DELAWARE VALLEY REGIONAL PLANNING COMMISSION

Congestion and Crash Site Analysis Project

Mercer County – Ewing Township
North Olden Avenue and Parkside Avenue

May 22, 2008

Overview

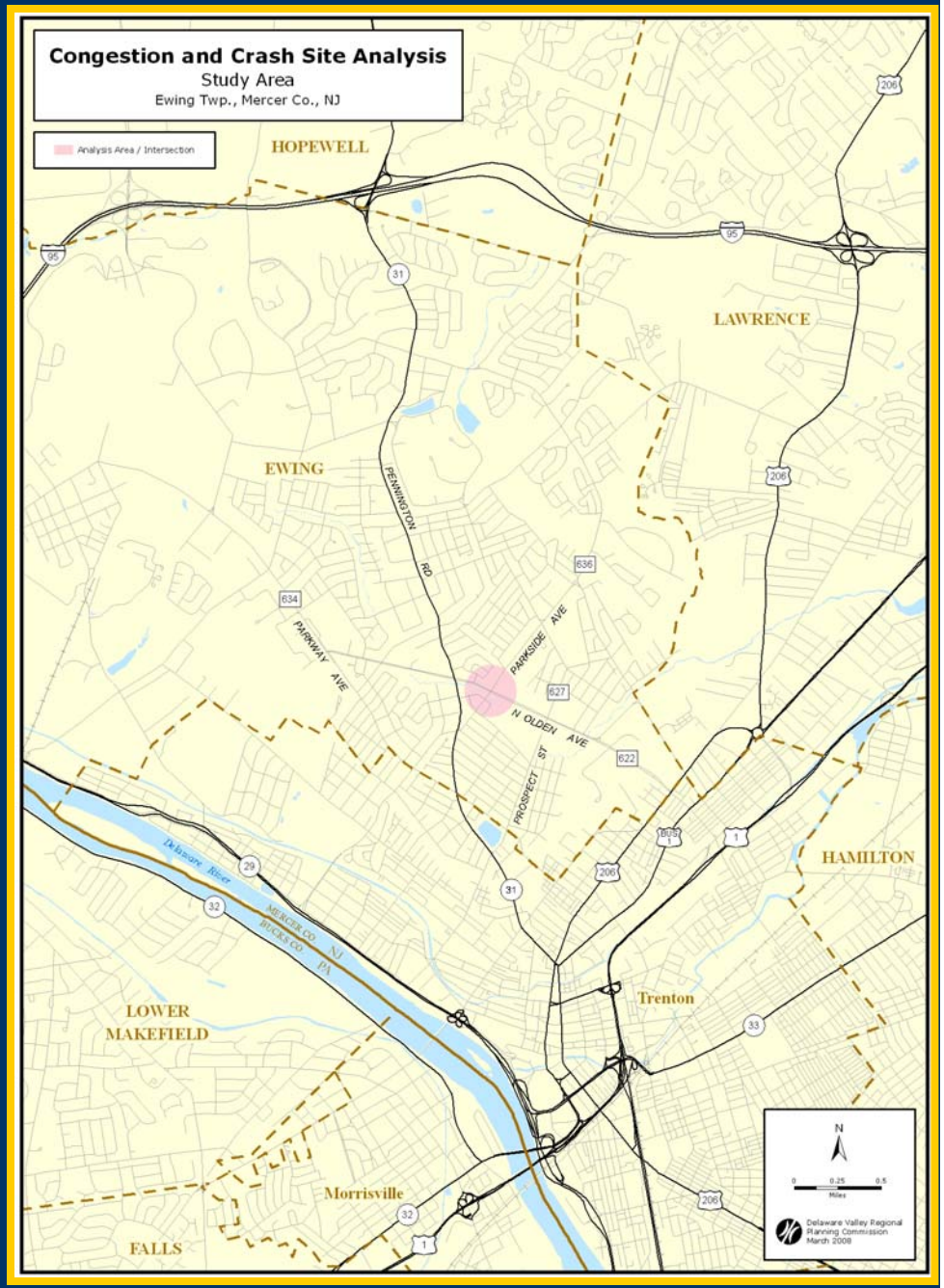
- **Background and Identified Issues**
- **Data Collection**
  - Stakeholder meeting
  - Traffic counts and volumes
  - Crash data
- **Improvement Scenarios**
  - Geometric/Operational Improvement
  - Synchro & SimTraffic Analysis
- **Preliminary Recommendations**
- **Discussion**

Study Location

Incorporates the intersection CR 622/CR 636 and environs

- **CR 622 – N. Olden Avenue**
  - **Urban Collector; W-E;**
  - **Whitehorse Ave to Parkway Ave**
  - **I-295, US 1, US 206, NJ 33, NJ 31, CR 620, CR 614**
  - **5 lanes**
  - **sidewalks**
  - **35 MPH**

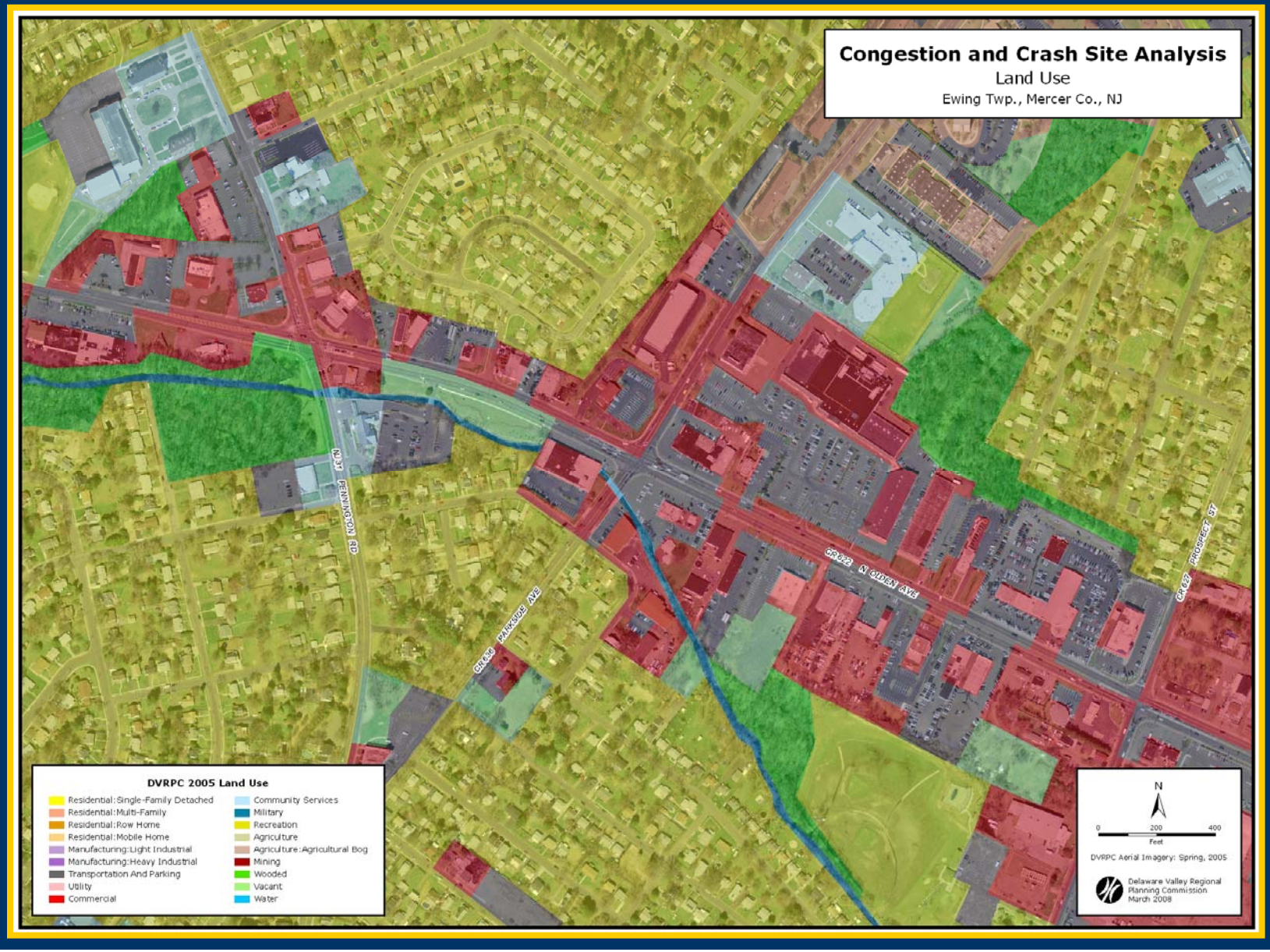
- **CR 636 – Parkside Avenue**
  - **Urban Minor Arterial;**
  - **Scotch Road to NJ 29**
  - **NJ 31, Parkway Avenue, Federal City Road**
  - **4 lanes**
  - **sidewalks**
  - **35MPH**



