

Appendix G

Design Information:

New Bridge Renderings
Ontario Ramp fly-over Renderings
Carnegie Access Alternatives
Fire Station Access Memo



Rendering of New Westbound Bridge
Existing Bridge in Service for Eastbound Traffic

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Rendering of New Eastbound and New Westbound Bridges
Existing Bridge Removed

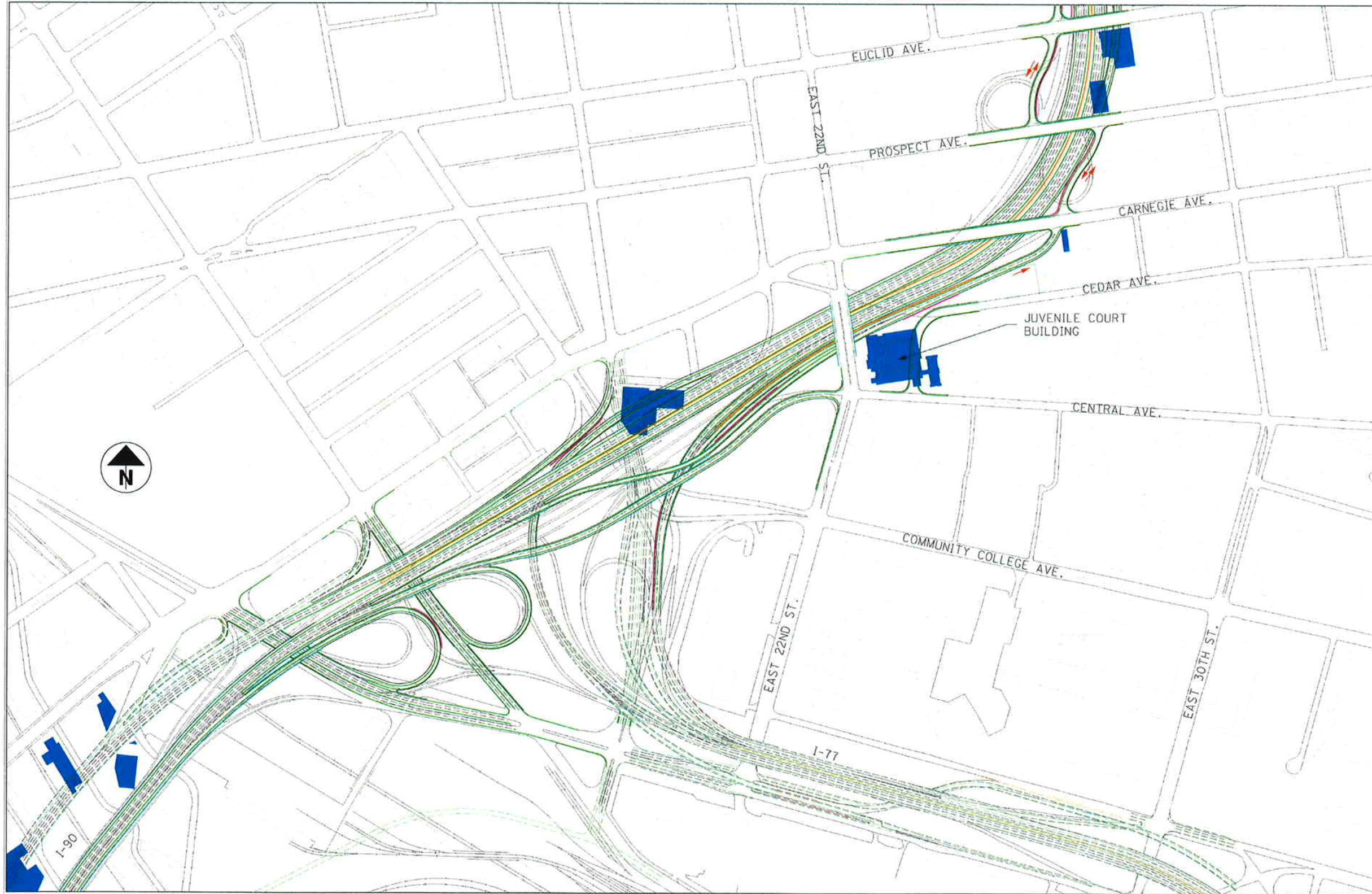


Rendering of Potential Ontario Fly-Over Ramp
View from Carnegie Avenue





Rendering of Ontario Fly-over Ramp Alternative
View from Upper Deck of Baseball Stadium



Carnegie Access Alternative 1



Carnegie Access Alternative 2



Carnegie Access Alternative 3

Commercial Road Rescue Station Access Options Memo

Revised - January 15, 2006

General Information

Background information for this memorandum has been gathered through three meetings with Captain Richard Patton of the City of Cleveland Division of FIRE – one on December 12, 2006 at Baker's Cleveland office and two site visits to the Commercial Road Rescue Station on December 28, 2006 and January 3, 2007. Specifications for the design vehicle(s) were field measured on these visits.

