



3D from theory to practice

WHO is Topcon?



GeoPositioning

Optical Instruments Total Stations GPS Systems	Laser Scanning Mobile Mapping GPS Networks	Field Controllers Software Survey Solutions
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Agriculture

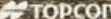
Analyse des cultures Gestion de données	Guidage et Autopilotage Pesage et mesure Cartographie	Implémenter le contrôle Gestion des aliments
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Construction

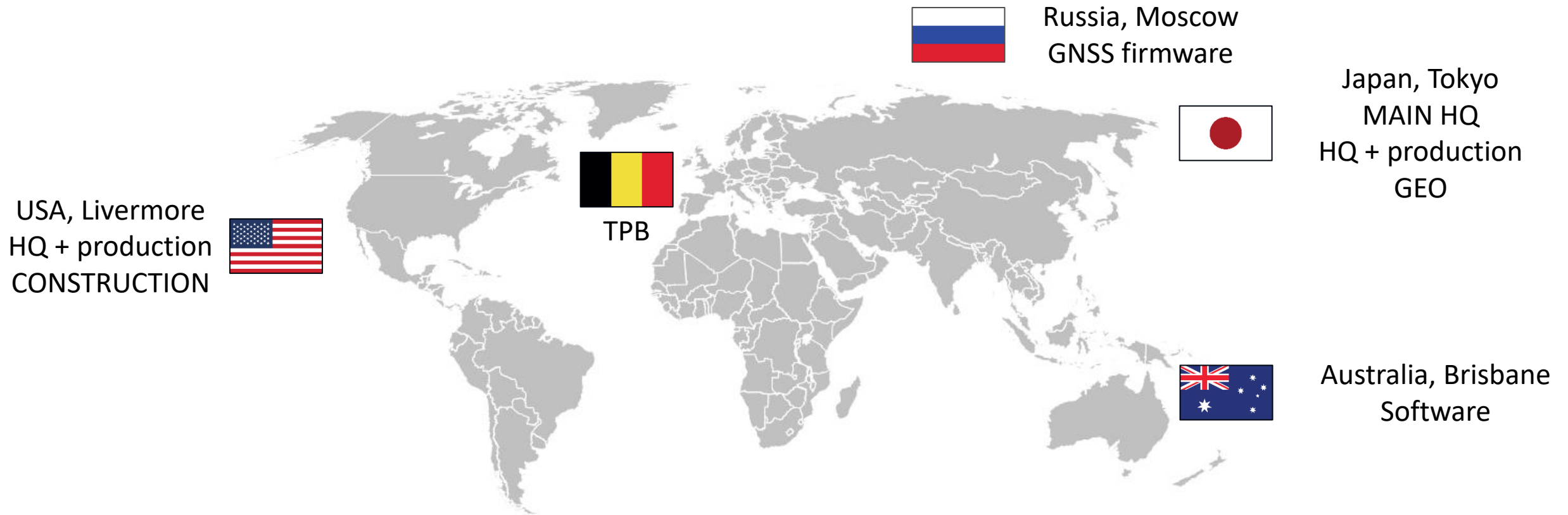
Elevation Lasers Alignment Lasers GPS Rovers	Layout Instruments Equipment Automation Sonic Grade Control	Workflow Solutions Telematics Site Management
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Topcon's world map



