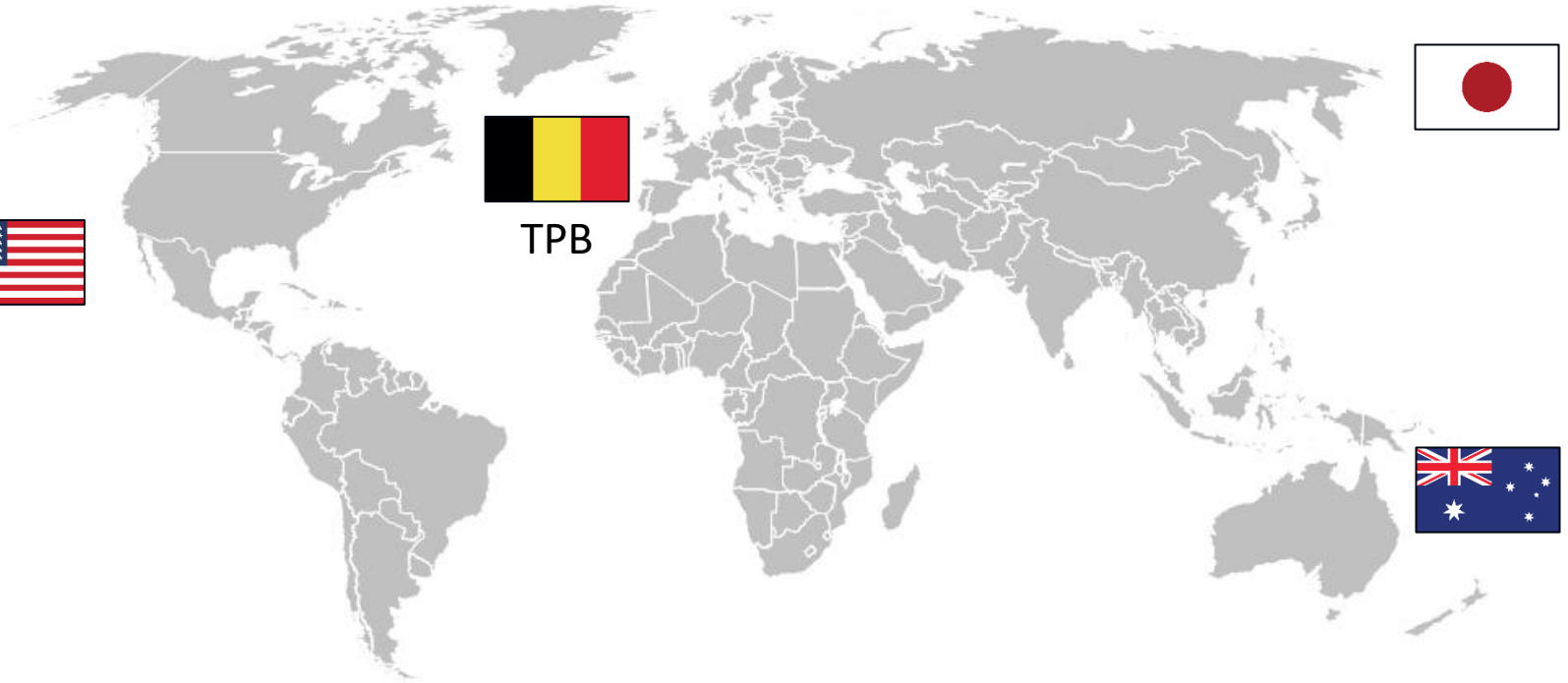
3D from theory to practice

WHO is Topcon?