Captain Patton explained that the Commercial Road Station houses one heavy duty rescue squad, generally considered the most specialized of all the Cleveland rescue squads. In addition to the rescue squad, the station also performs repair and maintenance operations, and houses specialized equipment on trailers, such as cribbing for tunnel rescue. No hook & ladder or other large trucks come in and out of the station.

The major regions of Cleveland served by the rescue squad are downtown, the west, and the near south. The response time to the west may be increased by a change in access to the station. Today, the squad relies heavily on quickly accessing WB I-90 via the Ontario Street ramp. While Captain Patton indicated that a change in access for the station (possibly down Old Commercial hill) may not be detrimental to the station's operations, the Division of FIRE's official stance on the issue would be determined by Chief Paul Stubbs.

Existing Conditions



Aerial View of Rescue Station & Fire Museum



View Facing Rescue Station from Commercial Road

Outline of Information

Two major options for maintaining access to the station are presented with preliminary analysis in this memorandum.

1. Maintain access similar to existing.
2. Reroute main access to/from station via Old Commercial Road.

Maintain Access Similar to Existing

Preliminary analysis indicates that maintaining access to and from the rescue station exactly as it is today would not be possible given the current plan for the Ontario Street ramp to I-90 WB,

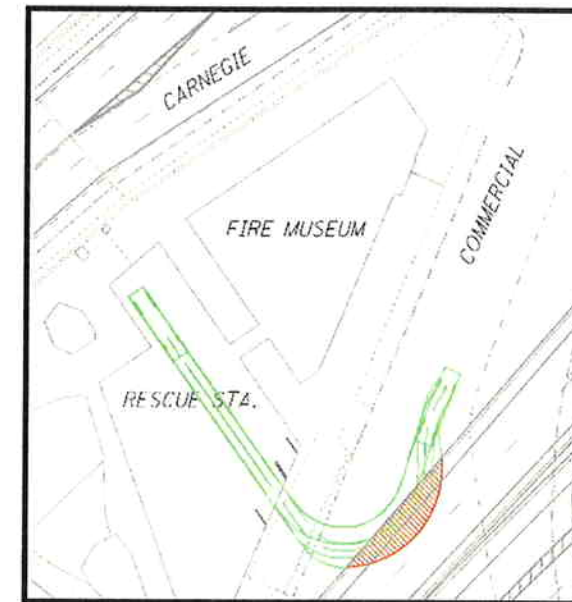


Figure 1

The above option ensures that the design vehicle clears the existing garage door of the rescue station prior to initiating the turning movement. If this constraint is removed, the design vehicle is able to clear the proposed Ontario Street ramp. As depicted in Figure 2, the 24' wide double-door will accommodate the 4' shift to the right for the design vehicle prior exiting the building. However, possible drawbacks include conflict with vehicles in neighboring garage bays, constraints for backing a vehicle into the garage, and restrictions on vehicles and vehicle types entering and exiting the adjacent 12'-6" wide single-door. The scenario depicted in Figure 2 shows that the FIRE Department's primary access to the Ontario Street Ramp and WB I-90 can be maintained, though with tighter turning radii.