Digital workflow

Plan

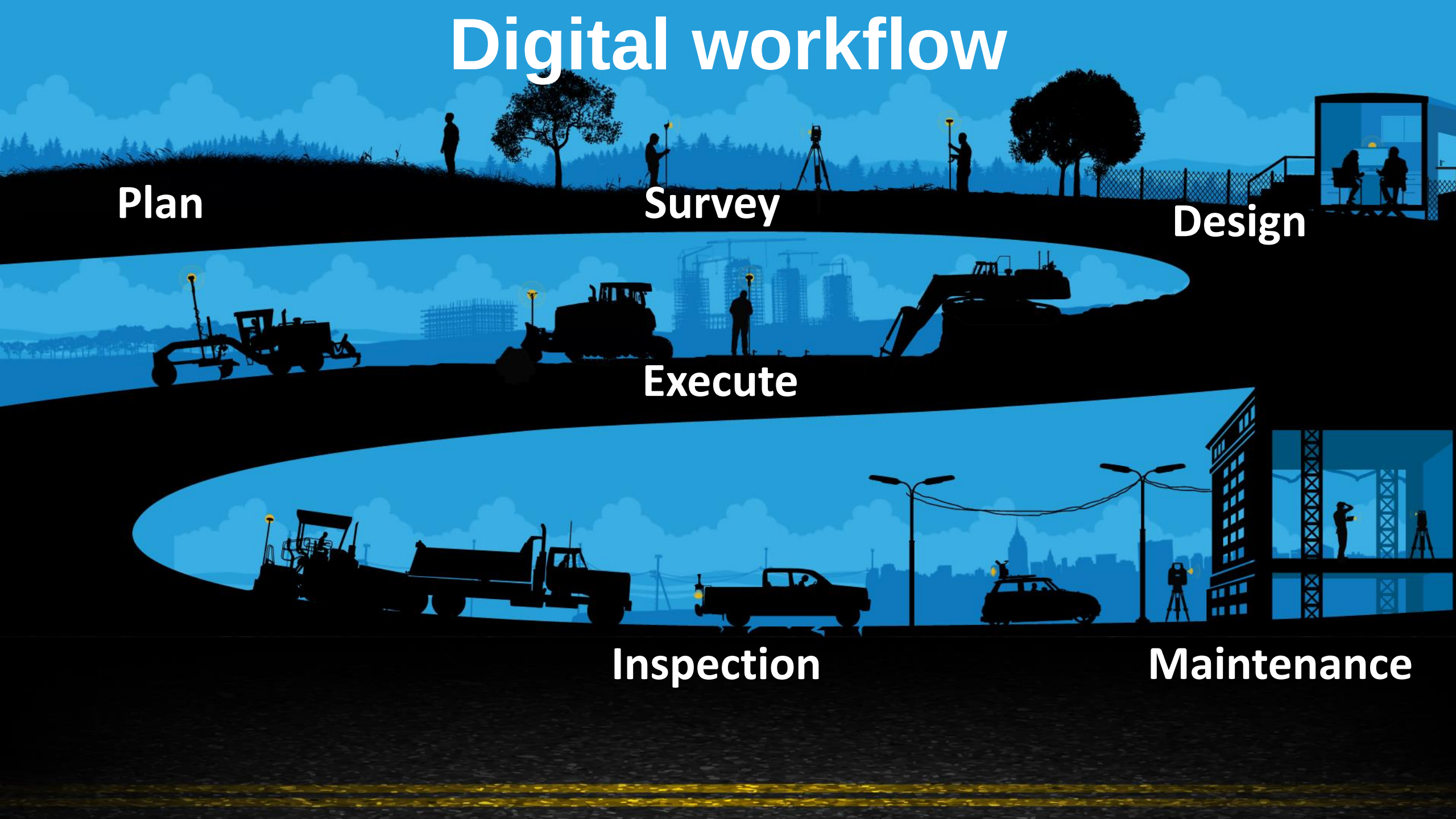
Survey

Design

Execute

Inspection

Maintenance



3D from theory to practice

3D system on a slipform paver

Workflow



3D Sensor input

- LPS: total stations



