Getting the Picture:

Bilingual Pictogram Messages on Ontario Variable Message Signs

New VMS Technologies Enabling New Concepts

Roger Browne (MTO), Maryann Lovicsek (IBI) and Mohamed Wahba (IBI)

ITS Canada – ACGM 2013
Toronto, Ontario

Ontario News Flash!

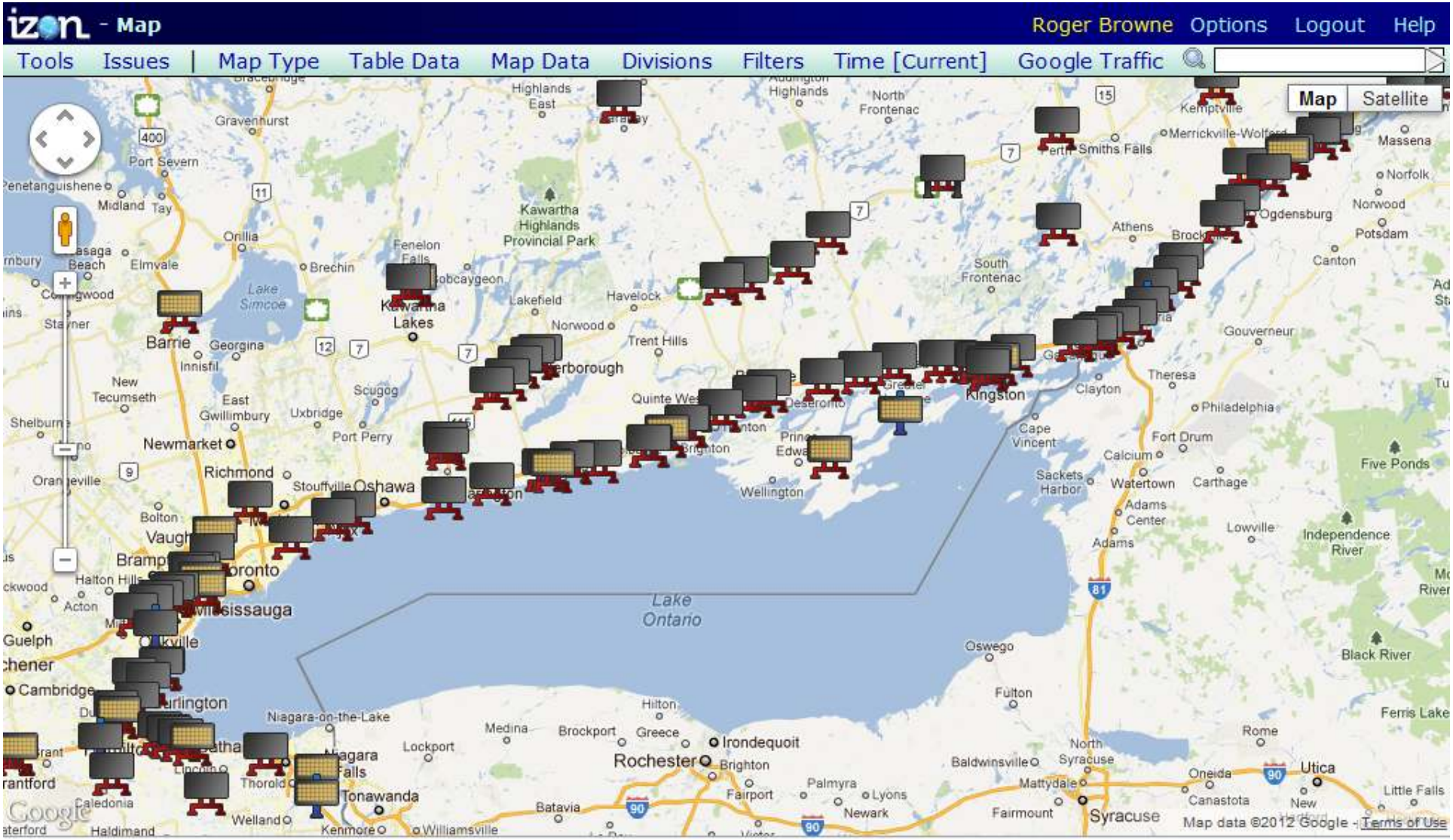
- Province of Ontario now deploying full-colour, full-matrix, full-size overhead VMS on a mass scale
- Initiative driven by Ontario laws pertaining to bilingual road signing requirements

- Ministry taking the innovative approach to use ‘pictograms’ instead of text to ensure that messages are understood by all languages