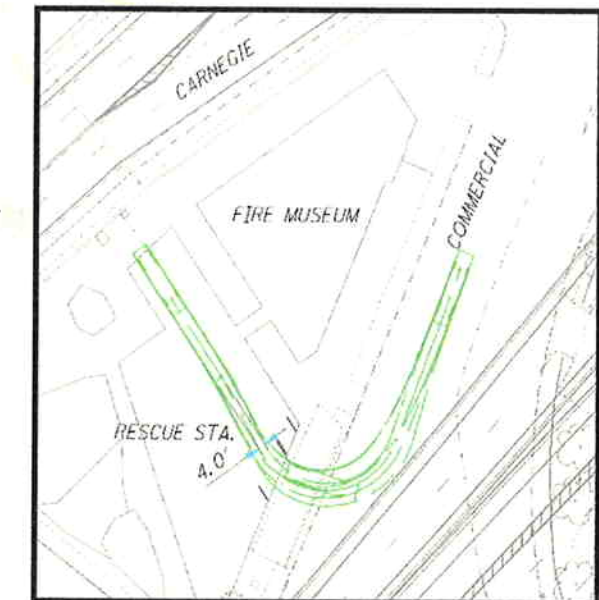


Figure 2

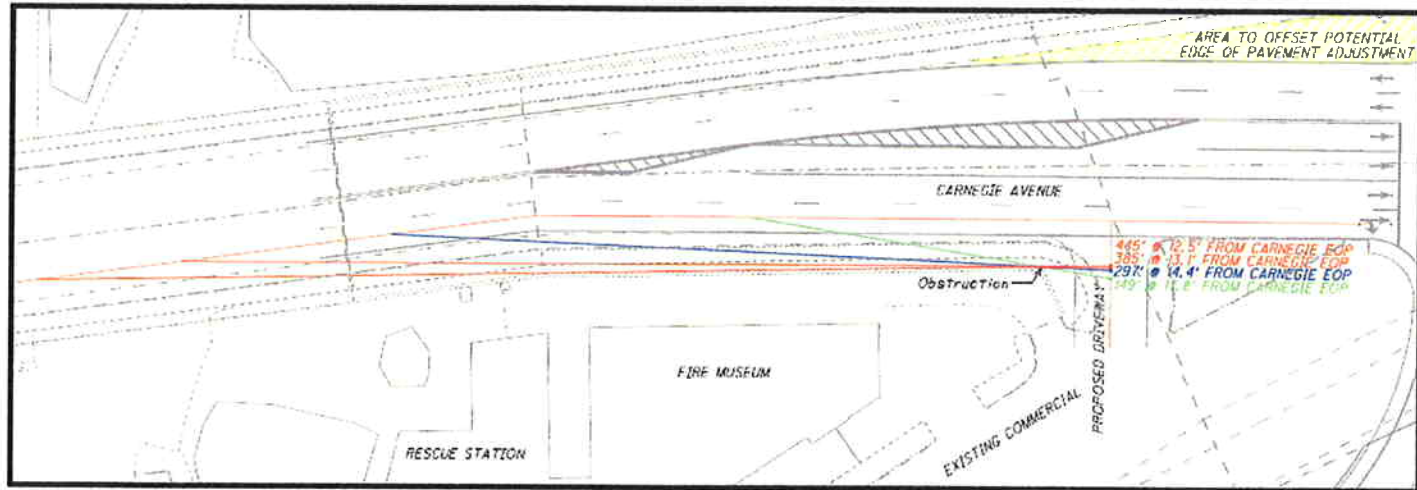


Figure 3

Intersection sight distance at the intersection of the proposed driveway and Carnegie Avenue was also examined for this alternative. The sight distance obstruction is the existing parapet of the Hope Memorial (Lorain-Carnegie) Bridge. The design speed of Carnegie Avenue is 40mph. Therefore, the required sight distances at the intersection are 445' (left turn) and 385' (right turn). According to the ODOT Location and Design Manual, these distances should be visible from a minimum 14.4' (17.8' preferred) offset from the edge of pavement of Carnegie Avenue. As shown in Figure 3, these sight distances are not met using the preliminary proposed mapping provided to Baker. Site distance is 149' at the preferred offset and 297' at the recommended offset. However, the left turn sight distance (445') is accomplished at an edge of pavement offset of 12.5'. Therefore, if the proposed edge of pavement of Carnegie Avenue were to be shifted 2' north from its preliminary location, sufficient sight distance for both right and left turns would exist. Preliminary analysis indicates that shifting the proposed alignment 2' north in this region is a reasonable possibility (see "area to offset potential edge of pavement adjustment" in Figure 3), but this would need to be confirmed through the final design process.

Reroute Access via Old Commercial Road Hill

The other option examined in this memorandum is providing access to the rescue station via a new driveway connecting to the relocated Commercial Road alignment south/east of the existing I-90 Viaduct. To accomplish this access may require some modifications to the currently proposed Ontario Street alignment and profile, however. Preliminary analysis indicates that it may be possible to raise the profile of the Ontario Street Ramp from 4% to 5% and/or slightly shift the intersection of Carnegie Avenue & the Ontario Street Ramp to the east. Additionally, the profile of Old Commercial Road may be lowered in the vicinity of the Rescue Station. Access restrictions forcing vehicles to utilize the existing Commercial Road hill would apply only for vehicles exiting the Rescue Station. The first option will re-align Commercial Road to allow for direct access from the Rescue Station down Old Commercial Road hill. Emergency vehicles will not be required to maneuver around the Ontario Street Ramp, nor would they be required to back into the garages on an angle. Based upon the existing Commercial Road profile, the clearance at the proposed Ontario Street Ramp would be approximately 7'. However, adequate clearances may be achieved if the Ontario Street Ramp profile is raised from 4% to 5%, the Commercial Road profile is modified to an approximate slope of 5% away from the building, and the floor of the Rescue Station is lowered approximately 18" in the appropriate bays. Additional analysis of the existing building would be required to determine if modifying the structure is possible.

