

Pine Grove Mills Mobility Study

Intersection Improvement Update

Pine Grove Road (SR 0045/0026)
& Water Street (SR 0026) / Nixon Road

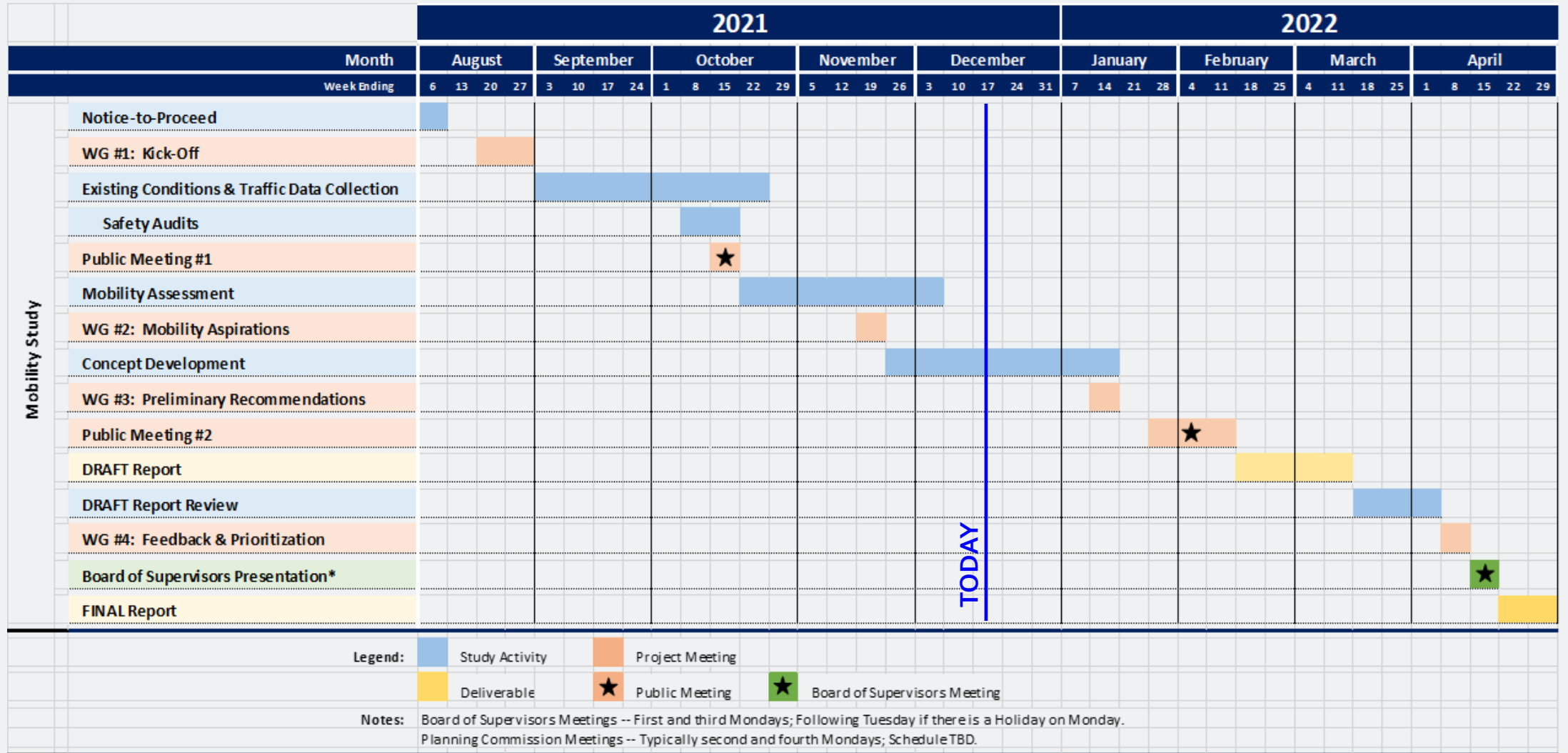
Pine Grove Mills Small Area Plan Advisory Board Meeting
December 16, 2021



Today's Presentation

- Introductions
- Status of Pine Grove Mills Mobility Study
 - Public Survey – SAP Transportation Priorities
- Traffic Signal Warrant Study
 - Manual on Uniform Traffic Control Devices
 - Concepts
 - Traffic Signal Warrants
 - Warrants Evaluated
 - Results
- Intersection Improvement Toolbox
 - Concerns & Opportunities

Mobility Study – Project Schedule



Manual on Uniform Traffic Control Devices (MUTCD)

- United States standard governing all traffic control devices
 - Signs, pavement markings, traffic signals
- Published by the Federal Highway Administration (FHWA) under 23 Code of Federal Regulations (CFR), Part 655, Subpart F
 - https://mutcd.fhwa.dot.gov/kno_2009r1r2.htm
- Adopted by states
- Applies to all public streets, highways, bikeways, and private roads open to public travel



Nine MUTCD Traffic Signal Warrants

1. Eight Hour Vehicular Volume
2. Four Hour Vehicular Volume
3. Peak Hour Vehicular Volume
4. Pedestrian Volume
5. School Crossing
6. Coordinated Signal System
7. Crash Experience
8. Roadway Network
9. Intersection Near a Grade Crossing



Nine MUTCD Traffic Signal Warrants

1. Eight Hour Vehicular Volume
2. Four Hour Vehicular Volume
3. Peak Hour Vehicular Volume
4. Pedestrian Volume
5. ~~School Crossing~~
6. ~~Coordinated Signal System~~
7. Crash Experience
8. ~~Roadway Network~~
9. ~~Intersection Near a Grade Crossing~~

What does it take to warrant a traffic signal?



