Smart Technology for Innovative Data Collection and Analysis of Pedestrian and Bicycle Paths (STIG)

Project pitch
Small, safe vehicle project

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Background

- Data collection from pedestrian/bicycle networks is lacking compared to car roads
- Lack of maintenance leads to safety risks and reduced usage
- Traditional inspection methods are time-consuming and don't provide comprehensive coverage
- Helsingbotica pre-study shows potential for image-based data collection but needs adaptation for pedestrian/bicycle paths

TRAFIK

En av fem cykelolyckor under våren sker på grund av grus

2:10 min Dela

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- Förra året registrerades omkring 11 000 cykelolyckor i landet. Under våren orsakas 20 procent av alla singelcykelolyckor på grund av grus som ligger kvar på landets vägar.
- Resten av året är siffran 10 procent, enligt statistik från polisens och sjukvårdens gemensamma olycksdatabas. Samtidigt tros mörkertalet vara stort då många olyckor som inte kräver sjukhusvård inte rapporteras.
- ”Det är viktigt att ta upp vintersanden tidigt på året sedan är det ju en stor process för kommunerna, både kostnadsmässigt och resursmässigt”, säger Anna Niska, forskningsledare på VTI, statens väg- och transportforskningsinstitut.

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Project Goals

- Develop prototype (TRL 5-6) for AI-based analysis of pedestrian/bicycle path images
- Evaluate different data collection methods (cyclists, maintenance machines, etc.)
- Link identified damages to the ”Bära eller Brista” (en. ”Bear or Break”) methodology
- Develop implementation and procurement guidelines

Project execution

AP1 - Project Management

AP2 - Use Scenarios

- Identification of use scenarios (e.g., night cycling, commuting)
- Mapping scenarios to infrastructure parameters (what needs to be identified in these scenarios)
- Initial data collection on selected routes

Project execution

AP3 - Technology Development

- Implement machine learning model for detection and geolocation of infrastructure elements on pedestrian/bicycle paths
- Coordinate data collection with municipalities for ground truth validation
- Iterate and optimize the system until desired precision is achieved

AP4 - Field Testing

- Testing different collection methods:
  - Stockholm: Cycle patrol, service vehicles
  - Järfälla: Home care services, contractors
  - Helsingborg: Employees, contractors, school children, e-scooters
  - Umeå: Home care services, maintenance vehicles

AP5 - Validation

- Validate analysis results against established standards and technical manuals
- Evaluate method reliability for different infrastructure parameters and identify when complementary measurement methods are needed
- Develop recommendations/feedback for implementation and continued development

Three iterations

Project execution

AP6 - Implementation and Scaling

- Development of procurement documentation linked to “Bära eller brista”
- Implementation guide for municipalities
- GDPR strategy and data management

Partners

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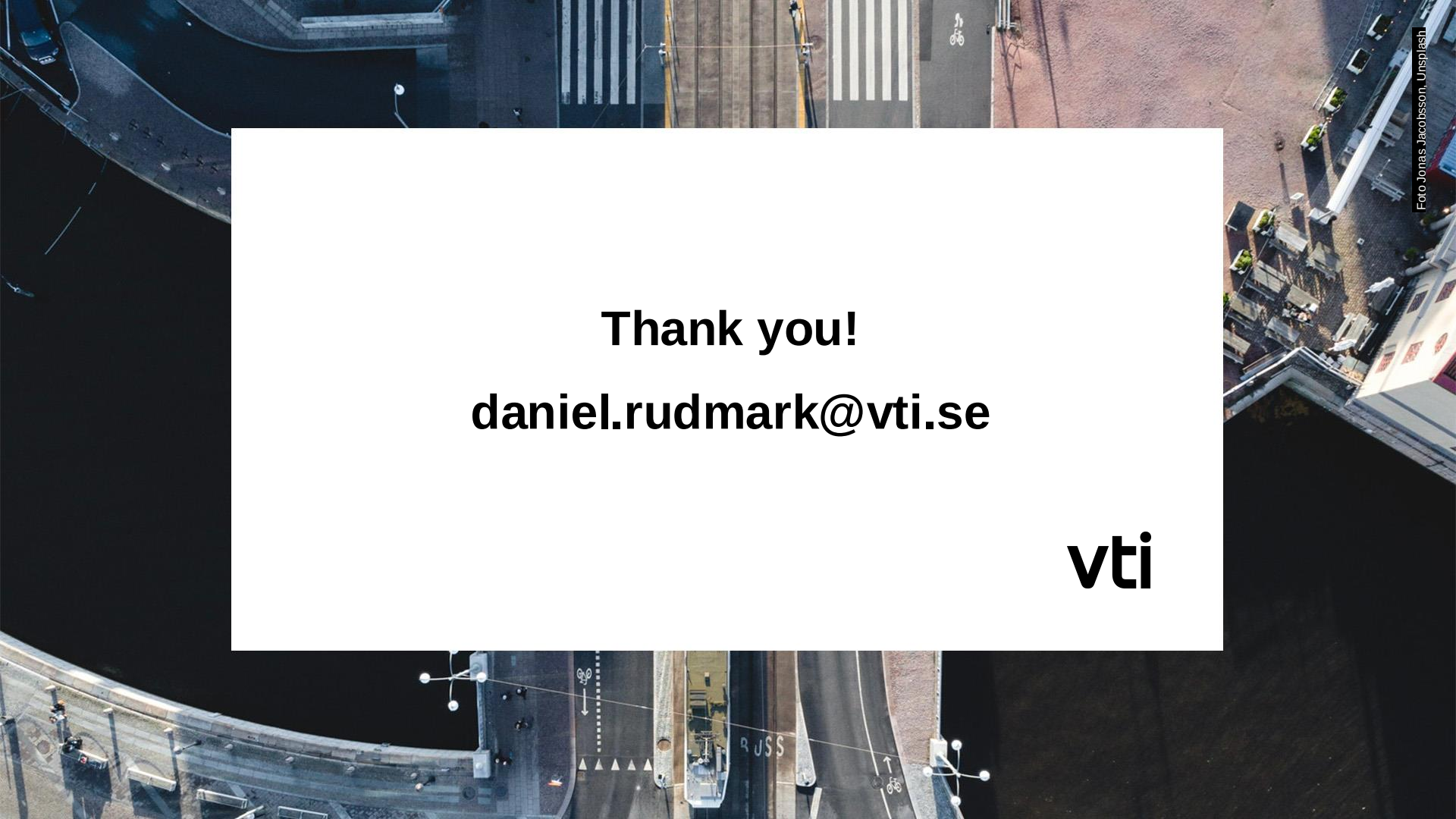

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Thank you!

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