Another possible option is to re-align Commercial Road around to the

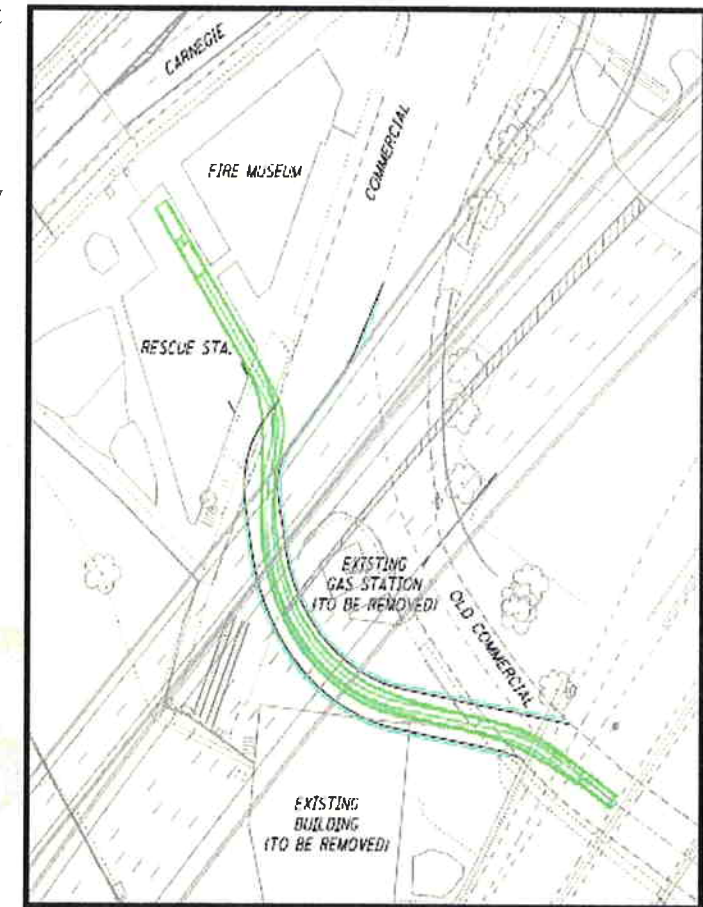


Figure 4

west such that the clearances under the Ontario Street Ramp will no longer be a concern as shown in the Figure 4. The combination of a raised ramp profile and lowered Commercial Road profile will accommodate vehicle access into and out of the Rescue Station from all existing bays. Figure 4 depicts Commercial Road designed as an Urban-Local road with a design speed of 20 mph. The green lines indicate the path of the design vehicle, which, in this scenario is the Truck & Cribbing Trailer. The Truck & Cribbing Trailer is 51' in total length, in which the trailer measures 29' in length and 9' in width. The design vehicle contains a maximum steering angle of 30 degrees, and an articulation angle of 70 degrees.

Conclusion

There appear to be two general options for providing access to the existing FIRE Department operations: Option 1) Maintaining their current preferred access via Commercial Road to Carnegie; Option 2) Relocating their primary access (for emergency response) via a new driveway to the proposed, relocated Commercial Road to the South/East of the existing I-90 WB.

Chief Paul Stubbs has strongly recommended allowing direct access to WB I-90. Therefore, Option 1 is the best scenario to maintain direct access to the Carnegie Avenue and Ontario Street intersection on their preferred route. Pavement striping depicting turning guides for Rescue Station vehicles placed specifically for individual bays may perhaps be the only notable modification necessary.

In the event it is deemed that the limitations are too restrictive for efficient operations, or alternate vehicles will be required to access the Commercial Road Rescue Station in the future, Option 2 (re-routing access down Old Commercial Road hill) may be preferred.

If Option 2 is preferred, the FIRE Department will still have direct access to the Carnegie Avenue and Ontario Street intersection as detailed in Option 1. Thus, Option 2 provides the most flexibility to the FIRE Department for future use.