

# A Big Win; A Highway 407 VE Success Story!

2009 CSVA Conference – Ottawa

**Highway 407 East Extension 35/115 Area**  
Town of Clarington



November 24, 2009  
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**AECOM**

# Agenda

- Project Background
- MTO/Municipal Partner Goals and Objectives
- Notable Issues
- Key Focus Areas
- VE Team Recommendations
- Implemented Ideas

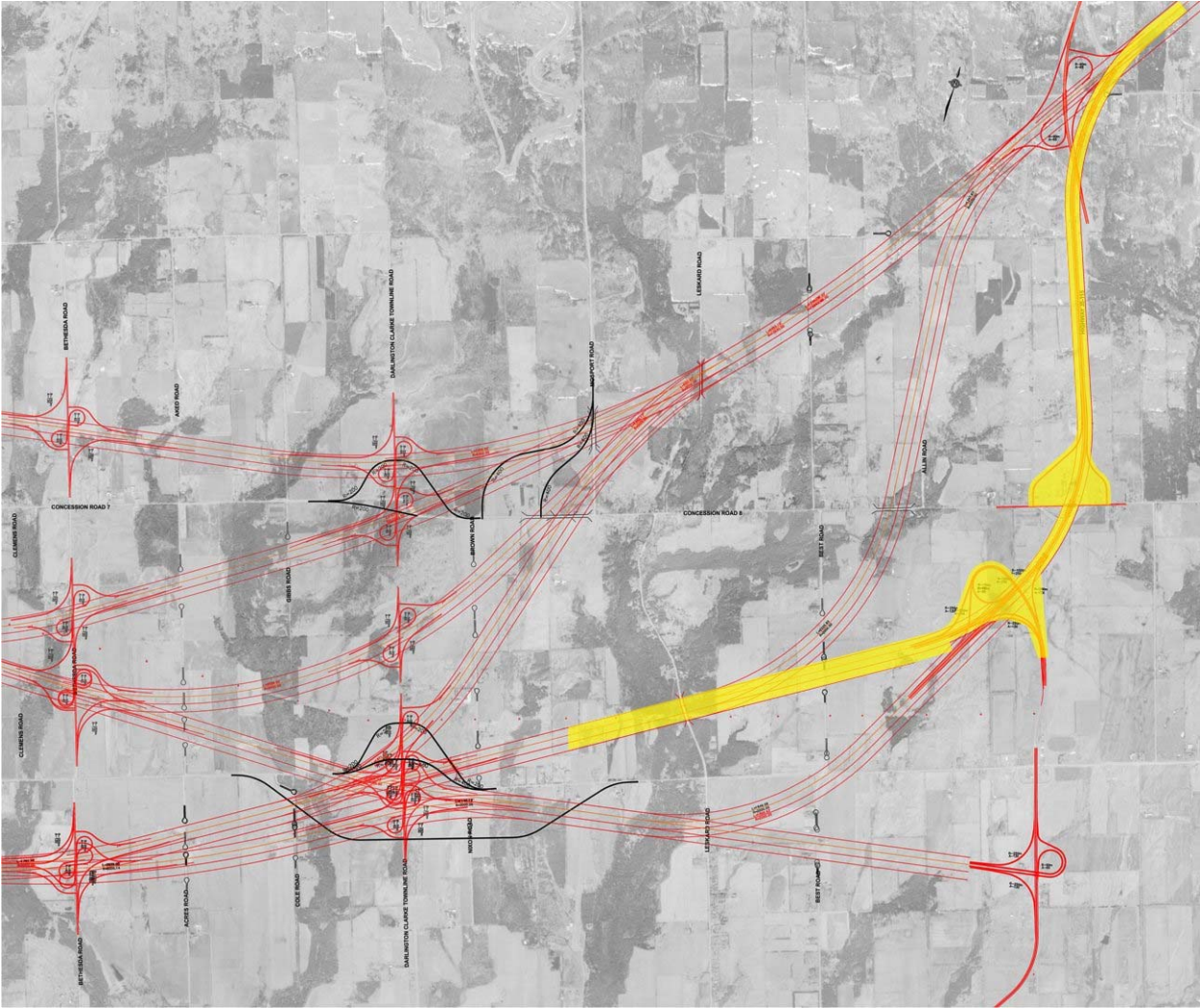
# Technically Recommended Route



# Study Background

- Hwy 407 corridor identified in planning studies in the 1940s and 1950s
- Highway 407 Overview Study in 1989 confirmed need and justification of new highway
- Current EA commenced in 2002
- Preliminary Design assignments initiated in 2007
- Ontario Government committed to initial **construction by 2013**

