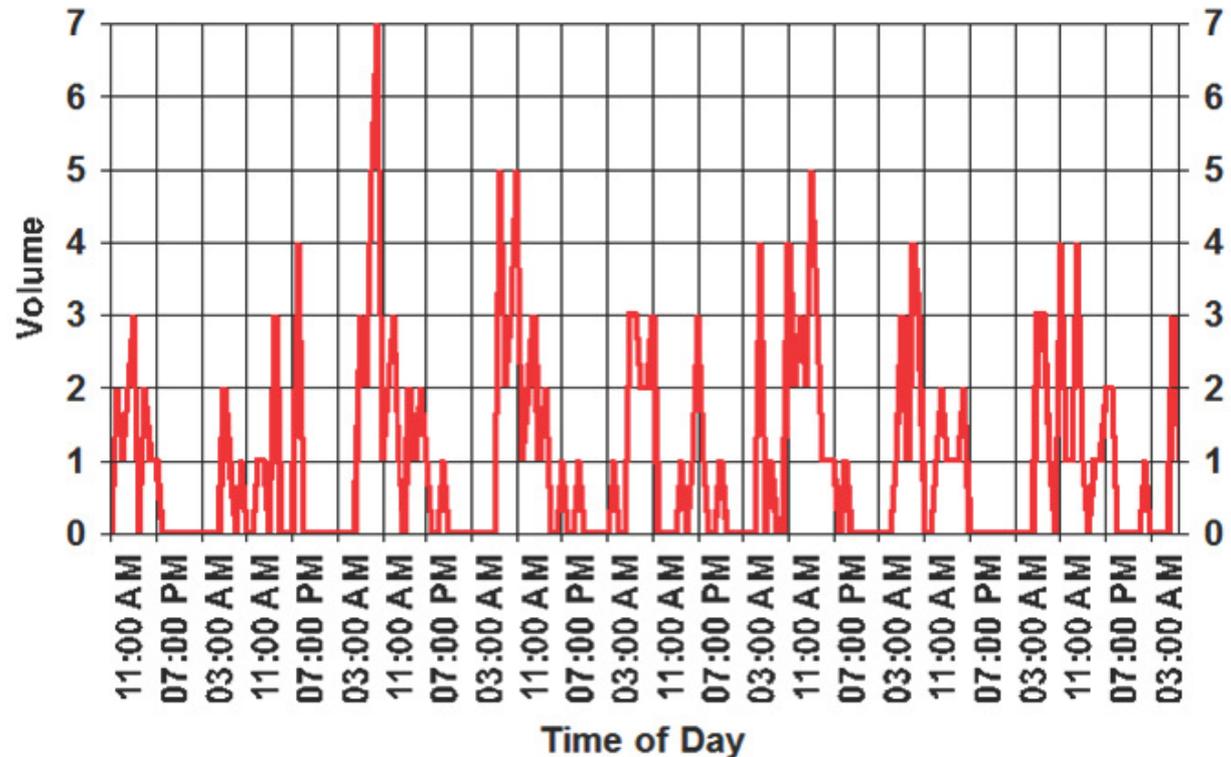
Main Street and Adams Avenue

- Busiest Day of the Week: Thursday (1,243 Counts)
 - Slowest Day of the Week: Saturday
 - Busiest Time of Day: 12:00 PM
 - Daily Average: 785
 - Min: 441 (Saturday)
 - Max: 1,243 (Thursday)
- 

BICYCLE COUNTS

Main Street and Adams Avenue

— Total



Busiest Day of the Week: Thursday

Slowest Day of the Week: Wednesday

Busiest Time of Day: 11:00 AM

Summary of Data Three Count Locations

Summary of Data (2017 Counts)

Locations	Main/Adams		Dunlap/ Jefferson		Humphreys/ Shady Grove	
	<u>Pedestrian</u>	<u>Bicycles</u>	<u>Pedestrian</u>	<u>Bicycles</u>	<u>Pedestrian</u>	<u>Bicycles</u>
Total Counts	5,496	158	653	1408	177	218
Busiest Day	Thursday	Thursday	Wednesday	Sunday	Sunday	Monday
Slowest Day of the Week	Saturday	Wednesday	Saturday	Saturday	Saturday	Saturday
Busiest Time of Day	12:00 PM	11:00 AM	9:00 AM	12:00 PM	9:00 AM	12:00 PM

