

# SAMPLE PROJECTS

## Multi-Process Project Assurance Reviews

### 403/ QEW Freeway-Freeway Interchange, Greater Toronto Area

#### Combined Project Assurance Processes

To capture Owner, Designer and Project Stakeholder input a project assurance review, integrating the following 4 processes was performed:

- Value Engineering (VE)
- Quantitative Risk Assessment (RA)
- Road Safety Analysis (RSA)
- Constructability Review (CR)

#### Original Project Concept

The 403/QEW Project, a \$235 Million, freeway-freeway operational improvement project, proposed adding the following new interchange movements:

- North-South (N-S) High Occupancy Lanes
- North-South (N-S) General Purpose lanes
- South– East (S-E) High Occupancy lanes

These new movements are to be built, within the footprint of the existing interchange, while maintaining traffic. This requires the reconfiguration of various existing freeway-freeway connectors and the reconfiguration of 4 local interchanges. The justification and need for the S-E High Occupancy Lanes, from an operational standpoint, was a key Owner issue (debated for over 10 years).

#### 1st Project Assurance Review (VE/RA/RSA)

The first project review, integrating 3 of the 4 assurance processes: VE/RA/RSA, generated 3 new project strategies from a list of 20 alternatives. Of these, the designer and owner implemented 9 alternatives, organizing them into a new project concept. This concept maintains a similar level of mainline operations & highway safety, as the original concept, while significantly improving the local access configurations—as exemplified in Alternative 5.1, shown above. As part of the process, all project revisions were assessed for market and event risk uncertainty using quantitative risk analysis; all changes in project cost, schedule, performance and project value were displayed on a frequency distribution curve indicating the range of probability of occurrence for a given value.



#### Alt. 5.1: Eliminate the stub to the Ford Drive loop on-ramp to 403 and replicate the moves on the north side



**Cost Savings: \$19 Million**

**Construction Schedule Savings: 4 months**

#### 2nd Project Assurance Review (CR)

Following the development of preliminary plans by the Design Team, a Constructability Review (CR) was carried to establish the following constructability fea-



- Staging / access and egress details
- Worker and traffic safety
- Operational constraints
- Environmental considerations
- Construction schedule & working day estimates
- Construction cost estimates
- Pavement selection & grade raises



#### 403/OEW Project Review Benefits:

- ✓ Corroborated the benefit of the S-E HOV movements
- ✓ Reduced project costs by \$42 million (20% )
- ✓ Reduced construction schedule by 12 months
- ✓ Project value index increased by 18% (Project Performance / Project Resource)