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Excess Soil Management Practices in Ontario: Survey Results

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Steven Rose, P.Eng., P.Geo., OSPE
Andy Manahan, RCCAO

Survey Collaborators

Ontario Society of Professional Engineers

Residential and Civil Construction Alliance of Ontario

Greater Toronto Sewer & Watermain Contractors Association



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Constructing Ontario's Future



Key Issues / Considerations

Expense:

- There is a perceived expense to infrastructure projects where soils have no beneficial re-use (onsite or offsite)
 - Trucking / Disposal / Make-up Fill

Environmental Impacts:

- Air Emissions / Noise
- Resource Depletion (soil / landfill capacity)
- Traffic Congestion
- Other

Key Issues / Considerations

Other Concerns:

- Impact to municipal budgets (limited spending available for other priorities)
- Wear and tear on roads due to heavy truck traffic
- Current practice defaults are ultra-conservative (liability avoidance)
- Undesirable precedents (problems reported in the press)
- Regulatory uncertainties
- Substandard practices by QPs
- Geotechnical suitability of soils for re-use

Survey Goals & Design

Survey Goals:

- Benchmark current industry practices against:
 “Management of Excess Soil – A Guide for Best Management Practices”
 (2014 – “BMPs”)
- Understand the magnitude of soil movement on infrastructure projects
- Investigate opportunities for improvement of current industry practices
- Evaluate potential savings in reducing the volume of soils relocated for infrastructure projects

Survey Goals & Design

Survey Goals (cont'd):

- Evaluate the contributions of current excess soil management practices to GHG emissions in Ontario (and opportunities for their reduction)
- Provide support for municipal adoption of best practices (such as creation of a model by-law)
- Develop improved management practices for excess soils that can yield lower project costs and lower GHG emissions

Survey Goals & Design

Survey Design & Inputs:

- Prepared & conducted - Summer 2015
- 33 questions
 - Type of company responding
 - Typical projects & geographic coverage
 - Project values
 - Costs / distances for exporting *and* importing soils for projects
 - Ultimate disposition of exported soils (landfill / re-use)
 - Use of 2014 BMPs for soil management / cost savings realized
- Distributed to membership & networks of the 3 sponsoring groups
- 16 full surveys completed – provides a snapshot of (29) current projects