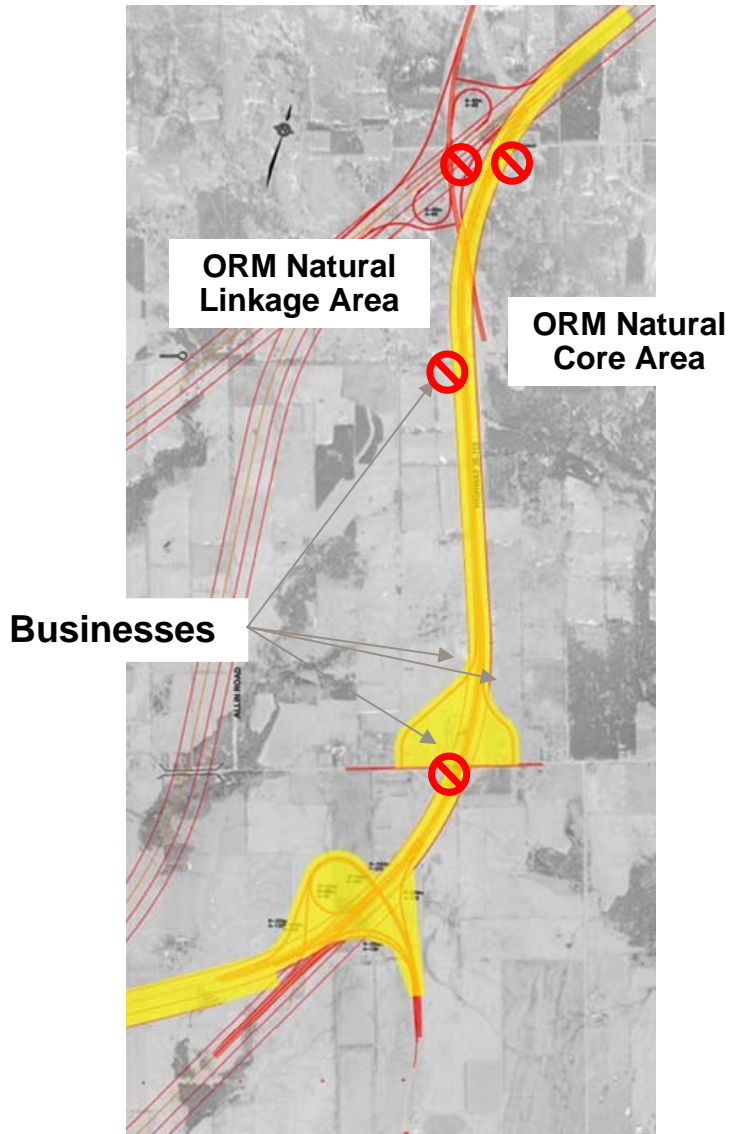
# Selection of the TRR



## Some Notes on the TRR

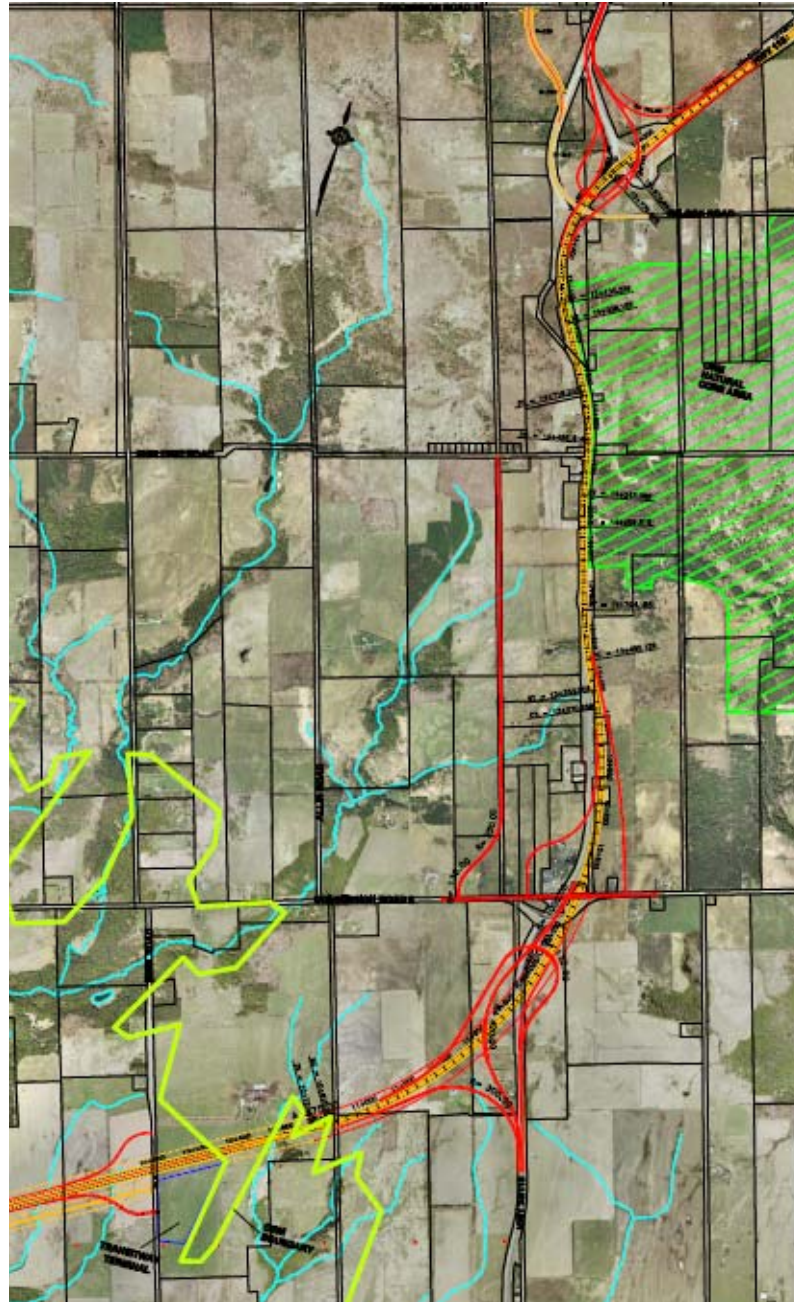
- Noted a preference to provide continuous freeway from 407 to Hwy 115
- Approximately 5 km of TRR over existing Highway 35/115
- This section used same design criteria as other sections of 407E (e.g., 1700 m curves, 110 m ROW) except for 35/115 section
- Existing full-move interchange at Concession Road 8 replaced with partial (to/from the north)
- Partial interchange provided at Best Road