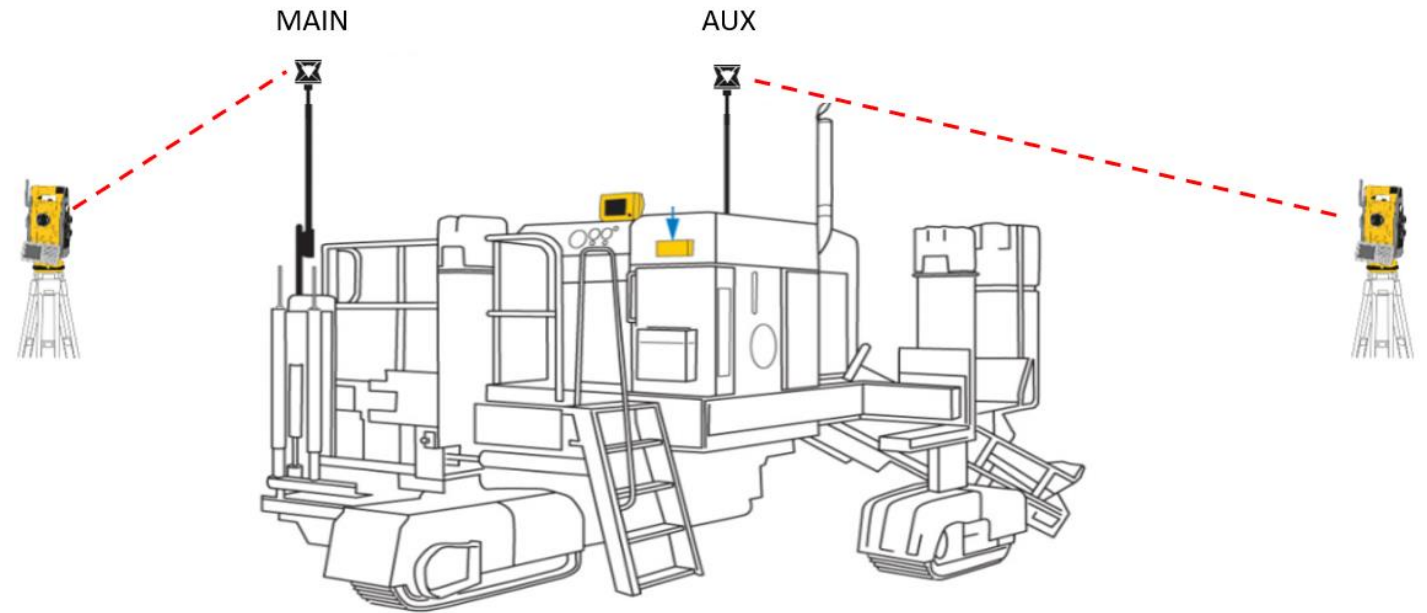
- MMGPS



LPS: Local Positioning System

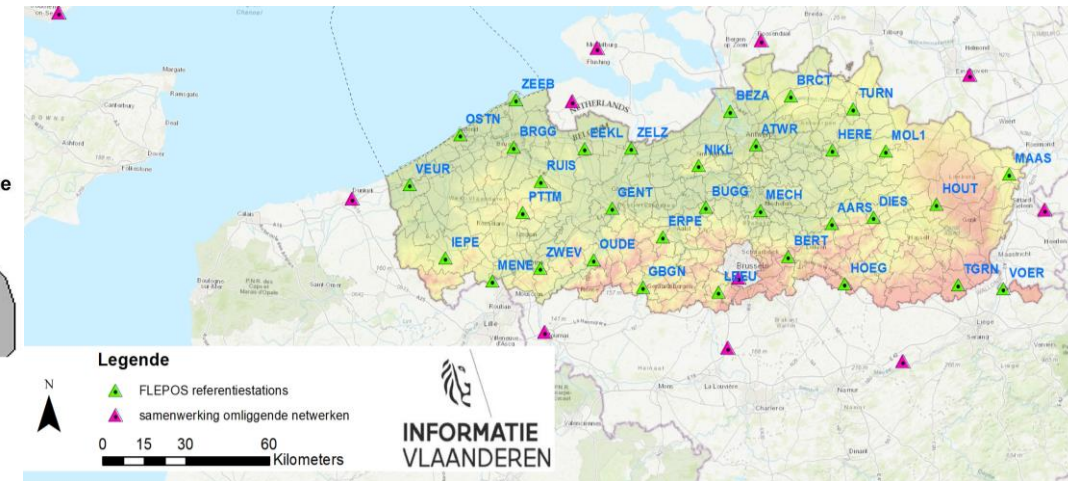
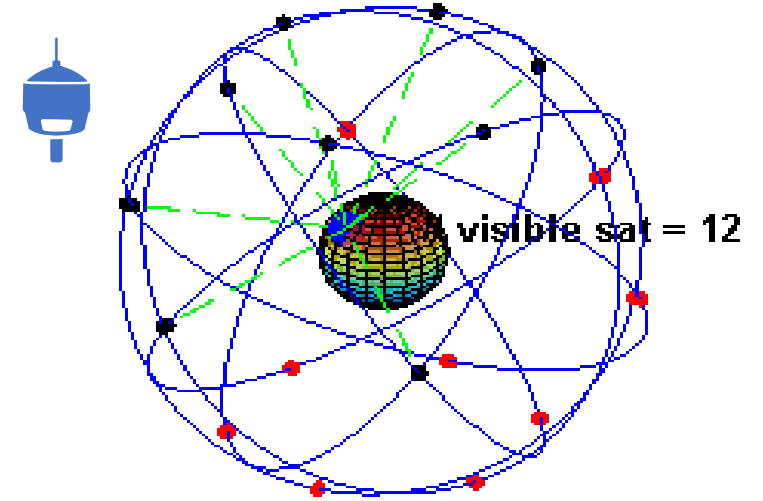
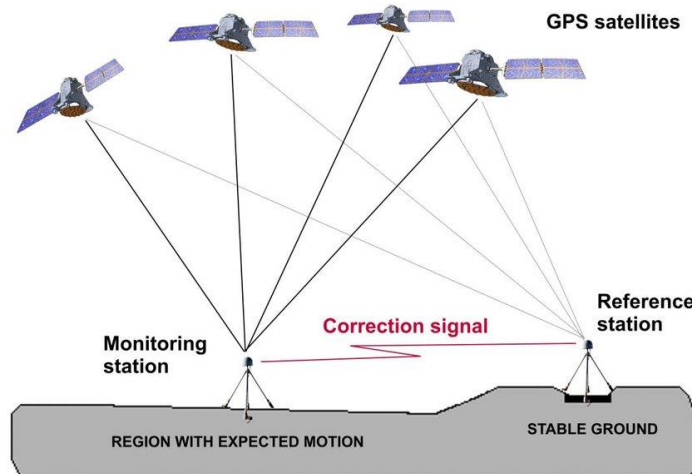