Outline

1. Background
2. Pictogram message development
   - Public sessions
   - Design charrette
   - Field observations on full-size VMS
   - Extensive human factors testing
3. Findings
4. Next steps

Almost 500 Variable Message Signs (VMS) in Ontario

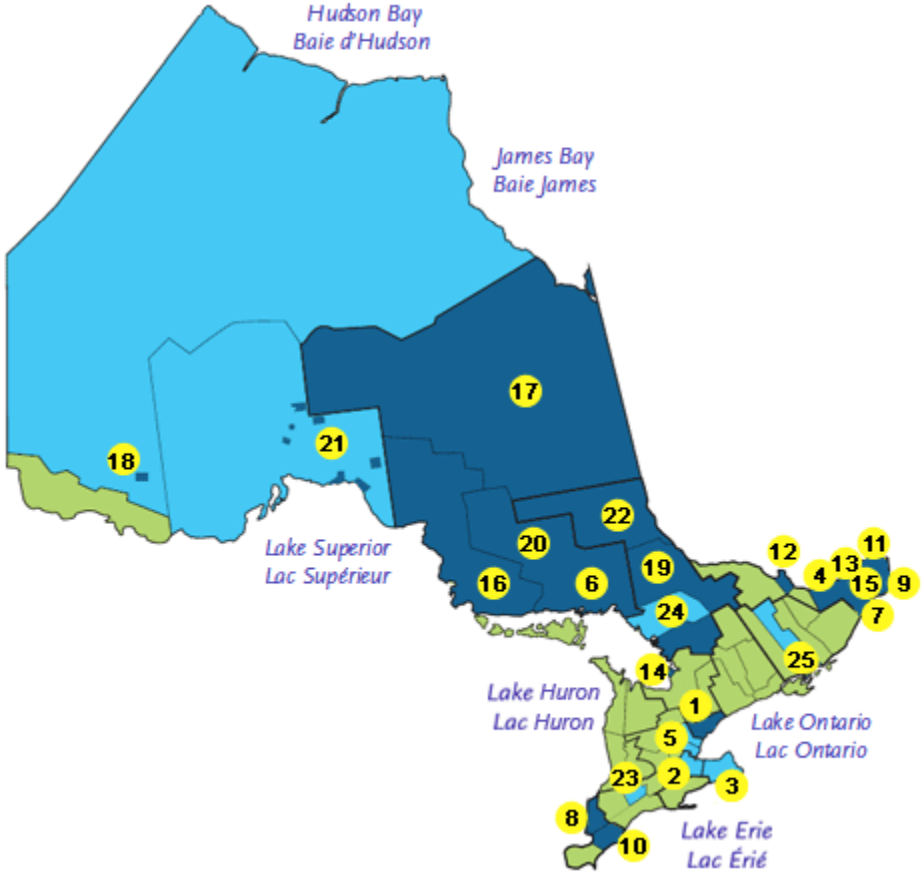


IBI GROUP

Ontario

Bilingual Signing Requirements

- Bilingual road signing is mandated by law in designated French Language Areas of Ontario



Bilingual Static Signing in Ontario

Previous Exemption for VMS

New Signs, New Capabilities

Before

After

- New technology in full colour, full matrix, double density VMS introduces a wide range of possibilities
- NTCIP 1201v2 means customized software can readily be developed to drive new signs