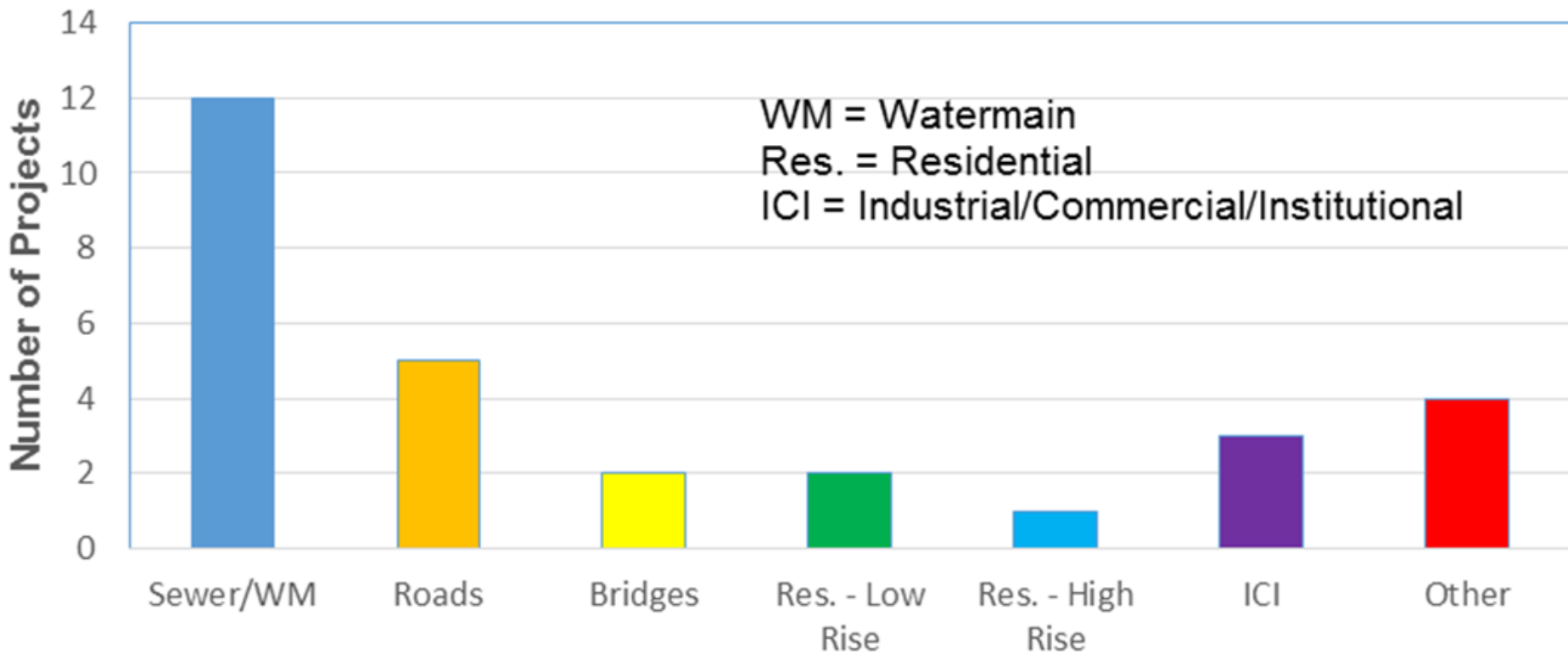
Survey Results

Survey Respondents / Project Types:

- 56% Earthworks Contractors
- 25% Consultants
- All respondents active in GTHA / 19% also active elsewhere