Traffic Signal Warrant Study Concepts

- Hourly volumes are evaluated
 - Unique, non-overlapping hours
 - Multiple unique hours (some warrants)
- Qualifying vehicular traffic volume:
 - Volume entering the intersection
 - Right turn considerations
 - Volume projections?
- Warrant purposes



Traffic Signal Warrant Study Analysis & Results

- Travel data – September 2021
 - Summarized by hour
 - Major street → Total both approaches
 - Minor street → Higher approach
 - Pedestrian – Crossings of Major Street
- Crash data – January 2016 to December 2020
 - 5 years – Standard time frame
 - Located as point events
 - Categorized by collision type, direction

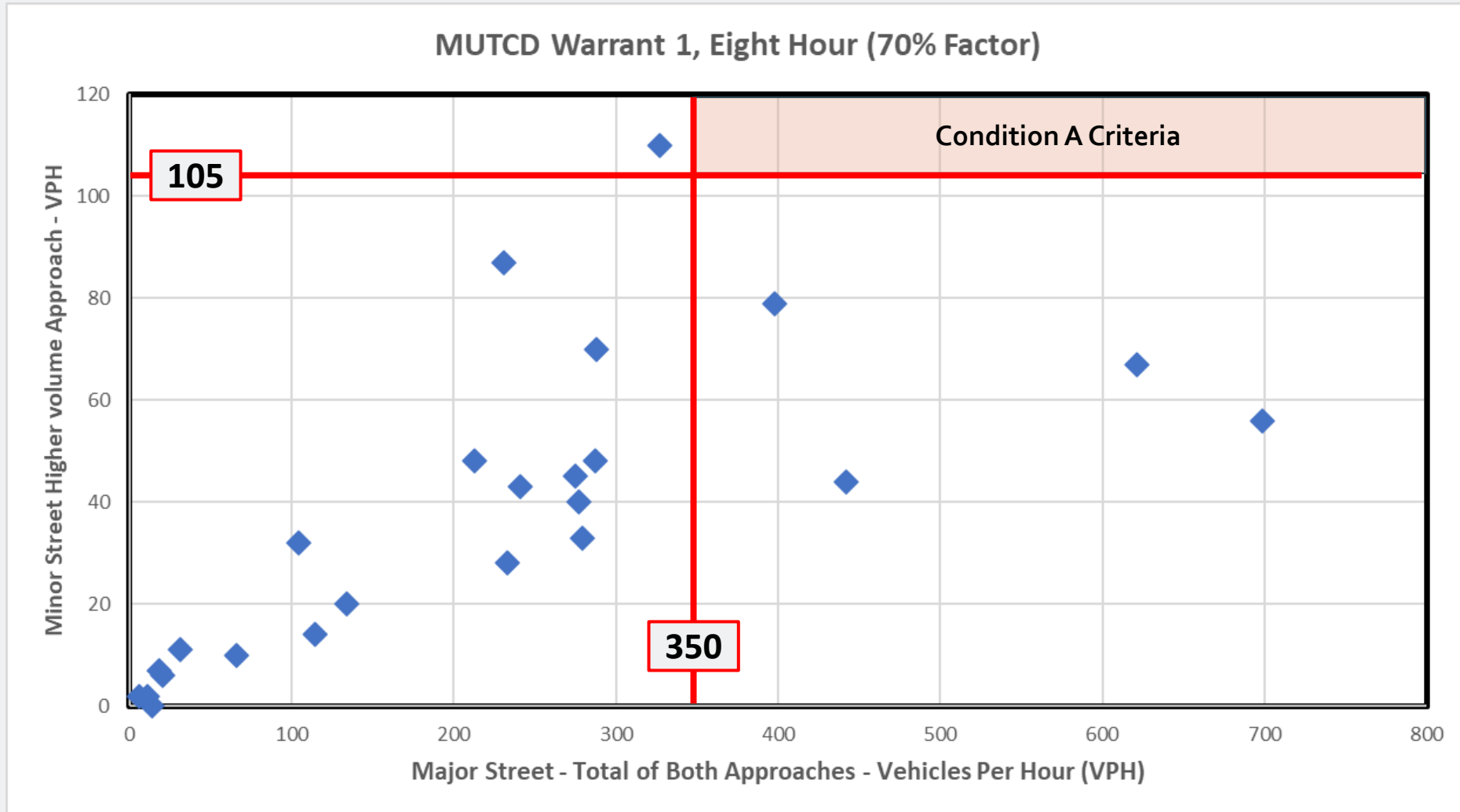


Eight Hour Vehicular Warrant

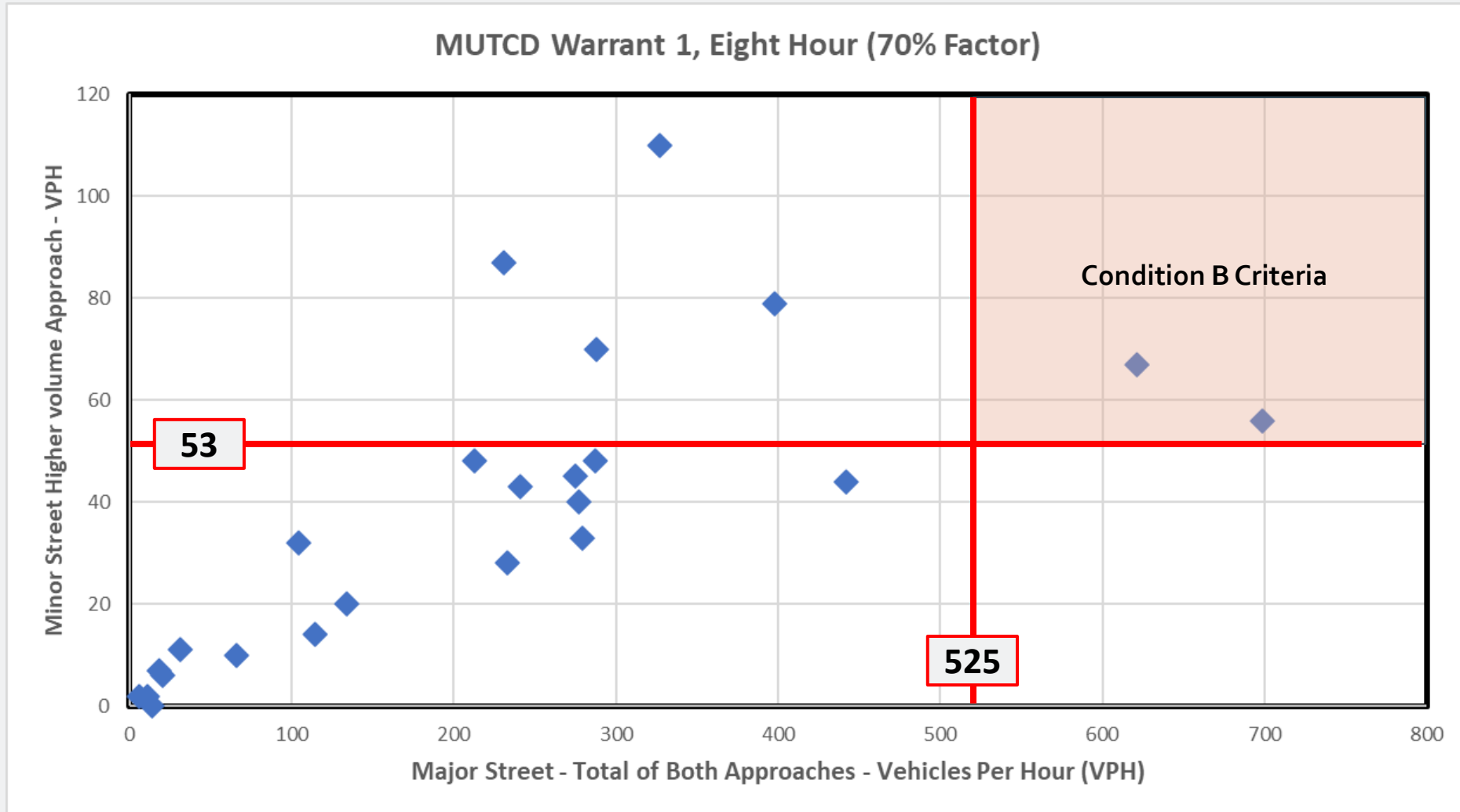
Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

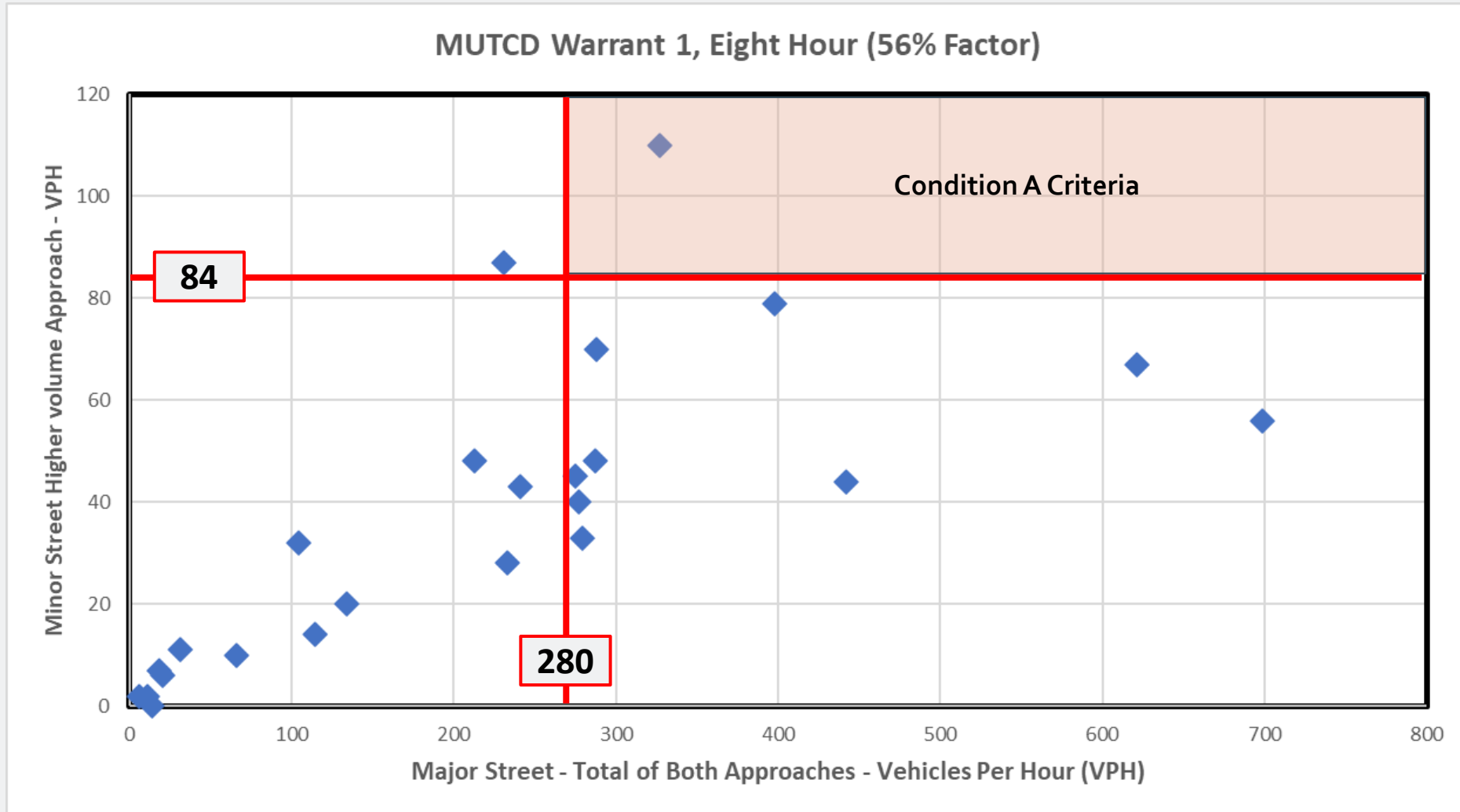
Eight Hour Vehicular Warrant – Condition A (70%)