Transit

- **NJ Transit Route 601**
  - **College of NJ to Hamilton Marketplace**
  - **EB trips – 21 Weekday, 12 Saturday, 8 Sunday**
  - **WB trips – 21 Weekday, 13 Saturday, 8 Sunday**
  - **Serves N. Olden Ave. between Prospect Ave. and Parkside Ave.**
  - **Serves Parkside Ave. between N. Olden Avenue and Ewingville Road**
  - **Daily weekday ridership of 1,014**

Land Use


Congestion and Crash Site Analysis
Land Use
Ewing Twp., Mercer Co., NJ
NJ 31
PENNINGTON RD
GR 622
PARKSIDE AVE
GR 622
N OLDEN AVE
GR 637
PROSPECT ST
DVRPC 2005 Land Use
Residential: Single-Family Detached
Residential: Multi-Family
Residential: Row Home
Residential: Mobile Home
Manufacturing: Light Industrial
Manufacturing: Heavy Industrial
Transportation And Parking
Utility
Commercial
Community Services
Military
Recreation
Agriculture
Agriculture: Agricultural Bog
Mining
Wooded
Vacant
Water
N
0
200
400
Feet
DVRPC Aerial Imagery: Spring, 2005
Delaware Valley Regional Planning Commission
March 2008

Pedestrian Movement

Shop Rite

Pedestrian Movement Saturday (2/16/08

TIME	Bus Stop EB	Bus Arrival	Bus Stop WB	Bus Arrival	Others Crossing Olden Avenue/Walking in the Vicinity	TOTAL
11:00 - 11:30	3	11:10			2	5
11:30 - 12:00			2	11:55	1	3
12:00 - 12:30	2	12:25				2
12:30 - 1:00					2	2
1:00 - 1:30			3	1:12	4	7
1:30 - 2:00	2	1:40			3	5
2:00 - 2:30			1	2:26	1	2
2:30 - 3:00	4	3:00				4
3:00 - 3:30					1	1
3:30 - 4:00			1	3:37		1
Total	11		7		14	32

Identified Issues

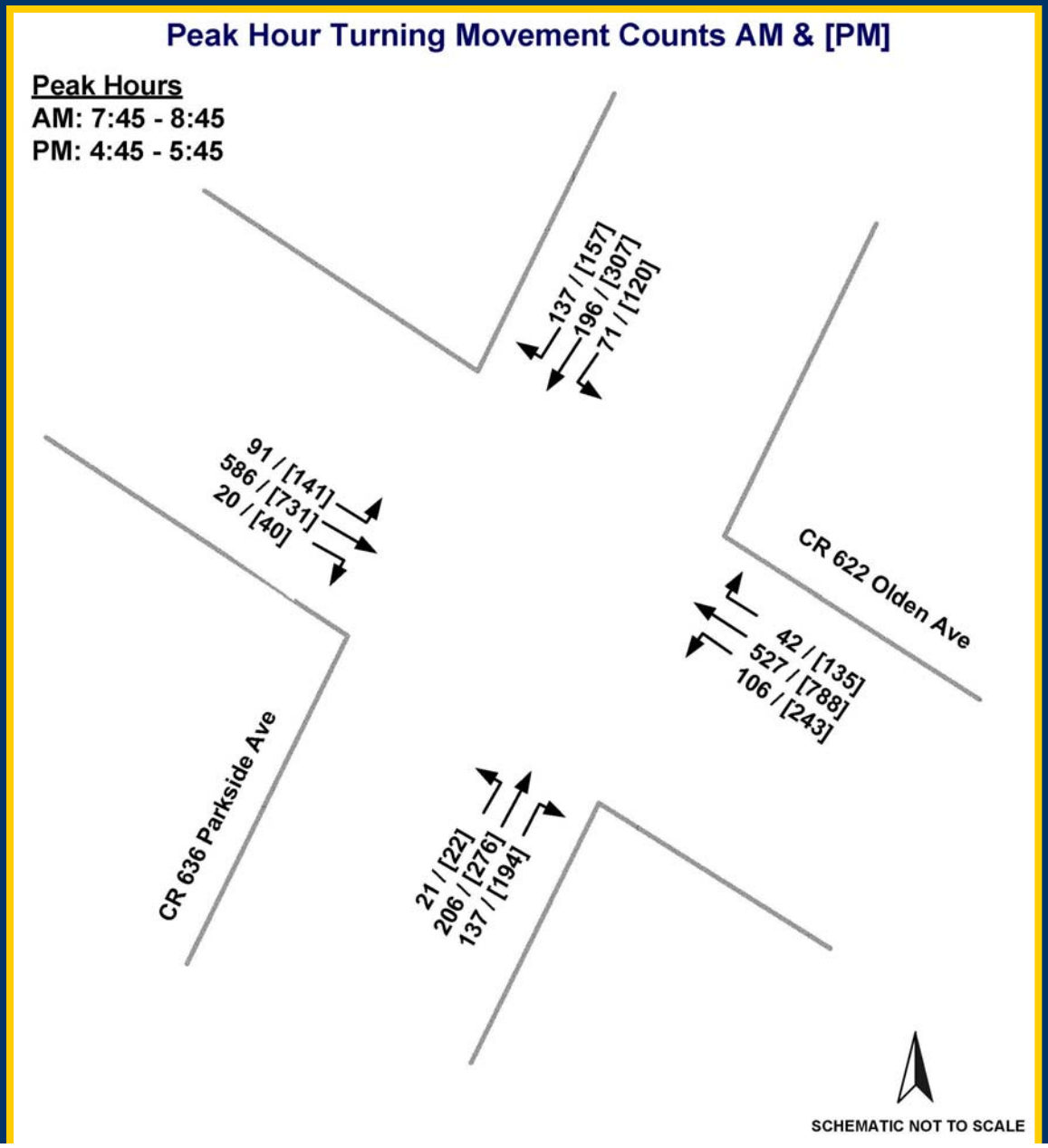
- Traffic Congestion
- Limited Capacity
- Pedestrian Amenities
- Access management
- Safety

Identified Issues - Congestion

Heavy Traffic Volumes

- **Weekday Peak Hours**
  - Morning 7:45AM to 8:45AM
    - Volumes 2,140 vehicles
    - Dominant movements – East, West
  - Afternoon 4:45PM to 5:45PM
    - Volumes 3,154 vehicles
    - Dominant movements – East, West