Survey Results

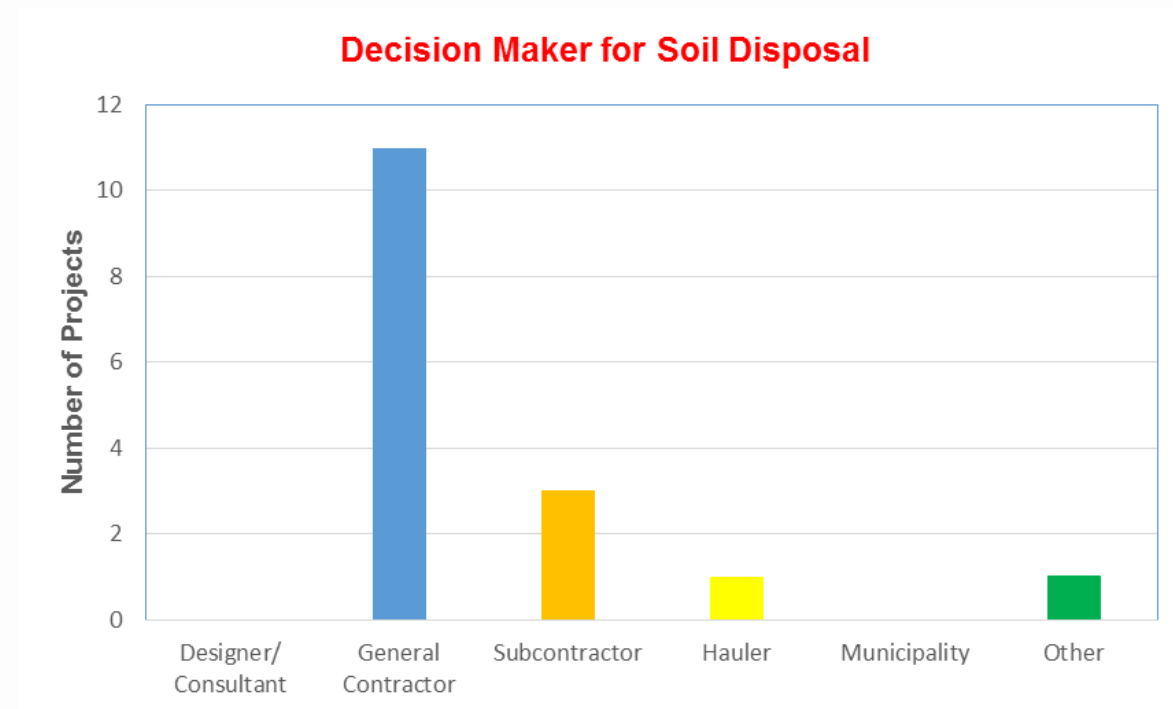
Typical Projects Respondents Worked On



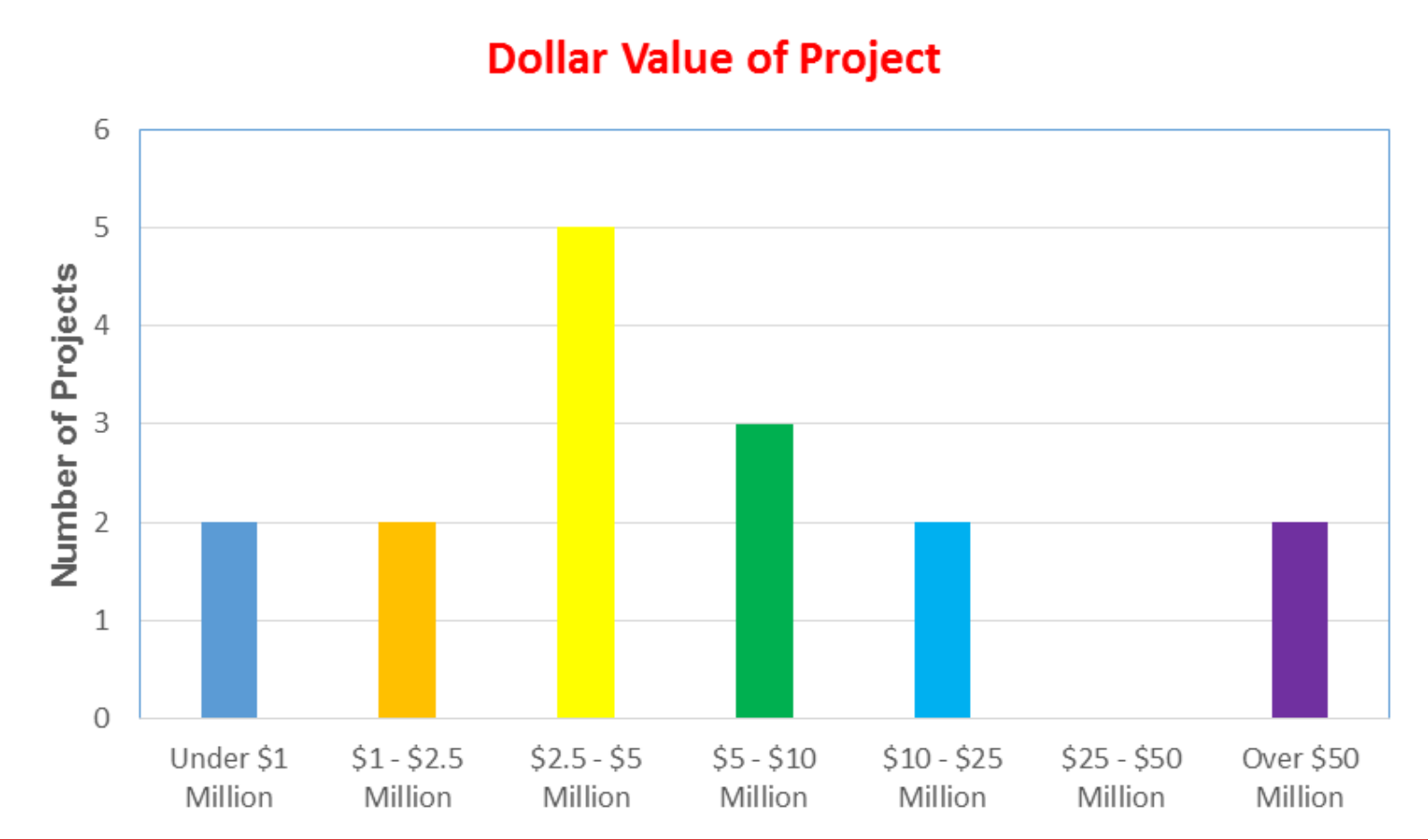
Survey Results

Who makes the decisions on where to take excess soils?