IBI GROUP Ontario

The Pictogram Solution

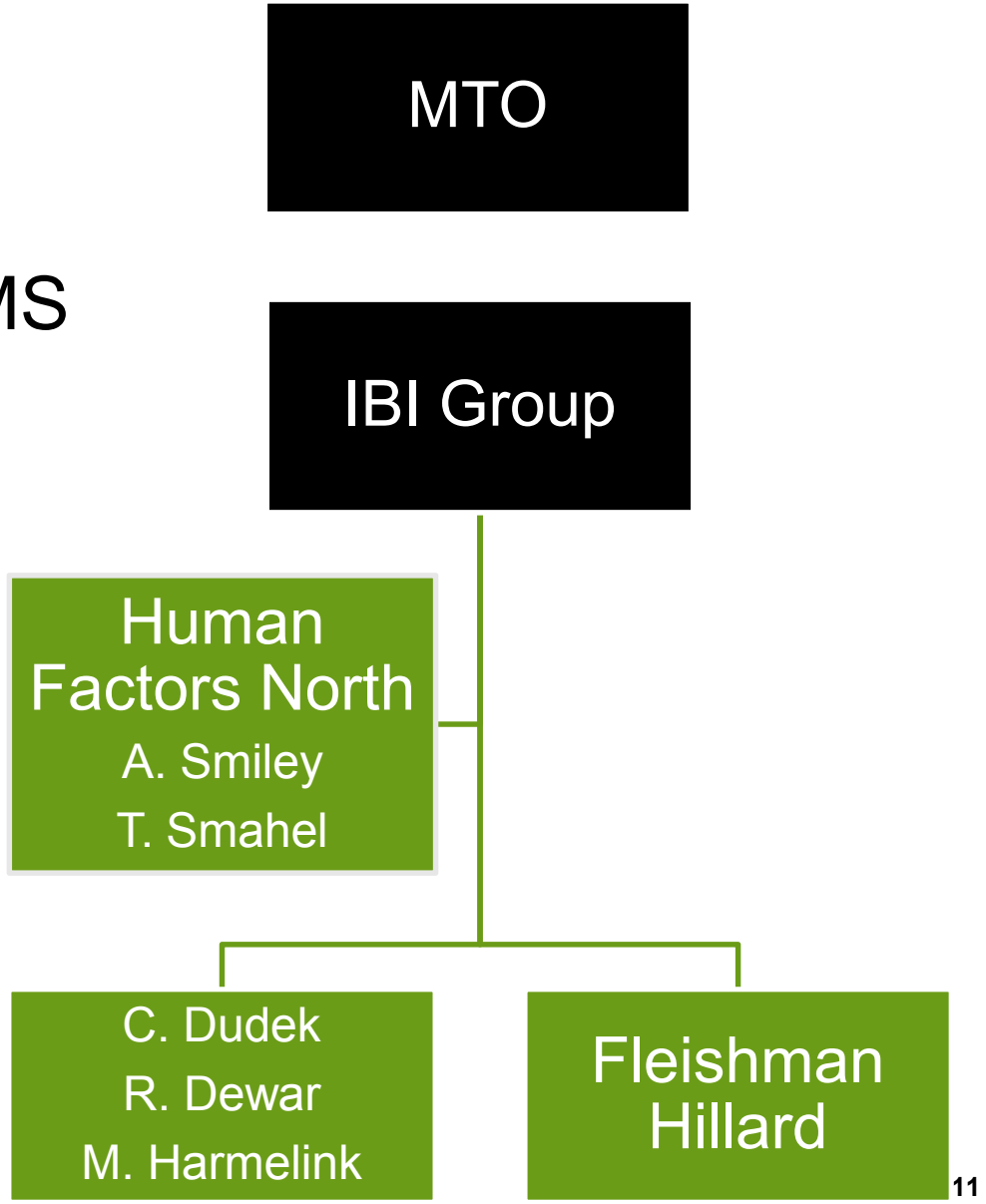
- Pictograms transcend language barriers and can improve reading time
- Ontario already using some commonly recognized graphic symbols
- Better images with the new VMS technology

Outline

1. Background
2. Pictogram message development
   - Public sessions
   - Design charrette
   - Field observations on full-size VMS
   - Extensive human factors testing
3. Findings
4. Next steps

Pictogram Message Development

- Comprehensive MTO project to develop bilingual pictogram messages for new VMS technology

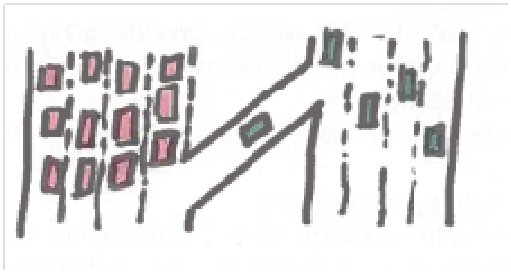


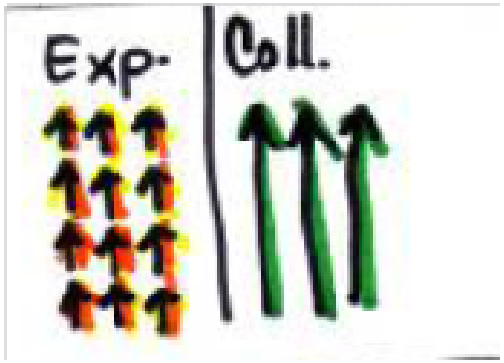
Public Sessions

Process:

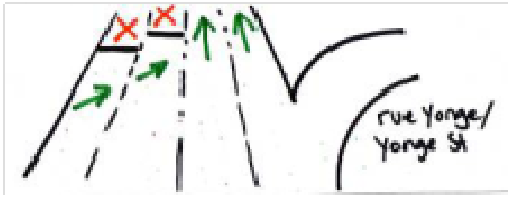
1. Create new symbol ideas
2. Assemble most common themes for each symbol message
3. Test which symbol is best understood by people who will see the image