# TRR Challenges

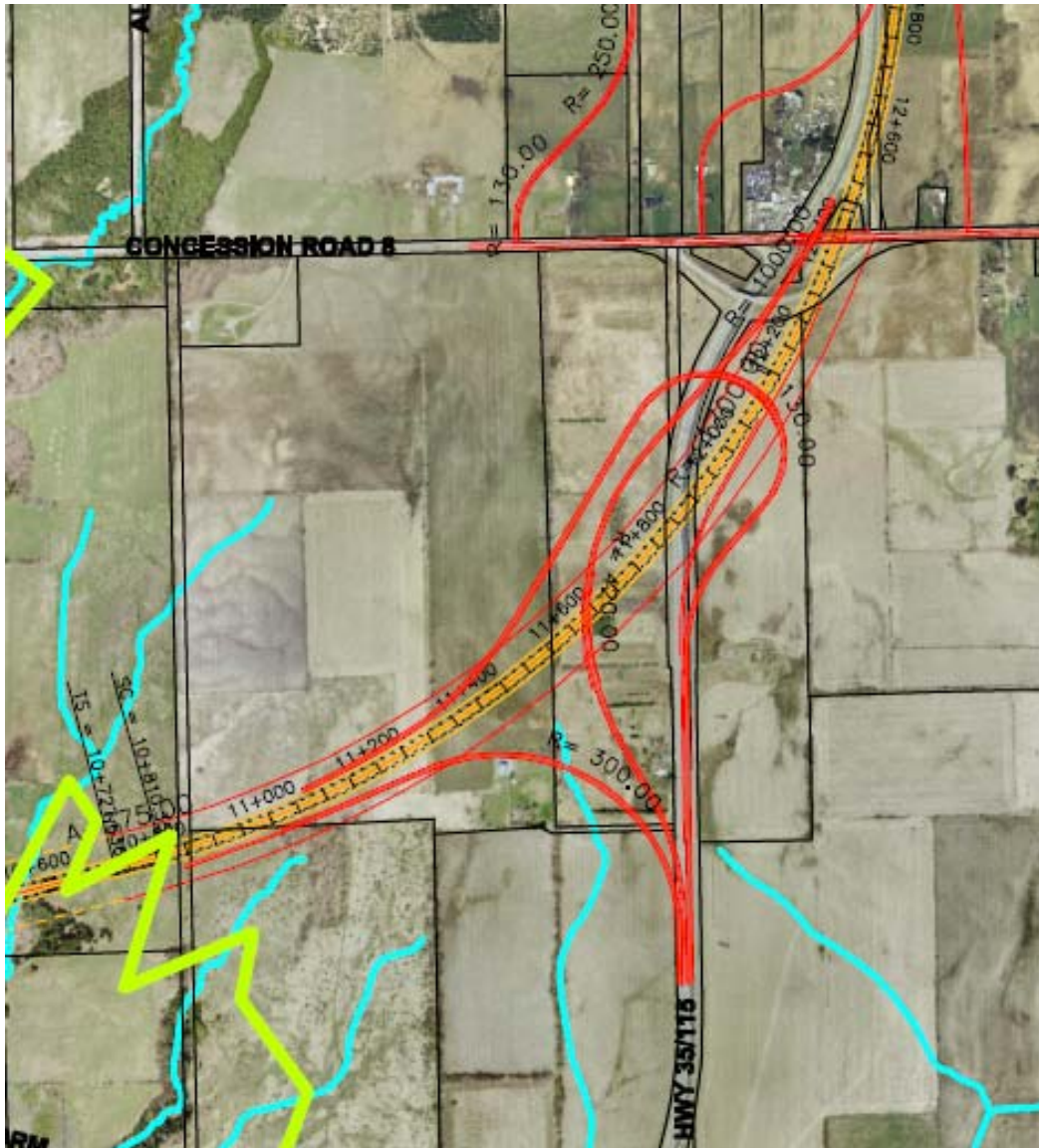


- Oak Ridges Moraine impacts
- Business impacts
- Local roads
- Access impacts
- Rolling terrain
- Constructability

# Recommended Plan in vicinity of 35/115



# 407/35-115 Tie-in



- Directional ramps to SB Hwy 35/115
- Semi-directional ramp to WB 407

# Municipal Roads Preferred Interchange Alternative



- Split diamond configuration
- To/from the north at Concession Rd. 8
- To/from the west at Best Rd.
- Transitway terminal at Best Rd

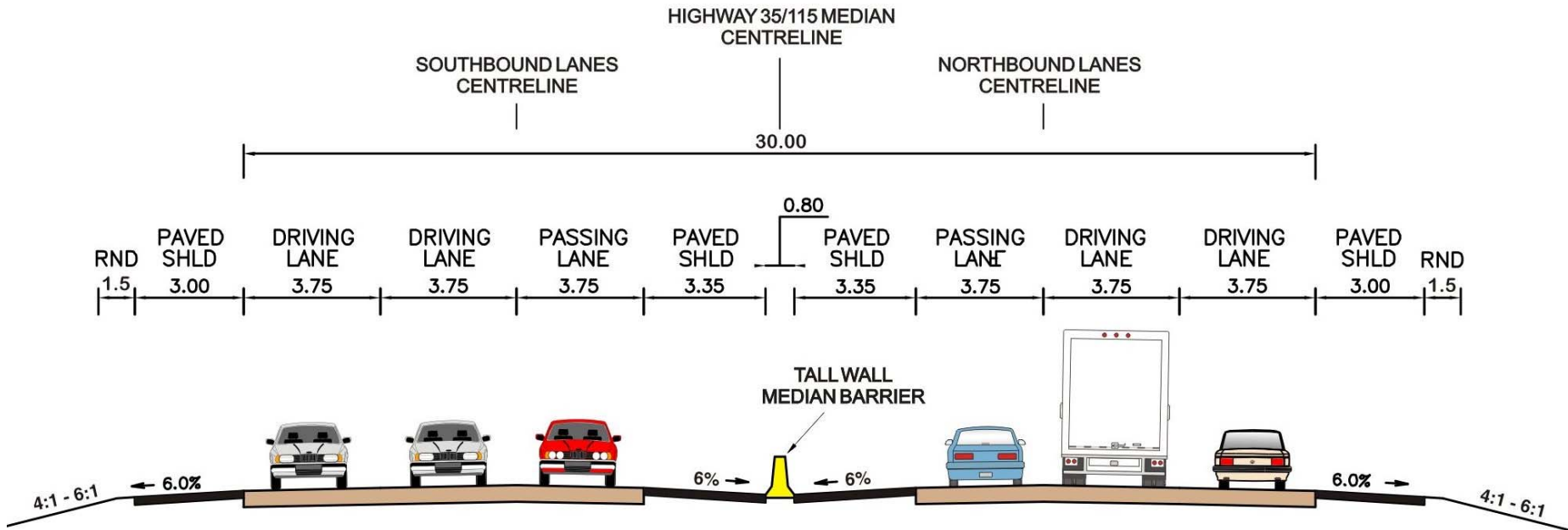
# Horizontal Alignment

- Revised alignment more closely matches existing Hwy 35/115 alignment
- Avoids footprint impacts to ORM Natural Core Area
- Design speed for horizontal elements = 120 km/h
- Avoids businesses on west side of Hwy 35/115 in the south