Identified Issues - Congestion



Identified Issues - Congestion

- Level of Service (LOS)
  - Morning "C"
  - Afternoon "D"

Existing (103 sec. Cycle)				
	AM		PM	
Direction	Delay (sec)	LOS	Delay (sec)	LOS
Olden EB	21	C	30	C
Olden WB	23	C	61	E
Parkside NB	33	C	24	C
Parkside SB	51	D	55	D
Total Int.	29	C	45	D

Identified Issues - Pedestrian

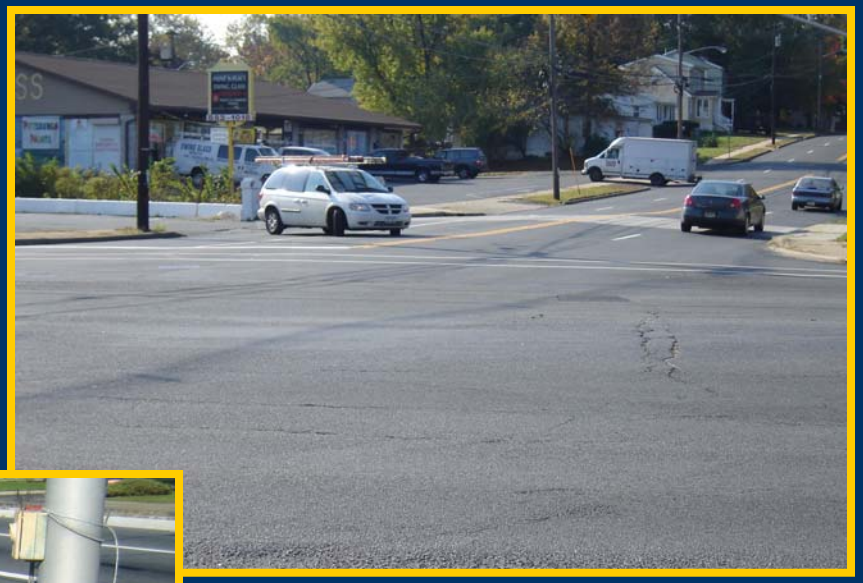
- Deficient pedestrian amenities
  - Sidewalks
  - Curb Ramps
  - Signal heads

Identified Issues

Access Management

Land Uses

- Commercial
- Retail



Identified Issues – Access

Identified Issues

- Safety
  - Vehicular Movements
  - Pedestrian Movements

Identified Issues - Safety

Crash Data

- Total of 92 crashes, 2005 – 2007
- Reportable = 89, non-reportable = 3
- Crash breakdown by year:

  2005 = 40 crashes

  2006 = 25 crashes

  2007 = 27 crashes

Identified Issues - Safety

Crash Data

Severity:

- No reported fatalities
- 23 injury crashes
- 69 property damage only

Road Surface:

- 74.2% Dry
- 22.6% Wet
- 3.2% Ice/snow

Lighting:

- 76.4% Daytime
- 22.6% Night
- 1.0% Dusk/dawn

Identified Issues - Safety

Crash Data

Predominant Collision Type Comparison:

Collision Type	Intersection	State Average
Rear-end	36.96%	30.32%
Angle	33.7%	18.09%
Sideswipe	15.22%	11.45%
Left Turn	9.78%	7.89%

