GeoNext Rail Resilience: Real-Time Monitoring for Seamless Construction Integration

GeoNext

Introduction

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Overview

Ensuring uninterrupted railway operations amidst construction is vital for safety and efficiency.

This presentation explores the significance of real-time track monitoring in safeguarding Train, Metro and Tram systems during construction.

By integrating Trimble technology, we address challenges, mitigate risks, and maintain operational continuity.

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Railway Construction Challenges

- Railway construction poses unique challenges that require careful management to ensure safety and efficiency.
- **Continuous Operations Requirement:** Railways must remain operational during construction to avoid disruptions to service.
- **Safety Risks:** Construction activities can lead to track geometry deformations, traffic delays or even derailing.
- **Operational Disruptions:** Changes in overhead wire positions may lead to damages in train power systems. Structural deformations or shifts can disrupt train, metro or tram operations.
- **Environmental Factors:** Challenges such as adverse weather conditions have huge impact, not only on construction itself but also on the monitoring systems.
- Addressing these challenges is critical to maintain operational continuity and ensure the safety and reliability of railway systems.

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Importance of Real-Time Monitoring

- Goals of the Railway Monitoring:
  - Continuous tracking of geometrical changes over time
  - Shift, Height and Twist of rails are three main factors to maintain safety
- Why is it better than the old-fashioned way?
  - Immediate Detection and Notification:
    - More observations = faster detection
    - Spot changes and deformations instantly
  - Timely Interventions:
    - Quick responses enhance safety and prevent disruptions
  - Enhanced Safety:
    - Reduced risk of accidents and derailments
  - Operational Stability:
    - Maintains smooth train operations
  - Cost Efficiency:
    - No surveyor needed

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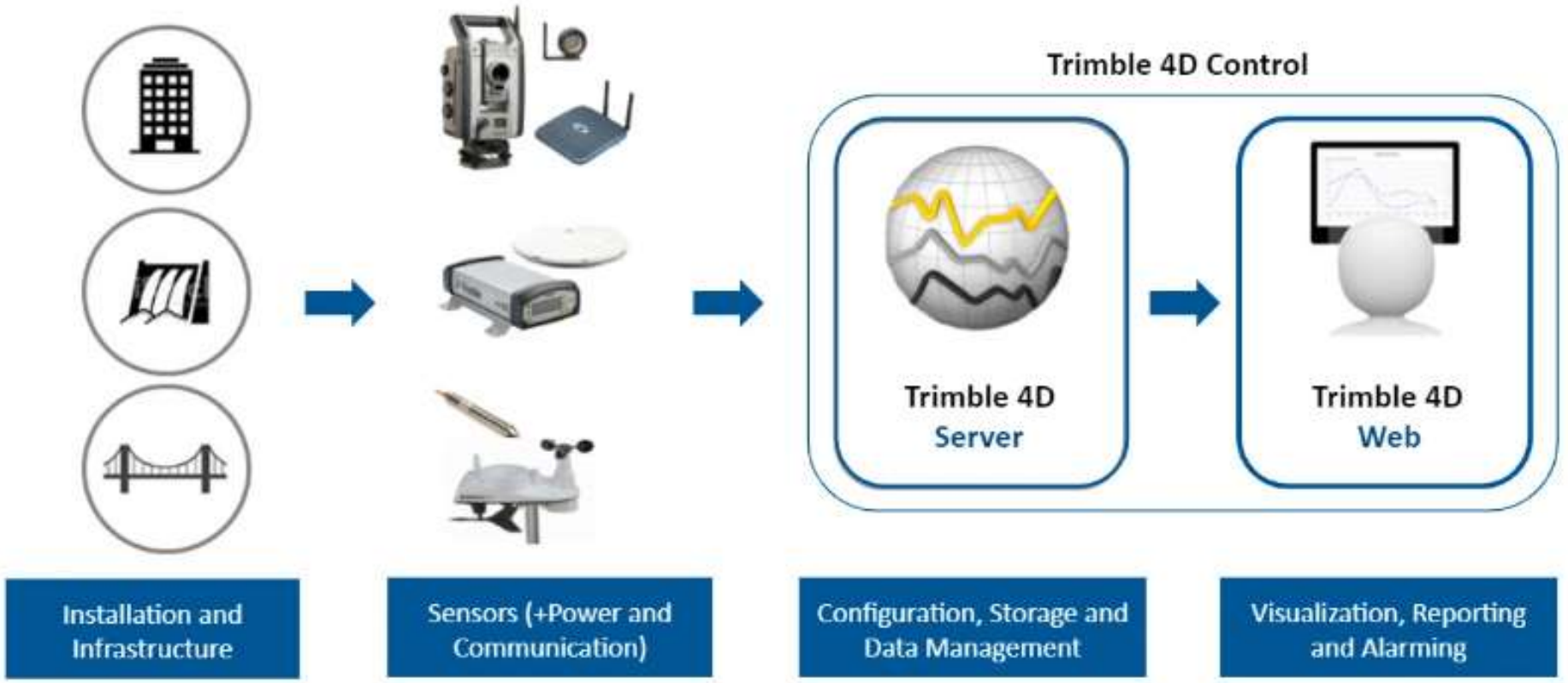
Automated Monitoring System