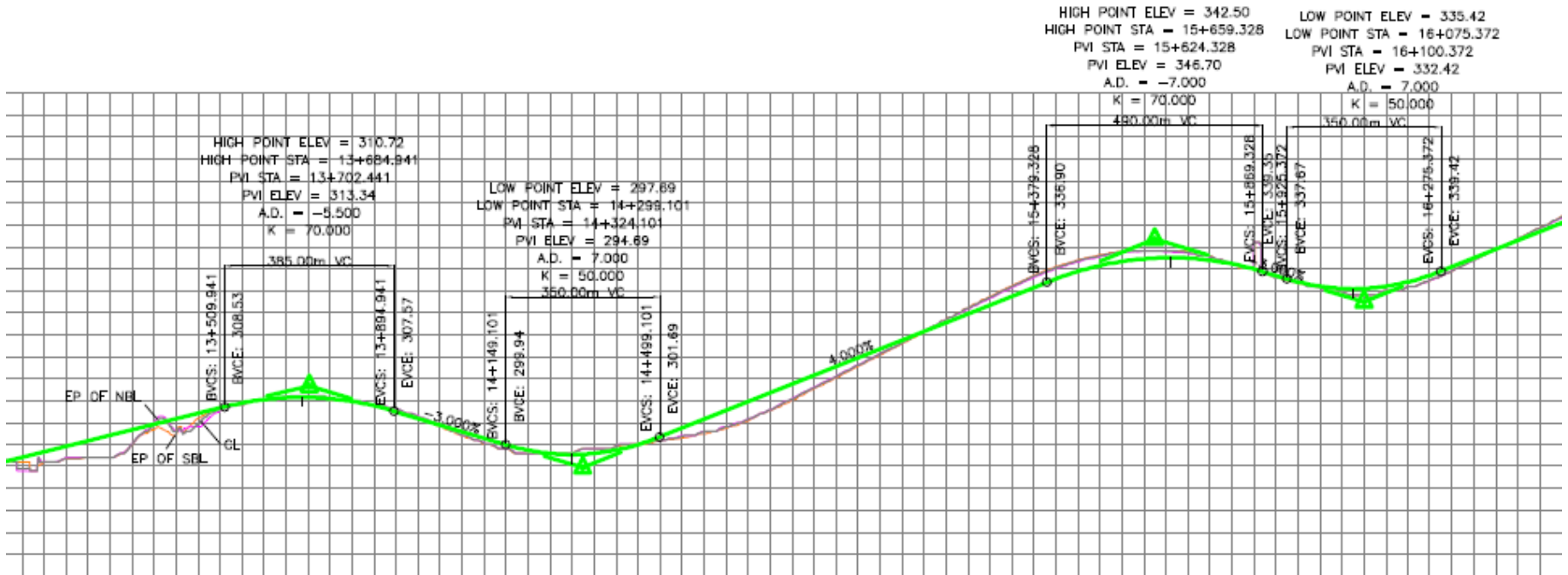


# Proposed Hwy 35/115 Cross Section

*VE Focus Area*



# Proposed Hwy 35/115 Profile



- Design speed for vertical elements = 100 km/h
- Existing Hwy 35/115 = 90 km/h

# VE Goals and Objectives

- Provide Appropriate Function to Satisfy Identified Need
- Maintain Project Schedule
- Minimize Construction Impacts
- Ease Constructability
- Reduce Costs
- Minimize/Avoid Business Impacts
- Avoid Oak Ridges Moraine Impacts

# VE Team Challenges/Opportunities

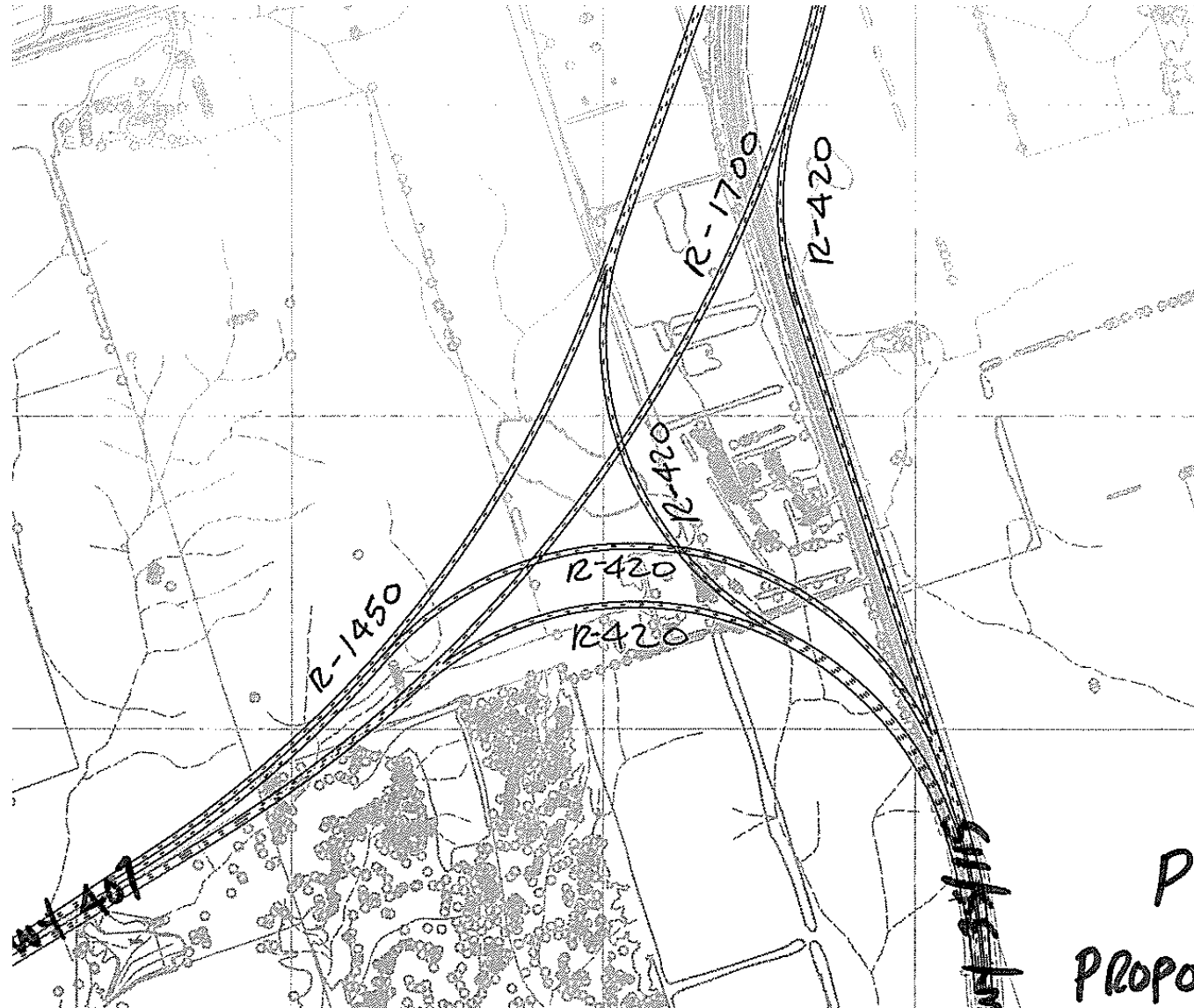
- Where does 407 end?
- Is work proposed on 35/115 justified; is it worth the money?
- How do we keep businesses in place?
- How can we build 35/115 with minimal impacts?
- How is system continuity provided?
- What can be done to reduce EA approval uncertainty?

# Selected Independent Ideas

## Use ‘Fork’ design for 407/35

- Convert S-W and N-S ramps to exit on left
- Ramps should be treated as major forks
- Reduces ramp and structures
- Savings ~ \$17M

