

Recommendations for Rawson Road / Broadway and Rawson Road / Warren Street

Issues:

1. Since 1990, each intersection has experienced approximately 2 crashes per year. While the crashes at Broadway / Rawson have been primarily property damage only (as is typical in Arlington), the crashes at Warren / Rawson have usually involved personal injury. (Note that several other intersections along Broadway and Warren also have similar crash rates.)
2. Parked cars on Broadway severely limit visibility for traffic at Broadway and Rawson. This intersection is part of a small commercial district.
3. Parked vehicles (trucks, vans, SUVs) on Rawson Road may obstruct the view of the stop sign at Warren. A street tree (in front of 13/15 Rawson Road) also obstructs the view of the stop sign. (Note that the Rawson/Warren crashes generally involved people from outside the neighborhood, people who presumably are less familiar with the hazards of this intersection.)
4. On Broadway, some 32 – 38% of vehicles were seen to be exceeding the 30 mph speed limit.

Immediate recommendations:

1. At Broadway and Rawson (north side) sign and enforce current restrictions against parking on a handicap ramp and within 20' of an intersection.
2. Erect a stop-ahead sign on Rawson on the southbound approach to the stop sign at Warren. (To reduce sign-clutter, the graffiti-covered "Children" sign at Amherst and Rawson should be removed.)
3. Maintain the stop bars that have recently been painted at both intersections.
4. Directed enforcement for speeding, especially on Broadway.
5. Provide education and enforcement on the 20' parking rule at intersections.

We do not recommend a 4-way stop. The added delay to motorists (thousands of hours for each crash prevented), as well as added pollution and noise from the stops and starts, would outweigh any safety benefit.

Potential future recommendations:

Enforcing the current 20' parking rule will improve visibility at these intersections, but may not be sufficient to ensure adequate sight distances. Should 20' prove insufficient, the following should be considered:

1. On Broadway, ask the MBTA to move the westbound bus stop (now located midway between Rawson and Tufts) to the north-east corner of Rawson, and prohibit parking in the bus stop.
2. On Warren Street, prohibit parking for a distance of 50' from Rawson at the north-east and south-west corners.

Rawson/Broadway and Rawson/Warren: Background Material

Crashes

There are approximately 2 crashes per year at each of these intersections. The following tables show various breakdowns by severity, time of day, etc. They cover the period 1990 to August 2003. Data from 1990 – 2000 is from the State. From 2000 to 2003 from APD.

Count of Year	Rawson and		
Year	Broadway	Warren	Grand Total
1990	2	2	4
1991	1	1	2
1992	2	2	4
1993	1	0	1
1994	0	0	0
1995	1	1	2
1996	2	1	3
1997	2	3	5
1998	1	3	4
1999	4	3	7
2000	2	3	5
2001	1	2	3
2002	2	2	4
2003	3	2	5
Grand Total	24	25	49

Crashes at Broadway typically occurred between 7 AM and 6 PM, at all hours in that time frame. Crashes at Warren typically occurred between 7 AM and 9 PM, at all hours in that time frame. The Daylight/Darkness, Injury/Property Damage distribution is shown below.

		Injury	Property	Unknown	Total
Broadway	Daylight	6	8	4	18
	Dawn/Dusk	0	2	0	2
	Dark	0	0	3	3
	Unknown	0	1	0	1
	Total	6	11	7	24

		Injury	Property	Unknown	Total
Warren	Daylight	9	2	5	16
	Dawn/Dusk	0	0	0	0
	Dark	3	1	4	8
	Unknown	0	1	0	1
	Total	12	4	9	25

Although the Town-wide proportion of injury crashes (versus property damage only) is about 1/3, the proportion of injury crashes at Rawson/Warren is about 3/4. Town-wide, about 70% of crashes occur in daylight, so the daylight/darkness proportions are not particularly unusual.

Count of DayOfWeek	DayOfWeek								
	Street	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Grand Total
Broadway		0	5	5	2	3	7	2	24
Warren		5	2	2	4	5	3	4	25
Grand Total		5	7	7	6	8	10	6	49

Crashes at Rawson / Broadway tend to occur more during the working week than on weekends. Crashes at Rawson / Warren occur on all days of the week.