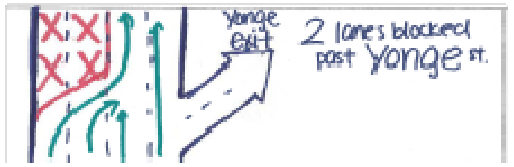
Public Sessions

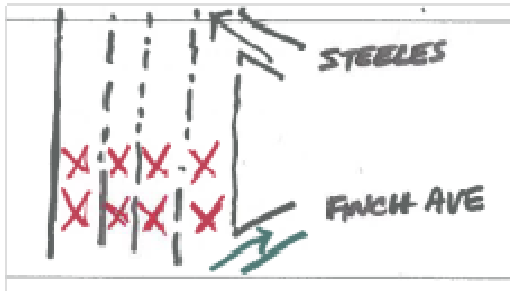




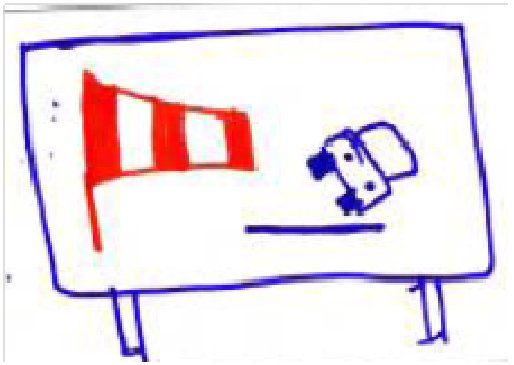
Express Very Slow – Collector Moving Well

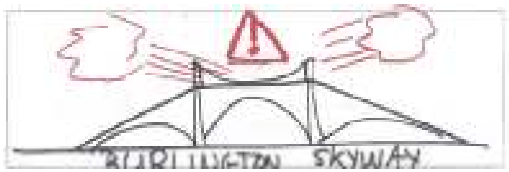






Blockage/Closure





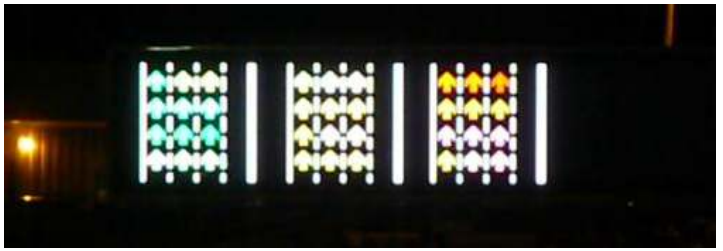
High Winds on Skyway

Design Charrette

Moving slowly/ well, very slow - 1

Moving slowly/ well, very slow – 2

Field Observations on Full-Size VMS



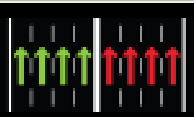
Human Factors Testing

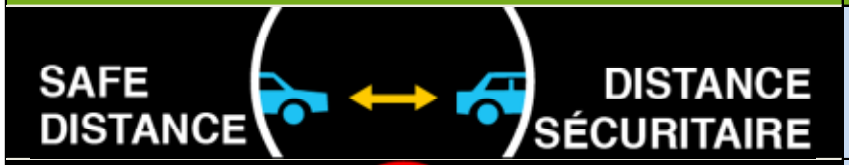
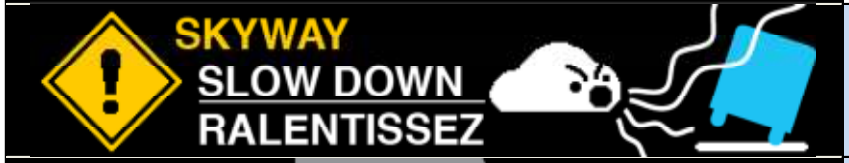
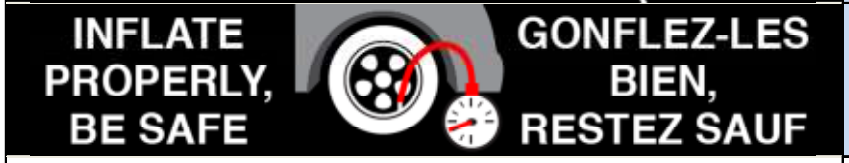
- Two rounds of testing
- Recruitment criteria
  - Valid driver's license (G2 or G)
  - Drive on highways at least once a month
- 3 cities (Ottawa, Sudbury, Toronto)
- 3 language groups (English, French, Other)
- 3 age groups (<25, 25-55, >55)
- Total sample size = 324

Testing Format

(1) What did the sign say and (2) what should drivers do?