www.trimble.com

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Automated Monitoring System

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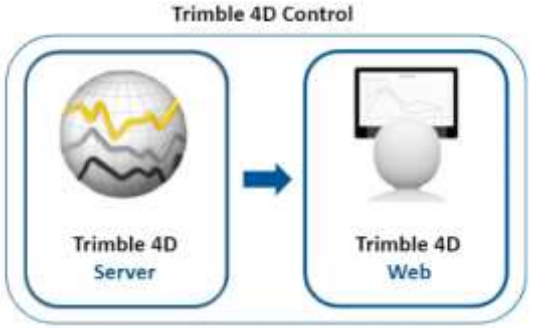

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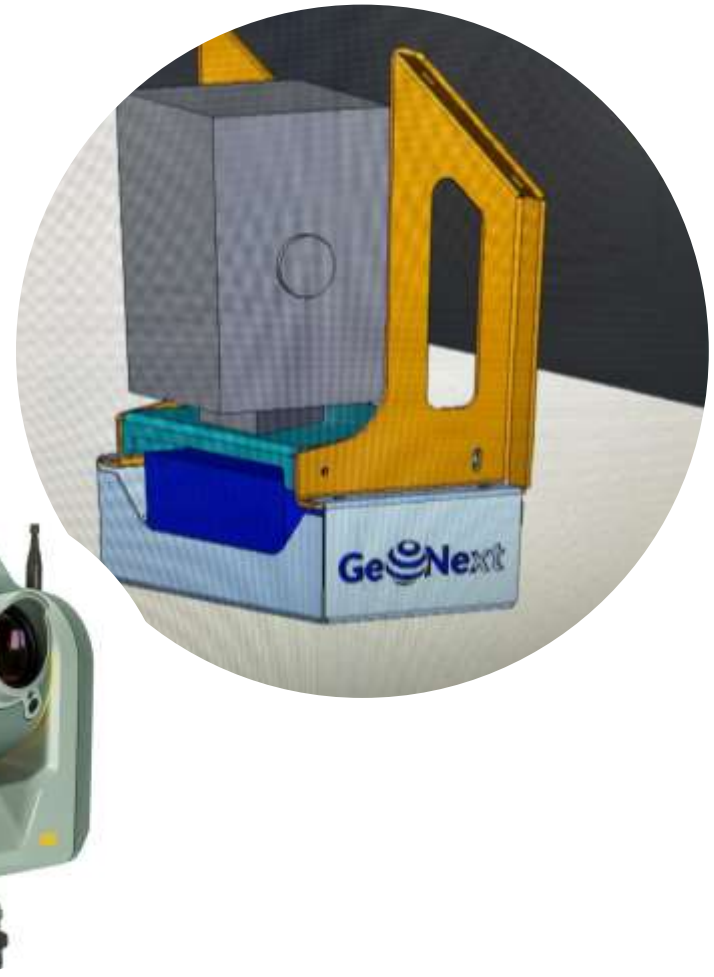
Technology Integration in Track Monitoring

Software

- Trimble T4D Control
  - Managing multiple sensors
  - Performing real-time and post-processed analysis
  - Visualizing data
  - Alarms and notifications
- GeoNext CoffeeCup
  - Advanced Track analysis
- GeoNext Online platform
  - Custom results presentation
  - Advanced Trend analysis
  - Custom / Automated reporting