- 88% General Contractor or Earthworks Subcontractor
 - Receiving site often selected with input from the Consultant

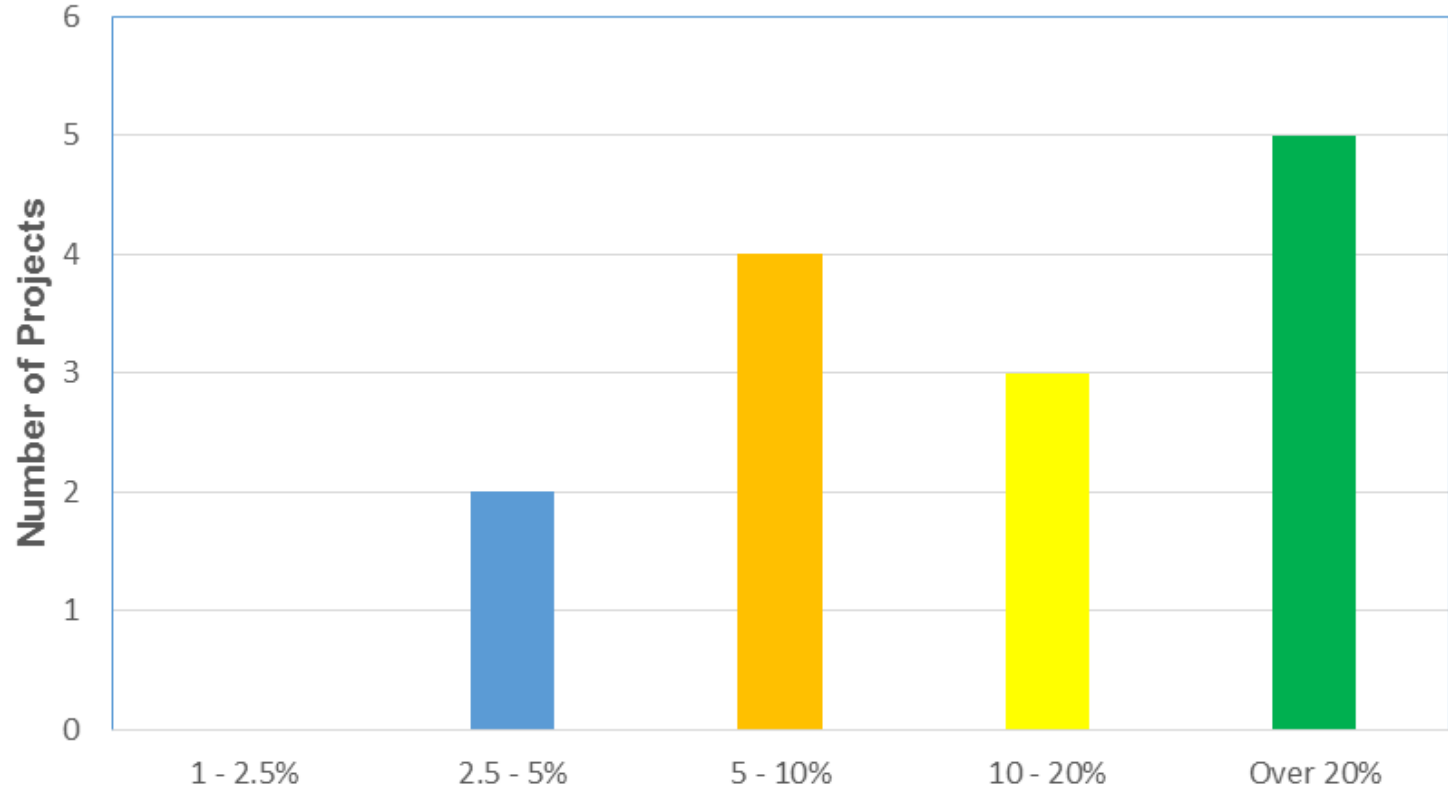


Survey Results



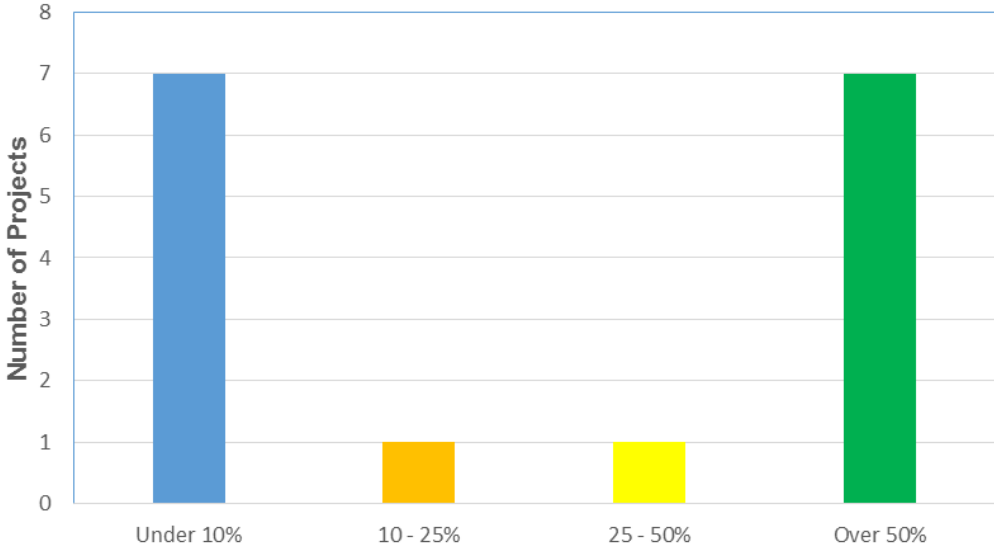
Survey Results

% of Project Value for Soil Removal and Importation