# PROPOSED "FORK" DESIGN



PI-3  
PROPOSED DESIGN

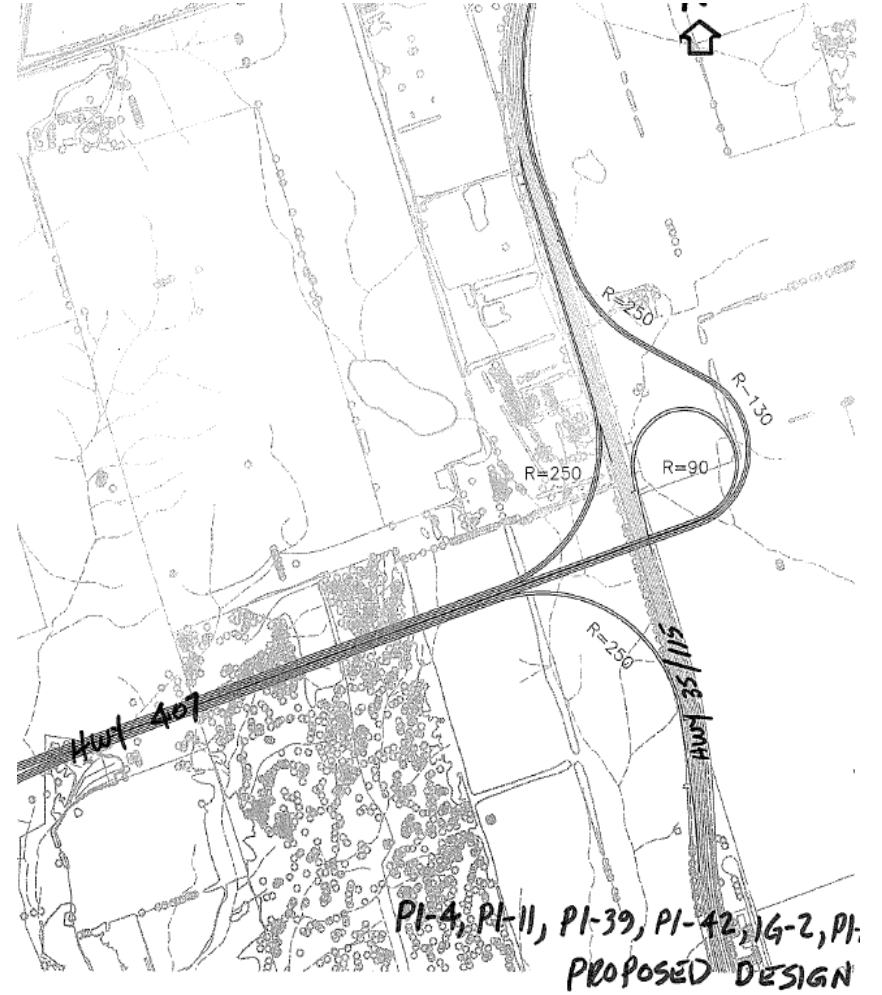
## Terminate 407 at 35/115

- Keep Highway 35/115 on existing alignment
- Realign Highway 407 to be perpendicular to Highway 35/115 and provide “Trumpet B” style interchange further to the south (approximately mid way between Concession Road 7 and 8)
- Highway 407 would terminate at Highway 35/115

# Base Design



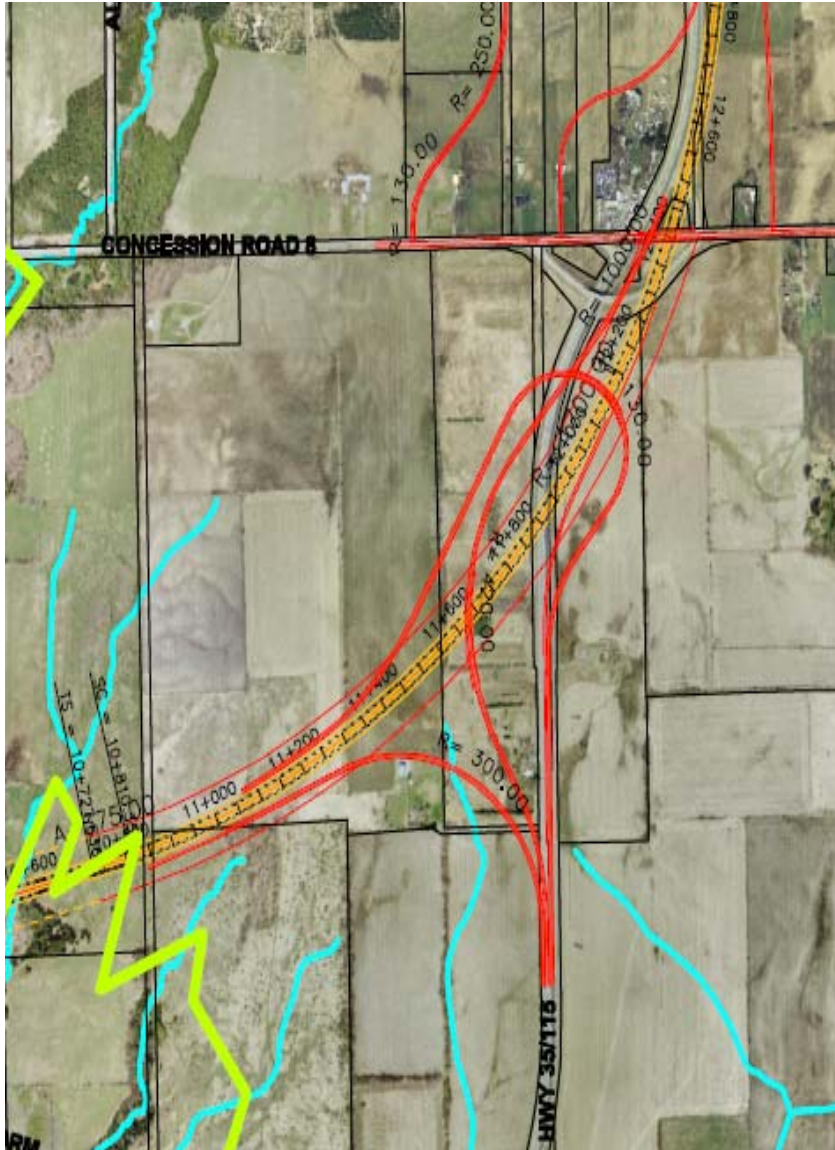
# VE Proposal



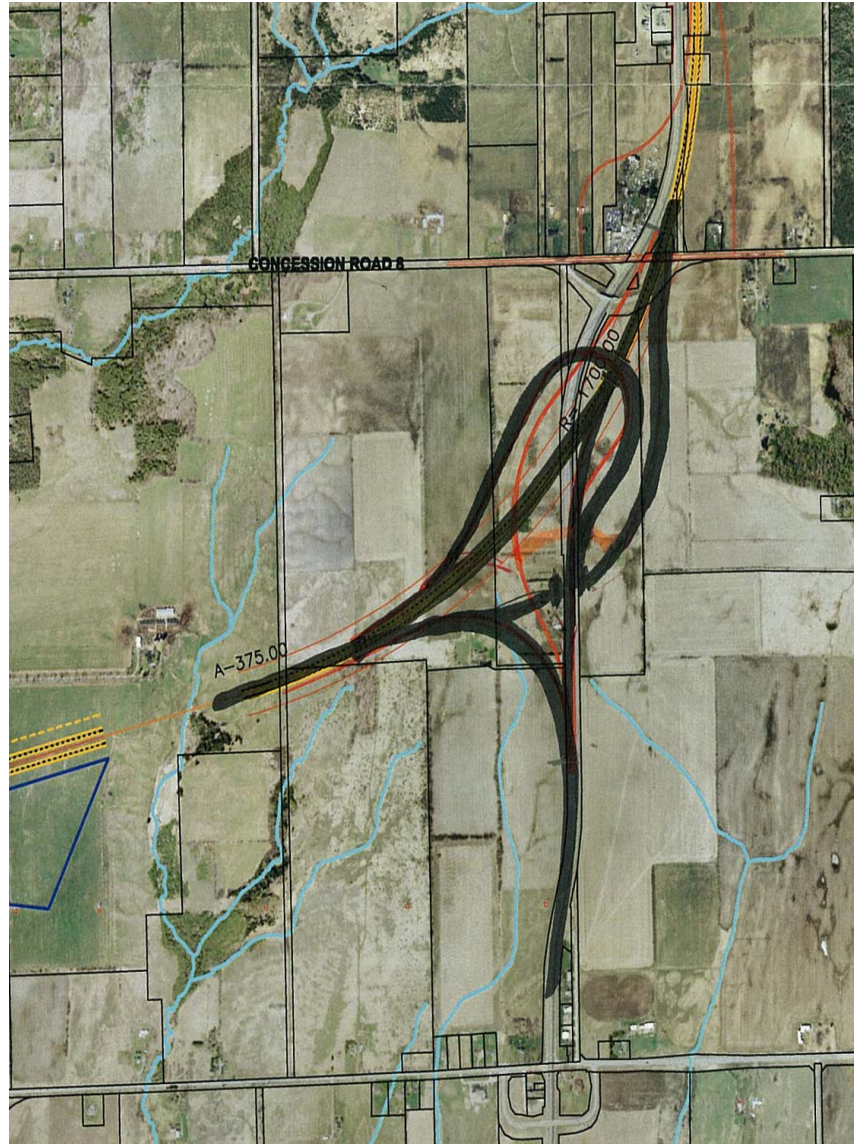
## Reconfigure 407/35 I/C to Make 407 the Exit