Topcon's world map



Russia, Moscow
GNSS firmware

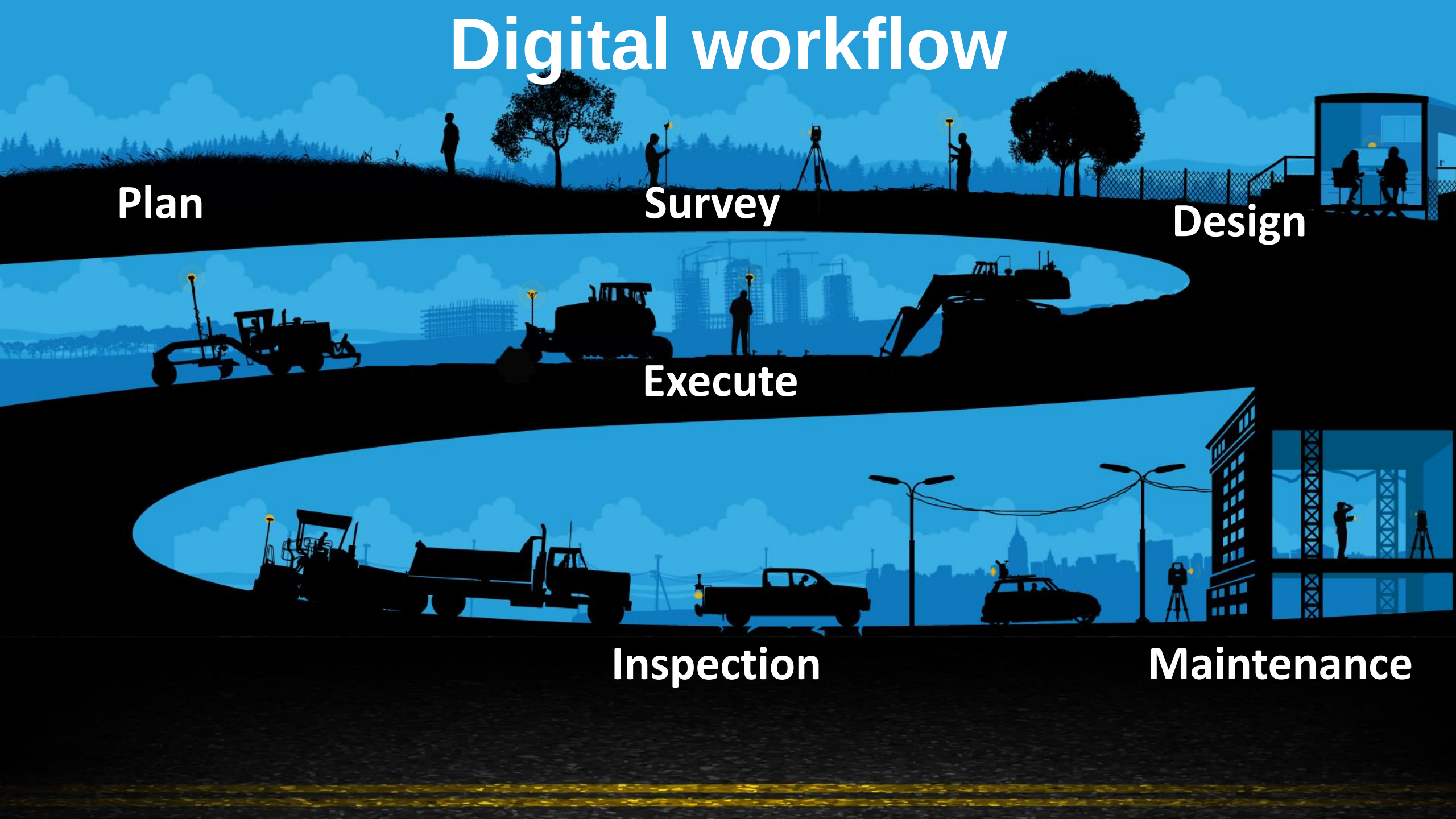
Japan, Tokyo
MAIN HQ
HQ + production
GEO

USA, Livermore
HQ + production
CONSTRUCTION

TPB

Australia, Brisbane
Software

Digital workflow



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3D system on a slipform paver

Workflow

3D Sensor input → Define position reference point → Calculate offset to alignment → Output data to machine

