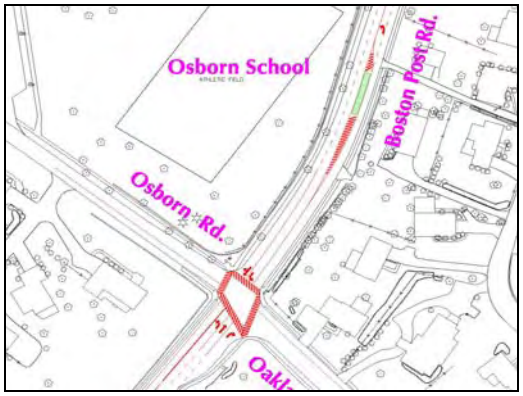

Boston Post Road
Design Feasibility Study

Prepared for the
City of Rye

Final Report

July 18, 2007

Prepared by:
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1. Introduction

BFJ was retained by the City of Rye to prepare a feasibility analysis of a potential redesign of the Boston Post Road between the City's border with the Village of Mamaroneck and the Old Post Road (the Rye downtown area).

The City requested this study to assess whether any changes in lane configuration on the Boston Post Road might be appropriate before undertaking a substantial re-paving effort of this road from the City Golf Club to the Mamaroneck Line. This assessment is similar to a 1999 study by Berger, Lehman Associates, which evaluated the feasibility of changing/reducing the lane configuration of Boston Post Road between Parsons Street and Old Post Road. That study concluded that reducing the number of travel lanes from the existing four (e.g. two lanes in each direction) to three (e.g. two lanes southbound and one lane northbound) would not adversely impact levels of service.

The objective of this study is to review the existing geometric and traffic conditions of this section of the Boston Post Road to determine whether the road could maintain or enhance existing levels of service, but also function safely with one through lane in each direction plus turn lanes at those intersections where they would be warranted. The City initiated the study noting the following possible benefits of a road diet:

- *Traffic Calming.* Replacing the current sub-standard four-lane roadway with a two-lane roadway has traffic calming characteristics that would likely reduce travel speeds resulting in a safer, more pedestrian-friendly road.

- *Opportunity for Bike Lane(s).* Reducing the number of vehicle travel lanes offers the opportunity to potentially add designated bike lanes (or at least provide wider shoulders for use by experienced bikers) without changing the existing cross-section of Boston Post Road.

- *Aesthetic Enhancements.* A design with a raised median may also allow landscaping features that would add to the aesthetic value of this corridor. Aesthetic considerations are important since a substantial section of this road is part of the Boston Post Road Historic District, which is listed on the State and National Register of Historic Places and is a National and Local Historic Landmark.

The focus of this study is on a redesign opportunity within the existing curb-to-curb width of the road. Any improvements beyond the curbs, as well as changes of the curbs are beyond the scope of this assignment. Significant realignments of the curb would also imply high construction costs.

2. Current Geometric and Traffic Conditions

Figure 1 shows current curb-to-curb widths of the roadway being studied. As can be seen, most of the Boston Post Road has a curb-to-curb width of 36' to 36'6", basically 9 feet per lane. The most westerly section near Overdale Road is 38'2" wide, basically 9'6" per lane.

Current peak-hour traffic volumes are shown in Figures 2 and 3. The following summarizes the traffic volumes:

- AM Peak Hour (generally from 7:45 to 8:45): NB 200 to 350 vehicles per hour
  SB 350 to 500 vehicles per hour
- PM Peak Hour (generally from 3:15 to 4:15): NB 350 to 450 vehicles per hour
  SB 300 to 450 vehicles per hour

These peak hour periods were determined based on traffic counts conducted in February, March and June 2007.
The posted speed for this section of the Boston Post Road is 30 mph.

3. Crashes along Boston Post Road

Figure 4 shows where the crashes occurred over the last three years (2004 through 2006). A total of 12 injury crashes and 67 property-damage-only crashes were recorded over the 3-year period. As can be seen the majority of the crashes occurred at intersections, primarily at the intersection of the Boston Post Road with Osborn Road/Oakland Beach Ave, with 24 crashes.

Accident reports show that 20% of the accidents were fixed-object crashes where vehicles hit a pole, tree or wall. Also overtaking, right-turn and left-turn collisions between two vehicles running side-by-side along Boston Post Road include 16% of accidents. This analysis concludes that more than 36% of accidents occur because of high speeds. Decreasing the number of travel lanes to one lane in each direction and introducing a raised median will reduce speeds and as a result will reduce the number and severity of accidents.

The accident reports also show that 57% of the fixed-object collisions occurred during nighttime. The headlight glare could be a major collision factor. A raised median with appropriate landscaping will reduce the quantity and severity of collisions.

4. Proposed Redesign

Given the relatively low peak-hour traffic volumes and the current configuration with four sub-standard lanes, the obvious redesign would involve one land in each direction, plus

occasional left-turn lanes where warranted or a flush[1] or raised median for those sections where we don't have an exclusive left-turn lane.

Table 1 shows the delays that exist with the current design and those that are predicted with a two-lane cross-section (one lane in each direction) with and without left-turn lane. The column entitled "BFJ Recommendations" explains the design recommended for each location, i.e. the locations where we recommend an exclusive left-turn lane and those where we recommend a break in the median. The resulting delays are shown in the last column.

As can be seen, the increases in delays that would be experienced at some locations with the redesign are insignificant, and will be more than off-set by reduced speeds, a traffic-calmed environment and improved safety and aesthetics. For some movements the delays would actually decrease slightly, since through traffic would not be held up by left-turning vehicles.

Figure 5 shows those locations where we recommend an exclusive left-turn lane and those locations where we recommend an opening in the median. The left-turn lanes should be as much as possible protected left-turn lanes, i.e. the vehicles making the left turn will shift into that lane to make the left-turn and will not risk being rear-ended by somebody continuing straight, as is the case today. The left-turn lanes are recommended at those locations where we have more significant left-turn volumes either on a regular basis or at special peak periods (such as the school). It should be noted that we do not recommend to reduce number of lanes along Boston Post Road from Oakland Beach Avenue to Old Post Road (South), since the delays would increase.

Locations with low left-turn movements that do not warrant a separate left-turn lane, will have a break in the median thus allowing left turns.

Figure 6 shows the recommended cross-sections for the Boston Post Road. Section D-D represents the existing cross-section. In all cases where we change from today's cross-section we try to introduce a shoulder, generally between 2 and 4 feet. The width of the shoulders shrinks to 2 to 3 feet whenever we introduce a left-turn lane. Ideally these sections should be widened so that a 4-foot shoulder can eventually be provided.

The purpose of the shoulder is threefold:1) General safety: the shoulders allow for more flexibility and avoidance in case of sudden conflicts; 2) emergency circulation: in case a car brakes down a fire truck can still pass, and 3) providing room for bicyclists.

Where a raised median is proposed we still maintain a 15'6" section between the curbs, enough for a car and a truck to pass each other if needed. The curbs of the median should also be designed as mountable curbs in case of emergency. In general the sections with raised medians do not exceed 200 feet in length, and will be interspersed with sections that have flush medians. Raised medians are only proposed at those locations that do not have driveways.

[1] A flush median is a strip in the centre of the road that is marked with white diagonal lines within parallel lines. It provides room for vehicles that are turning left, or vehicles that have turned left onto the road from a side road or driveway.

Designated bicycle lanes are not recommended, because the shoulder widths are not adequate, and if signed for a bike lane would imply an exaggerated level of safety. The proposed redesign shows sections that have only 2-foot shoulders and sections with no shoulders (those sections at signalized intersections where no changes are proposed). However, we suggest that eventually there be 4 foot shoulders all along the Boston Post Road. The purpose of these shoulders is not to address the family-type bicycling needs, but the desires of the more experienced bicyclists who bicycle to work or for more extended exercise.

5. Conclusions

We conclude that it is feasible to redesign the Boston Post Road. Good levels of service can be maintained with the proposed redesign and safety can be significantly improved. The raised median with landscaping allows for significant aesthetic enhancements.

Figures 7.1 through 7.11 show how the Boston Post Road can be redesigned. In general the median lane varies from about 5 to 7 feet for the flush or raised median (and the 4 foot shoulders) or is 10 feet wide when we provide for an exclusive left-turn lane.

When deciding on landscaping features for the sections with raised medians the City needs to take into consideration the maintenance needs and the need to maintain sight distances. The landscaping should either be low-height, or high canopy trees.

If the City wants to reduce the construction costs of the redesign, portions of the raised median could be replaced with a flush median. However we would not recommend the complete elimination of raised medians since the flush median is not as effective in terms of traffic calming and safety.

It is recommended that the City should plan to widen the curb-to-curb widths of these sections of the Boston Post road that do not have full 4-foot shoulders. The goal should be to construct continuous 4-foot shoulders along the full length of the road.

6. Next Step

The next step for this project includes a public consultation on this design concept to ascertain the general support for the redesign and possibly change some of the elements to respond to the public input.

Following the public input, the project needs to be engineered and cost estimates need to be prepared for final approval.