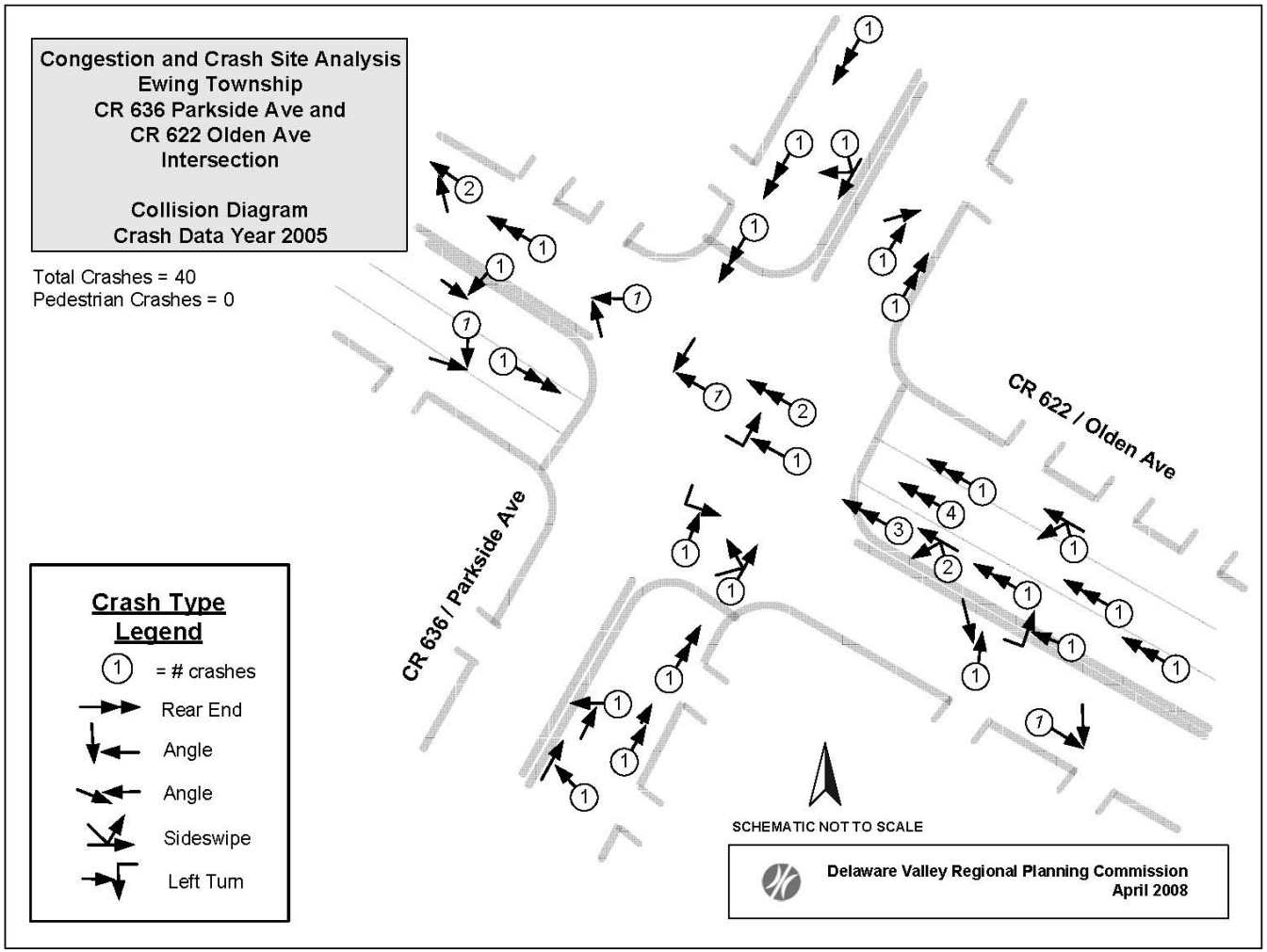
Identified Issues - Safety

CR 636 & CR 622 Police Report Summary	2005		2006		*2007		Total		County Road Average
	Crash	%	Crash	%	Crash	%	Crash	%	
*Reportable	39	97.50%	23	92.00%	27	100.00%	89	96.74%	~
Non-Reportable	1	2.50%	2	8.00%	~	~	3	3.26%	~
Collision Type									
Rear-End	21	52.50%	5	20.00%	8	29.63%	34	**36.96%**	30.32%
Angle	11	27.50%	11	44.00%	9	33.33%	31	**33.70%**	18.09%
Sideswipe	5	12.50%	1	4.00%	8	29.63%	14	**15.22%**	11.45%
Left Turn	3	7.50%	5	20.00%	1	3.70%	9	**9.78%**	7.89%
Hit Fixed Object	~	~	1	4.00%	1	3.70%	2	2.17%	11.89%
Encroachment	~	~	1	4.00%	~	~	1	**1.09%**	0.46%
Hit Parked Vehicle	~	~	1	4.00%	~	~	1	1.09%	5.67%
Intersection Type									
Intersection	6	15.00%	2	8.00%	7	25.93%	15	17.20%	39.52%
Not at Intersection	34	85.00%	23	92.00%	20	74.07%	77	**82.80%**	60.45%
Severity Type									
Fatality	~	~	~	~	~	~	~	~	0.27%
Injured	9	22.50%	9	36.00%	5	18.52%	23	25.00%	29.16%
Property	31	77.50%	16	64.00%	22	81.48%	69	**75.00%**	70.57%
Lighting Condition									
Day	29	73.17%	21	84.00%	20	74.07%	70	**76.34%**	70.25%
Dusk/Dawn	~	~	1	4.00%	~	~	1	1.08%	3.84%
Night	11	26.83%	3	12.00%	7	25.93%	21	22.58%	25.49%
Road Surface Condition									
Dry	30	75.61%	16	64.00%	22	81.48%	68	74.19%	77.54%
Wet	8	19.51%	8	32.00%	5	18.52%	21	**22.58%**	19.67%
Ice/Snow	2	4.88%	1	4.00%	~	~	3	**3.23%**	2.13%

* 2007 Does not represent the full year of crash data.