- 2 Total stations + 2 machine prisms
- Optical 1 on 1 “connection”
- Main (position of machine)
- Aux (heading of machine)
- Resection by control points
- Application: tunnels, city center,...



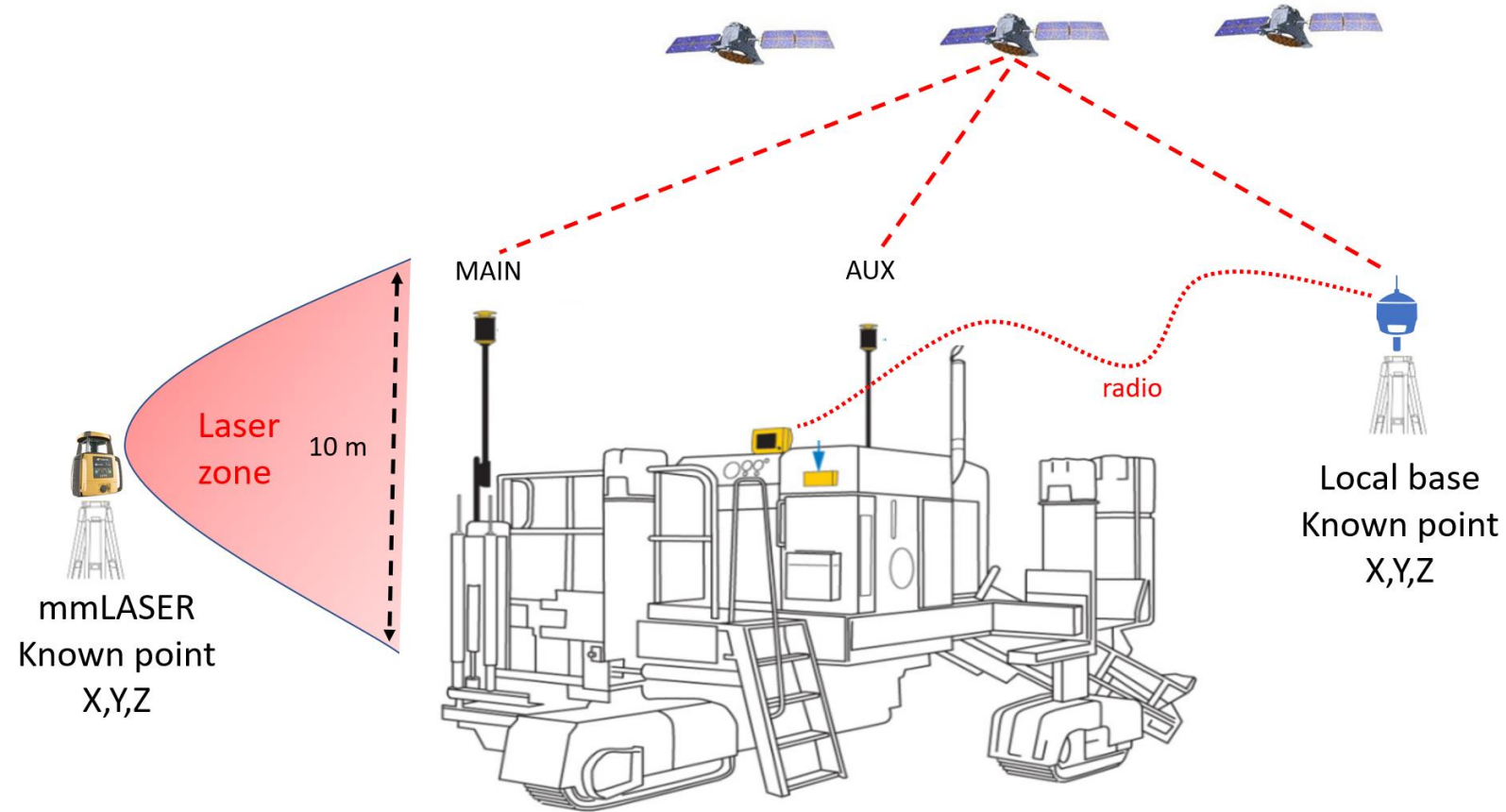
GNSS: Global Navigation Satellite System