The typical crash at Rawson / Broadway involved a southbound motorist on Rawson colliding with a westbound motorist on Broadway, although there were a few collisions with eastbound motorists. The typical crash at Rawson / Warren involved a collision with a motorist on the near side lane on Warren. Northbound motorists on Rawson would collide with eastbound motorists on Warren, while southbound motorists on Rawson would collide with westbound motorists on Broadway. Crashes were evenly split between northbound and southbound Rawson Road motorists.

For the 2000 – 2003 APD data, the motorist’s reported address was available. None of the 10 APD-reported Rawson/Warren crashes appeared to involve residents of the immediate neighborhood. (Rawson Road or the “college” streets).

Crashes at Rawson/Warren

Motorist’s residence	Motorist on Rawson	Motorist on Warren
Arlington	2	3
Non-Arlington	8	7

Crashes at Rawson/Broadway

Motorist’s residence	Motorist on Rawson	Motorist on Broadway
Arlington	4	3
Non-Arlington	3	4

Compared to other intersections in the area, crash rates at these two intersections are not exceptional. The following figure depicts the numbers of crashes at various intersections along Warren Street and Broadway.

Figure 1 Crashes



Traffic Volumes

Daily volumes on Broadway and Warren (from APD)

Street	Start Date	Meas Location	
Broadway	10/22/02 (Tu)	#212 Broadway	5722
Warren St.	10/15/02(Tu)	#74 / 76 Warren St.	6235

Peak hour turning movements at Rawson and Warren (from Transportation Assessment Study, 2001)

AM Peak Hour	Exiting direction				
	Warren Westbound	Rawson Southbound	Warren Eastbound	Rawson Northbound	
Entering direction Rawson Southbound		24	67	10	101
Warren Westbound	190		8		6
Warren Eastbound			30	298	11
Rawson Northbound		7		4	12
		221	105	312	29

PM Peak Hour	Exiting direction				
	Warren Westbound	Rawson Southbound	Warren Eastbound	Rawson Northbound	
Entering direction Rawson Southbound		12	18	7	37
Warren Westbound	228		9		11
Warren Eastbound			13	280	26
Rawson Northbound		5		9	19
		245	40	296	56

We have no direct observations of turning movements at Rawson / Broadway. The following peak hour observations may, however, be relevant

Time	Location	Vol.	Source
AM Peak	Rawson SB from Warren	105	See above
AM Peak	Foster SB entering Mass. Ave	93	Mass. Ave. Corridor Study, 9/2001
PM Peak	Rawson SB from Warren	40	See above
PM Peak	Foster SB entering Mass. Ave	43	Mass. Ave. Corridor Study, 9/2001

Parking

On Friday 9/26/2003, parking was observed between 10:55 am and 1:20 PM, for the segments of Broadway, Rawson Road and Foster Street marked on Figure 2.

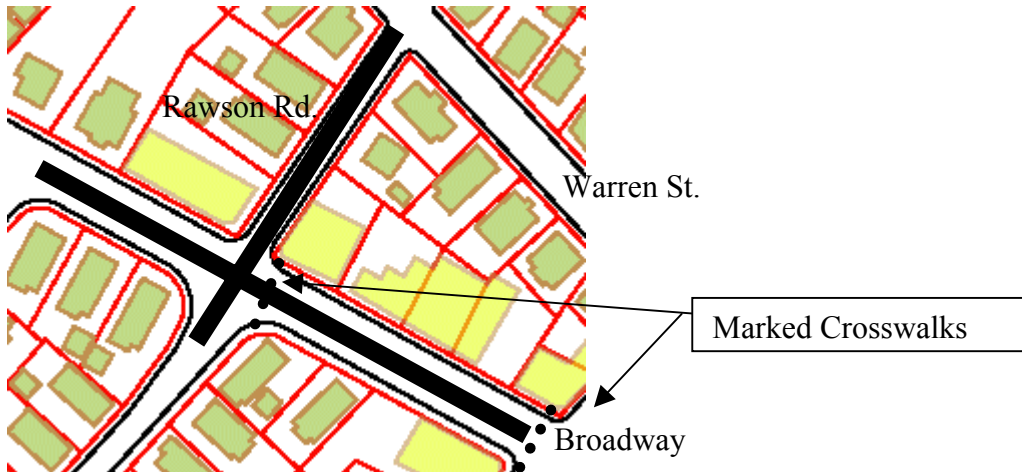


Figure 2 Parking Survey

At 11 AM, spaces on Broadway between Rawson/Foster and Tufts were almost all occupied, while numerous open spaces were available elsewhere. At 1 PM, spaces were available everywhere.