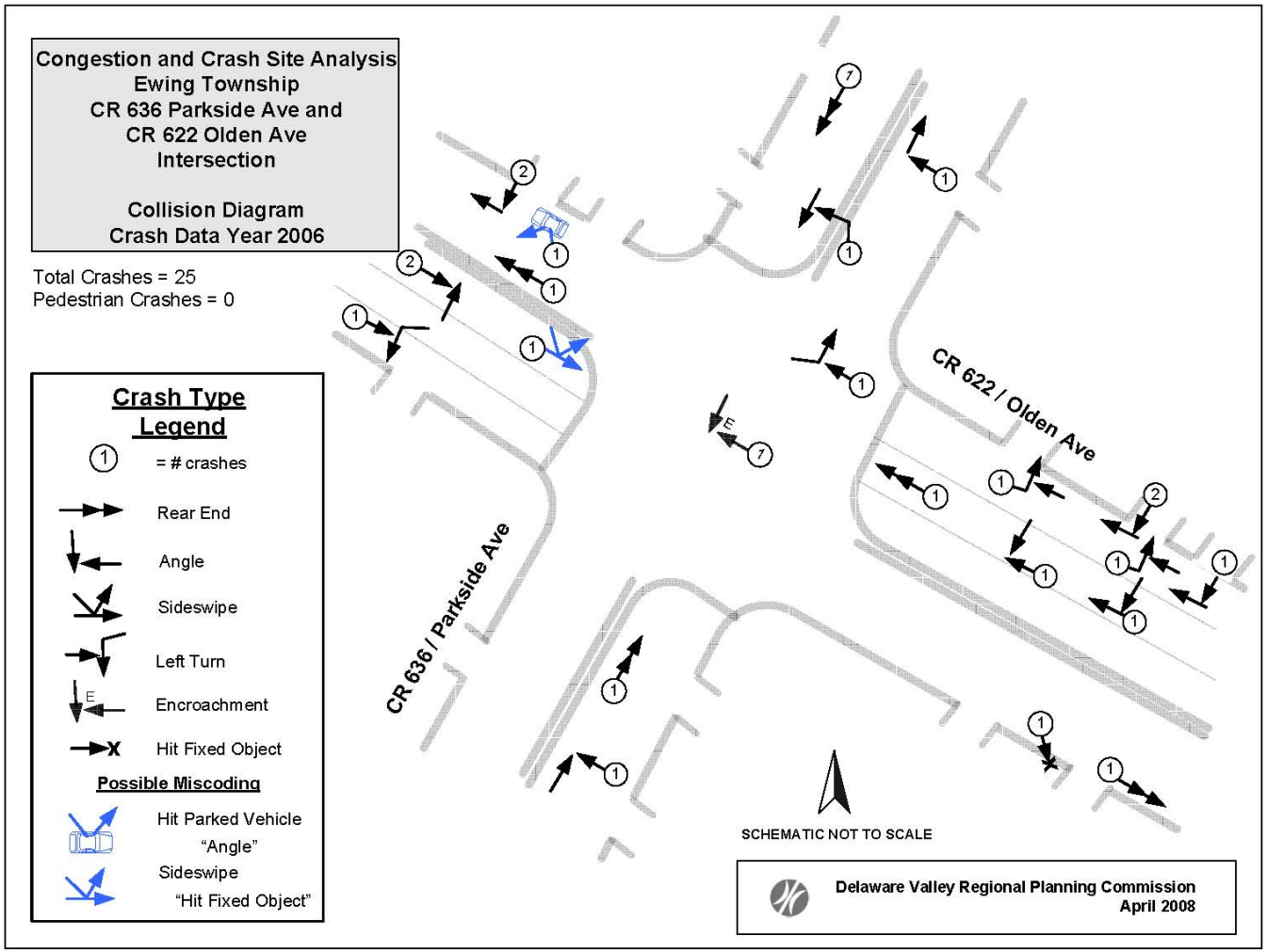
Identified Issues - Safety

2005 Collision Diagram



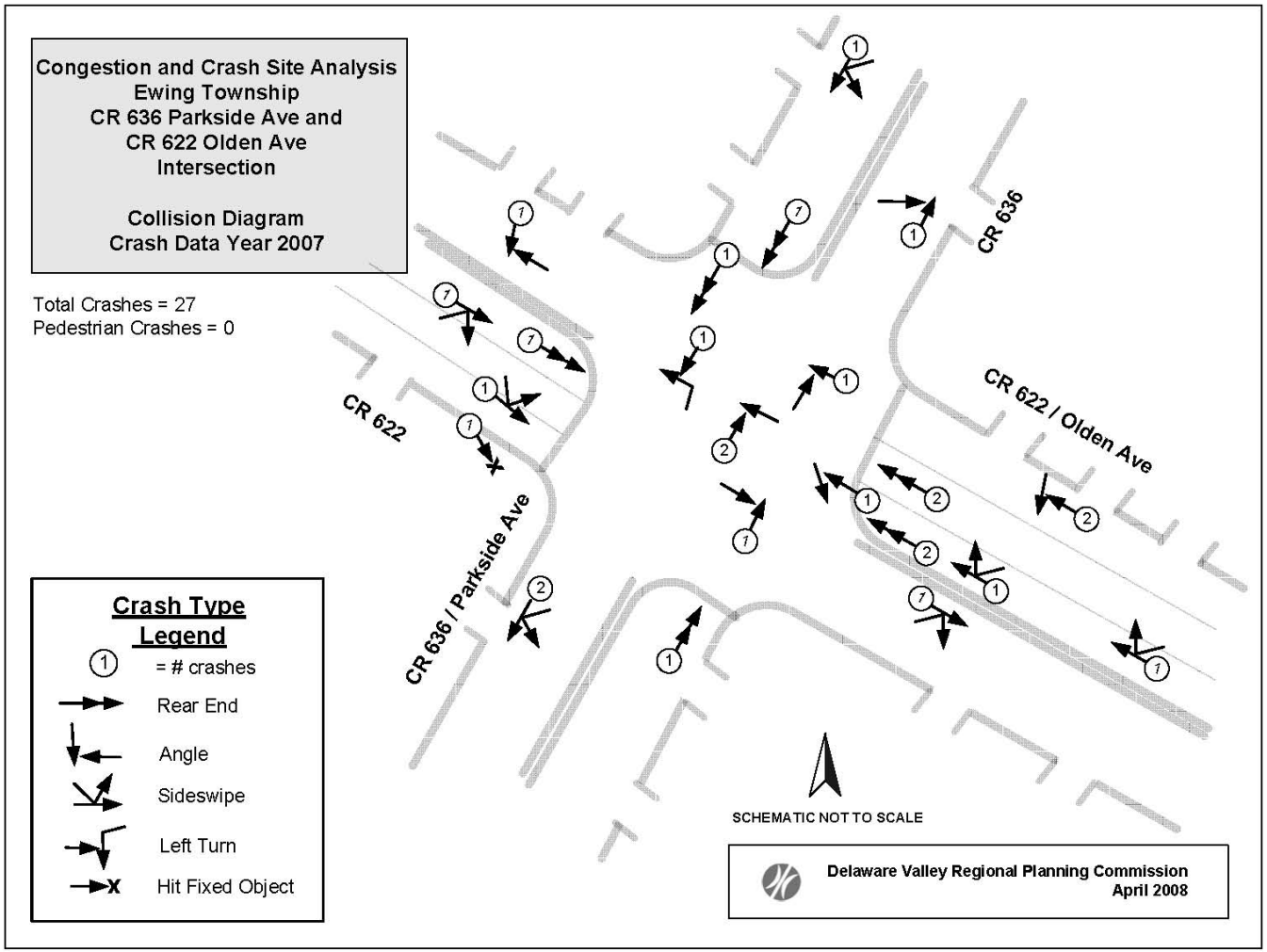
Identified Issues - Safety

2006 Collision Diagram



Identified Issues - Safety

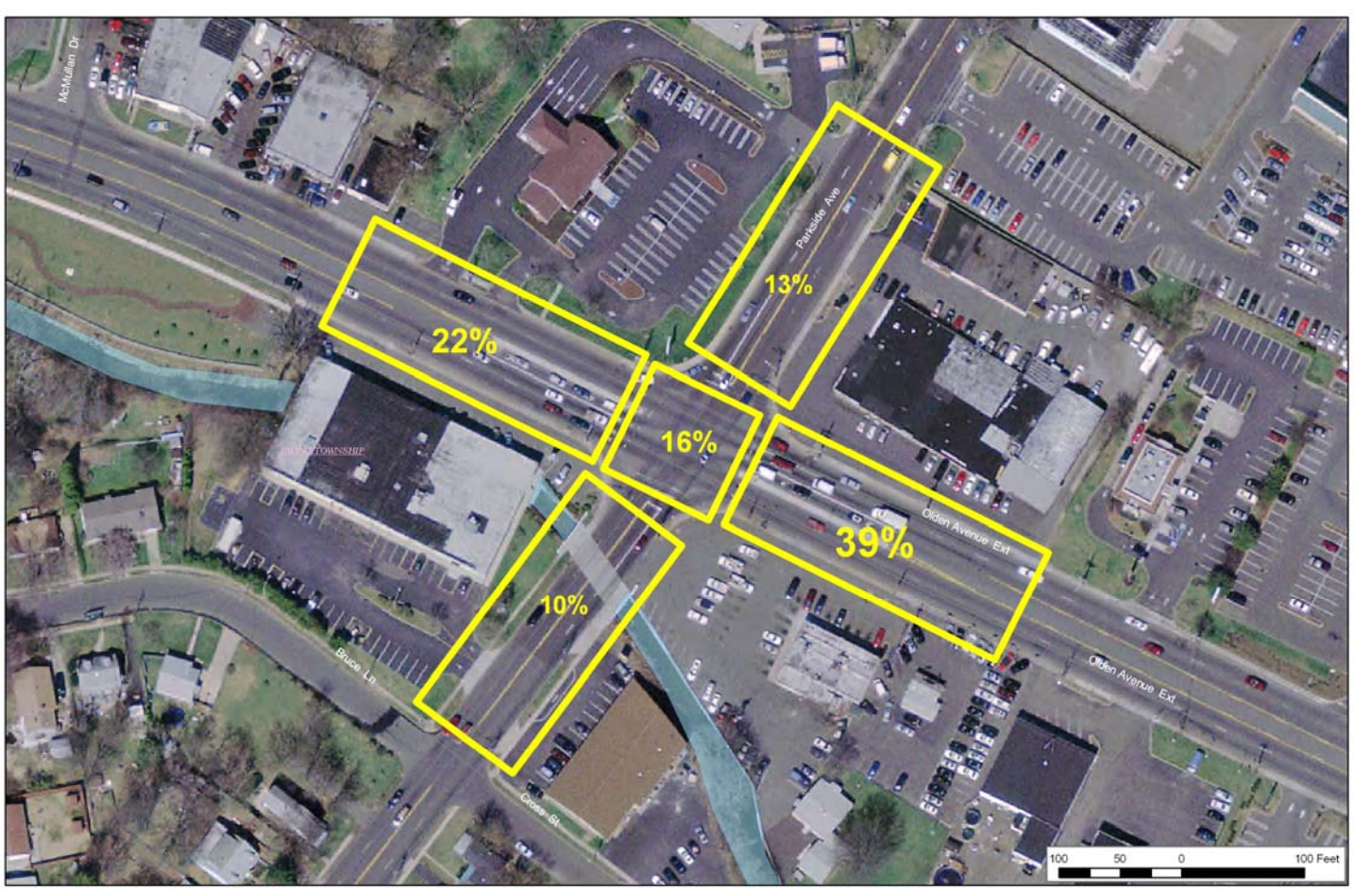
2007 Collision Diagram



Identified Issues - Safety

Crash concentrations:

- Olden Avenue., east side of intersection - 39%



Identified Issues - Safety

Olden Avenue, east side of intersection:

Crashes by Collision Type

Olden Avenue - east side of intersection (WB approach/EB departure) - 39% of the total crashes

Collision Type	2005	2006	2006	Total	%
Rear-end	11	2	4	17	47%
Angle	2	5	2	9	25%
Sideswipe	3	0	3	6	17%
Left Turn	1	2	0	3	8%
HFO	0	1	0	1	3%