Hardware

- Robotic Total Stations Trimble S7, Trimble S9, Trimble SX12
- Track measurement trolley – Trimble Gedo CE 2.0
- Settop M1 modem
- Custom made brackets and off-grid instruments Mounting System



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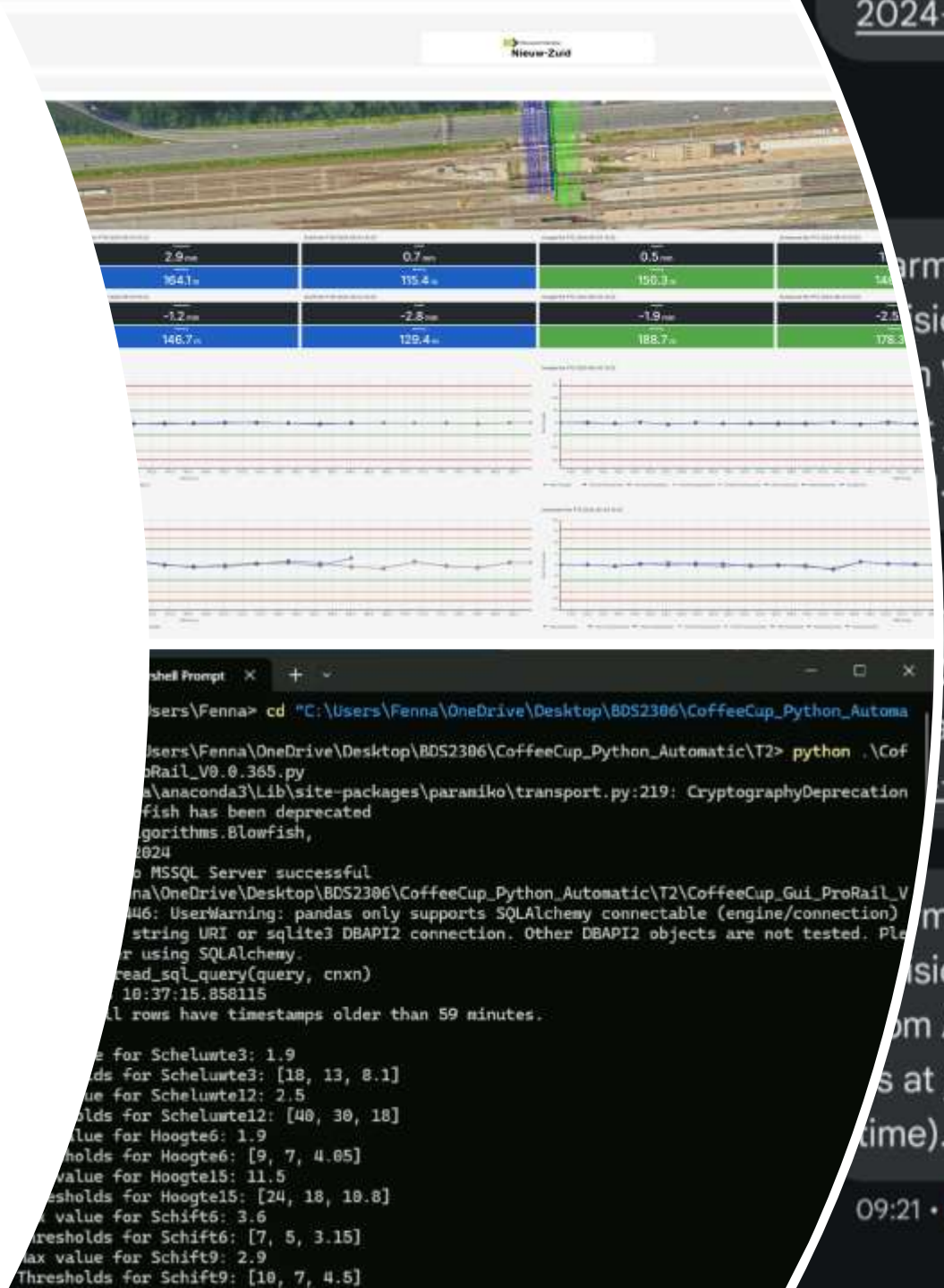
Automation in Track Monitoring

- System health check
- Automatic Real-time alarms and notifications
- Live results presentation on custom GeoNext online platform
- Automatic Reporting Tool



