

# 17 MEDZINÁRODNÁ KONFERENCIA ŽELEZNIČNEJ, OZNAMOVACEJ A ZABEZPEČOVACEJ TECHNIKY

• 24. - 26. APRÍL 2023, HOLIDAY INN, ŽILINA

**Implementácia BIM (digitálneho dvojčat'a) v  
projektovaní železničných zabezpečovacích zariadení,  
(Siemens Mobility s.r.o.)**

(Siemens Mobility s.r.o.)

**Tomáš Cesnek**



- Predstavenie oddelenia BIM@MT Siemens Mobility, s. r. o. ,
- Digital Track Capturing,
- Digital Site Survey,
- Q&A.



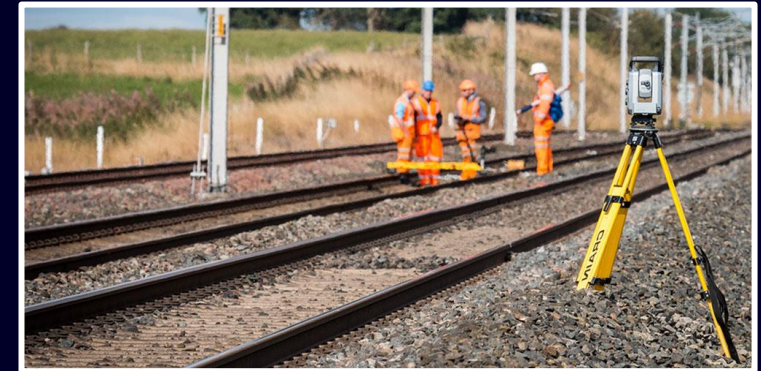
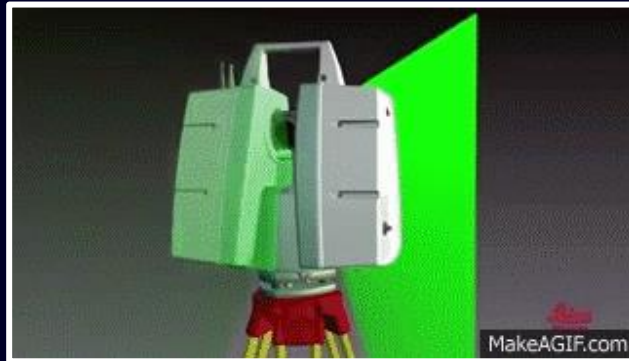
## Siemens Mobility - MT

- Digital Site Survey,
- Room Digitalization,
- BIM,
- Train Driver Simulator,
- Virtual Reality trainings,
- Skenovanie pre RS.