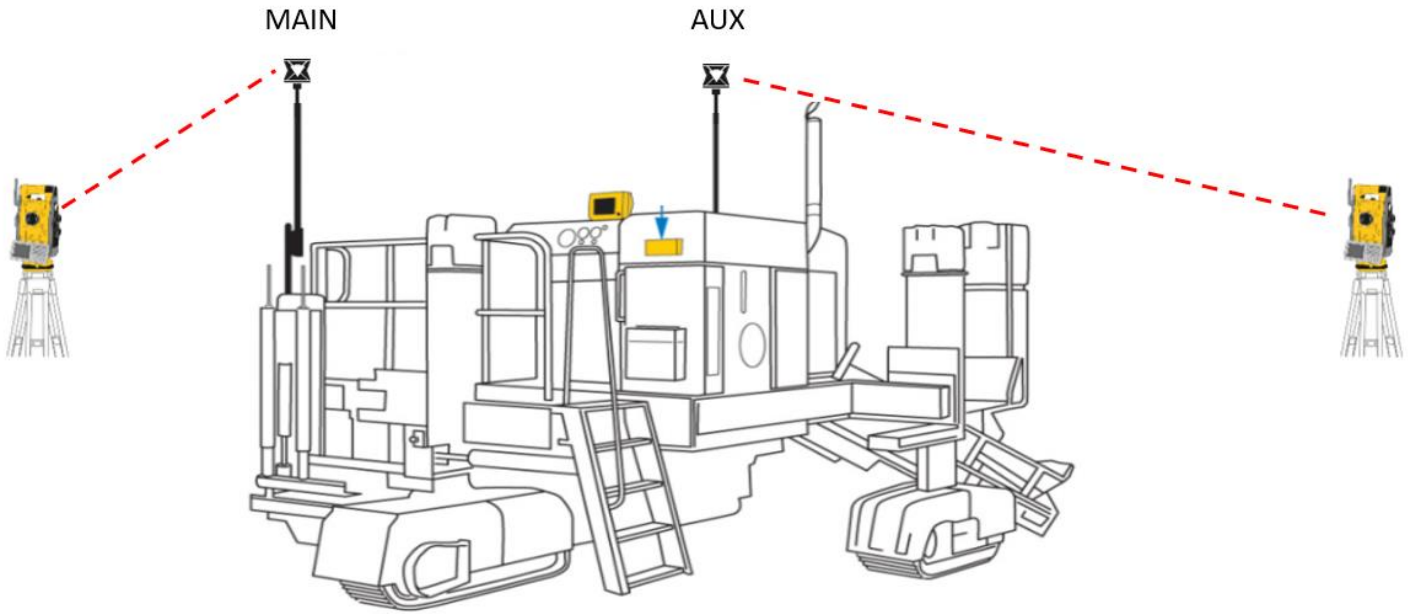
3D Sensor input

- LPS: total stations

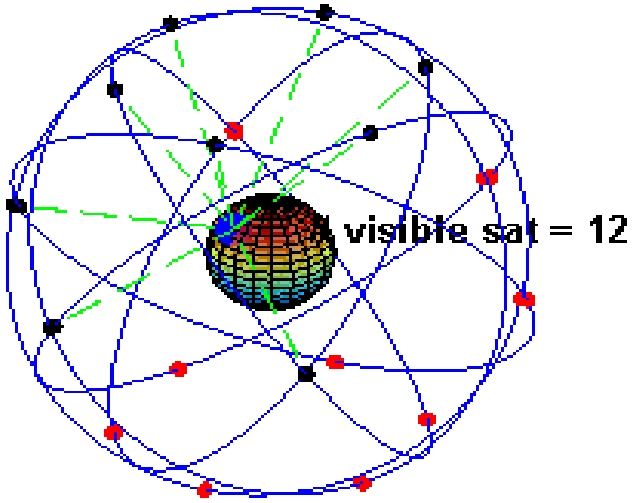
- MMGPS

LPS: Local Positioning System

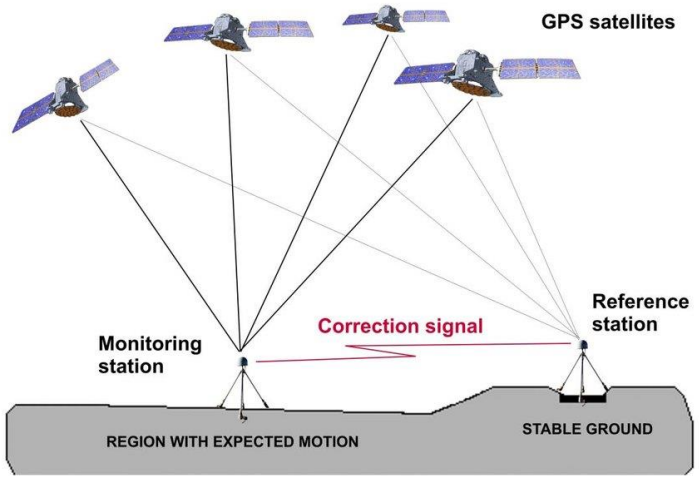
- 2 Total stations + 2 machine prisms
- Optical 1 on 1 “connection”
- Main (position of machine)
- Aux (heading of machine)
- Resection by control points
- Application: tunnels, city center,…