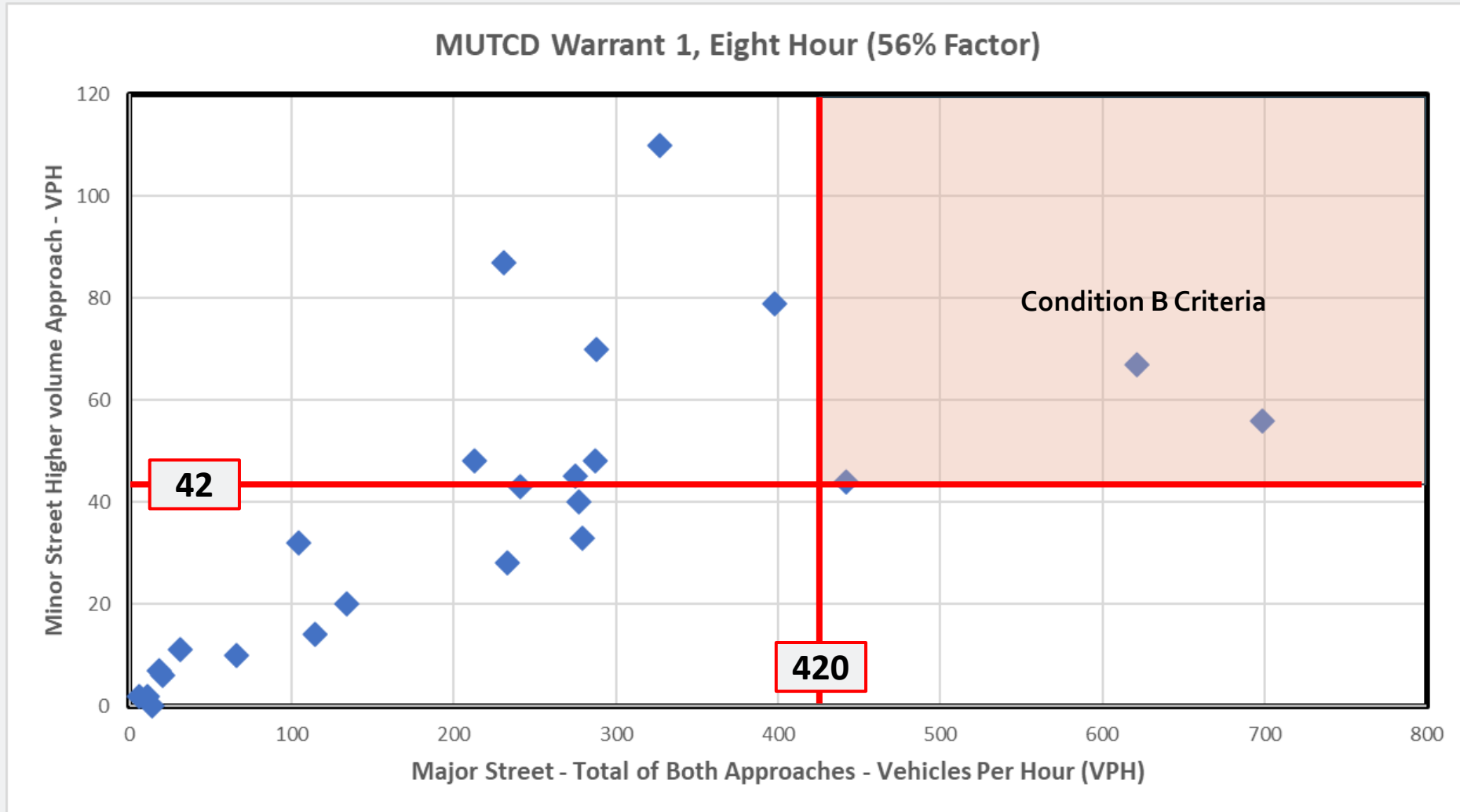
Eight Hour Vehicular Warrant – Condition B (70%)