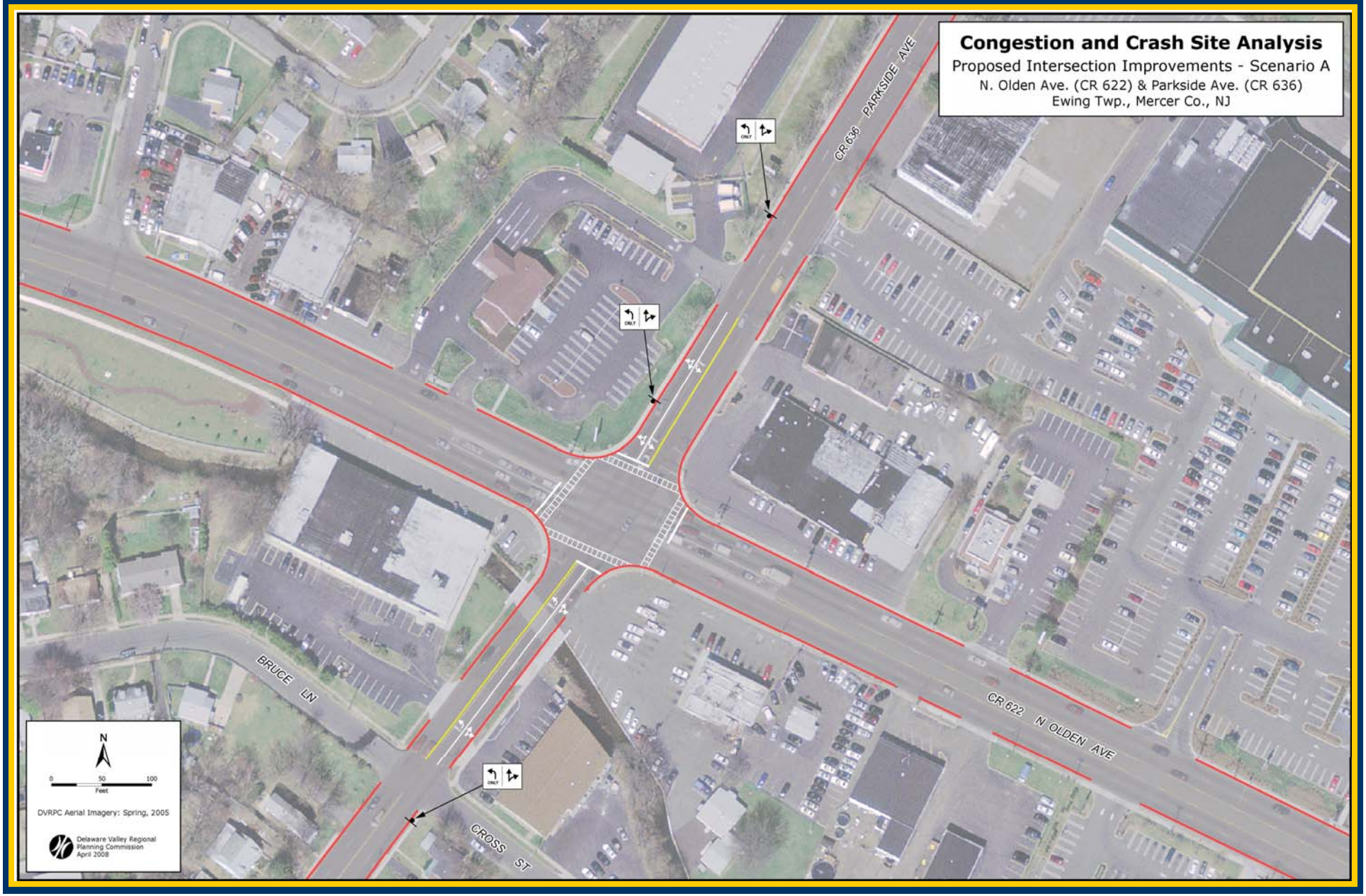
Improvement Scenarios

- Several improvement scenarios
  - Intersection improvements
  - Road Diet along Parkside Avenue
  - Commercial Access
  - Pedestrian Environment

Intersection Scenarios

- **Timing**
  - Signal Optimization
  - Introduce a 2 second all-red phase to follow Olden Left-Turns
  - Various signal protection types for Parkside Left-Turns
- **Geometric**
  A. Convert left-most travel lanes at Parkside Avenue approaches to left-turn only lanes
  B. Convert southbound approach to 3 lanes (dedicated right, thru, & left) by converting the left-most receiving lane to an approach lane
  C. Convert northbound approach to 3 lanes (dedicated right, thru, & left) by converting both left-most receiving lanes to approach lanes

Intersection Improvements



Intersection Improvements

- Delay & LOS Analysis

Medium-Term: Scenario "A"				
	AM (60 sec.)		PM (80 sec.)	
Direction	Delay (sec)	LOS	Delay (sec)	LOS
Olden EB	26	C	44	D
Olden WB	27	C	37	D
Parkside NB	23	C	56	E
Parkside SB	22	C	38	D
Total Int.	25	C	42	D

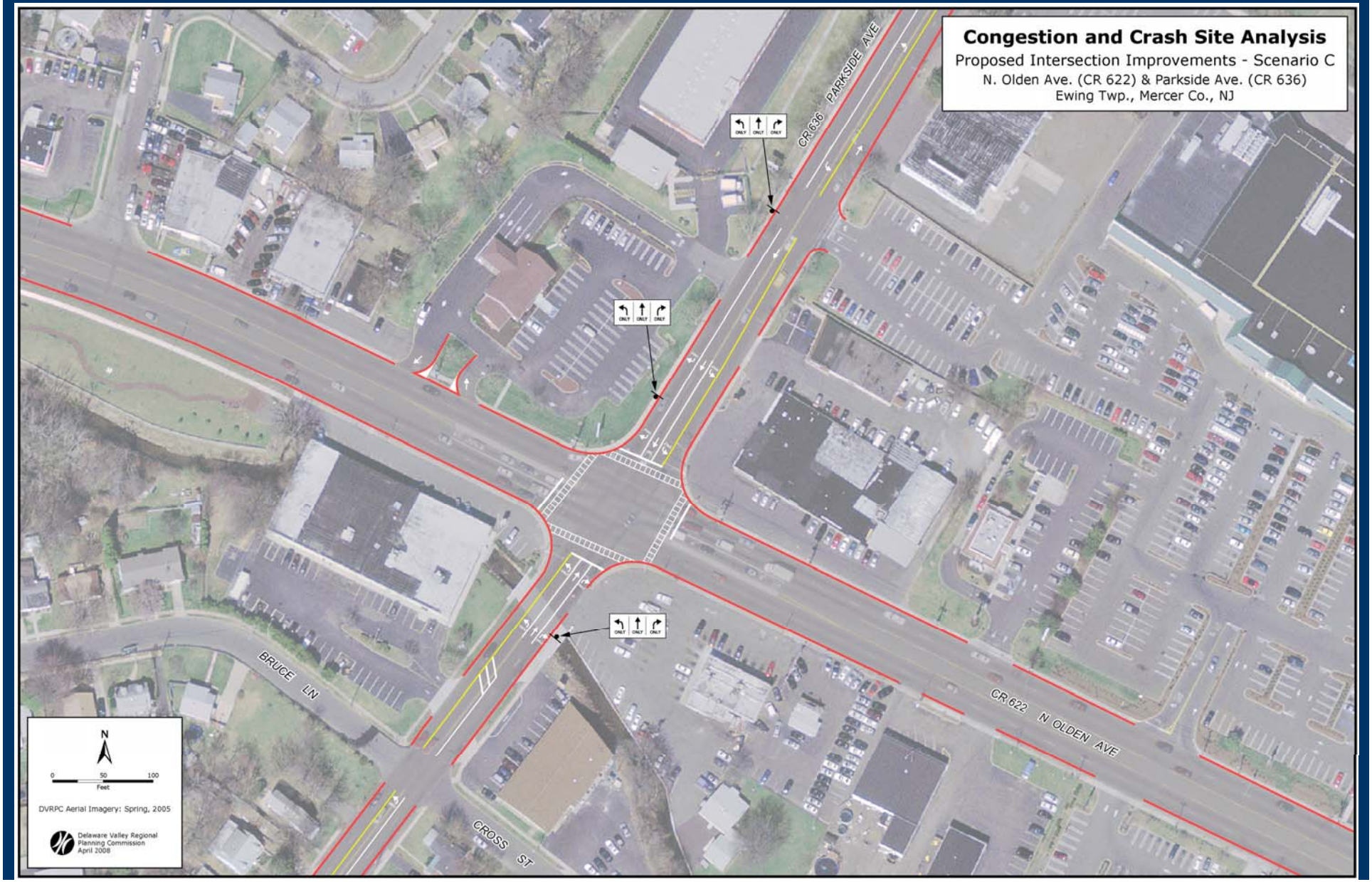
Intersection Improvements

Intersection Improvements

- Delay & LOS Analysis

Medium-Term: Scenario "B"				
	AM (60 sec.)		PM (75 sec.)	
Direction	Delay (sec)	LOS	Delay (sec)	LOS
Olden EB	23	C	43	D
Olden WB	24	C	38	D
Parkside NB	33	C	53	D
Parkside SB	16	B	24	C
Total Int.	24	C	39	D