- Base design favours SB traffic on 35/115 to Hwy 407 with right exit to 35/115
- Recommend making 35/115 main move with 407 the exit
- Potential saving ~ \$15.5M

# Proposed Design



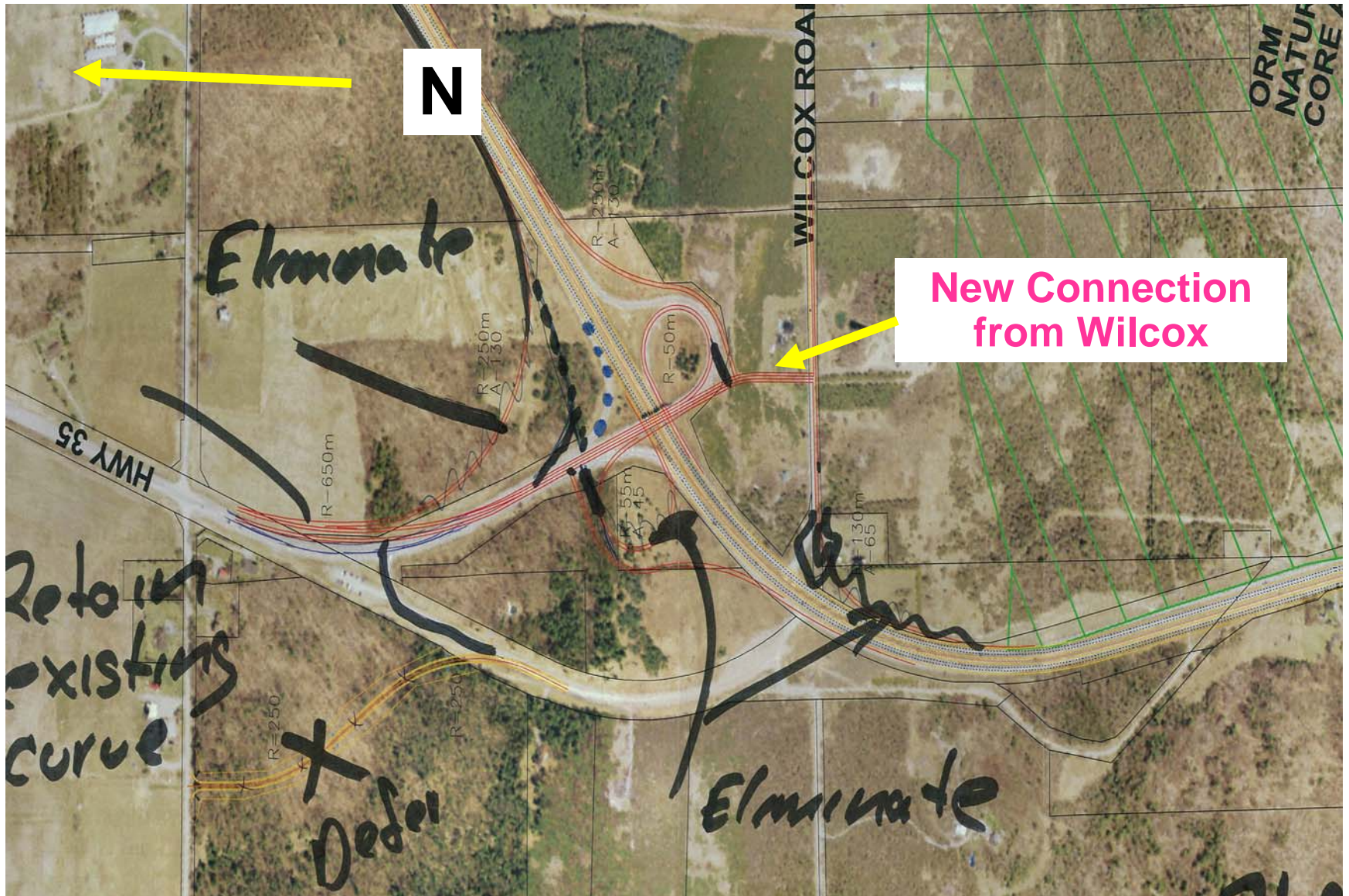
# VE Proposal



## **Leave existing 35/115 I/C as is – provide minor modifications**

- Base includes directional I/C for 35/115 split
- Recommend retaining existing configuration with minor modifications only
- Potential savings ~ \$23M

# PI 31A – 35/115 I/C



# Scenario #1 – Base Case

## Cost ~\$300M

- Construct four-lane mainline from Best Road to Hwy 115 north of Hwy 35 I/C.
- Provide freeway to freeway interchange between Hwy 407 and Hwy 35/115 south of Con 8.
- Follow the existing alignment of Hwy 35/115 from north of Con 8 northerly; however, realign the highway in the vicinity of Con 8 to the east to avoid property impacts on the existing west side businesses.
- Provide north-oriented diamond ramps at Con 8 and a west-oriented diamond ramps at Best Road to retain Tim Horton's/Petro Canada.
- Provide a freeway to freeway interchange at the 35/115 split. Provide a service road from Con 8 to Skelding Road and close Skelding Road at Hwy 35/115.
- Provide a service road from Wilcox Road to Con 10 and close Wilcox Road at Hwy 35/115.