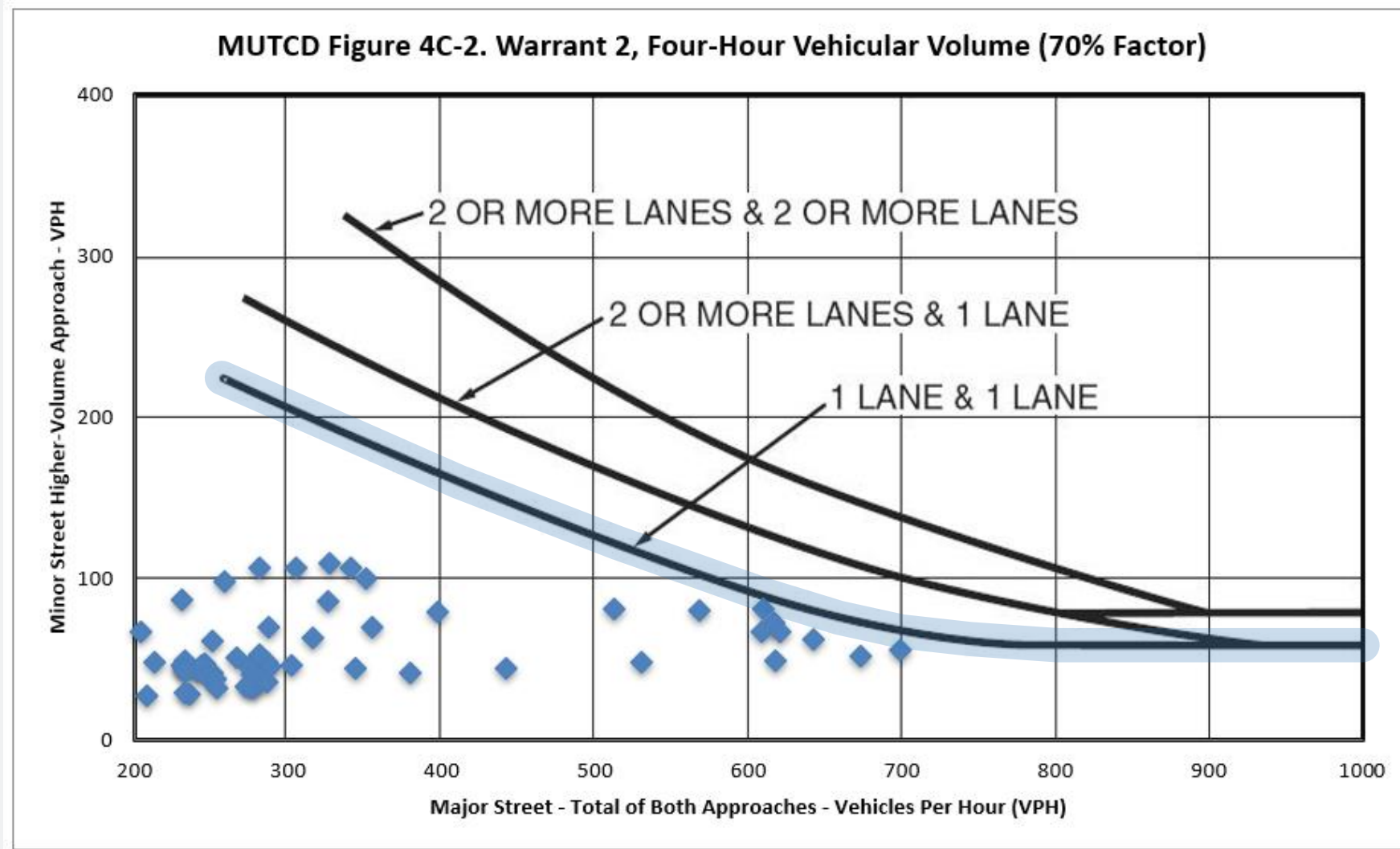
Eight Hour Vehicular Warrant – Condition A (56%)



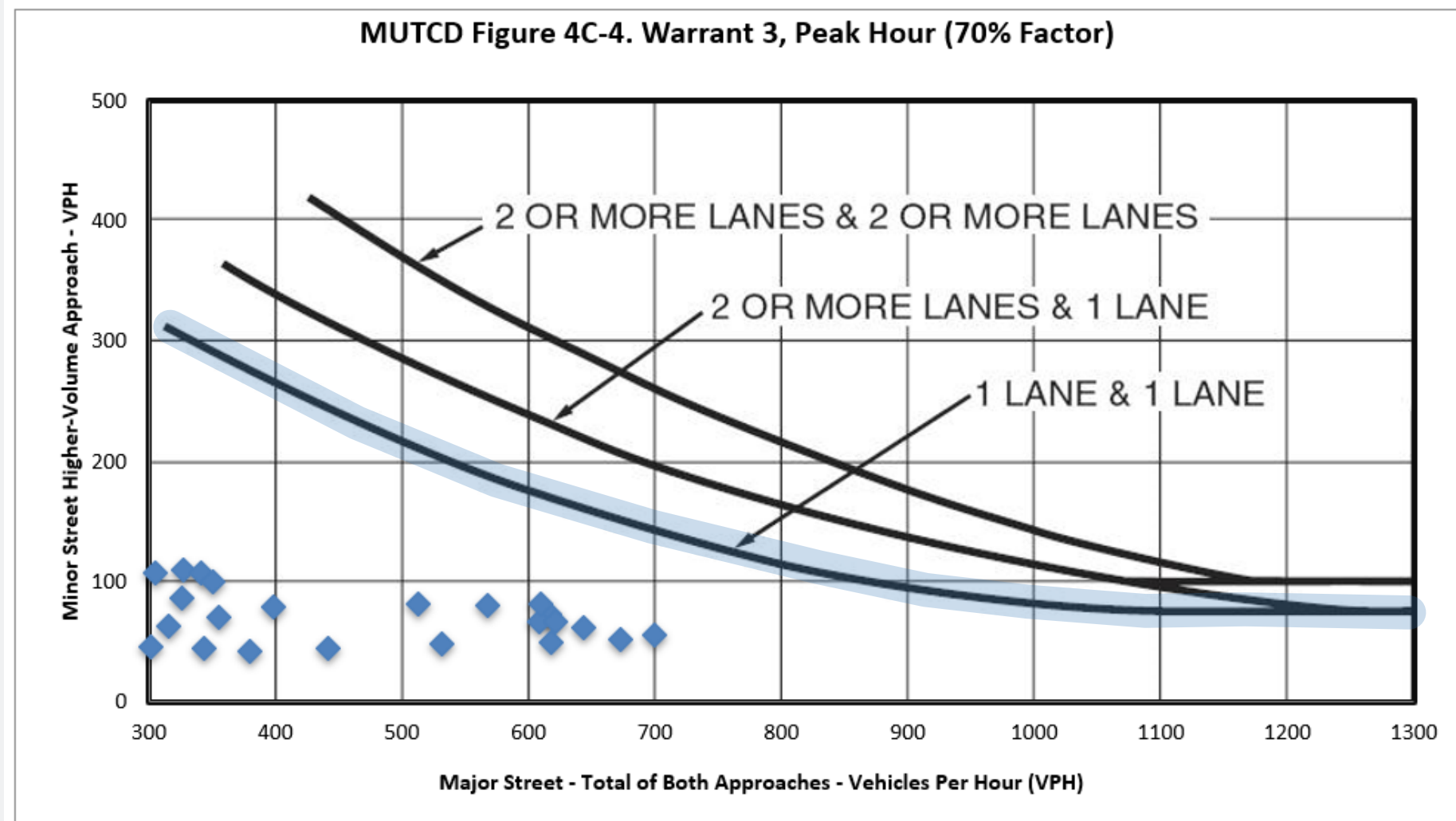
Eight Hour Vehicular Warrant – Condition B (56%)