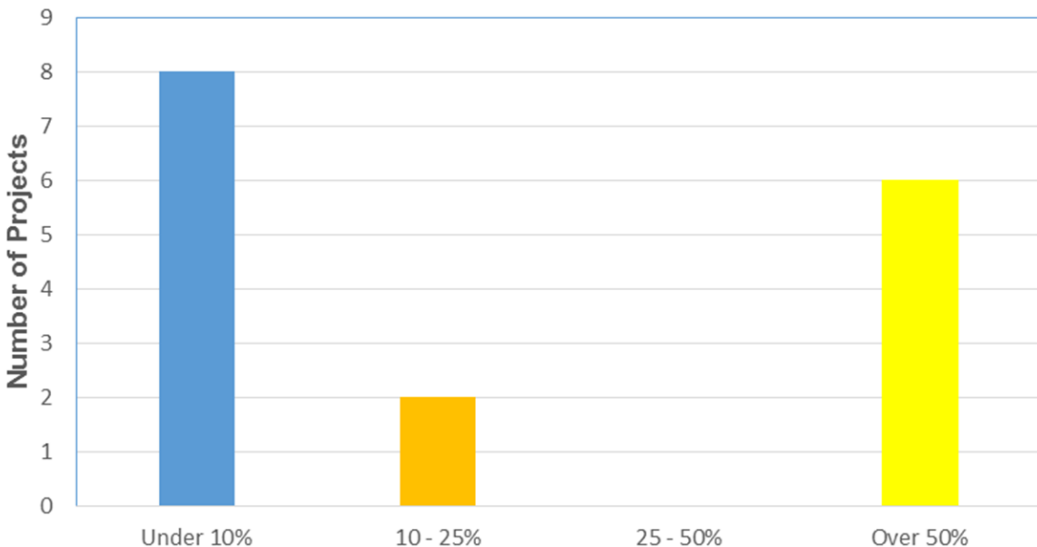


Survey Results

% of Disposed Soil Taken to Licenced Waste Disposal Site (Landfill)



% of Disposed Soil Taken to Site Using Like-Quality Fill Material



Survey Results

What was the typical travel distance (1 way)?