## **Scenario #2 – Freeway**

### **Cost >\$300M**

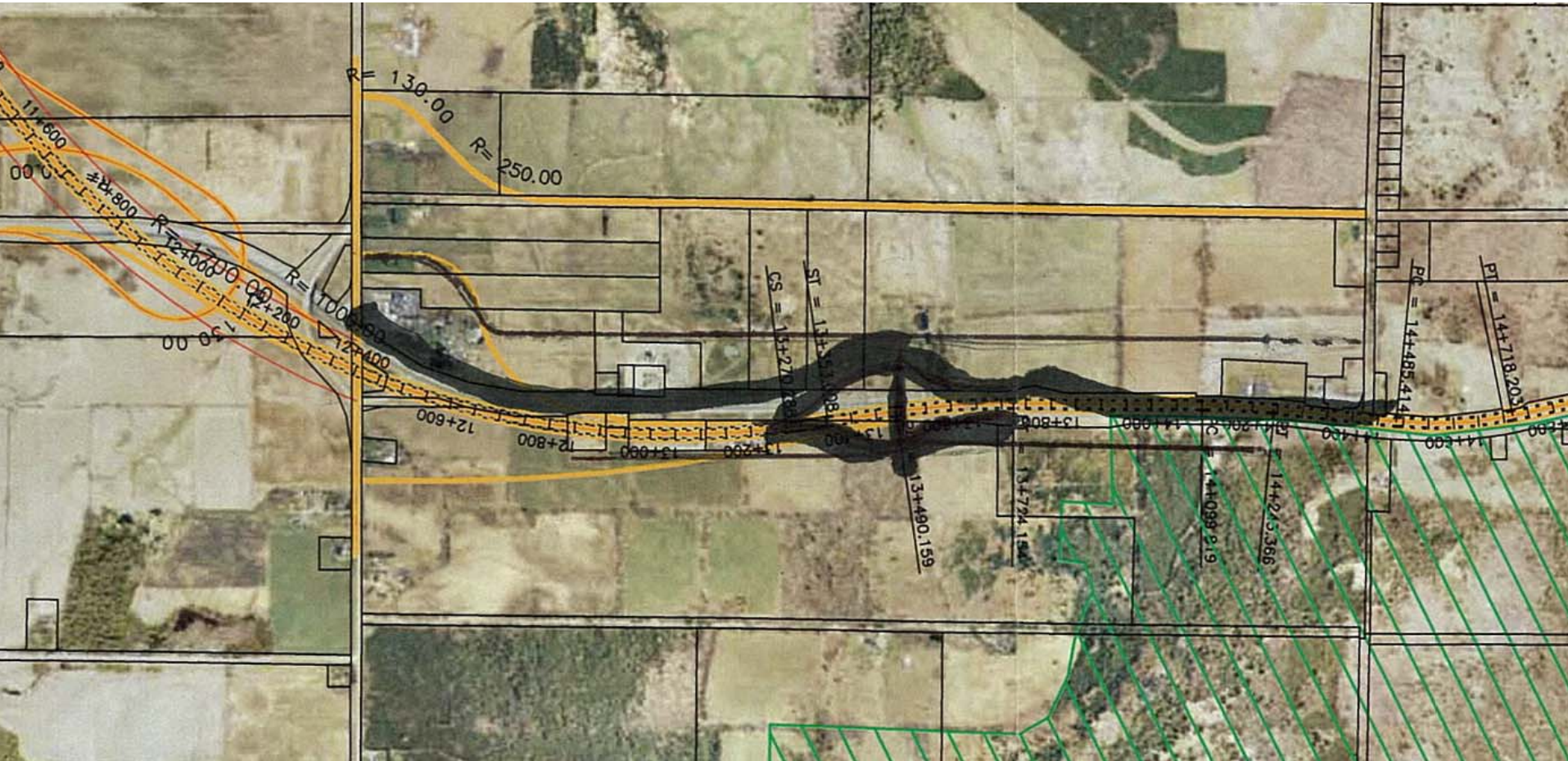
- Build freeway to a 120 km/h design speed for both horizontal and vertical alignments for entire length. This precludes access to existing businesses.
- Include a full interchange at Best Road to permit access to the Transitway station from the east and eliminate the partial interchange at Con 8.
- Provide fully directional interchange at Highway 407-Highway 35/115 using a diverge lane configuration (directional ramps).
- Maintain the improved connection at Highway 35/115 and the service roads as described for the Base Case.

## Scenario #3 – Freeway

### Cost <\$300M

- This alternative is similar to Scenario #2 but with no interchange at Best Road.
- Local property access would be provided through an interchange constructed to the north of Concession 8 with properties connecting to the service road.
- (This could be modified to include the revised Con 8 I/C and an expressway for 35/115)