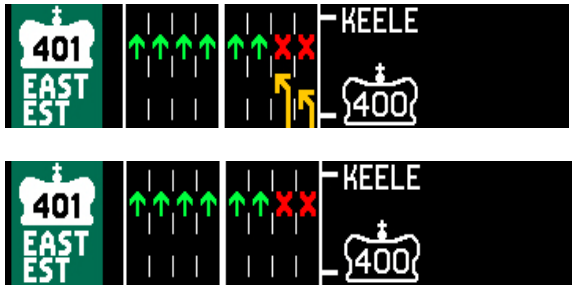
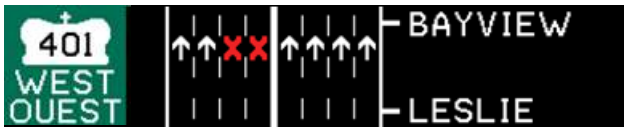
Type in your answer and hit "ENTER" when finished.

Text Traffic	End of Test (n=54)	Mean (n=324)	Pictograph Traffic	End of Test (n=54)	Mean (n=324)
EXPRESS MOVING SLOWLY COLLECTOR MOVING WELL	95%	92%		78%	60%
EXPRESS MOVING WELL COLLECTOR VERY SLOW	Not Tested			74%	62%
ALL LANES CLOSED BEYOND FINCH	91%	94%		80%	79%
EXP: ALL LANES CLOSED BEYOND MARKHAM	85%	92%		80%	72%
RAMP TO BRONTE RIGHT LANE BLOCKED	62%	64%		74%	74%
EXP: 2 RIGHT LANES BLOCKED COL: 1 RIGHT LANE BLOCKED BEYOND YONGE	76%	74%		70%	55%
HOV LANE BLOCKED 1 RIGHT LANE BLOCKED BEYOND DUNDAS	79%	78%		83%	76%
COLL: 2 RIGHT LANES BLOCKED COLLECTOR MOVING SLOWLY EXPRESS MOVING WELL BEYOND WARDEN	69%	69%		83%	72%
EXP: 2 RIGHT LANES BLOCKED EXPRESS VERY SLOW COLLECTOR MOVING WELL	Not tested			59%	58%
TOTAL	80%	80%	TOTAL	76%	68%

Pictograph Safety Message	Mean Comprehension (n=324)
	98%
	96%
	94%
	77%
	32%
	55%
	79%
	83%
TOTAL	77%

Message Development Example

401 WEST EXPRESS
2 RIGHT LANES BLOCKED
LESLIE TO BAYVIEW

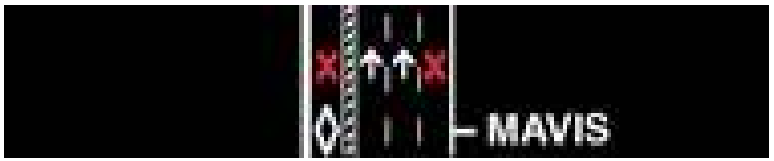
After Public Sessions	After 1st Round Testing	After 2nd Round Testing and Analysis
		

Outline

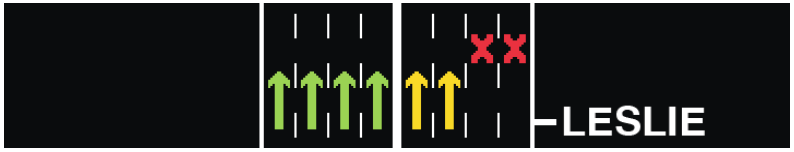
1. Background
2. Pictogram message development
   - Public sessions
   - Design charrette
   - Field observations on full-size VMS
   - Extensive human factors testing
3. Findings
4. Next steps

Findings

- Bilingual versions of every VMS message in Ontario
- Good understanding by end of testing session
- Pictogram messages better at depicting more complex configurations



- Pictograms enable new “combination” messages



- Redundancy reinforces understanding

- **Pictograms understood by ALL language groups**

Next Steps

- Implement “Early Wins” messages
- Preliminary/detail design for new message software
- Follow roll-out plan to implement remaining messages in Ontario
- **Coordinate with other jurisdictions** to implement pictogram VMS messages, leveraging off the findings of this study
  - Lessons learned
  - Extensive human factors testing
  - Uniformity

Thank you

For more information contact:
Roger.Browne@ontario.ca
mlovicsek@ibigroup.com

IBI GROUP

Ontario