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www.zuidas.nl/zuidasdok

Successful Project Implementation

- Zuidasdok – One of the largest infrastructure projects in the Netherlands

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Amsterdam Zuid
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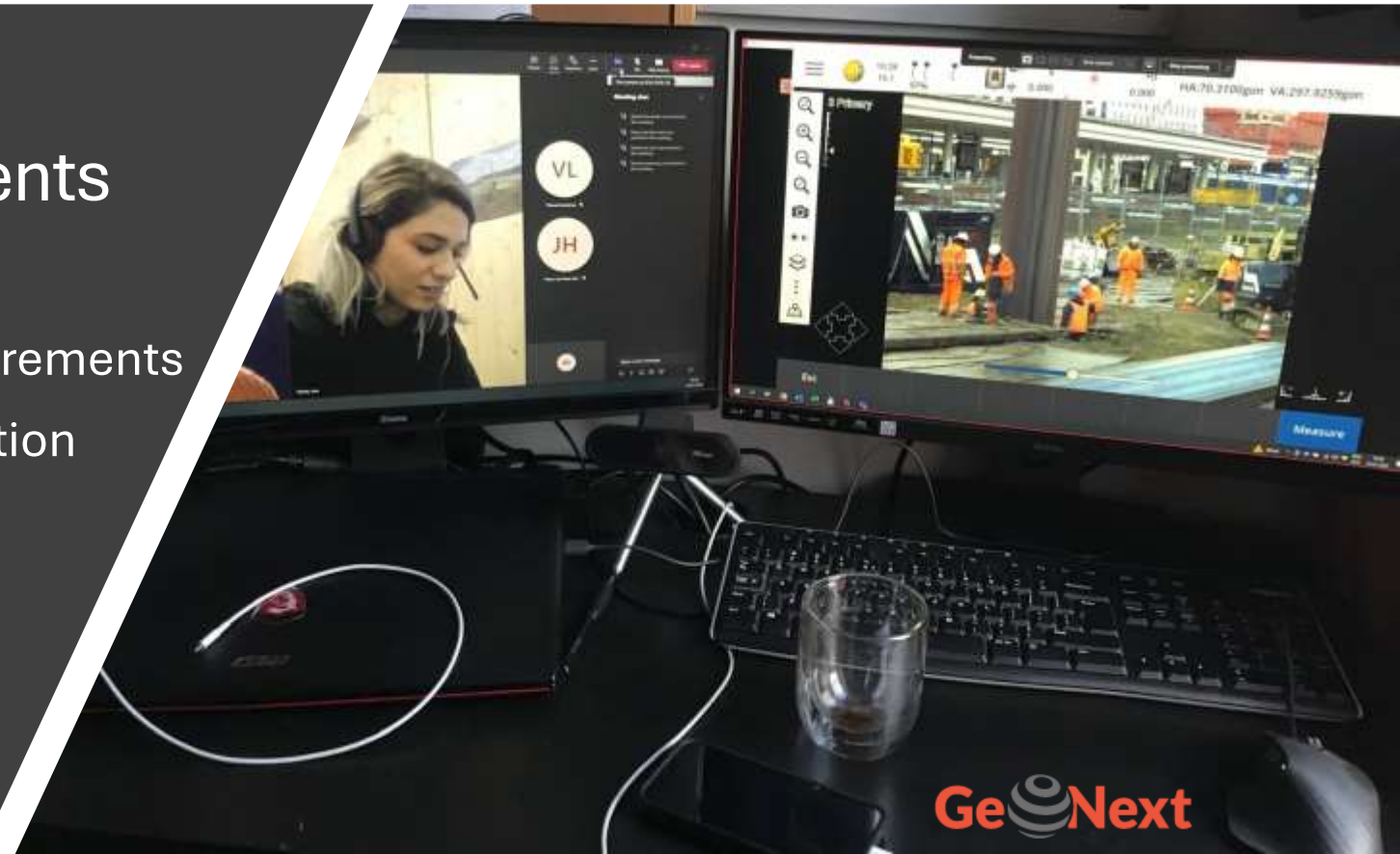
“KEUKEN TAFEL” measurements

- Automated Monitoring + Online remote measurements
- Live decision-making process during construction operations