Of the 29 vehicles present at approximately 11 AM, 20 were still there at 11:45 AM, and 12 remained at 1:20 PM. Of the 12 that remained, 10 were parked in 2-hour parking zones.

Perceived Issues

At Rawson/Broadway

1. Parked cars on Broadway limit visibility for both motorists and pedestrians. This applied to both the Rawson Road intersection and to driveways on Broadway. Vans, SUVs and panel trucks present a particular challenge.
2. Parking is permitted in the bus stop. Bus can't pull over to the curb and cars sometimes cross the double-yellow line to pass it.
3. Long pedestrian crossing distance due to the wide curb radius at Broadway and Foster. Motorists take the left turn from Broadway to Foster wide and travel across the crosswalk while driving on the wrong side of Broadway.
4. Speeding on Broadway

At Rawson/Warren

1. Observance of the stop sign
2. Parked cars on Warren sometimes limit visibility (although the number of cars parked on Warren is typically much lower than on Broadway)
3. Speeding on Warren
4. On Rawson northbound, the view of the stop sign is obstructed by a street tree.
5. On Rawson northbound and southbound, the view of the stop sign may be obstructed by high-profile parked vehicles (e.g. trucks) See Figure 3.



Figure 3 View towards Rawson / Warren (from Rawson/Amherst)

Community Meeting Attendance

Attendees at the neighborhood meeting in October were George Berberian, Gail DuBois, Susan Javurek, Marie Mignanelli Herald Sulahian, Lt. Jim Mc Hugh, Mike Rademacher and Scott Smith. Also, Scott Smith had telephone and personal conversations with five other people.

Possible Solutions at Rawson / Broadway

Action	Advantages	Disadvantages
1. Sign and enforce current 20' rule for parking at intersections	<ul style="list-style-type: none"> - Helps to solve a visibility problem for both motorists and pedestrians - Discourages blockage of the curb cut ramp in front of Ginnys. - Makes signage consistent with current law 	<ul style="list-style-type: none"> - Makes parking slightly less convenient for businesses at the corner.
2. Stop lines (already done)	<ul style="list-style-type: none"> - Encourages compliance with the stop sign 	<ul style="list-style-type: none"> - Needs to be repainted each year.
3. Move westbound bus stop to Broadway / Rawson, make into no-parking zone	<ul style="list-style-type: none"> - Enables bus to pull to curb - Will solve the visibility issue for westbound traffic on Broadway. (Note: given a 25 mph design speed, and a 2.5 second reaction time, approximately 50' of parking prohibition will be needed to ensure adequate visibility.) 	<ul style="list-style-type: none"> - Removes 1 – 2 parking spaces that are currently legal
4. 4-way stop	<ul style="list-style-type: none"> - May reduce the risk for traffic on Rawson - Makes visibility less of an issue (no need to restrict parking) 	<ul style="list-style-type: none"> - Risk of non-compliance, and its associated hazards. - Increased delay for traffic on Broadway - Increased risk of rear-end collisions - Added noise, fuel consumption, and emissions
5. Raised crossing	<ul style="list-style-type: none"> - Helps to ensure reasonable speeds for traffic on Broadway 	<ul style="list-style-type: none"> - Expense - Discomfort for motorists and bus passengers. - Added noise and emissions
6. Traffic signal	<ul style="list-style-type: none"> - Similar to 4-way stop 	<ul style="list-style-type: none"> - Similar to 4-way stop - Very high added expense
7. Targeted enforcement	<ul style="list-style-type: none"> - May help to slow traffic on Broadway 	<ul style="list-style-type: none"> - A temporary solution at best
8. Rawson One-way NB	<ul style="list-style-type: none"> - Solves visibility issue at this location 	<ul style="list-style-type: none"> - Inconvenient for residents of Rawson Rd, and roads that connect to Rawson. - Increased turns at Rawson (SB) and Warren will endanger pedestrians. - May simply move the problem elsewhere