Intersection Improvements



Intersection Improvements

- Delay & LOS Analysis

Medium-Term: Scenario “C”				
	AM (60 sec.)		PM (70 sec.)	
Direction	Delay (sec)	LOS	Delay (sec)	LOS
Olden EB	22	C	32	C
Olden WB	23	C	28	C
Parkside NB	16	B	22	C
Parkside SB	14	B	23	C
Total Int.	20	B	27	C

Intersection Scenario Summary

Short-Term: Signal Optimization				
	AM (55 sec.)		PM (55 sec.)	
Direction	Delay (sec)	LOS	Delay (sec)	LOS
Olden EB	19	B	36	D
Olden WB	18	B	30	C
Parkside NB	13	B	12	B
Parkside SB	16	B	27	C
Total Int.	17	B	28	C

Medium-Term: Scenario “A”				
	AM (60 sec.)		PM (80 sec.)	
Direction	Delay (sec)	LOS	Delay (sec)	LOS
Olden EB	26	C	44	D
Olden WB	27	C	37	D
Parkside NB	23	C	56	E
Parkside SB	22	C	38	D
Total Int.	25	C	42	D

Medium-Term: Scenario “B”				
	AM (60 sec.)		PM (75 sec.)	
Direction	Delay (sec)	LOS	Delay (sec)	LOS
Olden EB	23	C	43	D
Olden WB	24	C	38	D
Parkside NB	33	C	53	D
Parkside SB	16	B	24	C
Total Int.	24	C	39	D

Medium-Term: Scenario “C”				
	AM (60 sec.)		PM (70 sec.)	
Direction	Delay (sec)	LOS	Delay (sec)	LOS
Olden EB	22	C	32	C
Olden WB	23	C	28	C
Parkside NB	16	B	22	C
Parkside SB	14	B	23	C
Total Int.	20	B	27	C

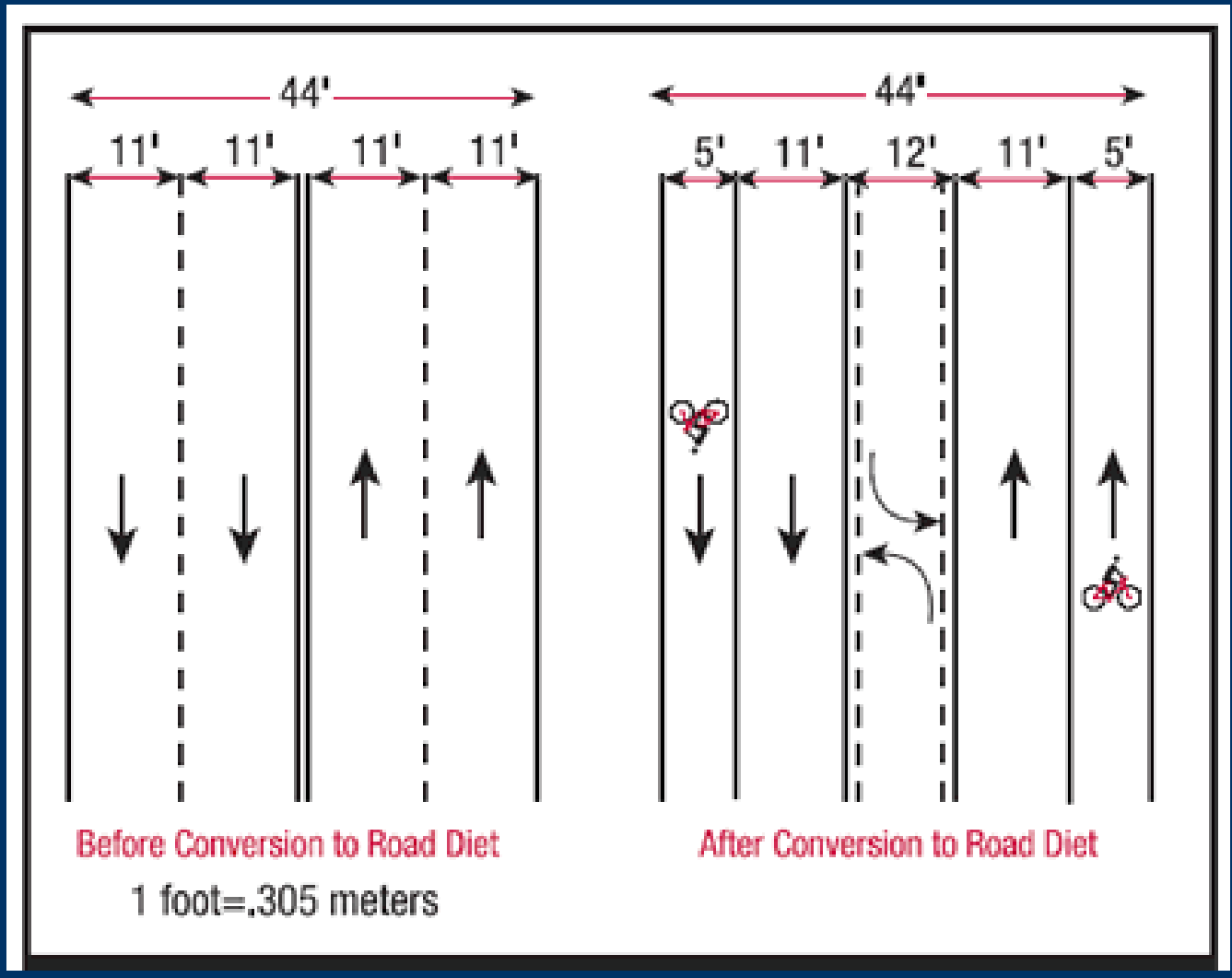
Traffic Calming

Road Diet

- A typical road diet technique used to reduce the number of lanes on a roadway cross-section. One of the most common applications of a road diet is to convert a 4-lane roadway, into 3 lanes with one travel lane in each direction and a two-way turn lane in the middle.
- Road diets can be used as a safety tool, or as a design objective.
- “Context Sensitive Design”, “Complete Streets”, “Place-making” and traffic calming have all contributed largely to the popularity of road diet projects.