Table 1- Traffic Level of Service Analysis

Boston Post Road Intersections	Approach	Existing Conditions (4-Lanes)				Conditions with 2-Lanes & Opening in Raised Median				Conditions with 2-Lanes & Left-Turn Lane				BFJ Recommendations	Conditions after BFJ Recommendations			
		AM		PM		AM		PM		AM		PM			AM		PM	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS
Old Post Rd. (North)	Northbound	0.3	A	0.3	A	0.5	A	0.4	A	0.3	A	0.3	A	Two lanes with opening in raised median	0.5	A	0.4	A
	Southbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A		0.0	A	0.0	A
	Overall	*0.2*	*A*	*0.1*	*A*	*0.3*	*A*	*0.2*	*A*	*0.2*	*A*	*0.1*	*A*		*0.3*	*A*	*0.2*	*A*
Old Post Rd. (South)	Eastbound	4.3	A	3.7	A	4.4	A	3.7	A	4.3	A	3.7	A	Existing Configuration	4.3	A	5.8	A
	Northbound	5.4	A	5.1	A	7.3	A	7.6	A	5.4	A	6.3	A		5.4	A	6.6	A
	Southbound	21.7	B	83.9	F	20.9	B	92.4	F	23.5	B	92.4	F		21.7	B	24.9	B
	Overall	*8.2*	*A*	*26.7*	*B*	*9.2*	*A*	*30.4*	*B*	*8.5*	*A*	*29.7*	*B*		*8.2*	*A*	*11.3*	*B*
Sonn Dr./ Osborn School Dr.	Eastbound	6.6	A	5.5	A	6.6	A	5.5	A	6.6	A	5.5	A	Existing Configuration	6.6	A	5.8	A
	Westbound	3.5	A	2.8	A	3.5	A	2.8	A	3.5	A	2.8	A		3.5	A	6.6	A
	Northbound	15.5	B	14.1	B	52.9	F	28.8	B	46.8	B	25.9	B		15.5	B	6.6	A
	Southbound	20.1	B	14.9	B	49.5	B	28.8	B	20.0	B	19.9	B		20.1	B	24.9	B
	Overall	*15.9*	*B*	*13.3*	*B*	*46.3*	*B*	*25.9*	*B*	*32.5*	*B*	*21.0*	*B*		*15.9*	*B*	*11.3*	*B*
Osborn Rd./ Oakland Beach Ave.	Westbound	171.8	F	77.3	F	171.8	F	77.3	F	171.8	F	77.3	F	One NB & SB Thru Lane plus one NB & SB LT Lane plus one NB RT Lane	171.8	F	77.3	F
	Southbound	205.9	F	200.8	F	205.9	F	200.8	F	205.9	F	200.8	F		205.9	F	200.8	F
	Eastbound	40.6	B	36.4	B	70.3	F	42.9	B	45.4	B	38.3	B		45.4	B	38.3	B
	Northbound	47.4	B	90.6	F	714.1	F	650.2	F	48.0	B	90.9	F		48.0	B	90.9	F
	Overall	*90.9*	*F*	*92.1*	*F*	*307.9*	*F*	*334.1*	*F*	*92.9*	*F*	*92.8*	*F*		*92.9*	*F*	*92.8*	*F*
Soundview Ave./ Glen Oaks Dr.	Eastbound	16.4	B	16.3	B	21.7	B	20.7	B	20.7	B	20.0	B	Two lanes with exclusive left turn lanes	20.7	B	20.0	B
	Westbound	12.9	B	15.0	B	14.7	B	17.9	B	14.6	B	17.7	B		14.6	B	17.7	B
	Northbound	0.1	A	0.2	A	0.2	A	0.2	A	0.1	A	0.1	A		0.1	A	0.1	A
	Southbound	0.7	A	0.6	A	0.8	A	0.7	A	0.6	A	0.4	A		0.6	A	0.4	A
	Overall	*1.6*	*A*	*1.7*	*A*	*2.0*	*A*	*2.1*	*A*	*1.8*	*A*	*1.9*	*A*		*1.8*	*A*	*1.9*	*A*
Park Ave.	Eastbound	14.7	B	17.7	B	14.9	B	22.8	B	17.8	B	22.8	B	Two lanes with opening in raised median	14.9	B	22.8	B
	Northbound	0.6	A	0.6	A	0.0	A	0.9	A	0.6	A	0.5	A		0.0	A	0.9	A
	Southbound	0.0	A	0.0	A	0.8	A	0.0	A	0.0	A	0.0	A		0.8	A	0.0	A
	Overall	*2.2*	*A*	*1.9*	*A*	*2.3*	*A*	*2.4*	*A*	*2.5*	*A*	*2.3*	*A*		*2.3*	*A*	*2.4*	*A*
Bradford Ave.	Eastbound	12.1	B	12.5	B	13.8	B	14.2	B	13.8	B	14.2	B	Two lanes with opening in raised median	13.8	B	14.2	B
	Northbound	0.1	A	0.2	A	0.1	A	0.2	A	0.1	A	0.1	A		0.1	A	0.2	A
	Southbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A		0.0	A	0.0	A
	Overall	*0.5*	*A*	*0.4*	*A*	*0.6*	*A*	*0.5*	*A*	*0.6*	*A*	*0.4*	*A*		*0.6*	*A*	*0.5*	*A*
Johnson Pl./ Barlow Ln.	Eastbound	10.8	B	14.7	B	0.5	A	17.4	B	12.0	B	17.1	B	Two lanes with opening in raised median	0.5	A	17.4	B
	Westbound	11.5	B	12.7	B	1.4	A	14.7	B	12.8	B	14.6	B		1.4	A	14.7	B
	Northbound	0.4	A	0.2	A	12.8	B	0.3	A	0.3	A	0.2	A		12.8	B	0.3	A
	Southbound	1.2	A	0.9	A	12.0	B	1.0	A	1.1	A	0.7	A		12.0	B	1.0	A
	Overall	*2.0*	*A*	*1.8*	*A*	*2.3*	*A*	*2.2*	*A*	*2.1*	*A*	*2.0*	*A*		*2.3*	*A*	*2.2*	*A*
Overdale Rd.	Westbound	10.2	B	10.1	B	0.0	A	11.4	B	11.7	B	11.4	B	Two lanes with opening in raised median	0.0	A	11.4	B
	Northbound	0.0	A	0.0	A	0.3	A	0.0	A	0.0	A	0.0	A		0.3	A	0.0	A
	Southbound	0.3	A	0.1	A	11.7	B	0.2	A	0.2	A	0.1	A		11.7	B	0.2	A
	Overall	*1.1*	*A*	*0.9*	*A*	*1.3*	*A*	*1.1*	*A*	*1.2*	*A*	*1.0*	*A*		*1.3*	*A*	*1.1*	*A*

Note: The Boston Post Road is assumed to run North-South throughout the study area.

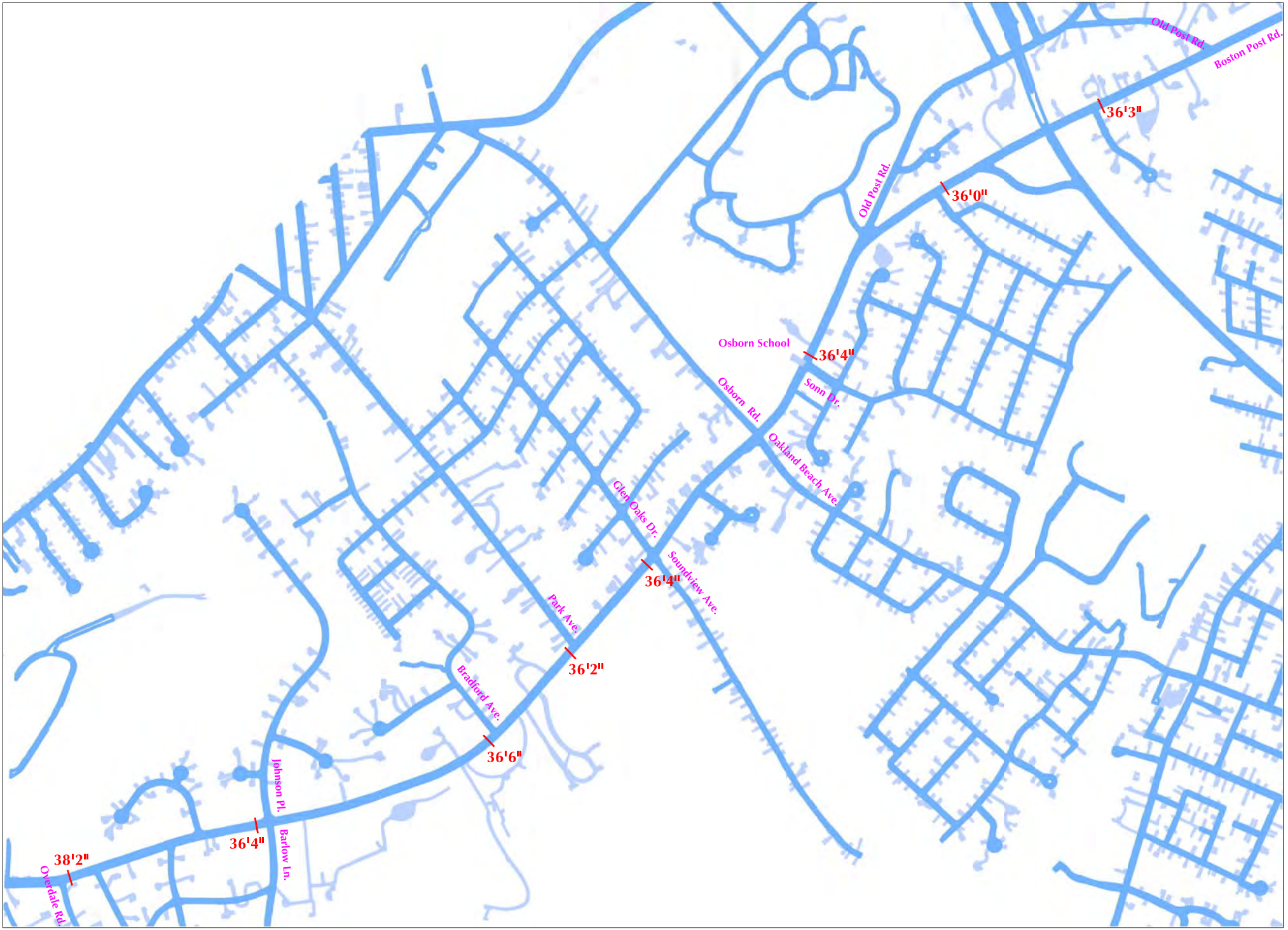

Figure 1. Existing Geometry (Curb-to-Curb Widths)