- For soil disposal: 70 km (inferred mean distance)

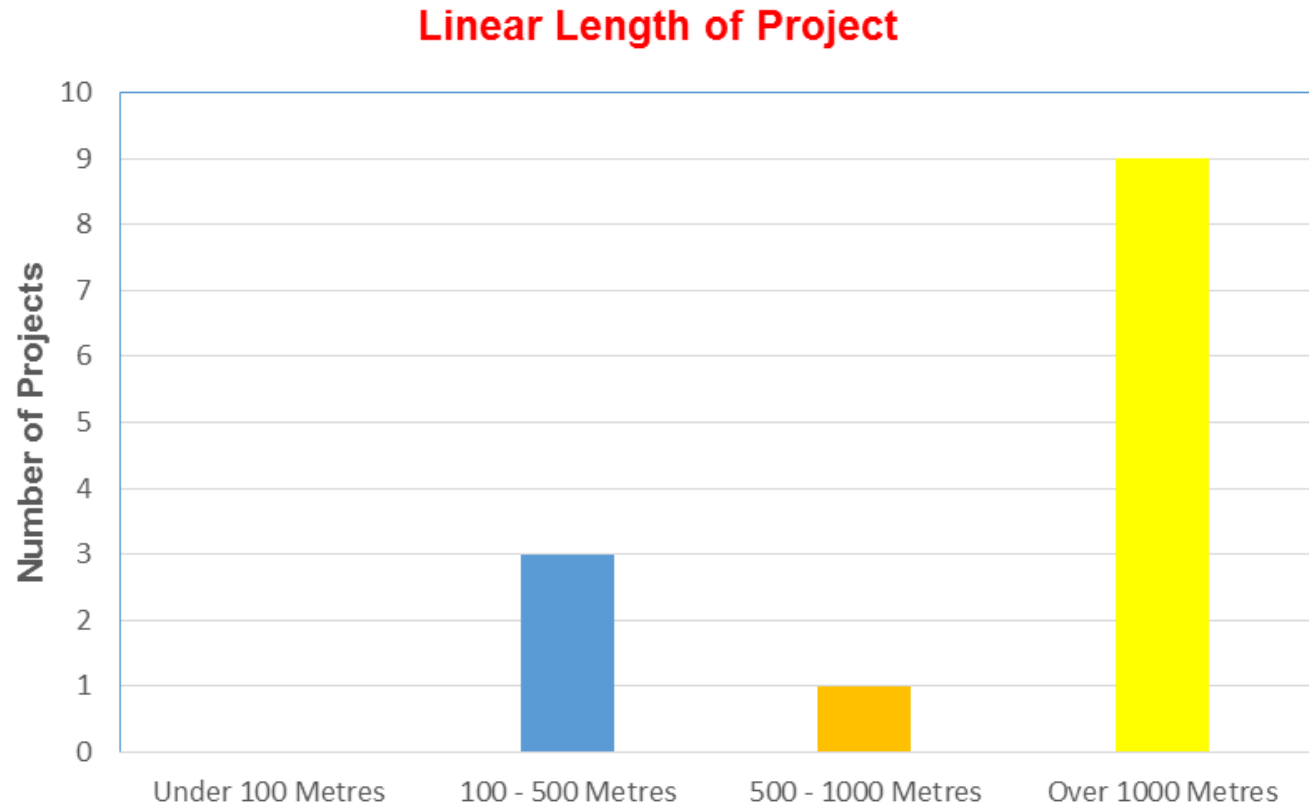
What was the typical number of loads?

- Dual Axle: 78% of projects > 100 loads
- Tri-Axle: 86% of projects > 100 loads
- Truck & Trailer: 100% of projects > 100 loads

