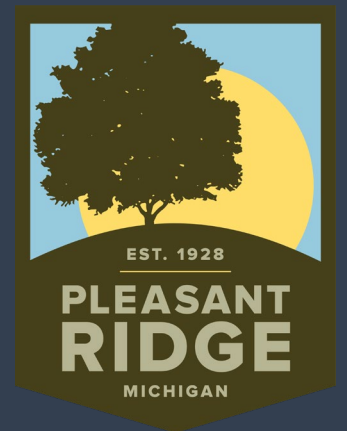


Woodward Heights Traffic Calming Test Project Evaluation

September 8, 2020



City Initiated Projects

- Volume higher than 2,500 vpd
- 85% speed greater than 32 mph
- Specific areas where a safety hazard for pedestrians or bicyclists exists
- Qualifying streets:
 - *Ridge & Woodward Heights*
 - *Oakland Park & Oxford (upon resident petition)*

Traffic Calming Tests

- Pinch Point @ Woodward Alley
- Bumpouts at Indiana & Bermuda crosswalks
- Stop sign removal at Bermuda (North)
- Speed Hump @ Bermuda (South)









Stop Signs

- ARE intersection control
- ARE NOT speed control
 - *Stop signs do not influence vehicle speed*
 - *Unwarranted stop signs can create higher speeds downstream*

Stop Signs

- Must meet specific criteria by law before they can be installed
- Should remove unwarranted signs (Michigan Manual on Uniform Traffic Control)
- Unwarranted signs do not increase safety, can decrease safety

Stop Sign Warrants

- Intersection of a less important street with a busier street
- Intersecting streets with equal volumes
- Other intersections where a combination of high speed, restricted view and serious crash record indicates a need for control by the stop sign

Research Basis

Multi-way Stops - The Research Shows the MUTCD is Correct!

W. Martin Bretherton Jr., P.E.(M)

Abstract

This paper reviewed over 70 technical papers covering all-way stops (or multi-way stops) and their success and failure as traffic control devices in residential areas. This study is the most comprehensive found on multi-way stop signs

The study looked at how multi-way stop signs have been used as traffic calming measures to control speed. There have been 23 hypotheses studied using multi-way stop as speed control. The research found an additional 9 hypotheses studied showing the effect multi way stops have on other traffic engineering problems.

The research found that, overwhelmingly, multi-way stop signs do NOT control speed except under very limited conditions. The research shows that the concerns about unwarranted stop signs are well founded.

Research Findings

- Multi-way stops do not control speeds (22 studies)
- Stop compliance is poor at unwarranted stop signs (19 studies)
 - *Drivers feel the sign has no purpose – no reason to stop because there are usually no vehicles on the minor street*
 - *About 30 failure to stop citations per month @ Bermuda*

Research Findings

- Do not reduce speeds on residential streets (19 studies)
- Unwarranted signs increase speed more than 150 feet away from the intersection (15 studies)

Research Findings

- Pedestrian safety decreased at unwarranted multi-way stops (13 studies)
 - *Pedestrians expect vehicles to stop, but many drivers get in the habit of running the unwarranted stop*
- Increase noise in the vicinity of an intersection (5 studies)
 - *Vehicle braking noise, acceleration back up to travel speed*

Not Tested: Parking on Both Sides

- Pros:

- *Cost (it's free)*
- *Effective - naturally implements traffic calming measures along entire street*
- *Easy to test, easy to reverse*

- Cons:

- *Resident preference*
- *No bicycle infrastructure*

Process

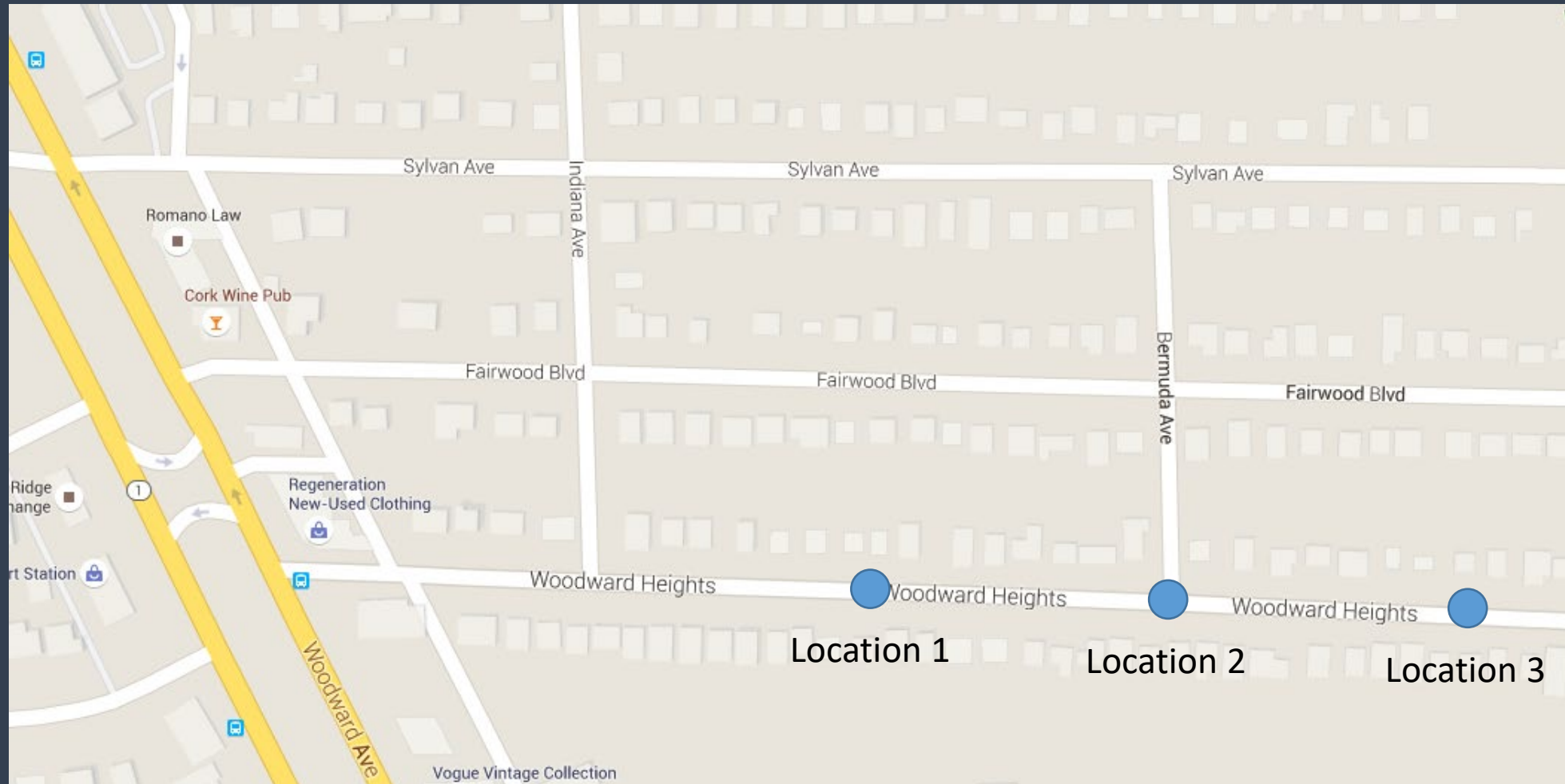
- Collect baseline data
- Install test projects
- Collect test data
- Remove some test projects
- Collect further test data
- Decision what (if anything) to implement

Traffic Data Collector

- Radar unit
- Collects speed and volume data
- Unobtrusive – does not influence results



Count Locations



Count Dates

Location 1

- April 21-28, 2015
- June 12-17, 2020
- July 28-29, 2020
- August 11-13, 2020
- August 31 – September 3, 2020