Benefits

Safety Enhancements

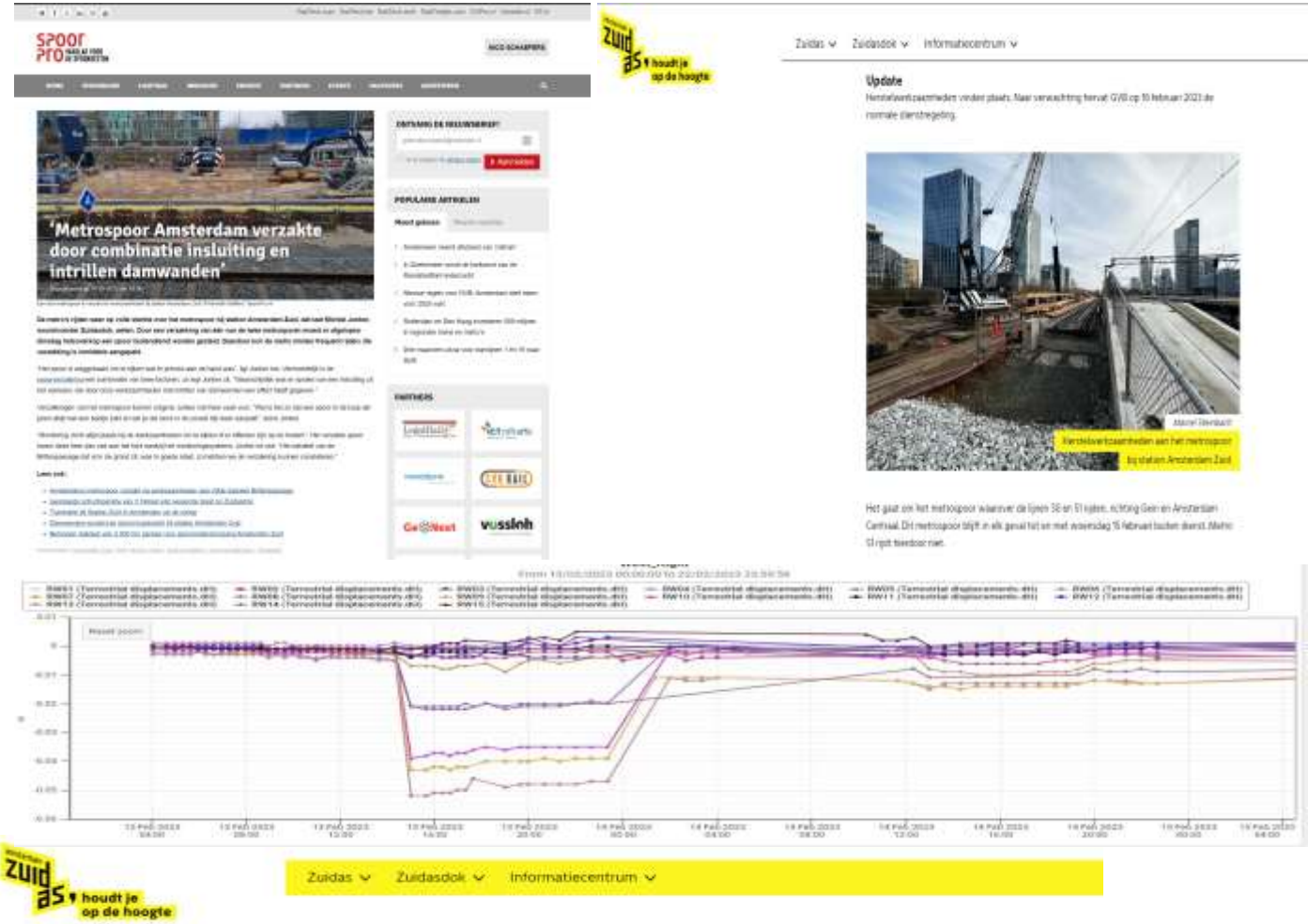
- Reduced incidents and accidents
- Improved response times to potential threats
- Enhancing passengers' safety

Operational Efficiency

- Optimal resource allocation
- 24h operational
- Mitigating risks
- Time and cost efficiency
- Minimizing service interruptions

Summary

- The critical need for real-time monitoring in construction
- Technological advancements, driving safety and efficiency.
- Future directions and potential for further innovation
- IoT sensors and total stations combination



Q&A Session

Thank you!

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