Total Estimated Distance Travelled (24 projects): ~ 170,000 km

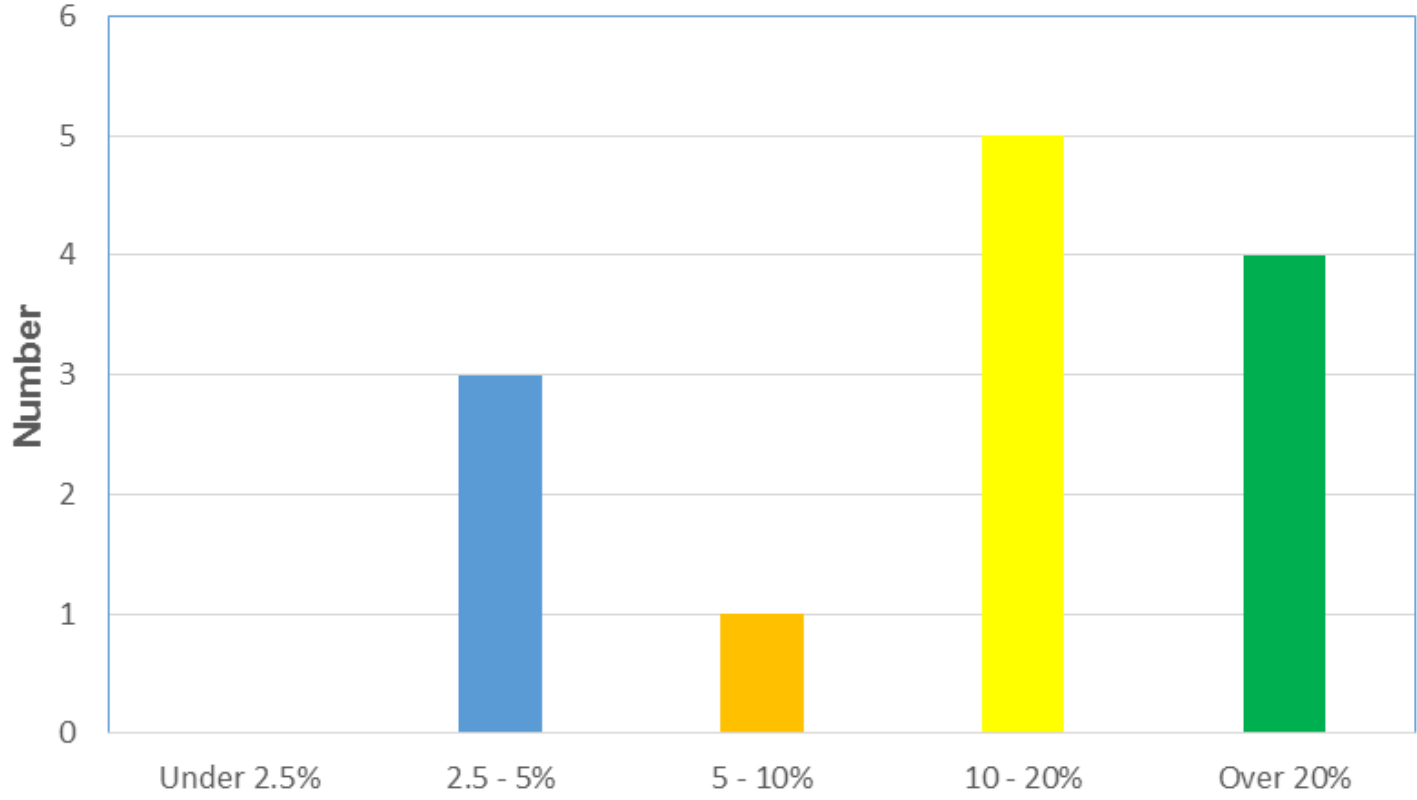
Survey Results

Project Dimensions:



Survey Results

Estimated Cost Savings if Soil Re-Used



Survey Results

Was a soil management plan (as recommended by the 2014 BMP) used?

- 25% = YES
 - out of this group, $\frac{3}{4}$ sent less than 10% of excess soils to landfill

What additional project costs were incurred?