Boston Post Road Design Study

0 800 1600 ft

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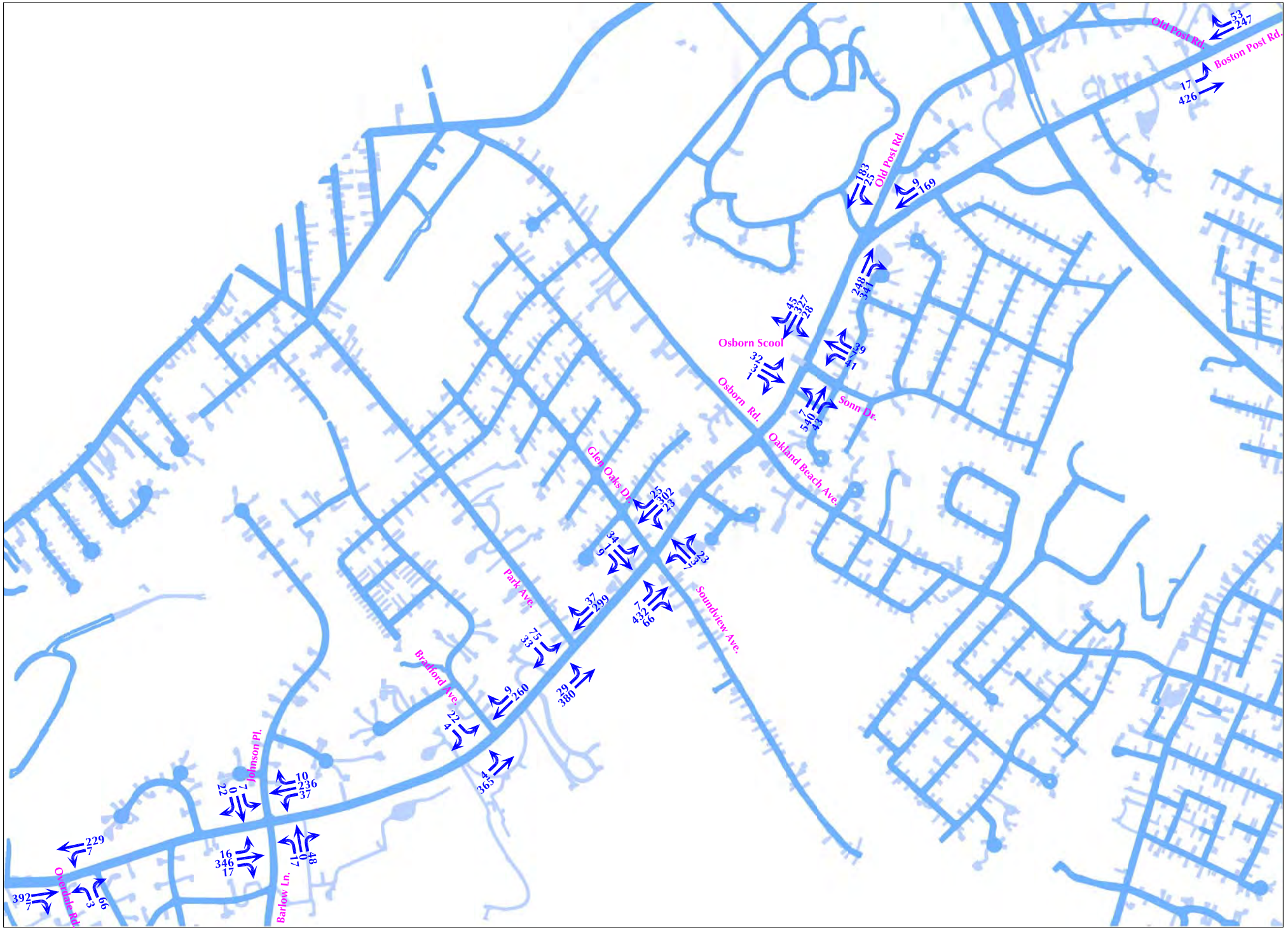