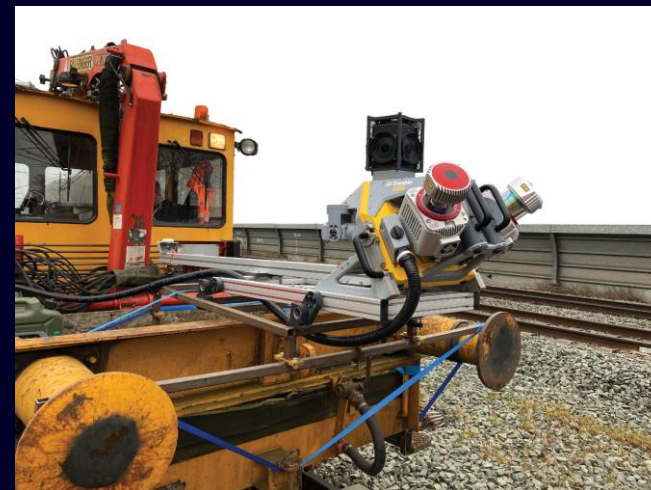




## Digital **Track** Capturing



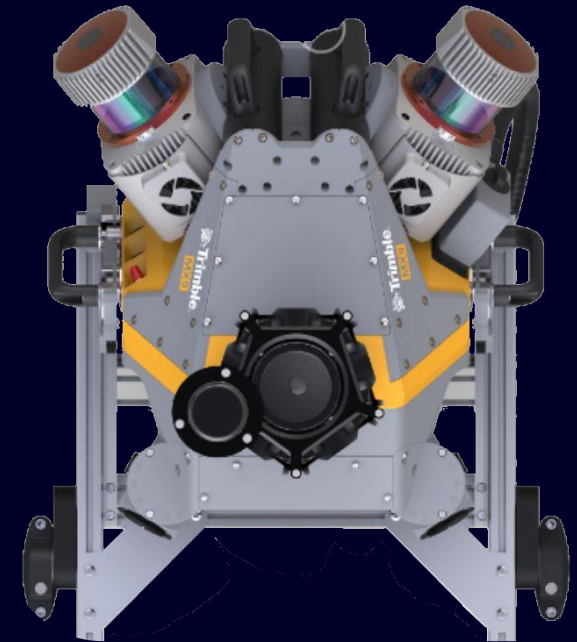
Rýchlosť + Presnosť → **DTC**



**SIEMENS**



# Digital **Track** Capturing

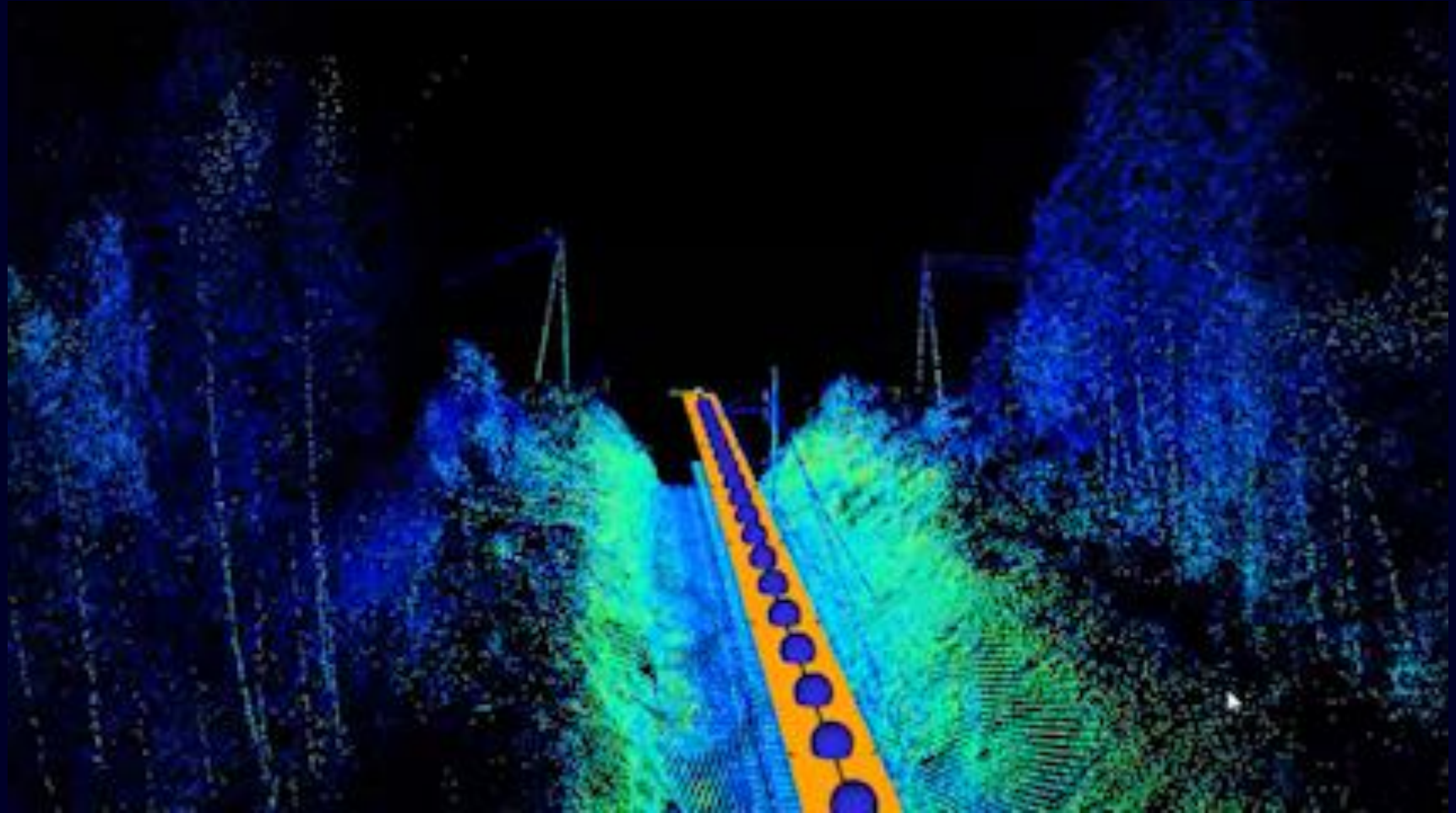


Top View