- $\frac{1}{2}$ cost more than \$10,000

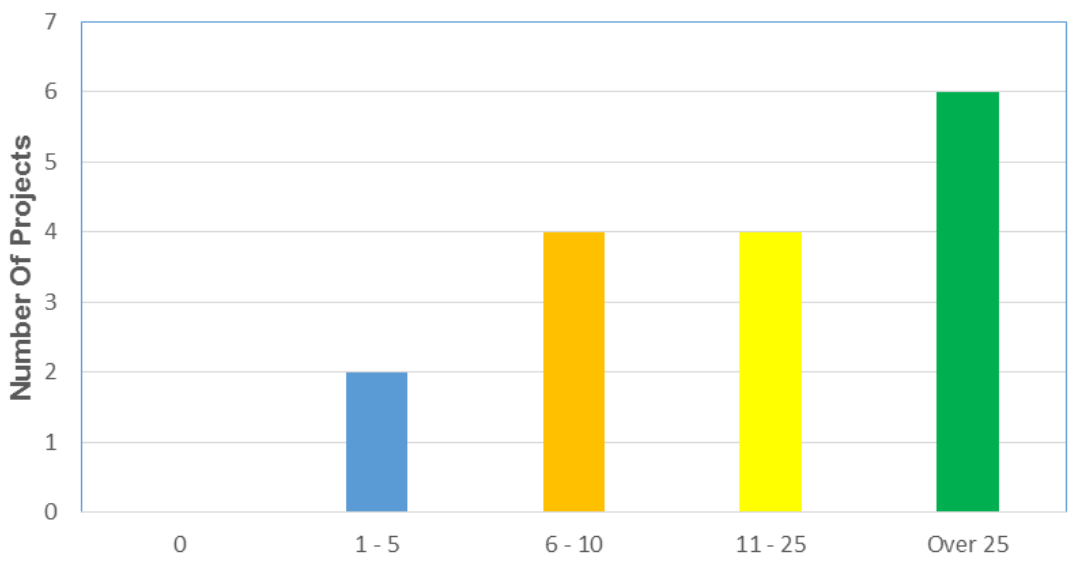
Survey Results

Did a BMP approach create any project savings?

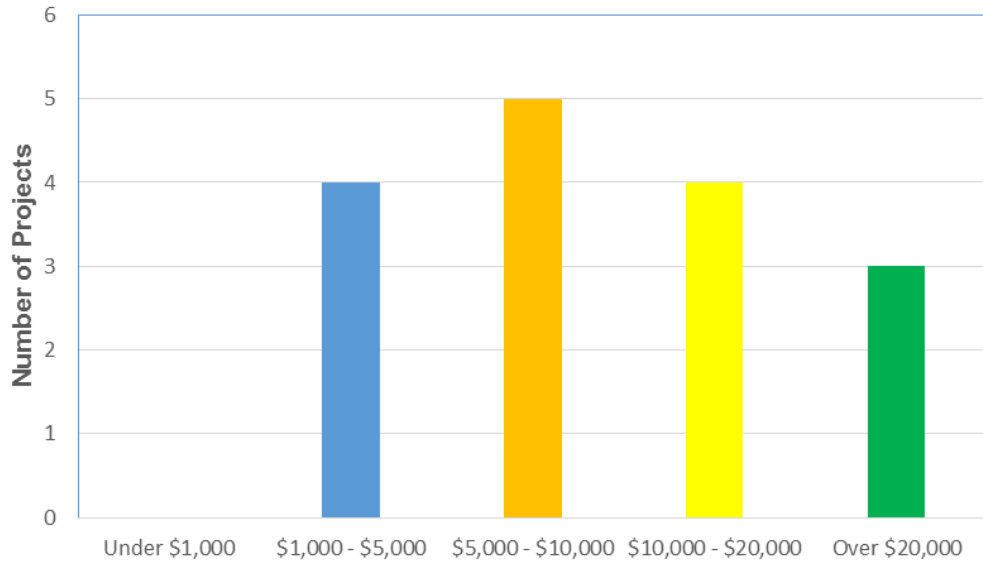
- Over 50% of projects achieved a project cost savings of 5% or less
 - One of these projects had a total value greater than \$50M
 - The estimated dollar value of savings for *that* project is at least \$1.2M
- Close to 45% of projects achieved project cost savings between 10% and 20%

Survey Results

Number of Soil Samples Sent to Laboratory



Typical Cost to Collect and Analyze Soil Samples



Summary

4 (Preliminary) Take Away Points:

- A small sampling of projects shows large volumes of soil are being transported substantial distances for infrastructure projects.
- 9 projects with linear length > 1 km;
costs to manage excess soils were ~ 10% of project costs
(estimated mean value of \$5M for soil management)
- Costs to undertake soil management plans are in the \$thousands;
potential savings are in the \$millions.
- Environmental impacts of current practices are significant
(emissions, loss of resources, traffic congestion and road wear).

Further Information

Steven Rose: rose@malroz.com
www.ospe.on.ca

Andy Manahan: manahan@rccao.com
www.rccao.com

www.gtswca.org



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