Figure 2. AM Peak Hour Traffic Volumes

Boston Post Road Design Feasibility Study

0 800 1600 ft

BFJ Planning/April 2007

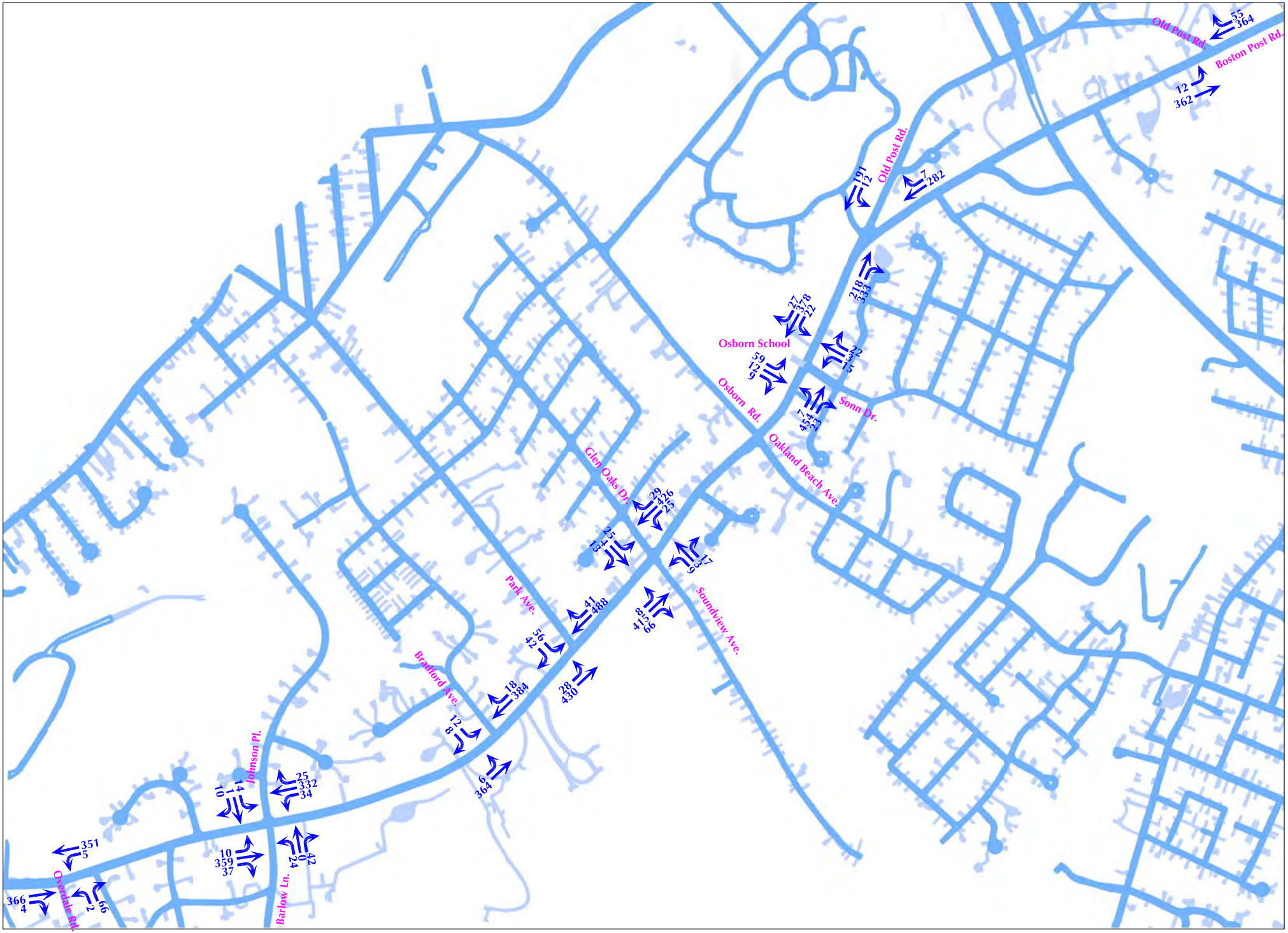

Figure 3. PM Peak Hour Traffic Volumes

Boston Post Road Design Feasibility Study

0 800 1600 ft

BFJ Planning/ April 2007

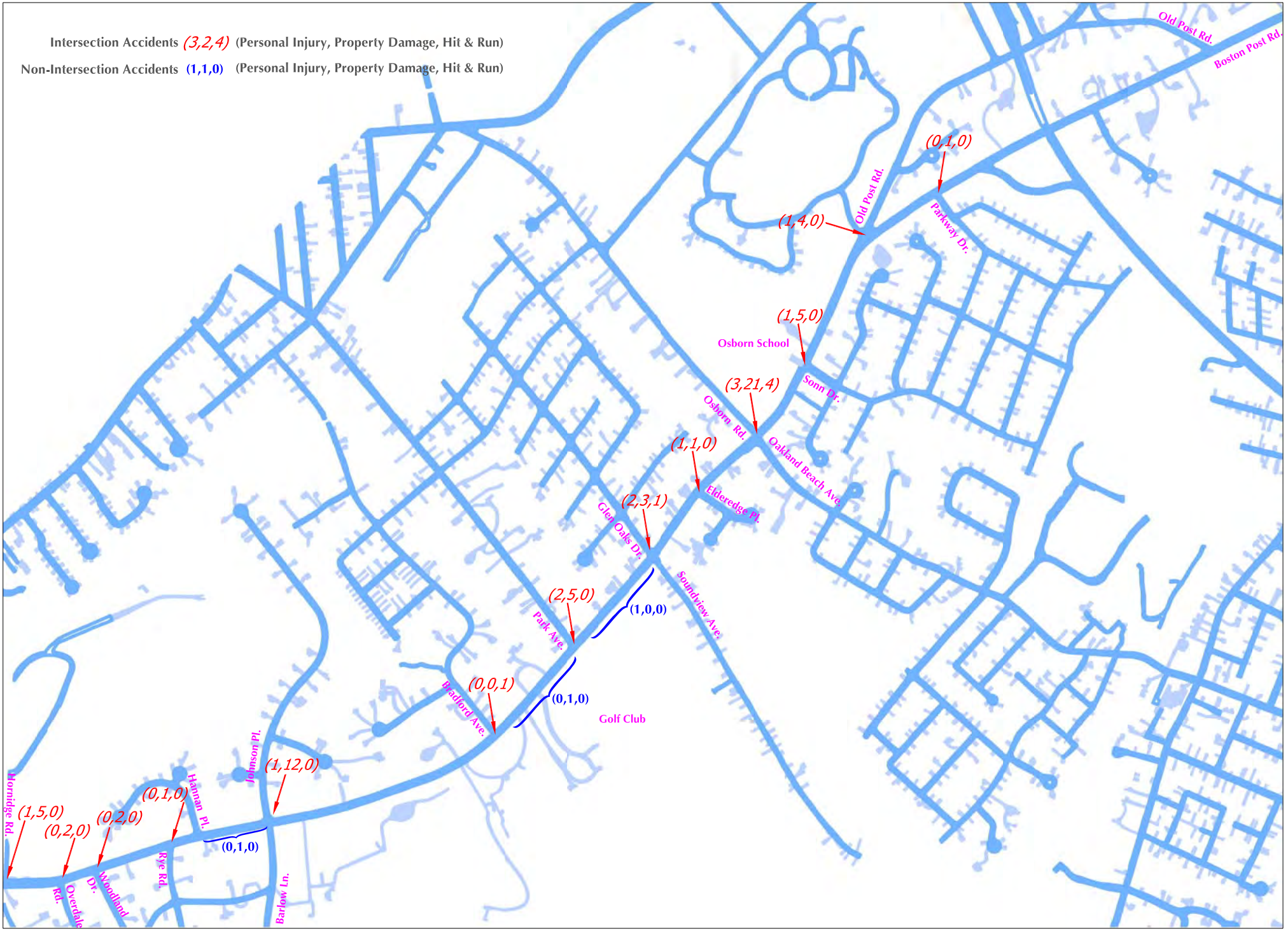

Figure 4. Crash Summary in Study Area: January 1, 2004 - December 31, 2006

Boston Post Road Design Study

Source: Rye Police Department

0 800 1600 ft

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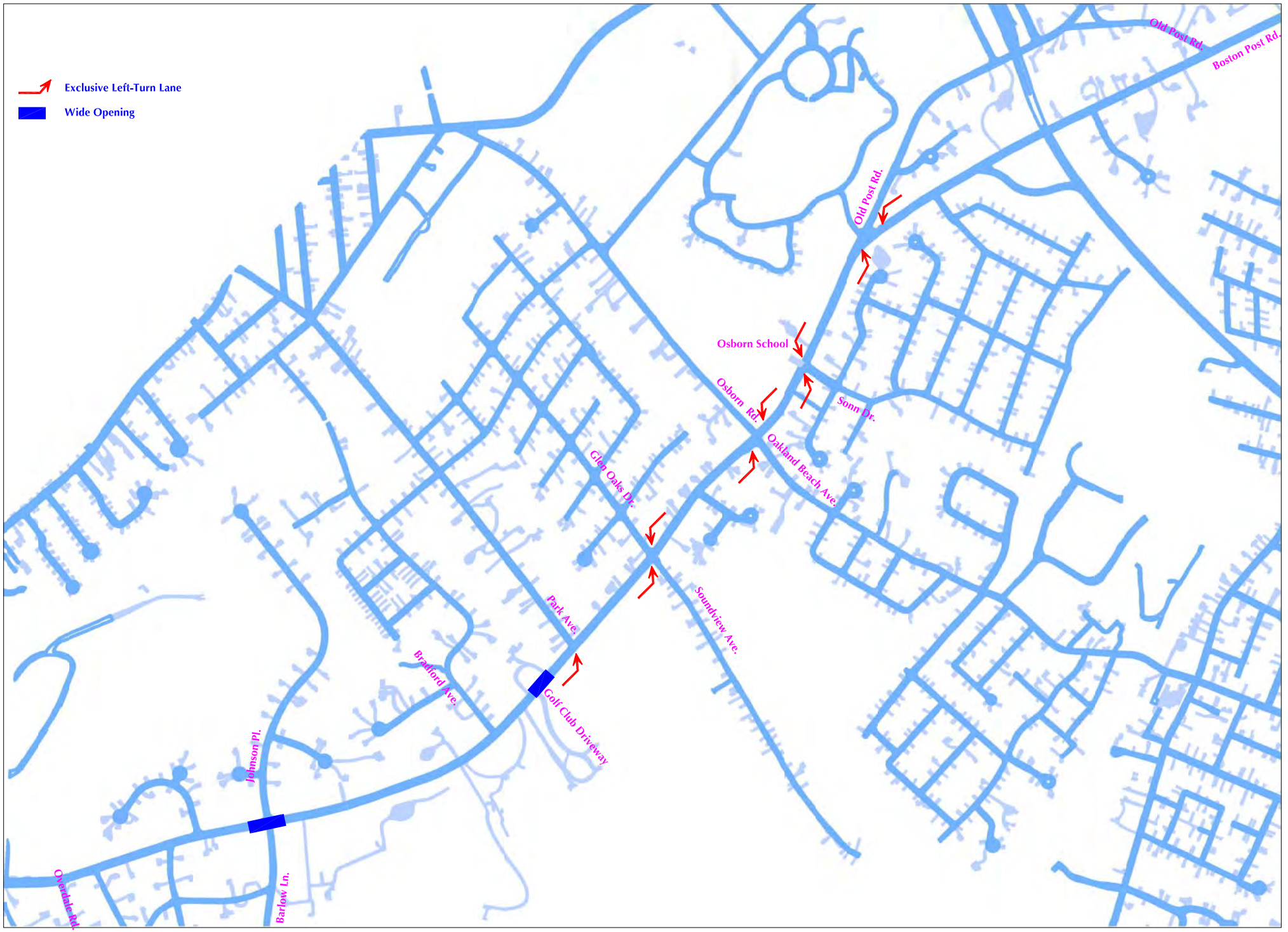

Figure 5. Left-Turn Lanes Recommended

Boston Post Road Design Feasibility Study

0 800 1600 ft

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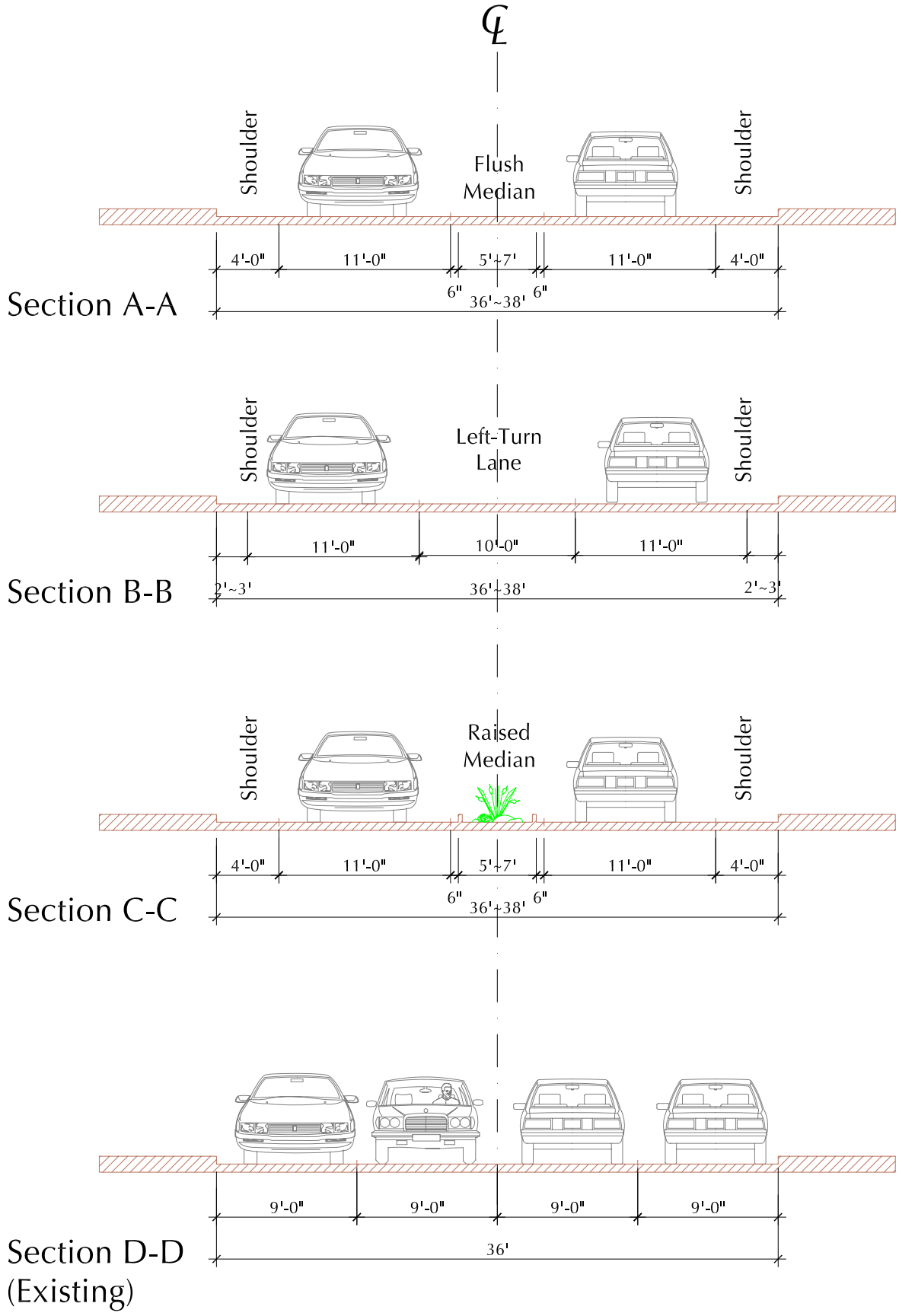

Figure 6. Typical Cross-Sections

Boston Post Road Design Study

Scale: 1"=10'

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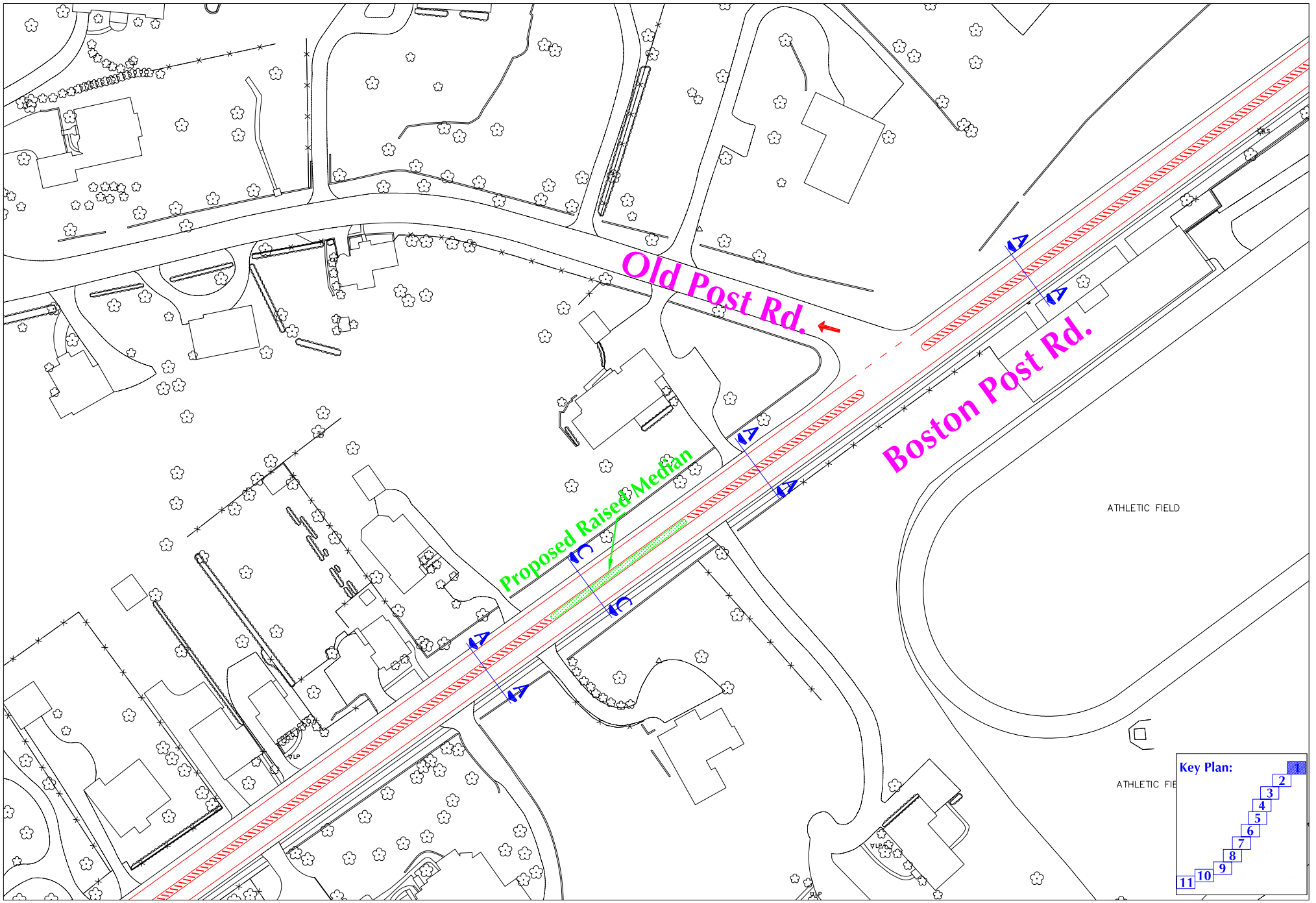