Location 2

- July 31 – August 5, 2020
- August 14-19, 2020
- August 26-31, 2020

Bottom Line Up Front

- Vehicle speed did not increase during test
 - *Average, 85% speeds unchanged at location 1*
 - *Bermuda stop has no impact on travel speed at location 1*
- @ Bermuda – average speed was 23 - 23.5 mph
 - *Stop sign removal did not result in excessive speed through intersection*

Key Data – Mid-Block Location 1

	May 2015	June 2020	July 2020	Aug. 2020	Sep. 2020
Avg Daily Vehicles	2,854	2,354	2,622	2,811	2,755
Avg Speed	26.2 mph	25.2 mph	25.4 mph	25.2 mph	25.2 mph
85 th % Speed	29.9 mph	29.0 mph	29.0 mph	29.0 mph	29.0 mph
% over 25 mph	54.7%	45.6%	46.6%	44.9%	43.4%
% over 30 mph	16.4%	11.7%	12.9%	12.2%	11.8%
% over 35 mph	3.8%	1.8%	2.3%	2.1%	2.4%
Avg Daily Trucks	18	52	39	40	44

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% over 25 mph	54.7%	45.6%	46.6%	44.9%	43.4%
% over 30 mph	16.4%	11.7%	12.9%	12.2%	11.8%
% over 35 mph	3.8%	1.8%	2.3%	2.1%	2.4%
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Key Data – @ Bermuda Location 2

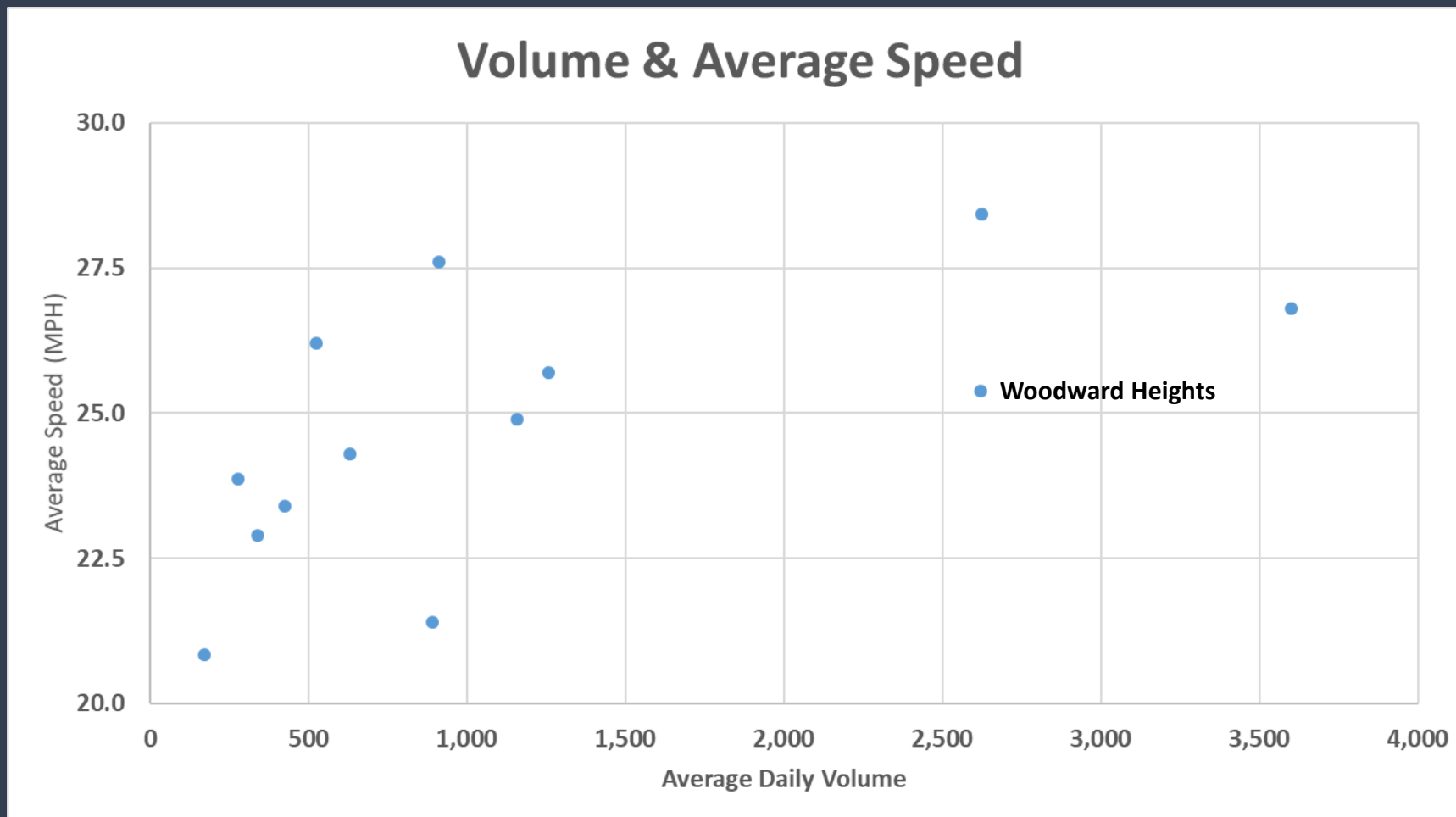
	July 30 – Aug. 5	Aug. 14-19	Aug 26-31
Average Daily Vehicles	2,319	2,707	2,703
Average Speed	23.5 mph	23.0 mph	22.7 mph
85 th Percentile Speed	27.0 mph	27.0 mph	27.0 mph
% over 25 mph	29.8%	26.3%	23.5%
% over 30 mph	6.6%	6.4%	5.6%
% over 35 mph	0.9%	1.1%	0.9%