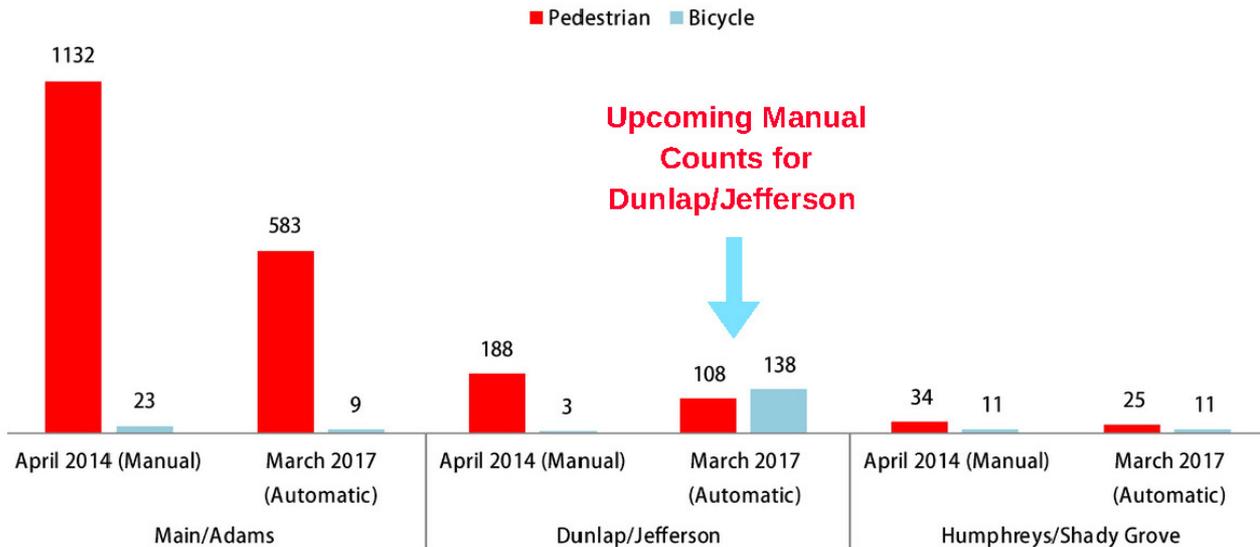


Comparison of Counts

Comparison of Counts (2014/2017)

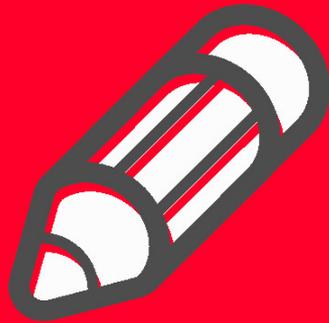
Count Type	Main/ Adams		Dunlap/ Jefferson		Humphreys/ Shady Grove	
	<u>April 2014 (Manual)</u>	<u>March 2017 (Automatic)</u>	<u>April 2014 (Manual)</u>	<u>March 2017 (Automatic)</u>	<u>April 2014 (Manual)</u>	<u>March 2017 (Automatic)</u>
Pedestrian	1132	583	188	108	34	25
Bicycle	23	9	3	138	11	11

2014 and 2017 Count Comparison



Note: Compared 2014 count to 2017 count on the same day of week and same 12-hour period.

Lessons Learned



LESSONS LEARNED

Scheduling

- Allow Sufficient Time and Resources (Before and After Count)
 - May Need to Validate Count (Manual)
-

Safety

- Work in Pairs,
 - Contact Law Enforcement at Busy Intersections
-

Working with Local Jurisdictions

- Partnerships conducting counts across the region
-

Organization and Documentation

- Mapping direction and location of counters
 - Counter numbering system
-

Future Efforts

MPO Ongoing Count Program

- Member Agencies Check-Out Equipment for Use in Their Area
- MPO Serve as Repository for Count Information
- Assist with Future Bicycle and Pedestrian Planning Efforts

Federal Initiatives for Collecting Count Data

- Traffic Monitoring Analysis System
- Working on Collecting Non-Motorized Counts

Video Detection

- Potential Capability to Collect Bicycle and Pedestrian Counts at Intersections
- Signal Software:
 - **SmartCyle** - Differentiate Cars & Bikes
 - **PedTrax** - Count Bikes/Peds Crosswalks
 - **VantageLive!** - Convert Raw Data, New Software: May 2017



- **Background**
- **Bicycle and Pedestrian Plan**
- **How We Got Started**

QUESTIONS?

- **FHWA Pilot Program**
- **Pedestrian Counters**
- **Bicycle Counters**
- **Test Period**

- **Summary of Data**
- **Comparison of Counts**
- **Lessons Learned**
- **Future Efforts**

CONTACT US

125 N. Main Street, Suite 450

K: +1 901 576-7218

Z: +1 901 576-7216

kate.horton@memphistn.gov

zylavian.watley@memphistn.gov

www.memphismpo.org