Figure 7.1. Proposed Redesign

Boston Post Road Design Feasibility Study

0 100 200 ft

BFJ Planning/ April 2007

Scale: 1"=100'

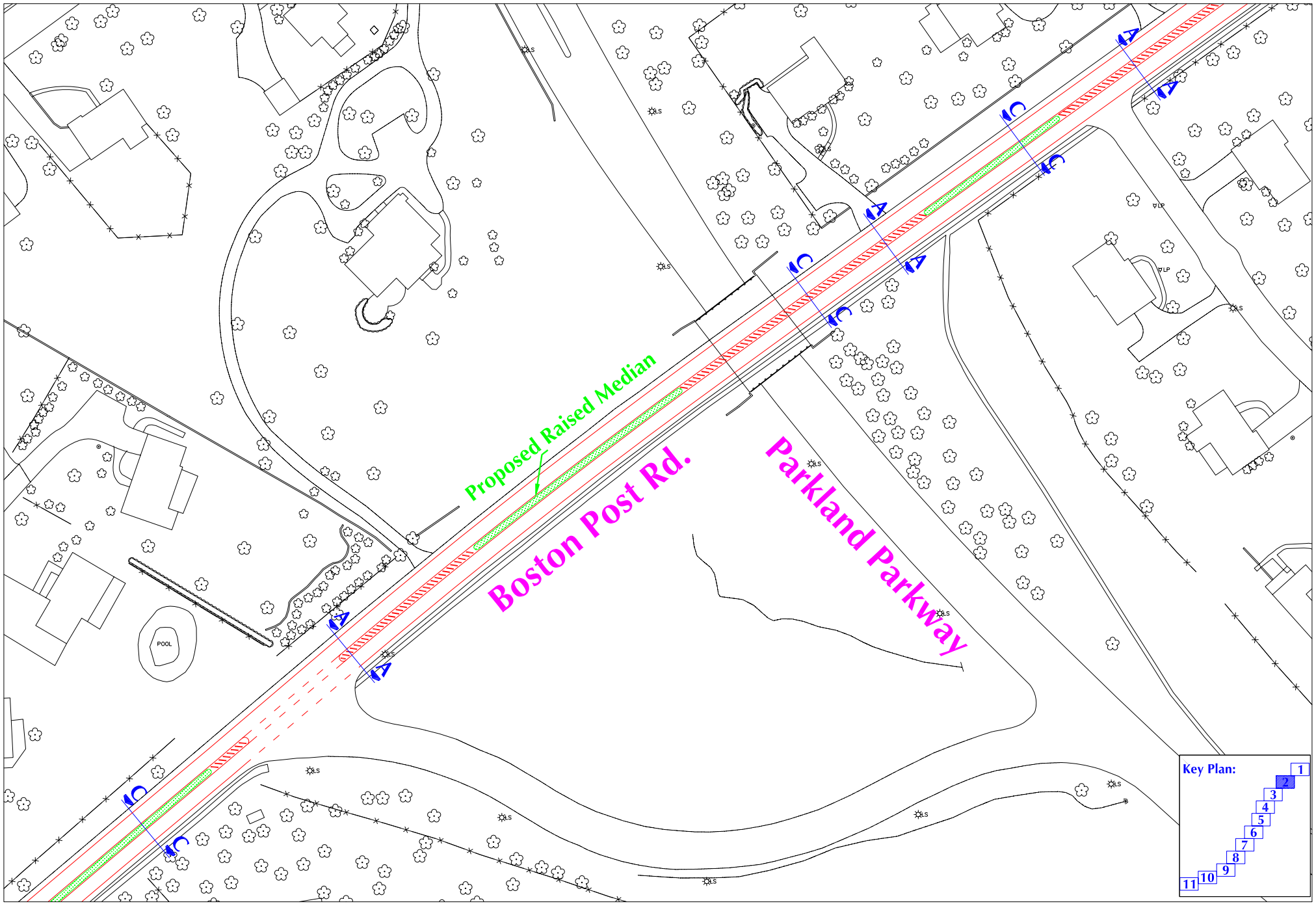

Figure 7.2. Proposed Redesign

Boston Post Road Design Study

0 100 200 ft

BFJ Planning/ April 2007

Scale: 1"=100'

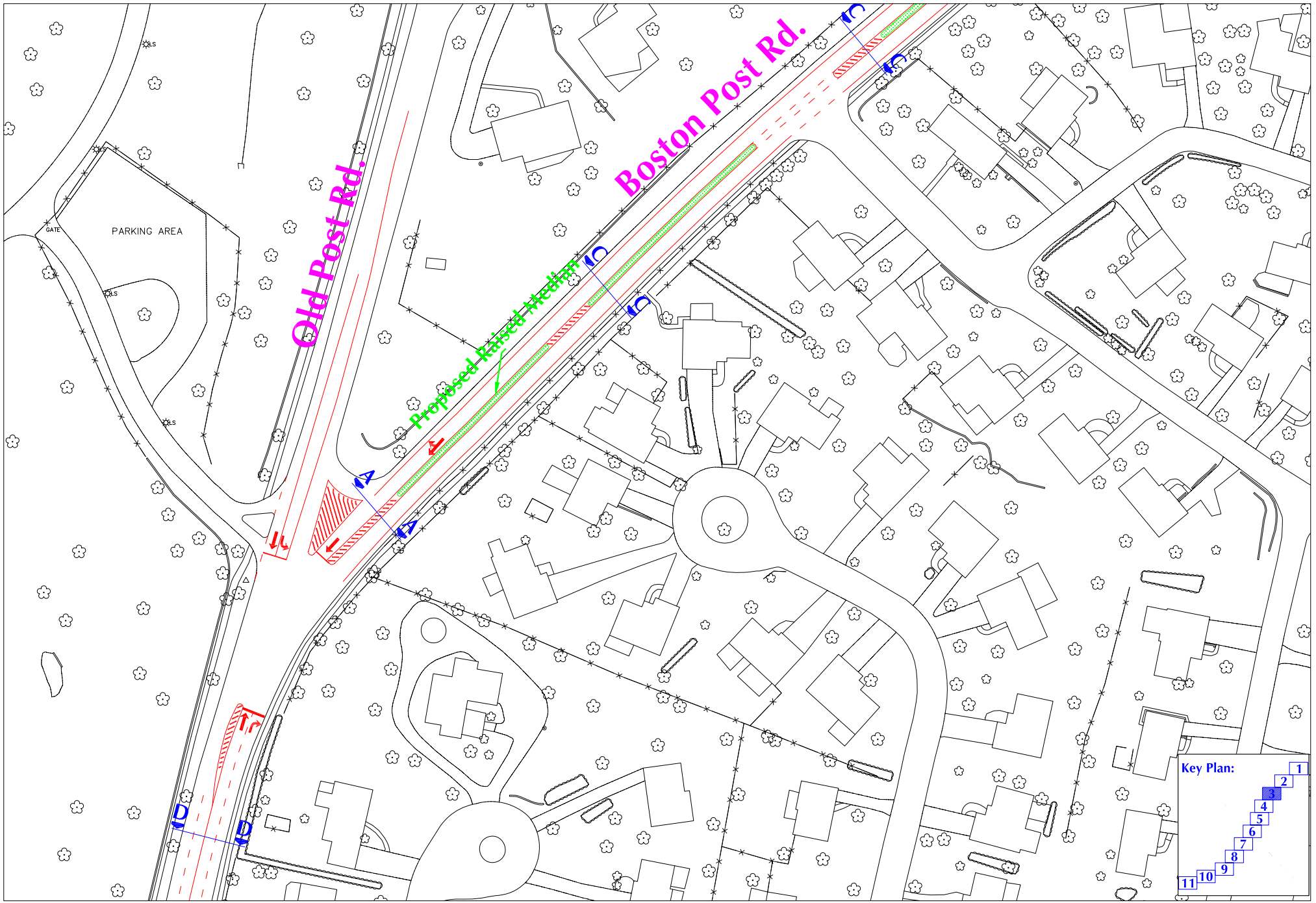

Figure 7.3. Proposed Redesign

Boston Post Road Design Study

0 100 200 ft

BFJ Planning/ April 2007

Scale: 1"=100'