Key Data – Speed Hump Location 3

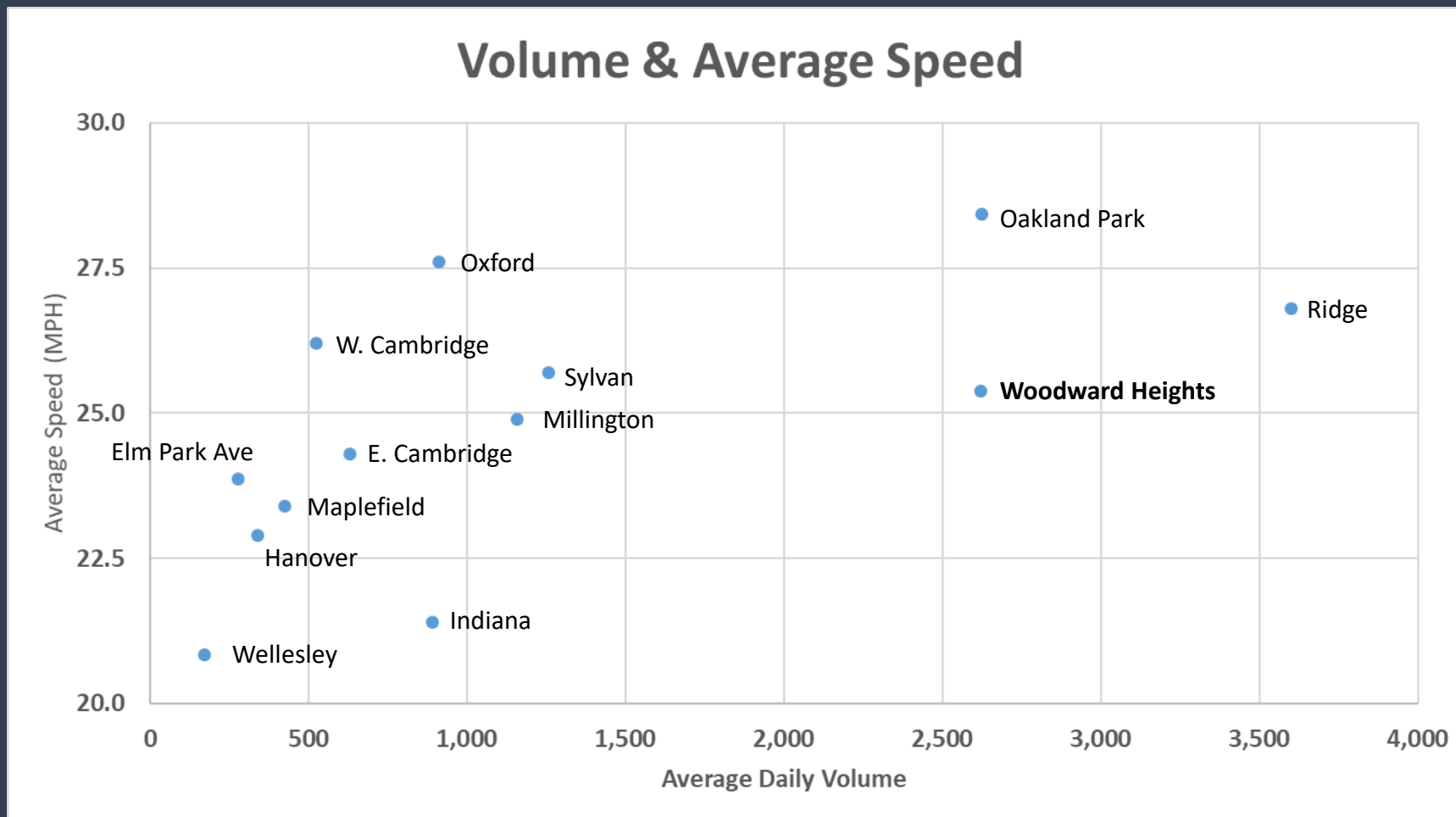
	150 ft. West	600 ft. West (pre)	600 ft. West (post)
Average Daily Vehicles	2,788	2,707	2,703
Average Speed	22.3 mph	23.0 mph	22.7 mph
85 th Percentile Speed	26.0 mph	27.0 mph	27.0 mph
% over 25 mph	15.2%	26.3%	23.5%
% over 30 mph	3.8%	6.4%	5.6%
% over 35 mph	0.4%	1.1%	0.9%
Trucks per day	--	45	47