- Satellite signals (GPS, GLO, GAL, BEI)
- GNSS Receiver (raw position)
- RTK network corrections
- **Virtual** reference station
- “Precise” position



mmGPS

- Positioning by GNSS
- **Local** base station (radio)
- Main (position of machine)
- Aux (heading of machine)
- Known reference points (X,Y,Z)
- Z: mm precision by mmLASER
- Multiple receivers on 1 source



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Workflow

3D Sensor input



Define position
reference point



Calculate offset
to alignment

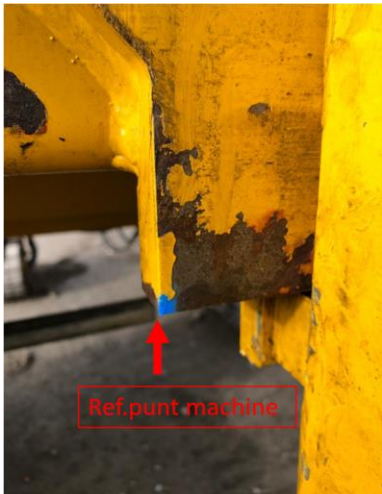


Output data to
machine



Reference point on machine

- Position MAIN and AUX towards ref point
- Position of mold towards ref point
- POI: MOLD



Curber w/mmGPS

Antenna: **Topcon PZ5-MC (mmGPS)**

Above (1)	3.480m
Right (2)	0.143m
Ahead (3)	0.674m

Mold Offsets

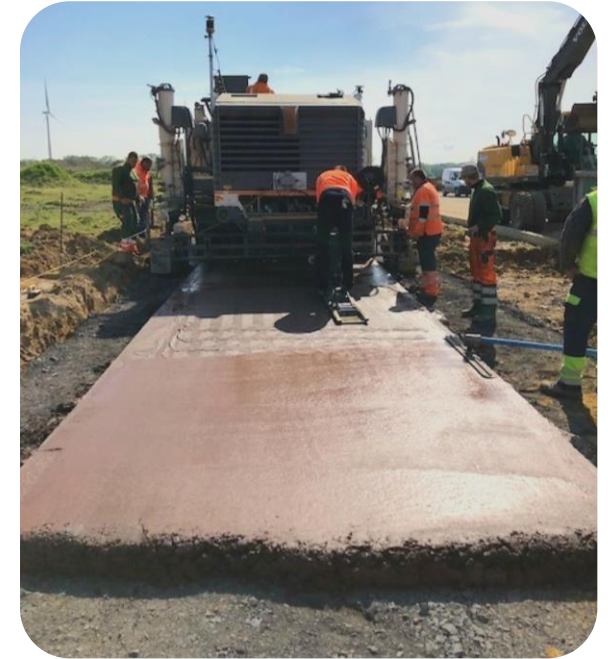
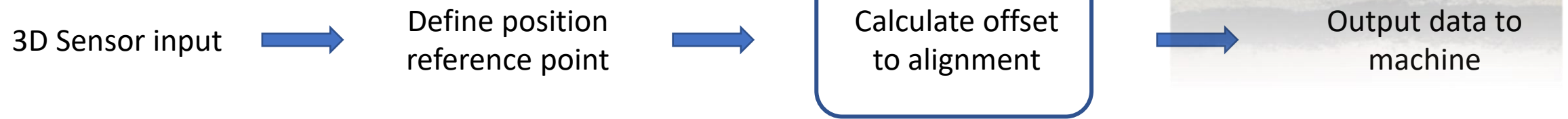
Mold Name: **fund 50**