# Move IC to north



## **Scenario #4 – Non-freeway**

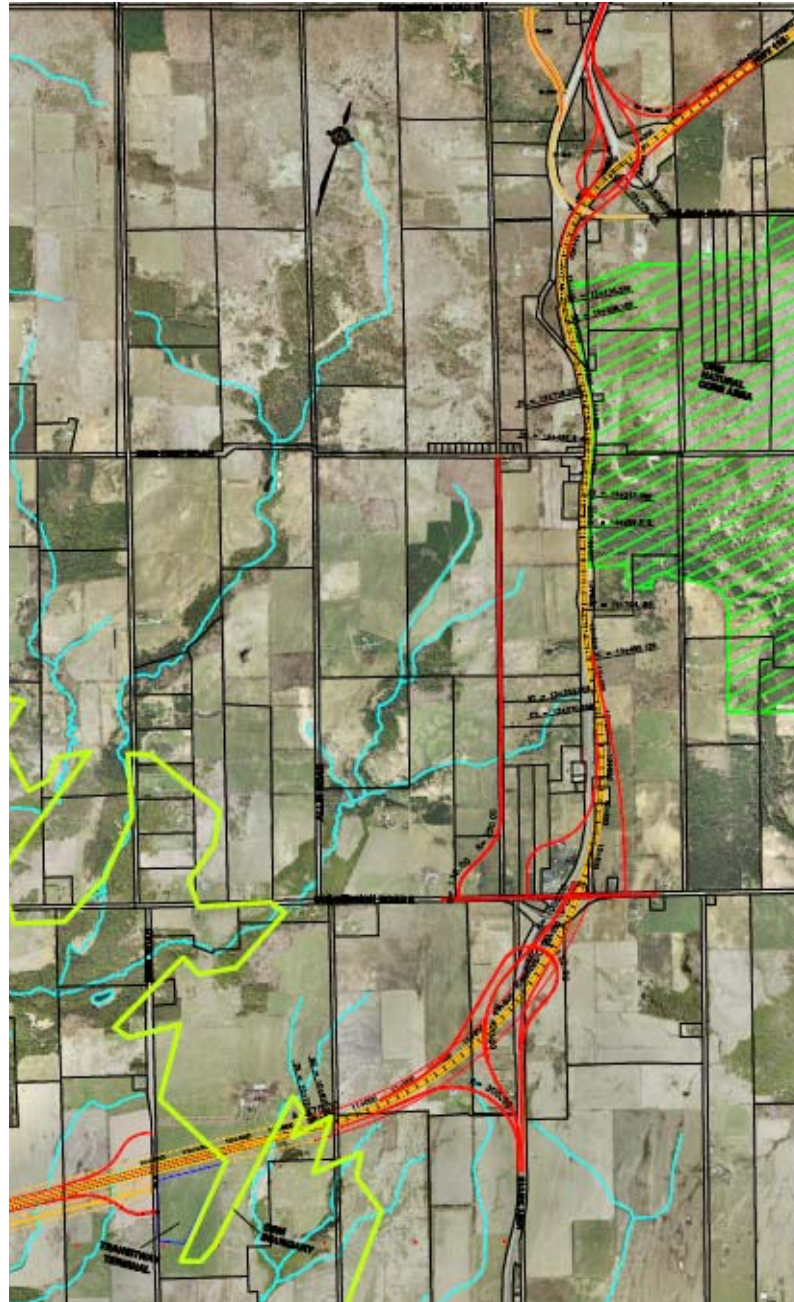
### **Cost \$180-200M**

- This alternative involves the termination of Highway 407 at Highway 35/115 south of Concession 8 in a trumpet 'B' interchange.
- Leave existing 35/115 I/C as is with minor improvements
- The interchange at Best Road would be deferred until needed to provide access for the future Transitway.
- Operational/safety improvements could be considered for 35/115 if/when warranted (subject to further traffic analysis)

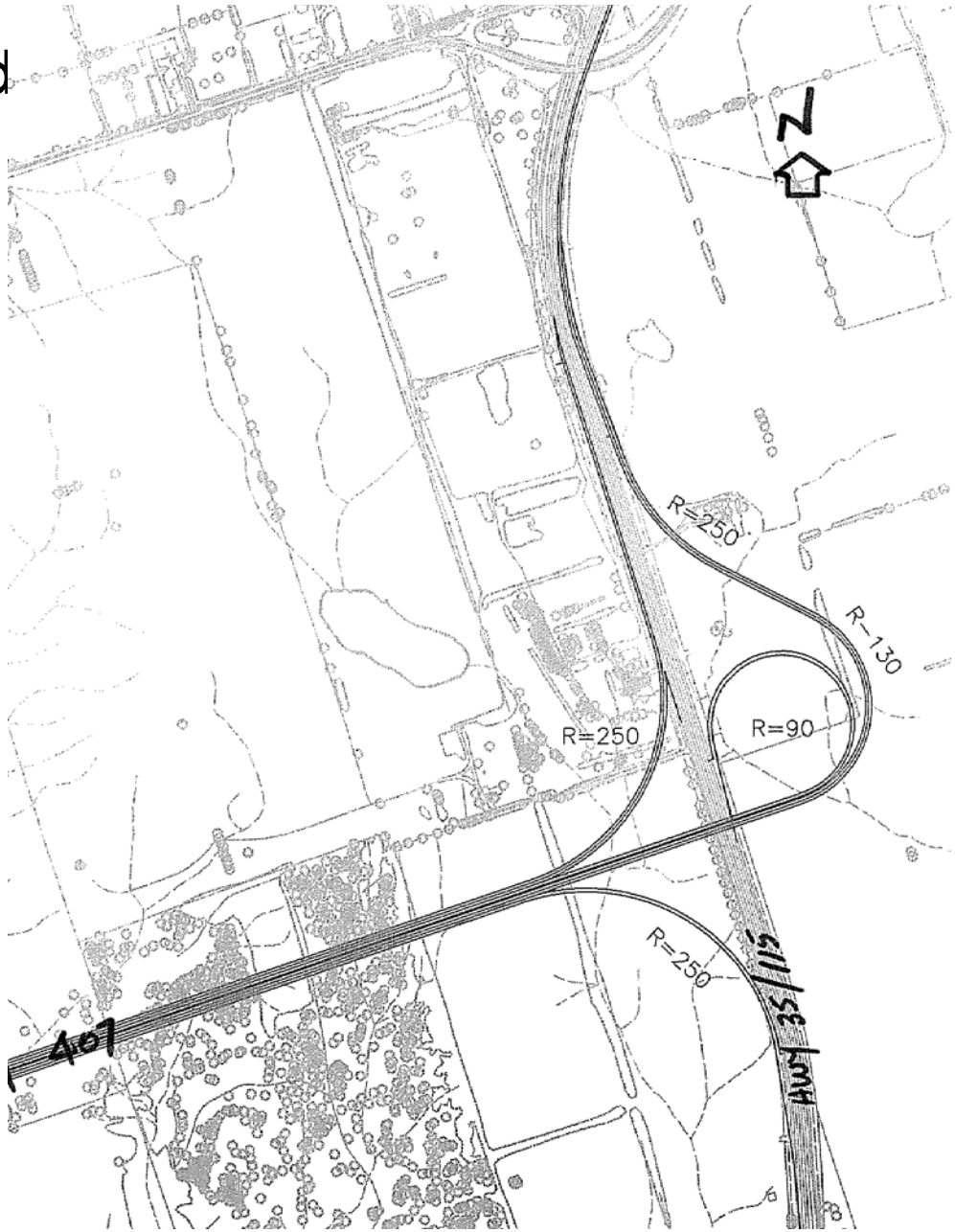
# Scenario Results

- The VE Team was unanimous in recommending the non-freeway scenario which ends Highway 407 at 35/115 south of Con Road 8.
- Rationale is provided on the next few slides.....

# Recommended Plan in vicinity of 35/115



# VE Proposed Design



## Rationale for Preferred Scenario..

- There is no evidence that any improvements are required to 35/115. This section operates at or below the provincial average accident rate for expressways and volumes do not justify expenditure (Approx \$95M)
- Deferring improvements to the 5 km section of Highway 35/115 makes it easier to implement Highway 407. The function of the road is provided at substantially less cost.
- The driving experience will be consistent (expressway standard) for Highway 35/115 users. It will be clearer to those leaving Highway 407 that they are leaving the toll road environment.

## Rationale for Preferred Scenario..

- Drivers wishing to use the Highway 407 toll route will be required to exit Highway 35/115. It will be less likely that a driver will unintentionally enter the toll road.
- Changes at the Highway 35/115 split interchange can be constructed without compromising future freeway upgrades;
- The cost of removing the businesses and the lack of other commercial properties in the area make the loss of these businesses a significant impact to the Municipality of Clarington

# What Was Implemented?

1. Terminate 407 at 35/115 with Trumpet I/C and reconfigure north approach to make 407 the exit -  
**Savings +/- \$42M**
2. Leave existing 35/115 I/C as is with minor improvements  
– **Savings +/- \$40M**
3. Eliminate 35/115 upgrade north of 407 – eliminate service roads and retain businesses – **Savings +/- \$31M**

# Conclusions

- VE Team critically reviewed the project to provide basic functions
- Cost/Worth analysis pointed to areas of potential value improvement
- VE Team not only looked at opportunities to reduce cost, the team also identified opportunities to facilitate project approvals and implementation within accelerated schedule and to improve network continuity

**Thank You!**