Possible Solutions at Rawson / Warren

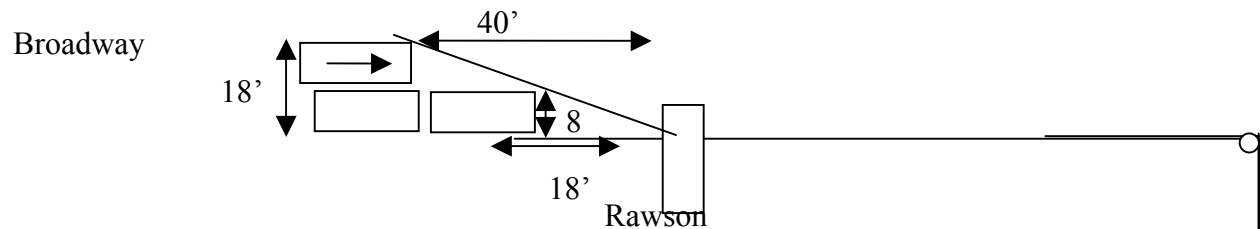
Action	Advantages	Disadvantages
1. Enforce current 20' rule for parking at intersections	- Helps to solve a visibility problem for both motorists and pedestrians	
2. Stop lines (already done)	- Encourages compliance with the stop sign	- Needs to be repainted each year.
3. 50' no-parking zone on Warren, on the northeast and southwest quadrants	- Will solve the visibility issue for near-lane traffic, provided motorists on Warren are driving at ~25 mph.	- Removes approximately 2 parking spaces that are currently legal
4. 4-way stop	- Same as for Broadway	- Same as for Broadway
5. Raised crossing	- Helps to ensure reasonable speeds for traffic on Warren	- Expense - Discomfort for motorists - Added noise and emissions
6. Traffic Signal	- Similar to 4-way stop	- Similar to 4-way stop - Very high added expense
7. Targeted enforcement	- May help to slow traffic on Warren - May encourage compliance with the stop sign	- A temporary solution at best
8. Larger stop sign at Rawson / Warren.	- Encourages compliance with the stop sign	- Expense - May still be obstructed by parked vehicles.
9. Stop-ahead signs on the approaches to the intersection	- Motorists will see at least one sign in time to stop.	- Expense
10. Trim street tree on Rawson northbound approaching Warren	- Encourages compliance with the stop sign, by making it more visible	- The result may not be esthetically pleasing.
11. Crosswalk with PWS at Warren		

General suggestions:

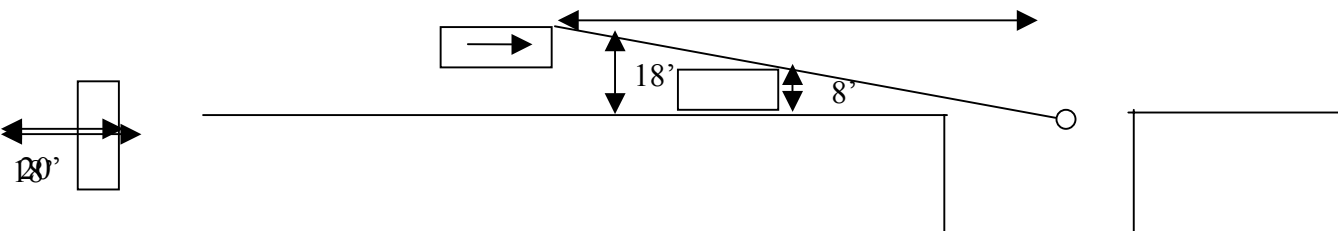
- Continue efforts to permit a 25 mph speed limit on Town streets.
- Education on the 20' rule for parking near intersections.

Appendix 1: Notes on Sight Distance

Note: Position of car on Rawson Road corresponds to common Boston-area driving practice, not to American Association of State Highway and Transportation Officials (AASHTO) guidelines! All distances are approximate.



With 40' (about 1 second of travel time for the car on Broadway), a collision will almost certainly occur.



With 85', there is a chance to avoid a collision. Note, however, that AASHTO stopping sight distance guidelines suggest at least 150' should be provided at 25 mph and 200' at 30 mph. Approximately 50' of parking prohibition would be required to provide 150' visibility.