Comparative Data

Volume & Average Speed



Volume & Average Speed



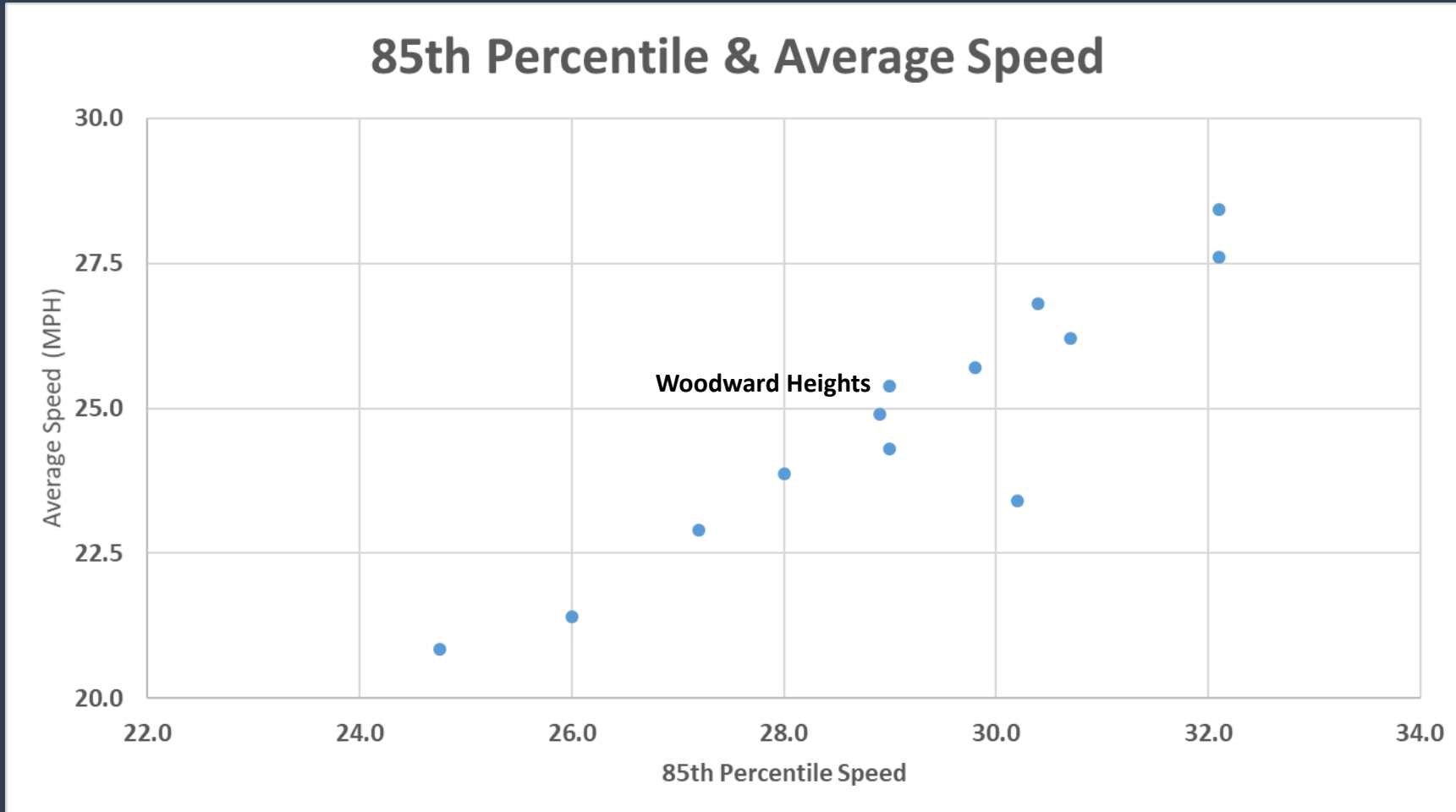
85th Percentile Speed

- The speed at or below which 85% of drivers travel on a given street
 - *Generally, the speed that drivers consider safe and reasonable*
- Design speed of street often equals observed 85th percentile speed

