Department of **Transportation**
Monroe County, New York

Maggie Brooks
County Executive

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Director

JUL 1 2010

June 29, 2010

Mr. James R. McIntosh, P.E.
City Engineer
City Hall, 30 Church Street
Rochester, New York 14614-1290

RE: BUMP OUT CURB EXTENSIONS AT UNSIGNALIZED INTERSECTIONS REVISED MCDOT GUIDELINES

Dear ~~Mr. McIntosh~~ Jim:

I am forwarding to you the attached copy of our revised bump-out design guidelines. We had originally provided bump-out design guidance in our September 30, 2008 letter to you. This update expands our guidelines to include more combinations of design variables such as lane width and intersection skew, and describes the general procedure for determination of bump-out lengths so that it can be tailored to individual situations not covered in the tables. The revision also explains how we calculated the desired minimum sight distance and the background information that our calculations were based on.

Please distribute these guidelines for use throughout your engineering services divisions and share them with consultants as they perform City street design work for you.

If you have any questions regarding the guidelines or their application, please contact either Dave Hrankowski at 753-7725 or me.

Sincerely,

James R. Pond

James R. Pond, P.E., PTOE
Associate Traffic Engineer

JRP/dph

W/ Encl.

cc: T. Rice
B. Penwarden
S. Leathersich
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CURB EXTENSIONS

The intent of using curb extensions or "bump-outs" is to improve safety for pedestrians through a reduced crossing distance, improve safety for vehicles at unsignalized intersections on the stop-controlled side street by allowing them to advance further out where the view may be better and to assist in calming traffic. Because the bump-outs also recess parked vehicles, there may be opportunities for creating parking while providing a raised physical feature that prevents illegal parking too close to the intersection. There should still be enough sight distance to minimally provide stopping sight distance thus allowing the primary street traffic to stop in time to avoid an accident. In most cases, recognizing the need for creating as much parking as possible in urbanized areas (i.e. – City of Rochester), we suggest using a 30 MPH design speed and the stopping sight distance criteria. Minimum stopping sight distance should also be provided at signalized intersections to accommodate the right turn on red movement.

In the AASHTO publication A Policy on Geometric Design of Highways and Streets (or "Green Book"), the standard for measuring intersection sight distance assumes that the driver is sitting approximately fourteen feet behind the edge of the travel lane. That is six feet from the travel lane to the front bumper plus eight feet from the bumper to where the driver is sitting. This is a guideline and may be realistic for new developments. However, for existing intersections and particularly under highly urbanized conditions, a driver sitting fourteen feet back would probably not be able to see along the major street due to fixed obstructions on the corners and would advance as far forward as possible without entering the intersection. Therefore, for the purposes of this bump-out policy, we assume that the driver would be sitting ten (10) feet behind the edge of the travel lane. We also assume the driver sits approximately three feet offset from the centerline on an unsignalized approach. Applying the full AASHTO policy is not practical due to the substantial impact on parking and urban street features.

Table II lists the total parking clearance needed to achieve the minimum stopping sight distance at an unsignalized intersection with some general geometric parameters. This parking clearance can either be achieved by constructing the bump-out to this length, or by adding enough parking clearance to the bump-out's length to achieve this distance. A full length bump-out is preferable because parking enforcement is not needed to maintain the parking clearance. Additional lengths may be desirable where the prevailing speeds are higher.

Table II
Parking Corner Clearance Required To Achieve Minimum Stopping Sight Distance

			[1]Skew Right 25°		No Skew		[2]Skew Left 25°	
Speed	Bump-out Width	Lane Width	Looking Left	Looking Right	Looking Left	Looking Right	Looking Left	Looking Right
30 MPH	6 Foot	11 ft	95 ft	75 ft	110 ft	85 ft	105 ft	80 ft
		13	85	70	95	80	90	75
		15	75	65	85	70	80	70
	8 Foot	11	90	70	95	80	95	75
		13	80	65	90	70	85	70
		15	70	60	75	65	70	60
35 MPH	6 Foot	11	120	95	135	110	135	105
		13	110	90	120	100	115	95
		15	100	80	105	95	105	85
	8 Foot	11	115	85	125	100	120	95
		13	100	85	110	95	105	90
		15	90	70	100	85	90	80