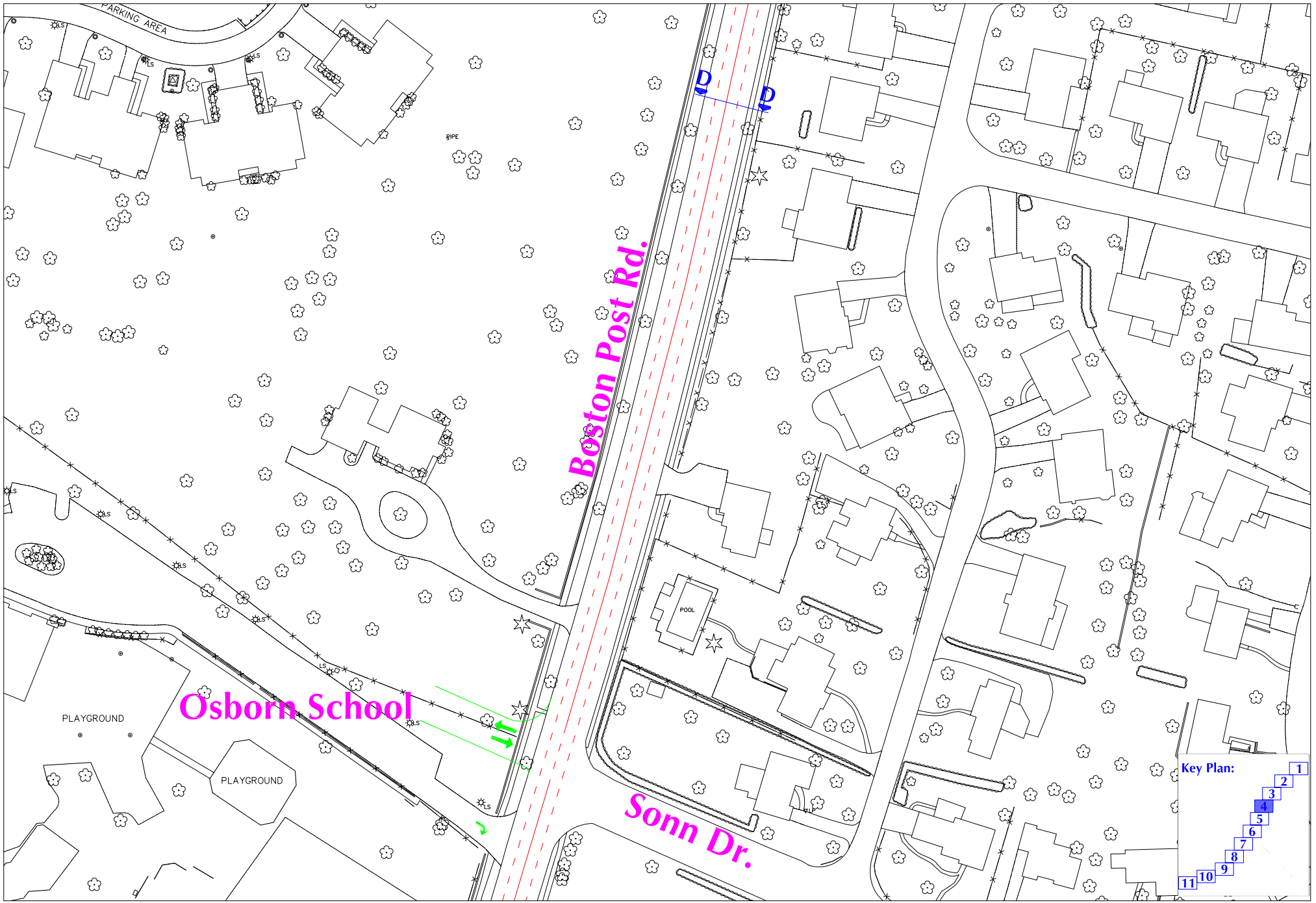

Figure 7.4. Proposed Redesign

Boston Post Road Design Study

0 100 200 ft

BFJ Planning/ April 2007

Scale: 1"=100'

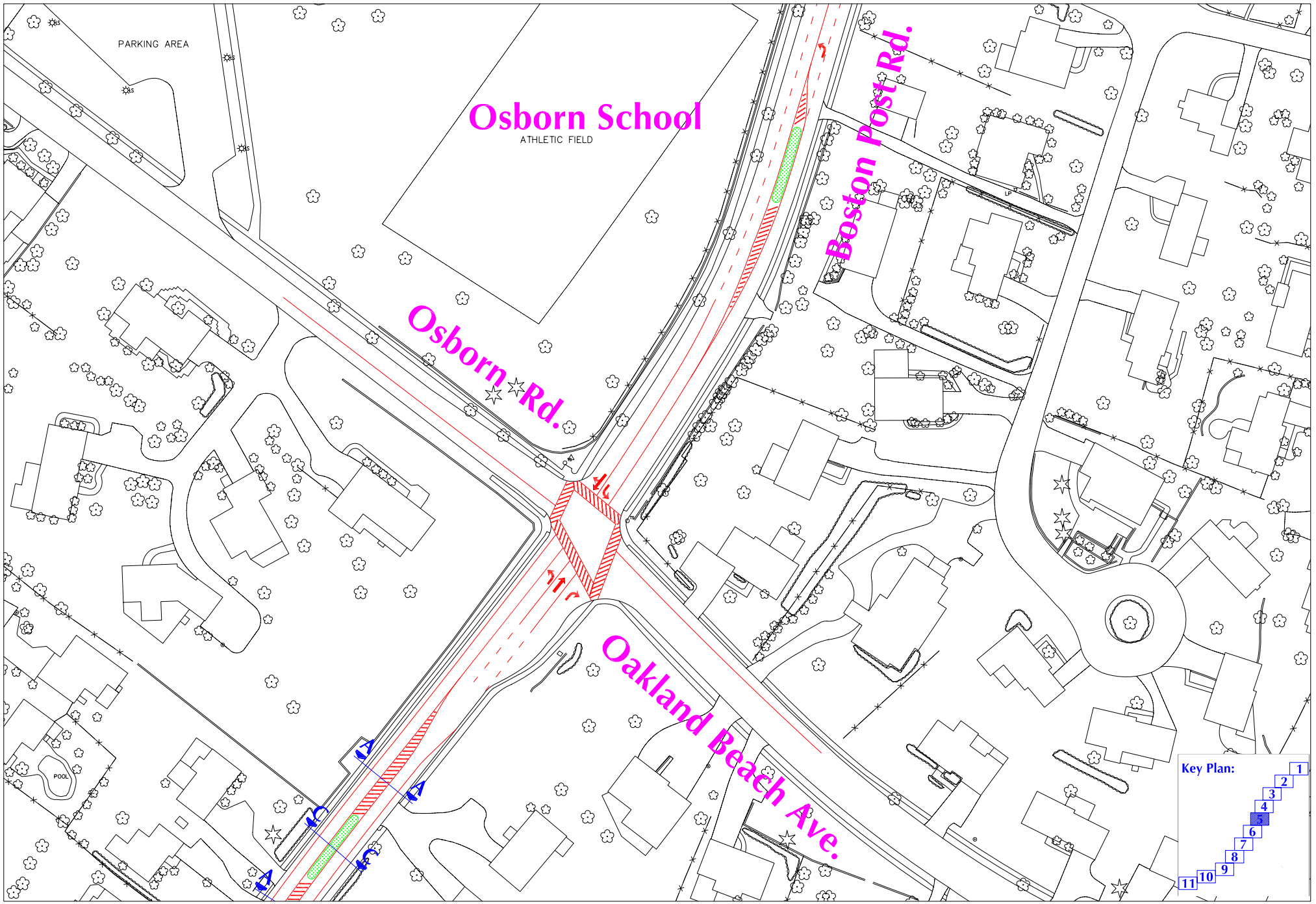

Figure 7.5. Proposed Redesign

Boston Post Road Design Study

0 100 200 ft

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Scale: 1"=100'

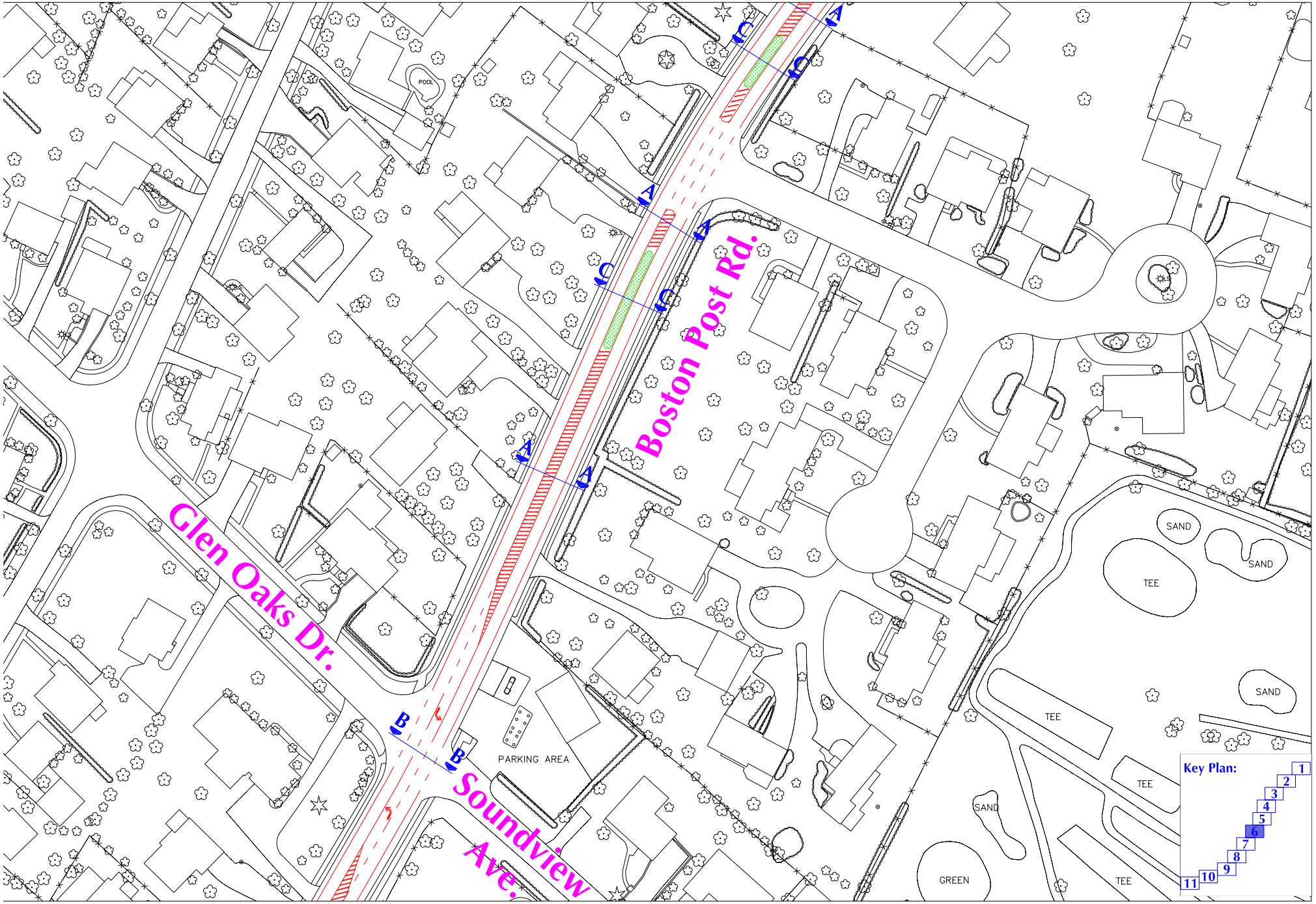

Figure 7.6. Proposed Redesign

Boston Post Road Design Feasibility Study

0 100 200 ft

BFJ Planning/ April 2007

Scale: 1"=100'