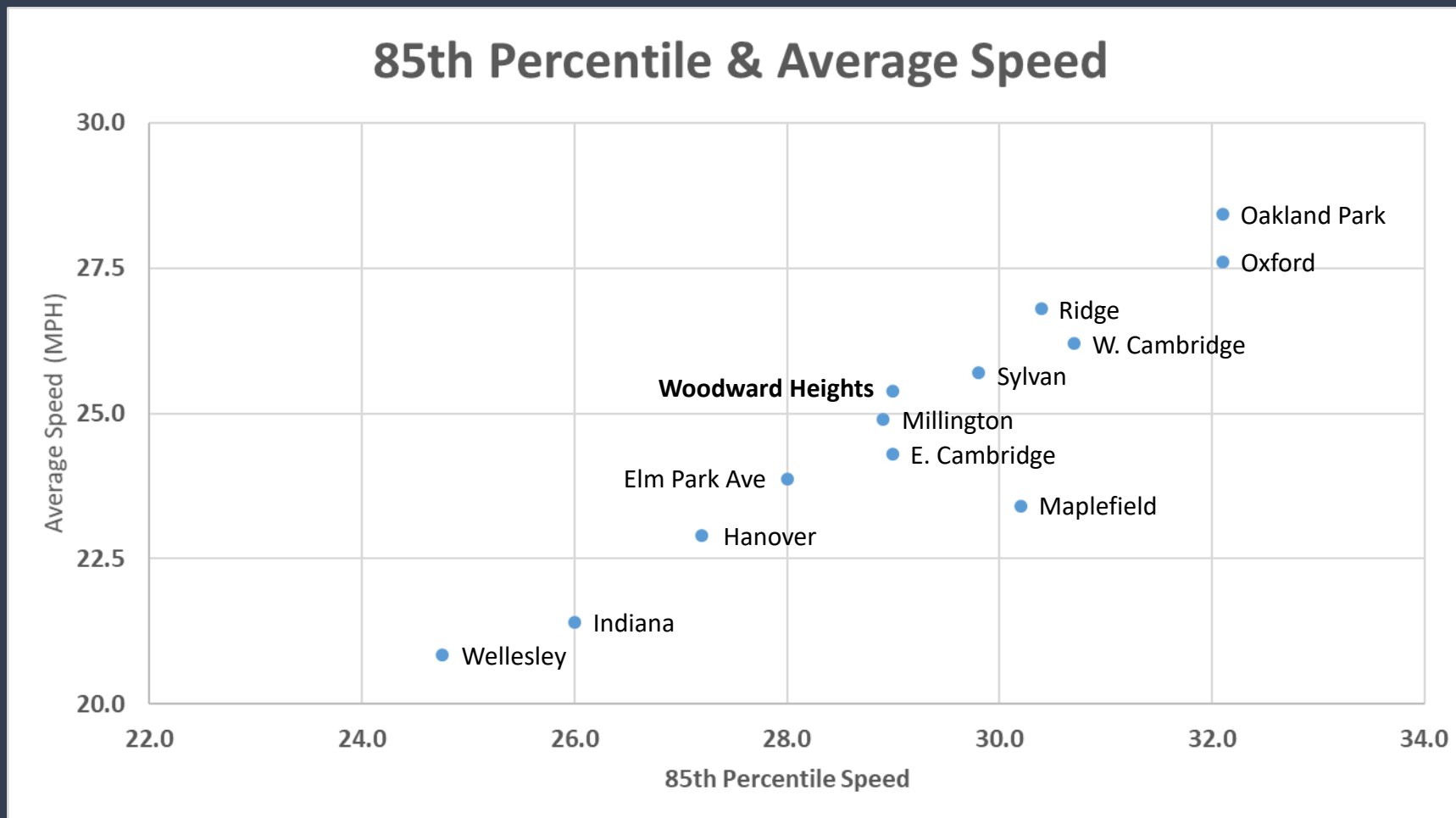
85th Percentile Speed

- Speed limits usually set based on 85th percentile speed
- Most residential streets have a 30 mph design speed, so 85% speeds are usually around 30mph
- Most streets have a design speed 5 mph above the target or posted speed
 - *The theory is that this builds in a “safety buffer” but it just induces higher speeds*