Below (1)	1.315m
Left (2)	0.563m
Ahead (3)	0.841m
Length (4)	1.950m
Width :	

3D from theory to practice

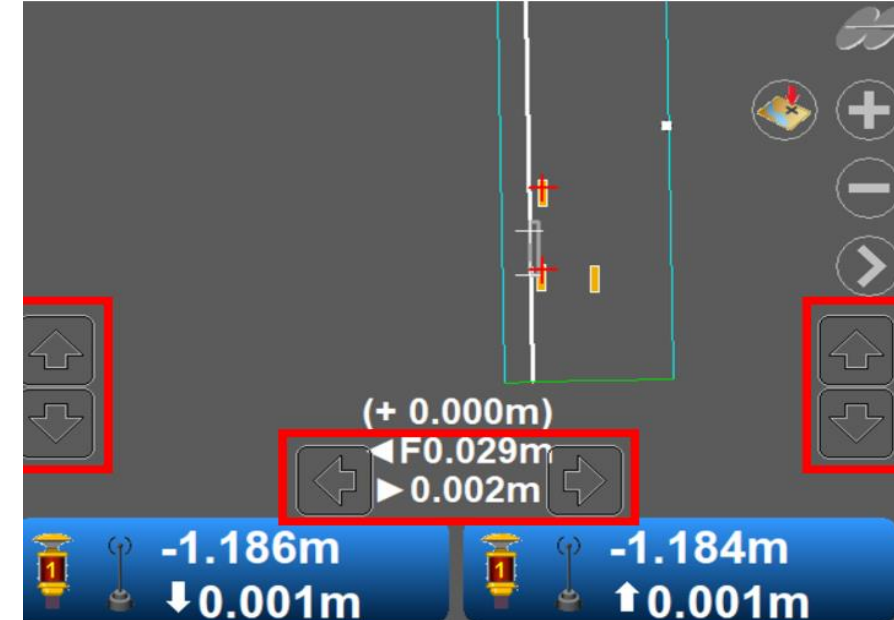
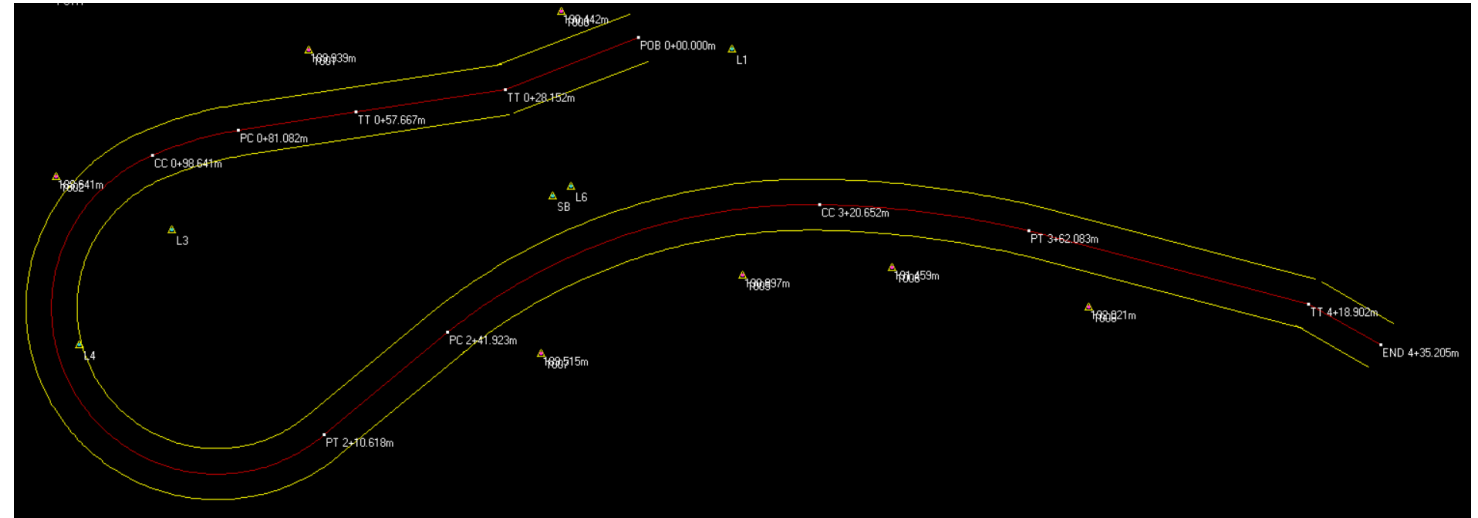
3D system on a slipform paver