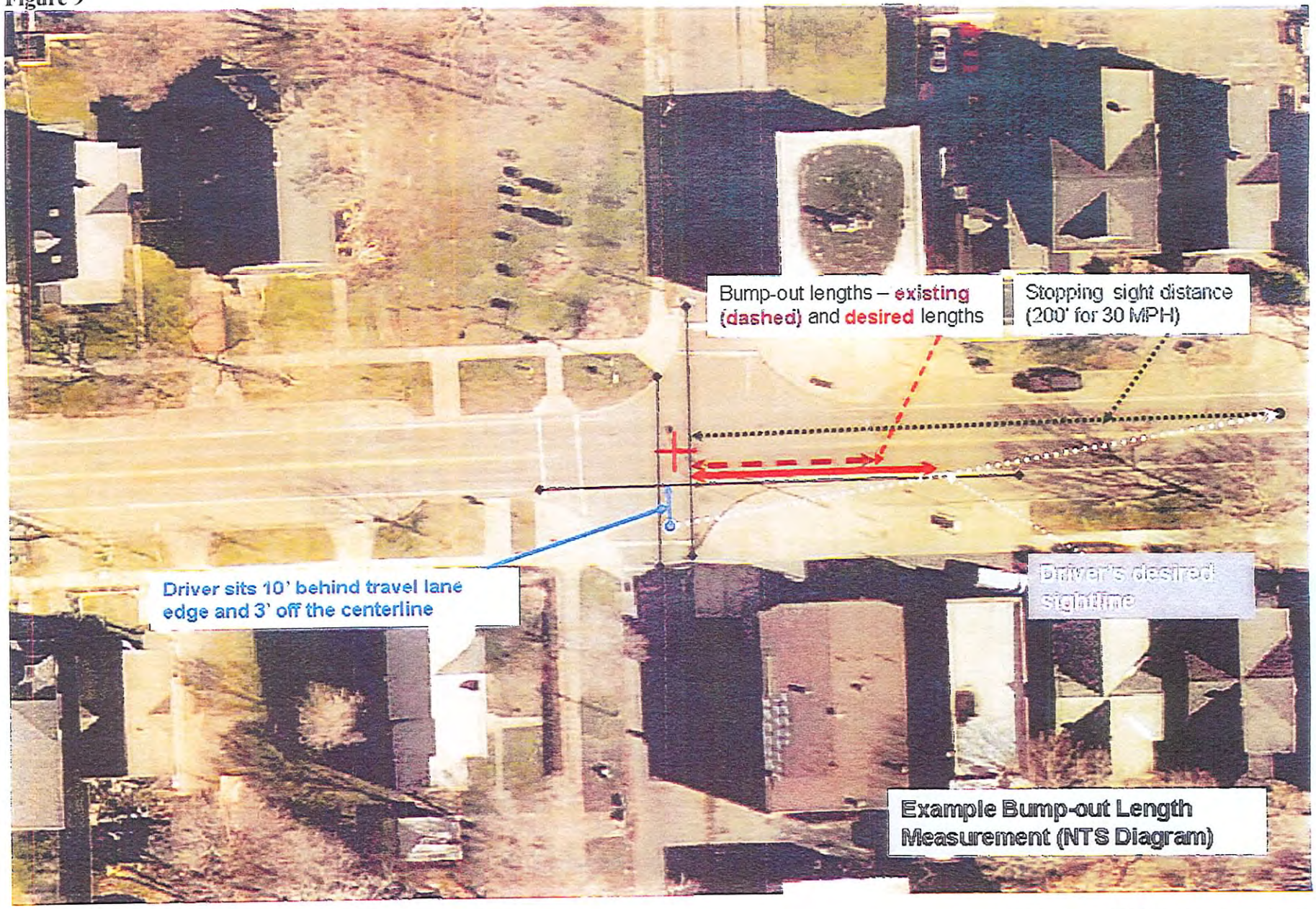
For notes 1 and 2, see the diagrams below

[1] Inbound side street approach skewed to the right

[2] Inbound side street approach skewed to the left

The clearance and/or bump-out length required for the approach speed will vary with the bump-out width, approach lane widths, and degree/direction of intersection skew. While the values in Table II can be used as a general guide, Figure 9 illustrates a general procedure to determine the required clearance for any unsignalized intersection configuration. In addition, for clearance at a signalized intersection for a right turn on red, engineering judgment should determine where the driver would be sitting. Drivers tend to start their right turn before stopping and their position would vary with the intersection corner geometrics.

Figure 9



Example Bump-out Length Measurement (NTS Diagram)