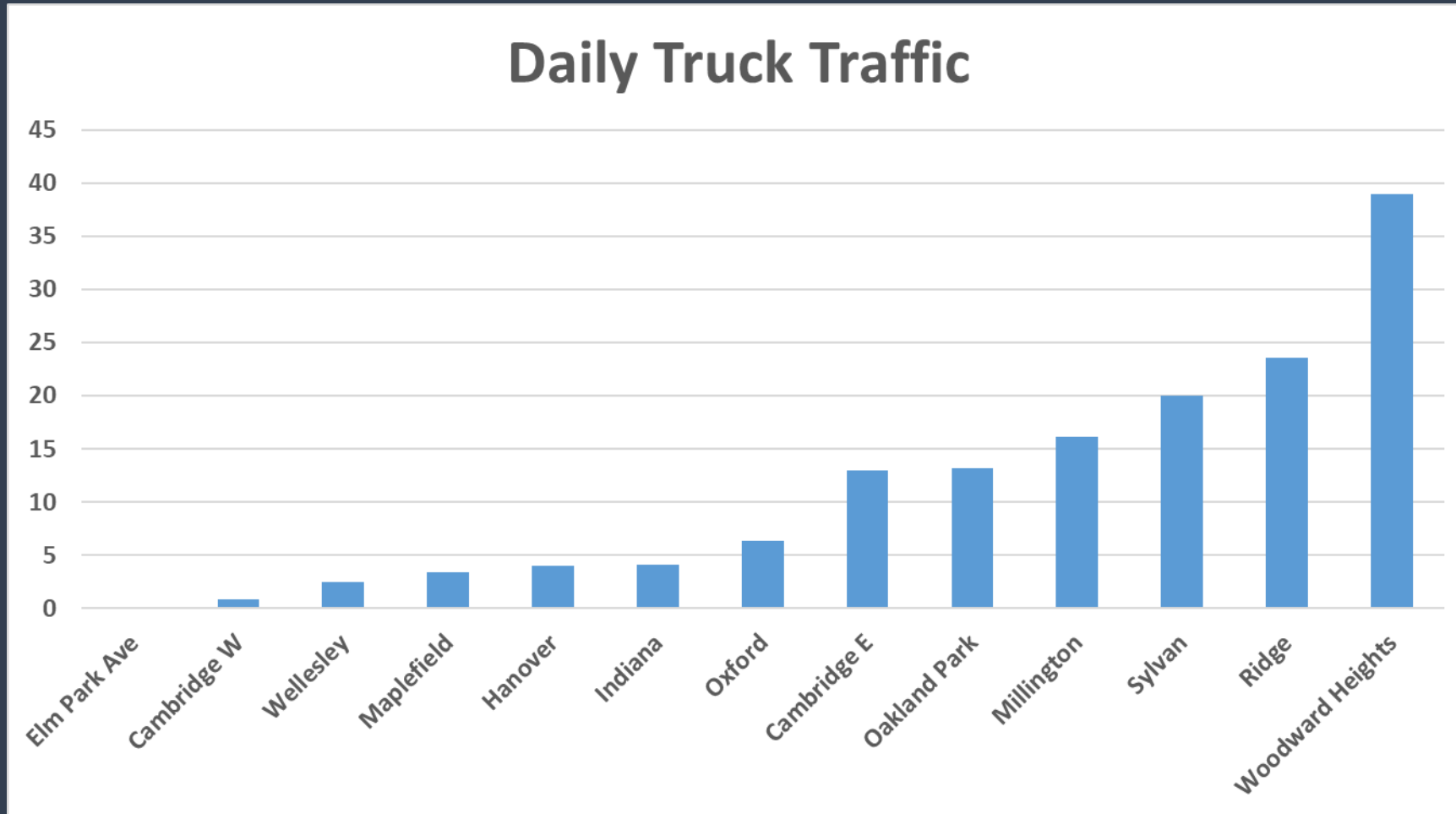
85th Percentile & Average Speed



85th Percentile & Average Speed



Trucks



Truck Takeaways

- Truck volume is 2-3x higher than other collector streets in the City
- Trucks = vehicles longer than 20 ft. as large vehicles
 - *Delivery vans*
 - *Busses*
 - *Dump trucks*
 - *Garbage trucks*
 - *18 wheelers*

City Commission Decisions

Pinch Point





Pinch Point

- Estimate \$30,000 to implement
- Survey results:
 - *55% Woodward Heights residents = YES*
 - *31% non-Woodward Heights residents = YES*

Indiana Bumpout



Indiana Bumpout

- Estimate \$30,000 to implement
- Survey results:
 - *57% Woodward Heights residents = YES*
 - *34% non-Woodward Heights residents = YES*

Bermuda (N) Crosswalk

- Stop sign not warranted
- Traffic is operating safely
- Survey results:
 - *57% Woodward Heights residents = keep stop sign*
 - *53% non-Woodward Heights residents = keep stop sign*
- Residents have reported reduction in noise



Bermuda (S) Speed Hump

- Little measurable impact on speed or volume
- No deterrence of trucks
- Resident feedback:
 - *80% remove*
 - *20% keep*
 - *Noise and vibration is chief complaint*

Decisions

- Pinch point at Woodward alley
- Bump out at Indiana
- Bermuda (N) stop sign
- Bermuda (S) speed hump