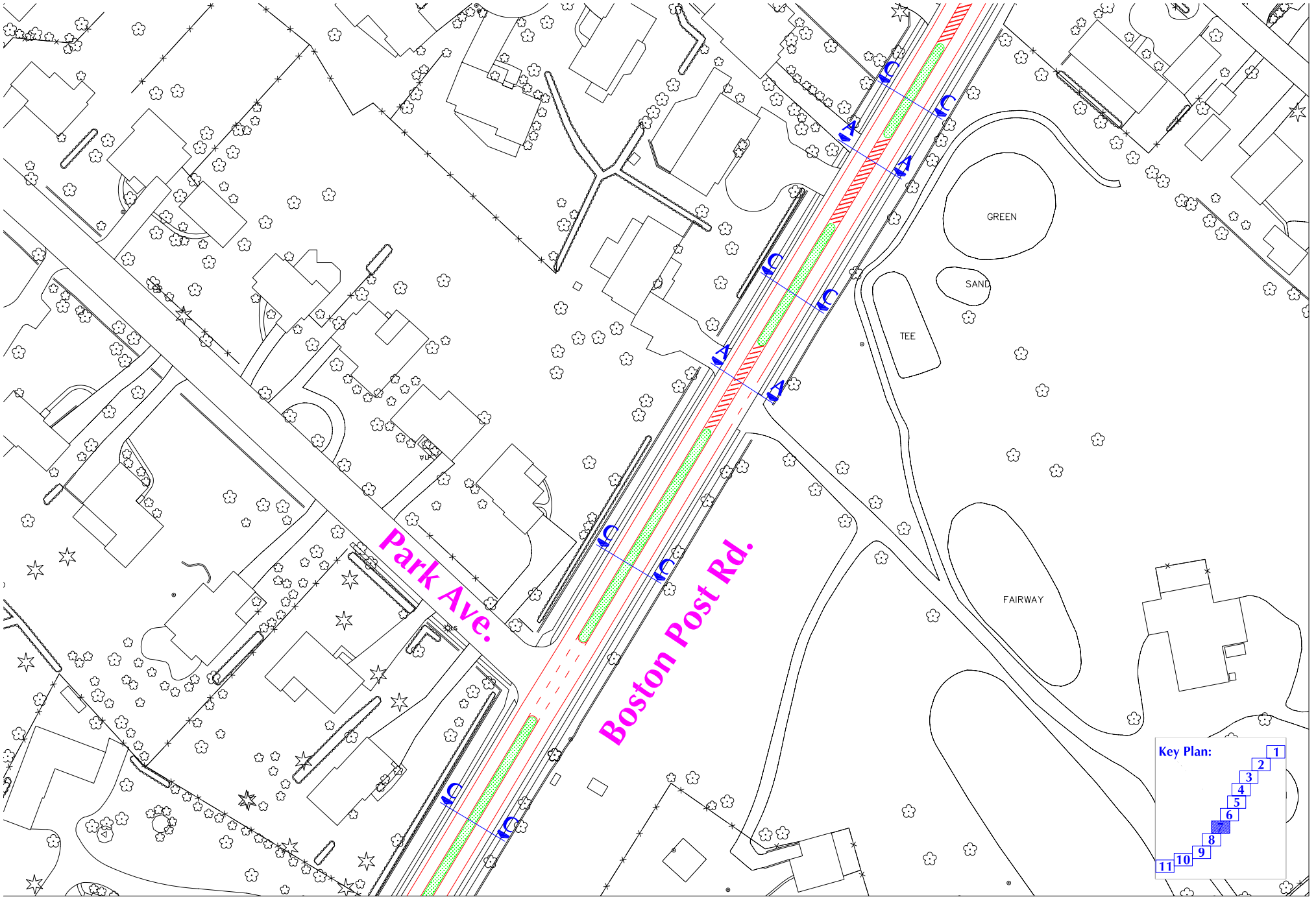

Figure 7.7. Proposed Redesign

Boston Post Road Design Feasibility Study

0 100 200 ft

BFJ Planning/ April 2007

Scale: 1"=100'

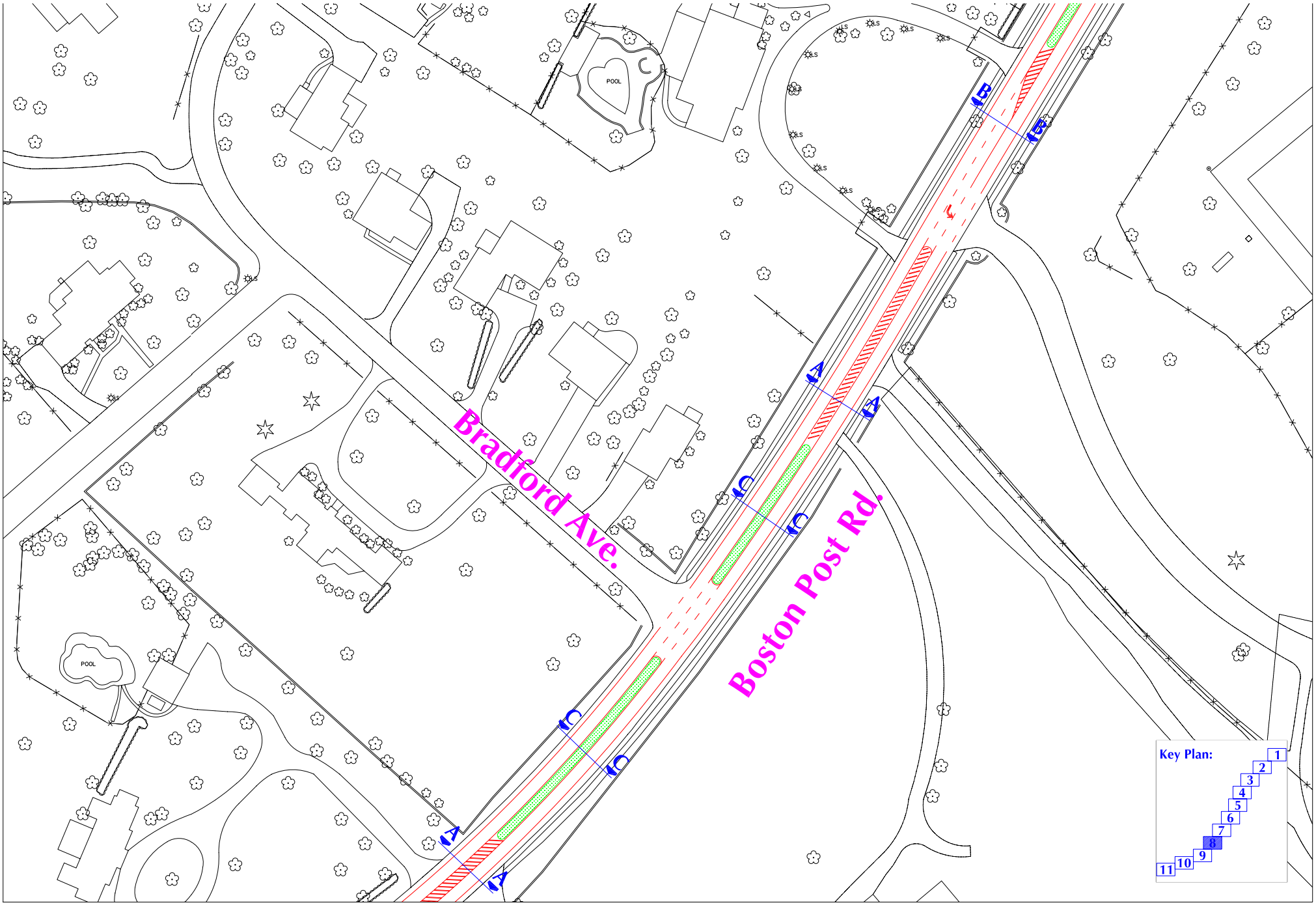

Figure 7.8. Proposed Redesign

Boston Post Road Design Feasibility Study

0 100 200 ft

BFJ Planning/ April 2007

Scale: 1"=100'