Traffic Calming

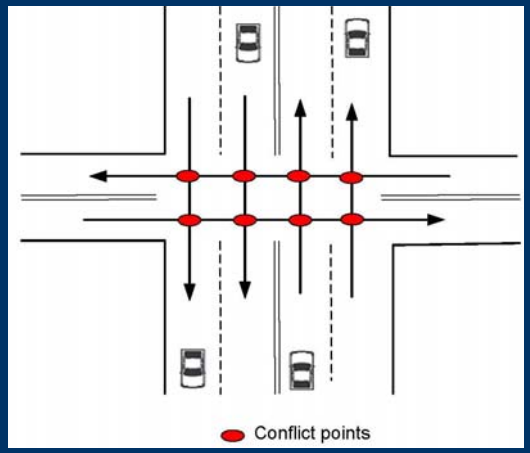
Road Diet



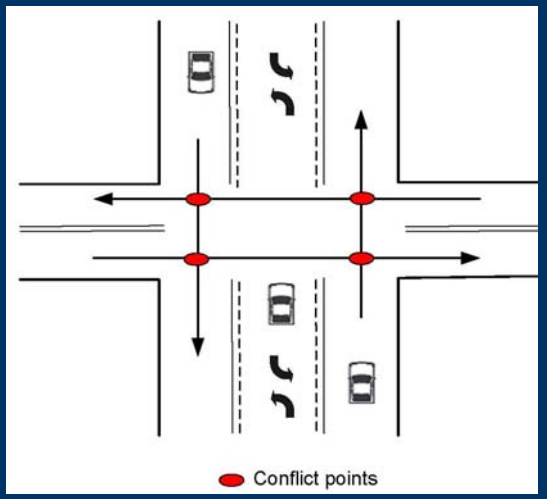
Traffic Calming

Road Diet

Intersection Conflict Points

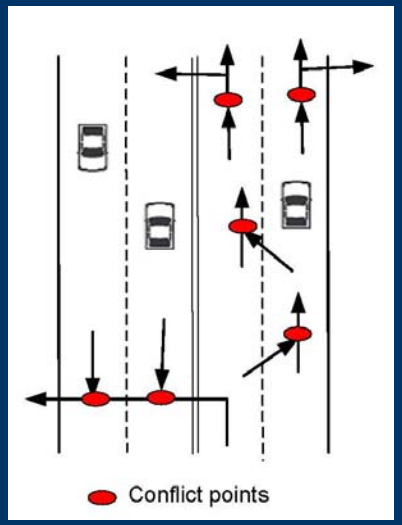


4 Lanes

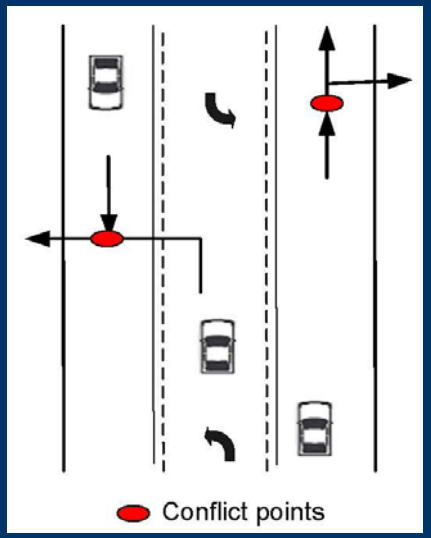


3 Lanes

Mid Block Conflict Points



4 Lanes



3 Lanes

Traffic Calming

Road Diet

Road Diet Improvement Scenario

- Road Diet
  - Buttonwood Drive to Pennington Road
  - Several left turns side streets
  - Below threshold volumes
  - Predominantly Residential
  - Opportunity to accommodate all users

SimTraffic Analysis

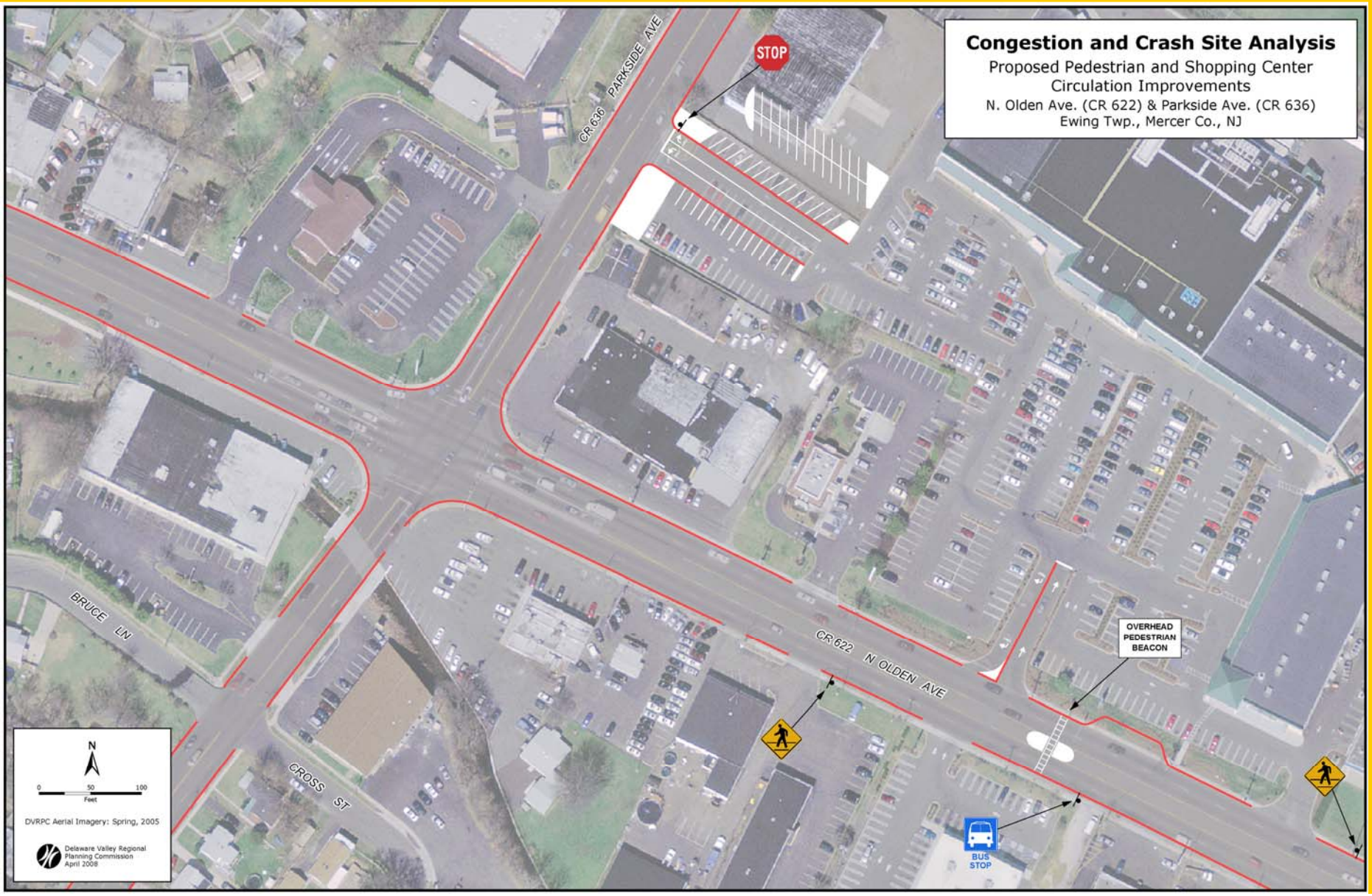
		Travel Time (sec)[1]	Average Speed (MPH)
PM Peak Hr Existing	Parkside NB	133	23
	Parkside SB	138	23
PM Peak Hr Road Diet[2]	Parkside NB	138	22
	Parkside SB	140	22

1. Along Parkside Avenue, from NJ 31 and Buttonwood Drive
2. This scenario does not consider changes at Olden Avenue intersection

Access Improvement Scenarios

- Circulation and Access Shopping Center
  - Driveways
- Pedestrian Amenities
  - Transit – bus pull-out
  - Shopping Center Access

Circulation & Pedestrians



Pedestrian Median Refuge

Pedestrian Improvement

- Improve Pedestrian Amenities
  - Sidewalks
  - Crosswalks at Intersection
  - ADA Compliant Curb Ramps
  - Improved Pedestrian Signals Heads

Recommendations

- Intersection
- Road Diet Application
- Access
- Pedestrian Activity

Open Discussion