Workflow



Offset to alignment

- Digital stringline
- POI mold
- Horizontal and vertical profile
- Templates for variable slope segments
- Radius info in curves
- Set points in software to add additional offset to alignment (position and elevation)
- Example: pitch machine (front track) for pressure on concrete when exiting mold



3D from theory to practice

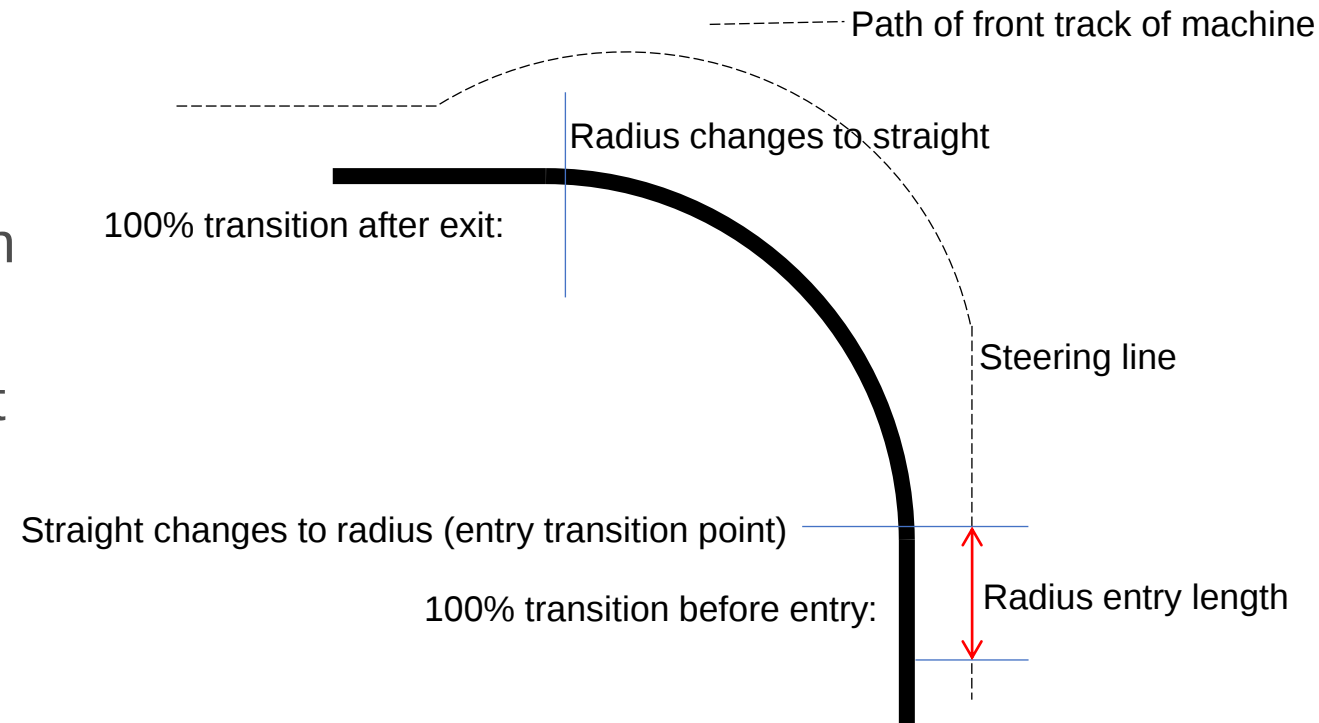
3D system on a slipform paver

Workflow



Output data to machine

- Compatible with major brands
- Only CAN machines
- Position of tracks is crucial 3DMC
- Software can steer machine very smooth in and out radius
- Digital soft wand straight vs radius left/right



Advantages 3D system

- DIGITAL stringline
 - Stake-out
 - Material
 - Obstruction
 - Labor
 - Time
- Auto transition from straight to radius
- Difficult situations
- Difficult shapes
- Exchangeable hardware LPS and mmGPS

< COSTS



Training

- Jobsite preparation
 - Control points
 - Design (alignment)
 - Calibrate mold
 - On jobsite preparation possible
- Training is a step-by-step process



Topcon
University

Questions?