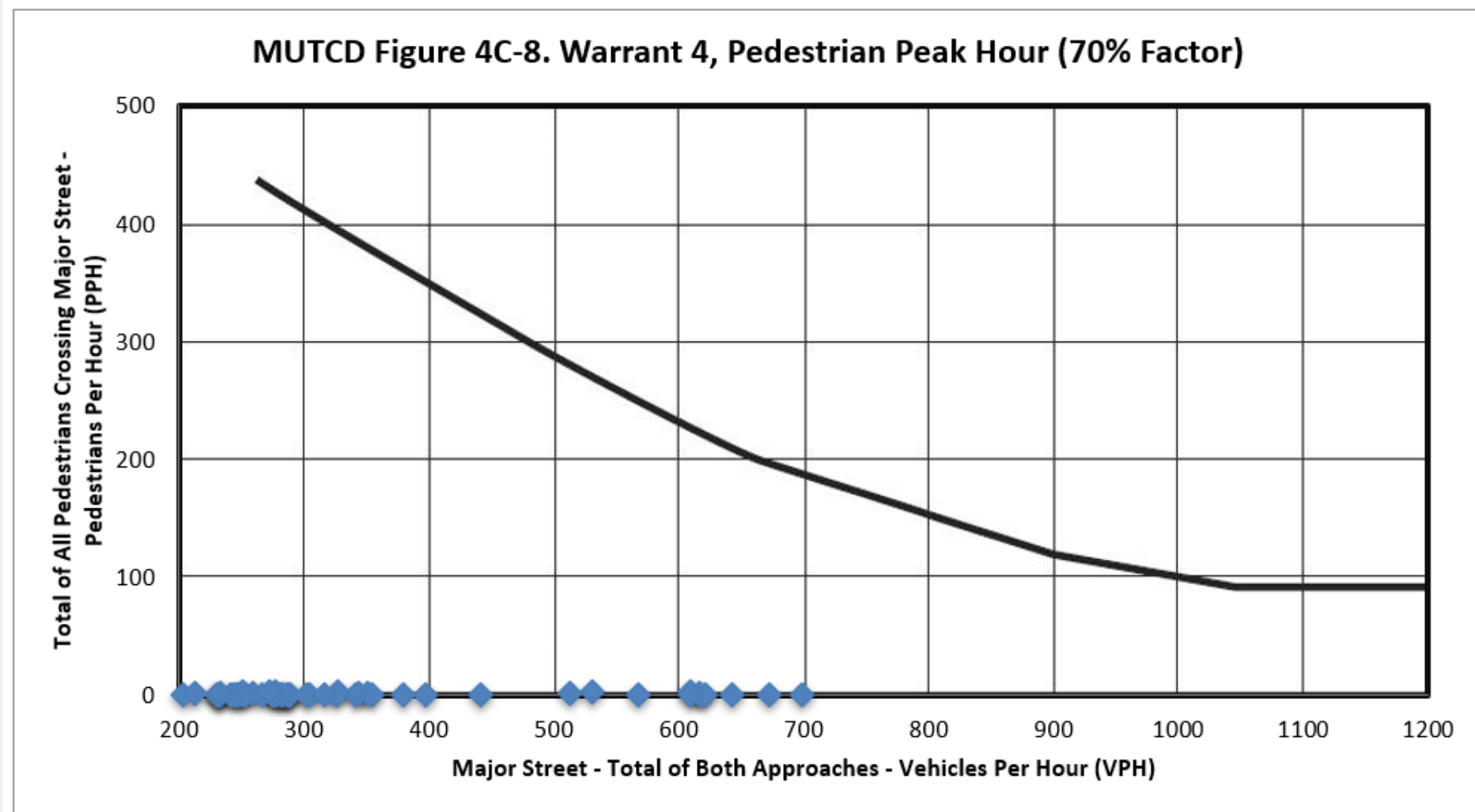
Four Hour Vehicular Warrant



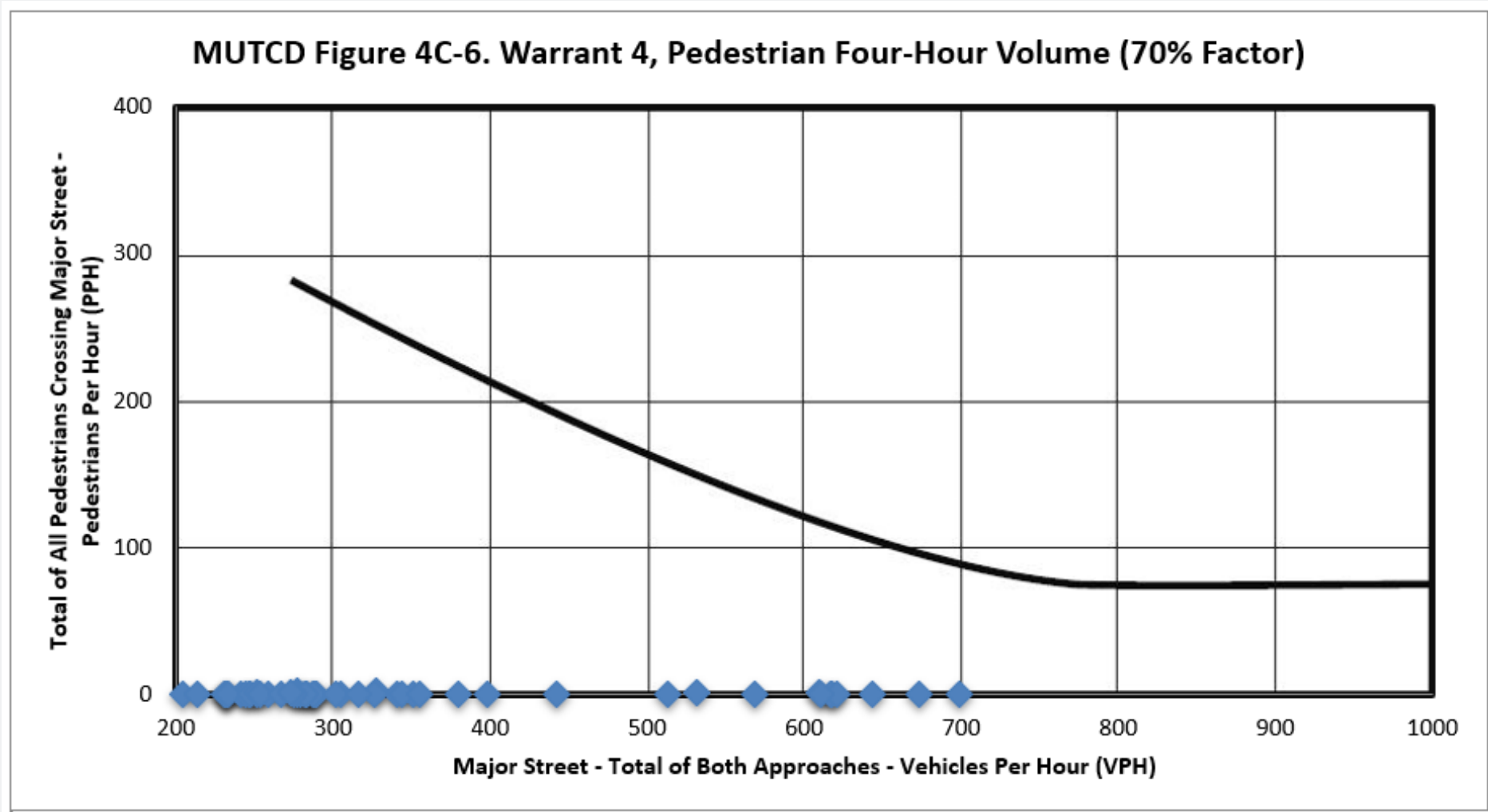
Peak Hour Vehicular Warrant



Pedestrian Peak Hour Volume Warrant



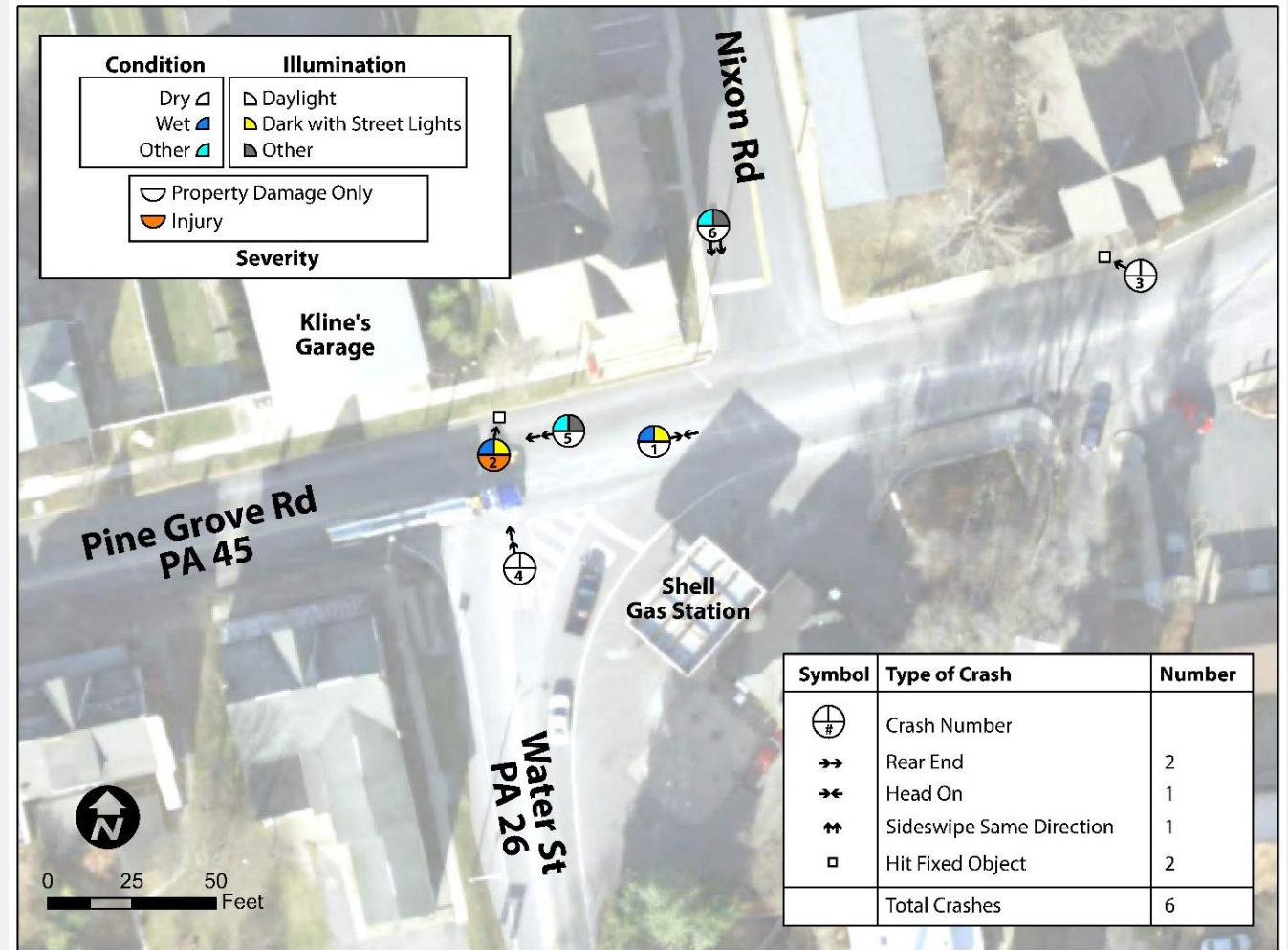
Pedestrian Four Hour Volume Warrant



Crash Experience Warrant

Three criteria must be met:

- Trial of other alternatives, with observation and enforcement