**Trimble MX9** - Mobile Mapping system



# Digital **Track** Capturing



# Digital Site **Survey**



1. Cloud Publisher,
2. Centerline detection,
3. Signaling element extraction,
4. Digital track layout,
5. BIM.



# Digital Site Survey

## 01. Cloud Publisher



# Digital Site Survey



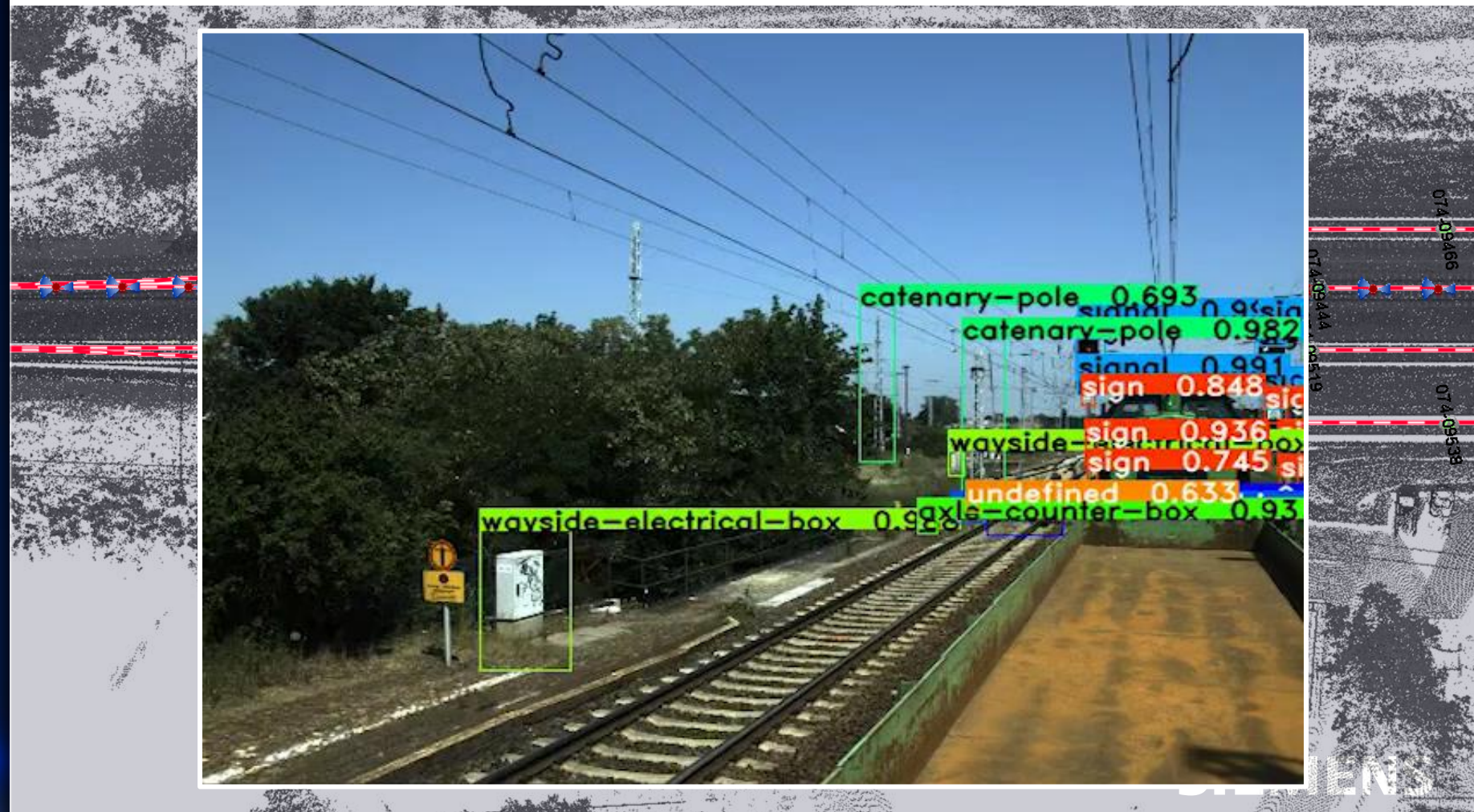
## 02. Centerline detection





# Digital Site Survey

## 03. Signaling element extraction

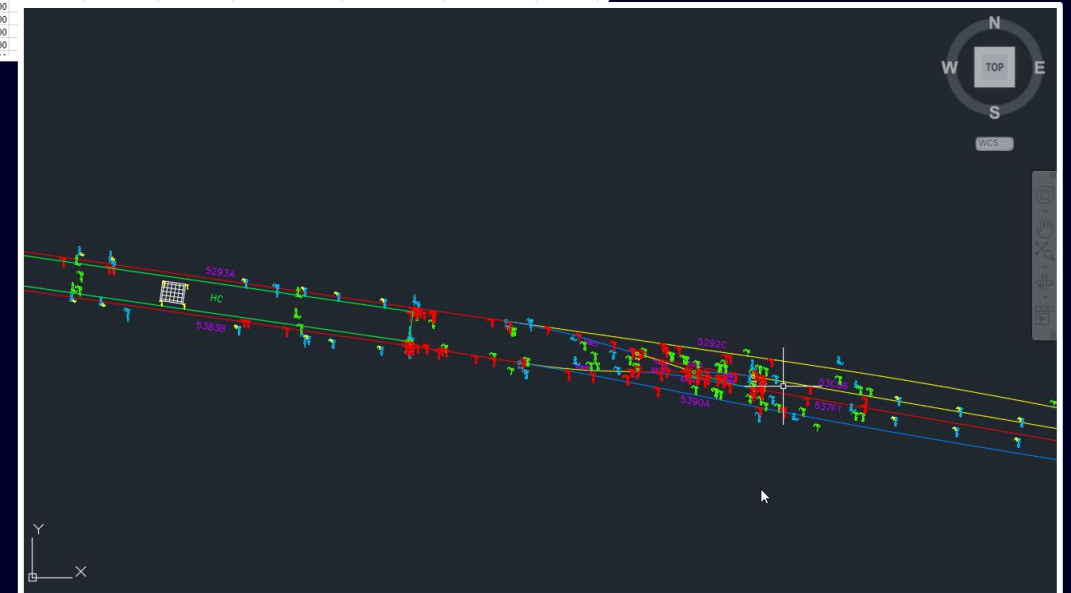
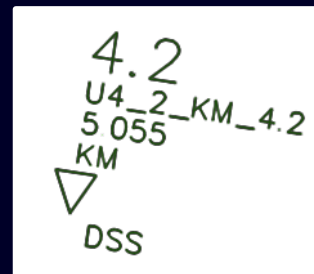