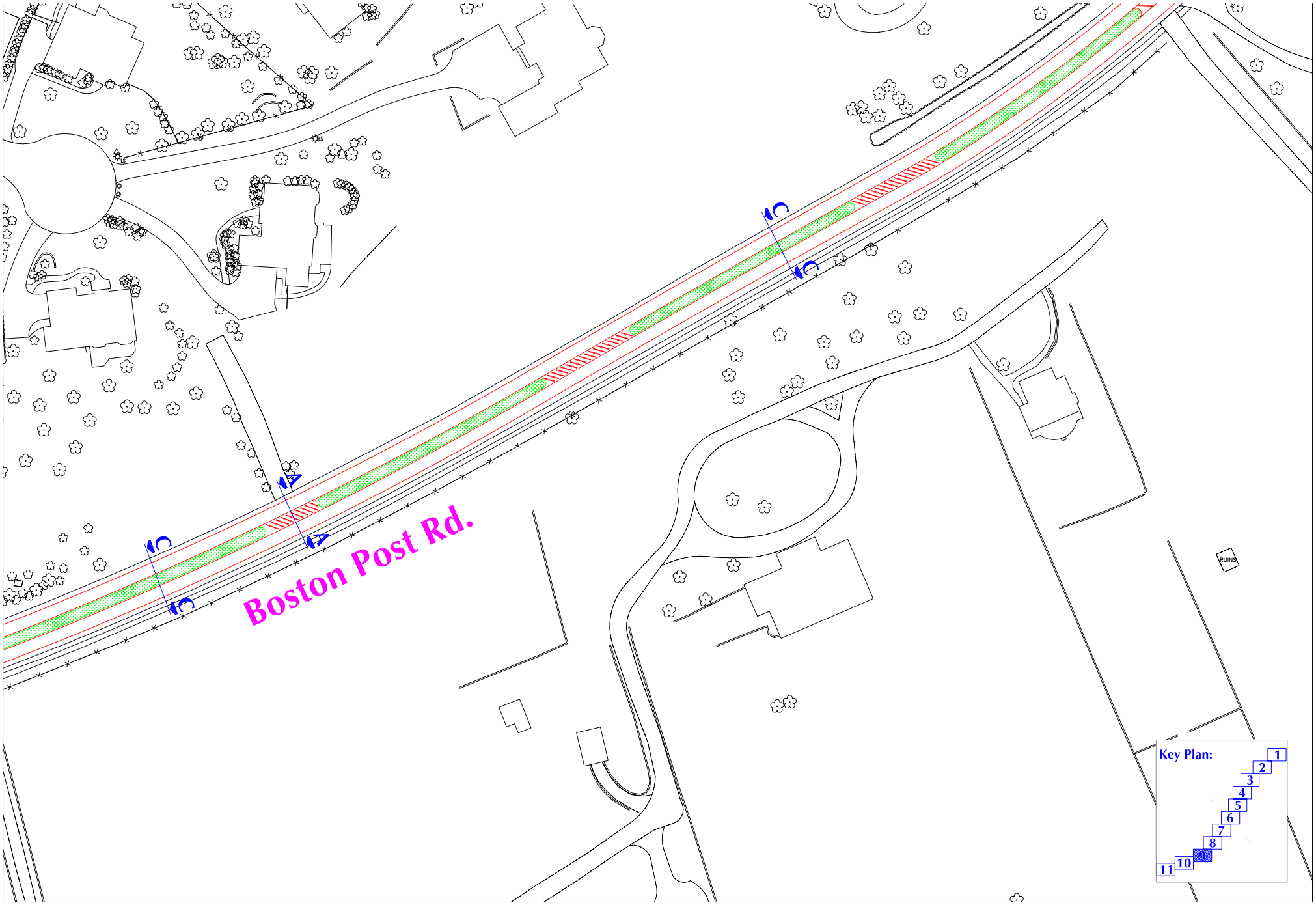

Figure 7.9. Proposed Redesign

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Scale: 1"=100'

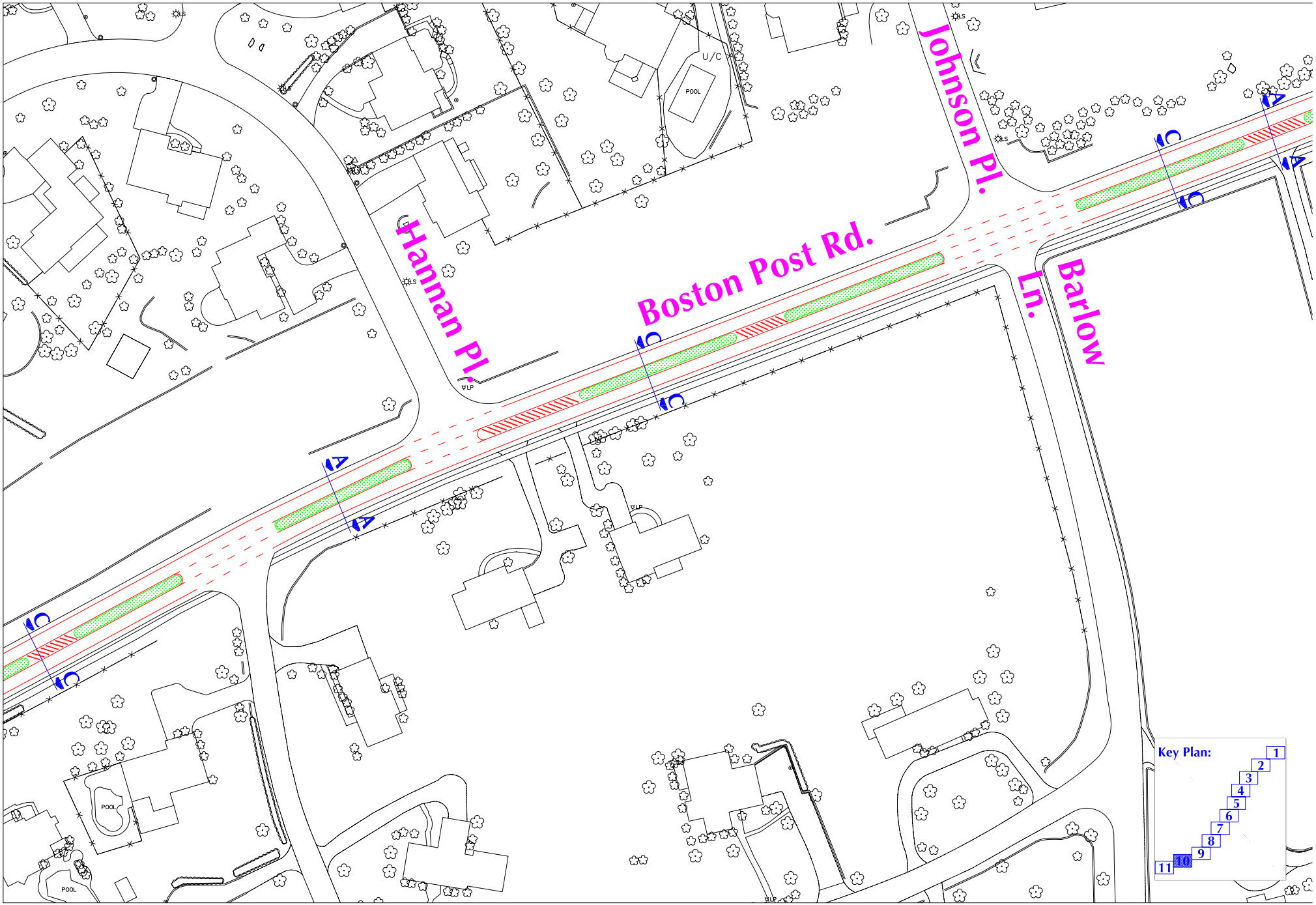

Figure 7.10. Proposed Redesign

Boston Post Road Design Feasibility Study

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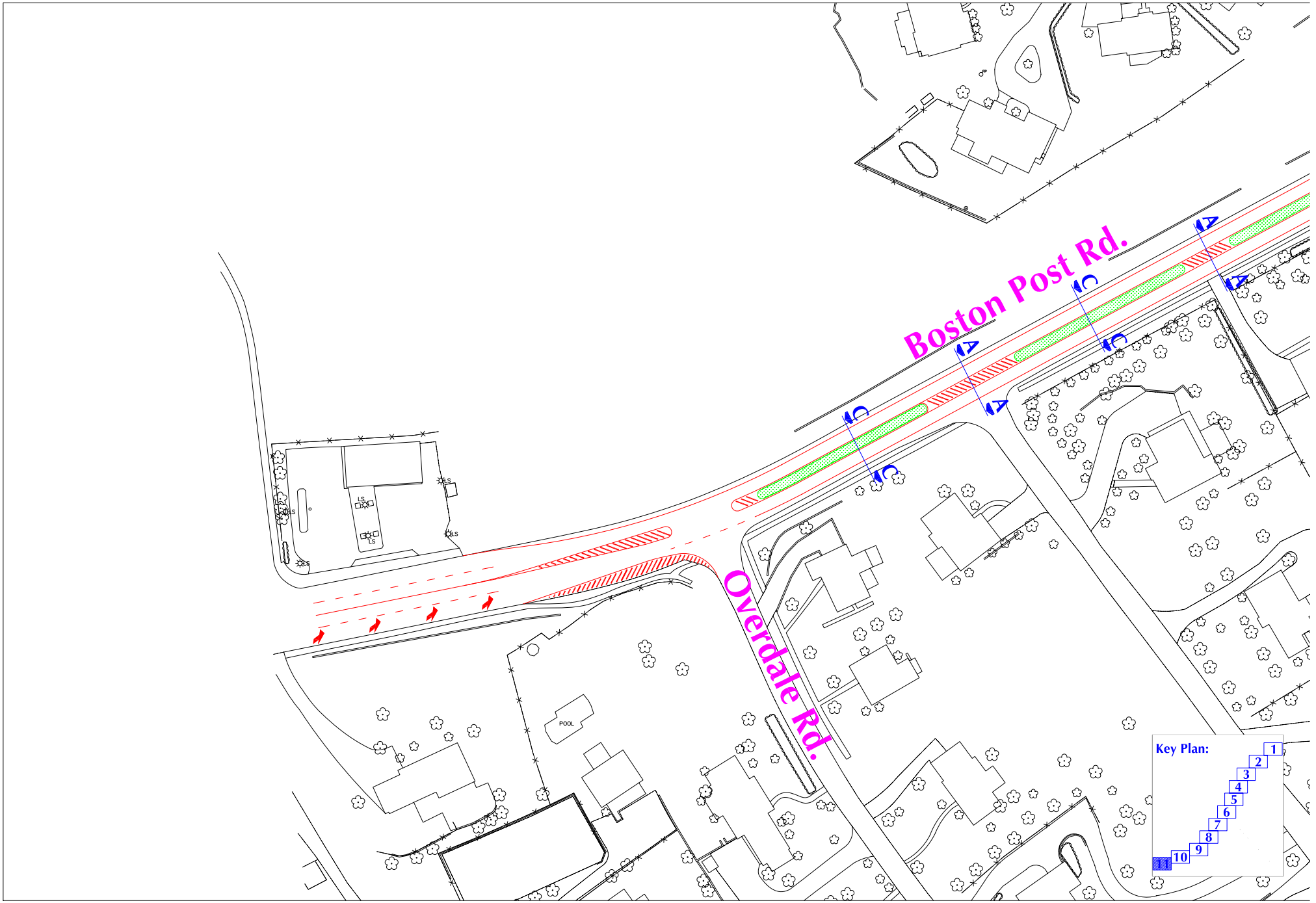

Figure 7.11. Proposed Redesign

Boston Post Road Design Feasibility Study

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Scale: 1"=100'