- Five or more crashes of a type correctable by a traffic signal
- Traffic volume component, based on Eight Hour Vehicular Warrant (56%)

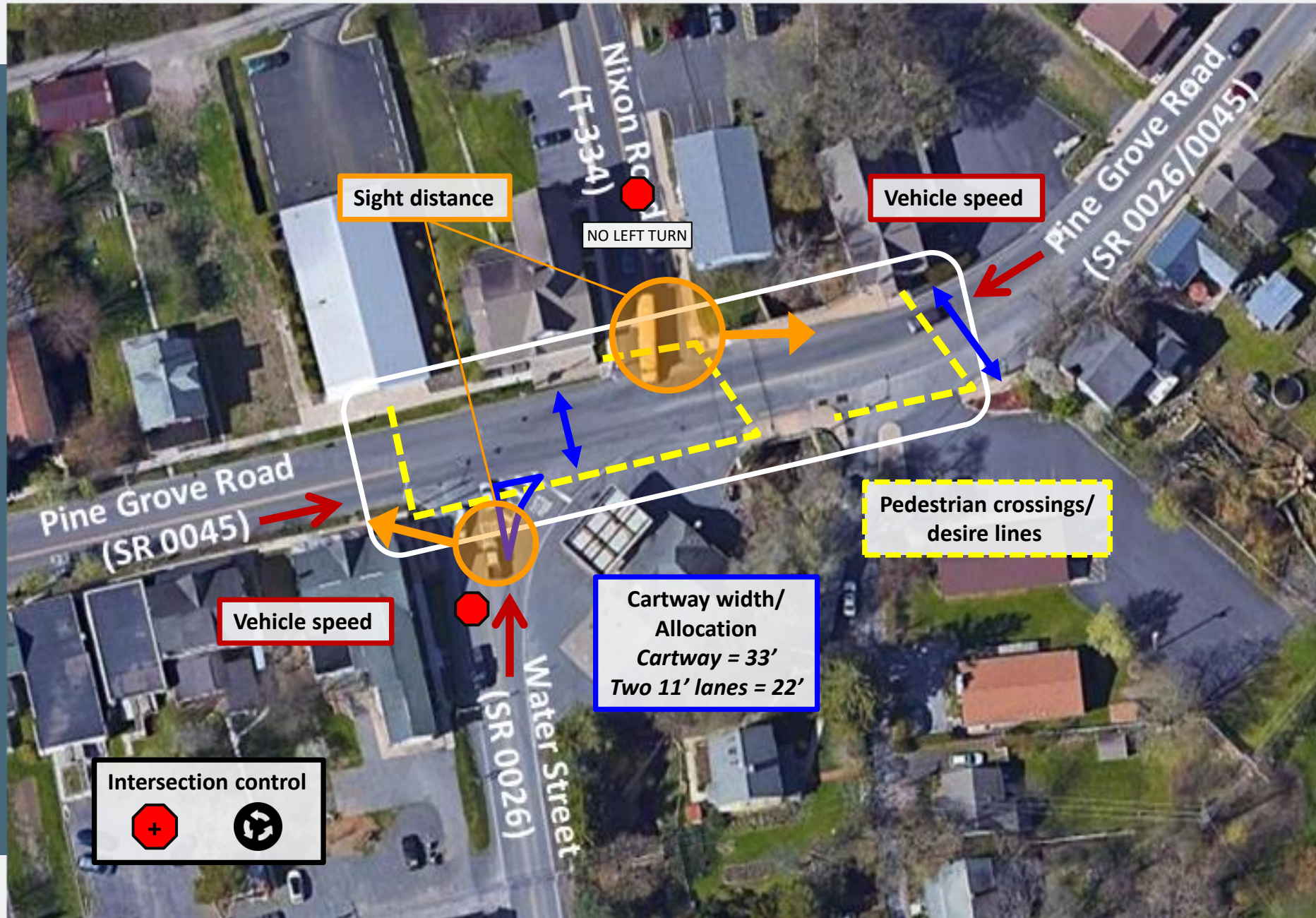


Intersection Improvement Toolbox

- Enhanced Crossing Treatments
 - Lighting
 - Rapid flashing beacons
 - Signage, pavement markings
 - High visibility crosswalks
 - ADA-compliant updates
 - Refuge islands, reduce crossing distance
- Sight distance improvements
- Speed reduction
- Guidance to best crossing points
- Vehicular control
 - Mini-roundabout
 - All-way stop control



Intersection Concerns & Opportunities



Mobility Study contacts:

Robert Watts

rjwatts@mccormicktaylor.com

Ron Seybert

rseybert@twp.ferguson.pa.us