# Digital Site Survey

## 04. Digital track layout

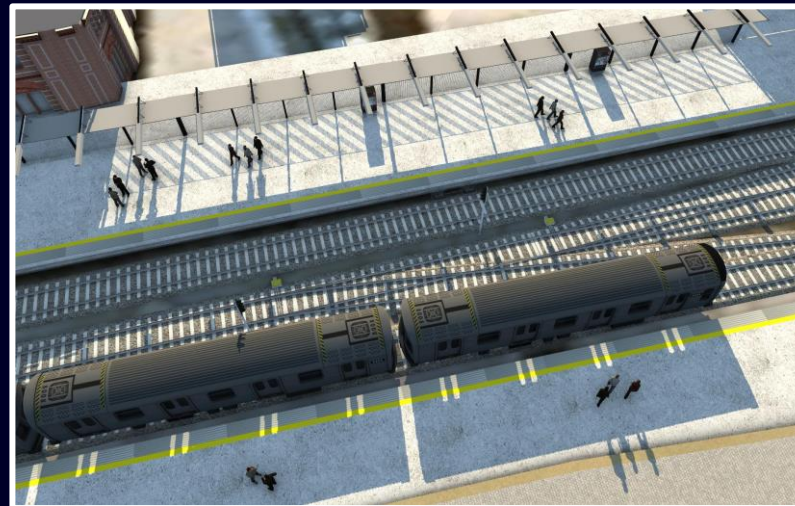
| Station | Edge   | Element Key | Element          | km. plan | Kilometer Point | SSP dDown | SSP bUp | Gradient dDown | Gradient bUp | Link | Remarks   | Track Edge | Line |
|---------|--------|-------------|------------------|----------|-----------------|-----------|---------|----------------|--------------|------|-----------|------------|------|
| 2 BERS  | 43B1.1 | KM_X        | A9               |          | 86.700.0        | 200       |         | -5.4           |              |      | %         | 42W12S1    | 6135 |
| 3 BERS  | 43B1.1 | S<          | 42FF             | 86.700.0 | 86.700.0        | 200       | 200     | -5.4           | 5.4 SBWA     |      | %         | 42W12S1    | 6135 |
| 4 BERS  | 43B1.1 | BG<         | 074-09296        |          | 86.708.0        | 200       | 200     | -5.4           | 5.4 SBWA     |      | %T20<T38< | 42W12S1    | 6135 |
| 5 BERS  | 43B1.1 | GR_CHANGE   |                  |          | 86.987.0        | 200       | 200     | 0.0            | 5.4          |      | %         | 42W12S1    | 6135 |
| 6 BERS  | 43B1.1 | BG<         | 074-09297        |          | 87.000.0        | 200       | 200     | 0.0            | 0.0 SBWA     |      | %T23<     | 42W12S1    | 6135 |
| 7 BERS  | 43B1.1 | GR_CHANGE   |                  |          | 87.476.0        | 200       | 200     | -0.3           | 0.0          |      | %         | 42W12S1    | 6135 |
| 8 BERS  | 43B1.1 | GR_CHANGE   |                  |          | 88.140.0        | 200       | 200     | -4.0           | 0.3          |      | %         | 42W12S1    | 6135 |
| 9 BERS  | 43B1.1 | BG>         | 074-09321        |          | 88.395.0        | 200       | 200     | -4.0           | 4.0 SBWA     |      | %T25<     | 42W12S1    | 6135 |
| 10 BERS | 43B1.1 | BG>         | 074-09322        |          | 89.790.0        | 200       | 200     | -4.0           | 4.0 SBWA     |      | %T25<     | 42W12S1    | 6135 |
| 11 BERS | 43B1.1 | GR_CHANGE   |                  |          | 89.915.0        | 200       | 200     | -2.0           | 4.0          |      | %         | 42W12S1    | 6135 |
| 12 BERS | 43B1.1 | GR_CHANGE   |                  |          | 90.065.0        | 200       | 200     | -1.2           | 2.0          |      | %         | 42W12S1    | 6135 |
| 13 BERS | 43B1.1 | GR_CHANGE   |                  |          | 90.548.0        | 200       | 200     | -0.4           | 1.2          |      | %         | 42W12S1    | 6135 |
| 14 BERS | 43B1.1 | BG>         | 074-09325        |          | 91.185.0        | 200       | 200     | -0.4           | 0.4          |      | %T25<     | 42W12S1    | 6135 |
| 15 BERS | 43B1.1 | GR_CHANGE   |                  |          | 91.300.0        | 200       | 200     | -1.4           | 0.4          |      | %         | 42W12S1    | 6135 |
| 16 BERS | 43B1.1 | BG>         | 074-09326        |          | 92.081.0        | 200       | 200     | -1.4           | 1.4          |      | %T28>     | 42W12S1    | 6135 |
| 17 BERS | 43B1.1 | BG>         | 074-09327        |          | 92.581.0        | 200       | 200     | -1.4           | 1.4          |      | %T23>T37> | 42W12S1    | 6135 |
| 18 BERS | 43B1.1 | KM_E        |                  |          | 92.701.0        | 200       | 200     | -1.4           | 1.4          |      | %         | 42W12S1    | 6135 |
| 19 BERS | 43B1.2 | KM_E        |                  |          | 92.700.0        | 200       | 200     | -1.4           | 1.4          |      | %         | 42W12S2    | 6135 |
| 20 BERS | 43B1.2 | GR_CHANGE   |                  |          | 92.717.0        | 200       | 200     | -1.8           | 1.4          |      | %         | 42W12S2    | 6135 |
| 21 BERS | 43B1.2 | BG>         | 074-09328        |          | 92.874.0        | 200       | 200     | -1.8           | 1.8          |      | %T28>T38< | 42W12S2    | 6135 |
| 22 BERS | 43B1.2 | S>          | 43A              | 92.880.0 | 92.880.0        | 200       | 200     | -1.8           | 1.8          |      | %         | 42W12S2    | 6135 |
| 23 BERS | 43B1.2 | J           | 43G101A          |          | 92.880.0        | 200       | 200     | -1.8           | 1.8          |      | %         | 42W12S2    | 6135 |
| 24 BERS | 43G101 | L_DP>       | 43A              |          | 93.182.0        | 200       |         |                |              |      |           |            |      |
| 25 BERS | 43G101 | J           | 43B143G10143G201 |          | 93.182.0        | 200       |         |                |              |      |           |            |      |
| 26 BERS | 43G201 | J           | 43G20143W11      |          | 93.222.0        | 200       |         |                |              |      |           |            |      |
| 27 BERS | 43W1A  | L_OL<       | 43P1_OL3         |          | 93.222.0        | 200       |         |                |              |      |           |            |      |



# Digital Site Survey



## 05. BIM



# Digital Site Survey



## Train Driver Simulator



## Q&A

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Digital Site Survey

Digital Track Capturing

BIM@MT

Obsah prezentácie



# Questions

&

# Answers

# Kontakt



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