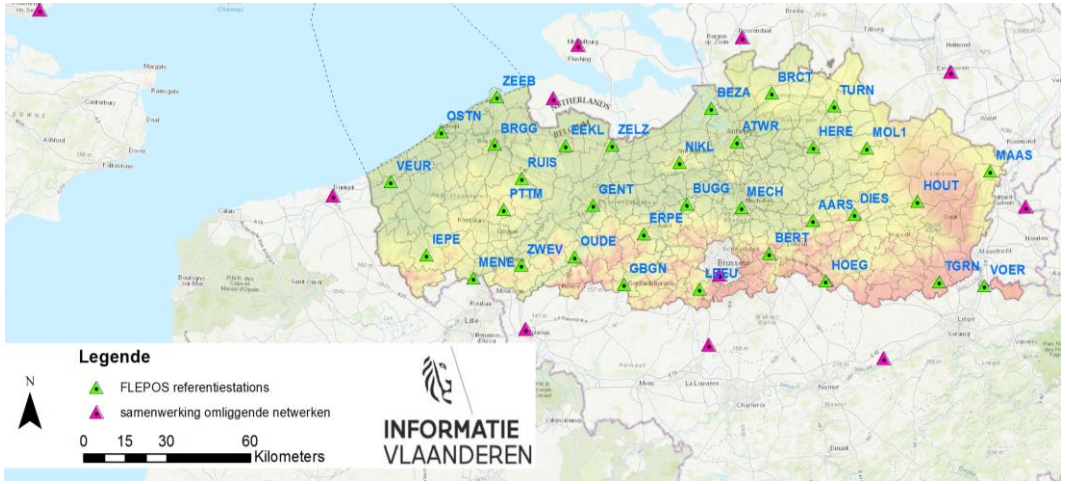


GNSS: Global Navigation Satellite System



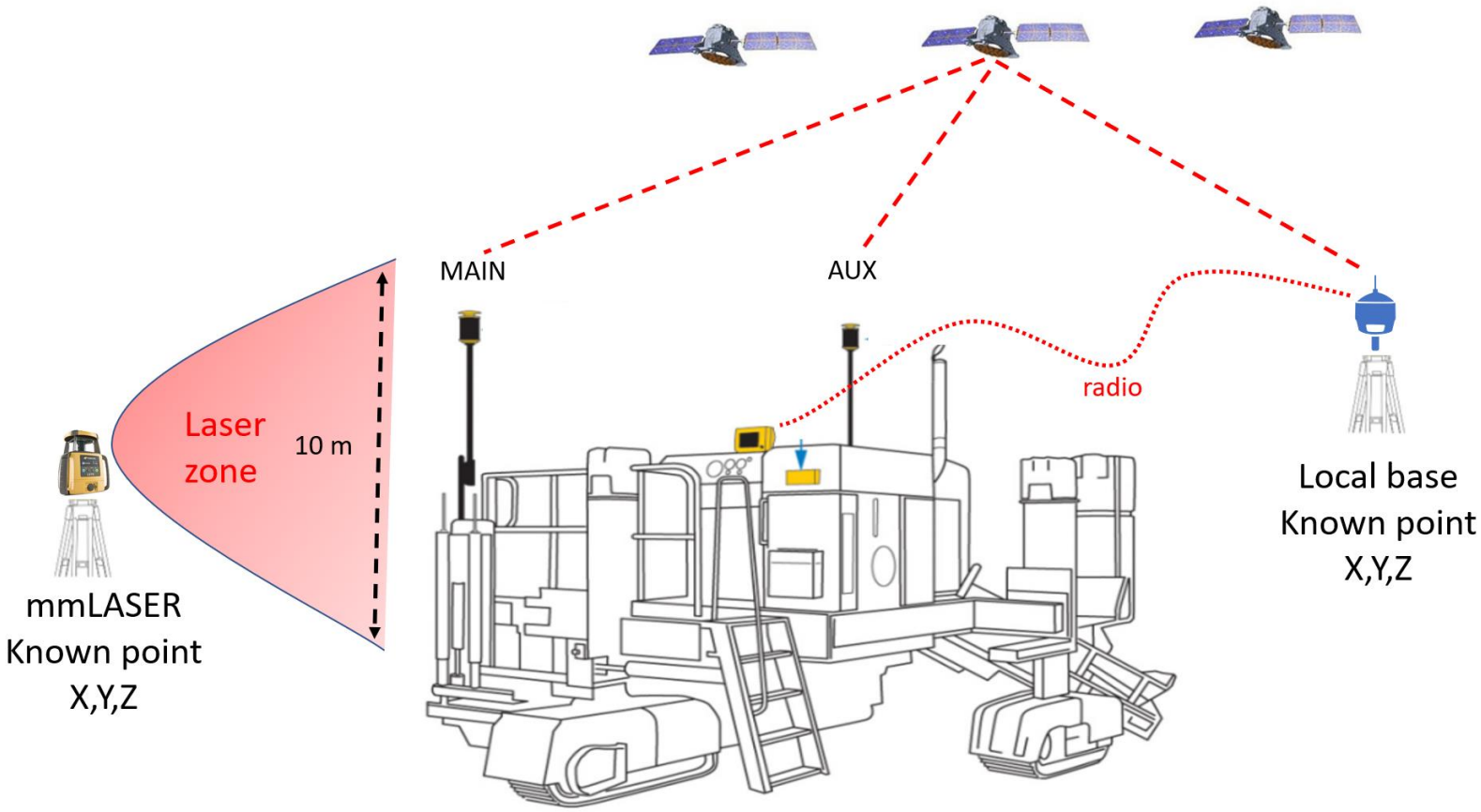
- Satellite signals (GPS, GLO, GAL, BEI)
- GNSS Receiver (raw position)
- RTK network corrections
- **Virtual** reference station
- “Precise” position





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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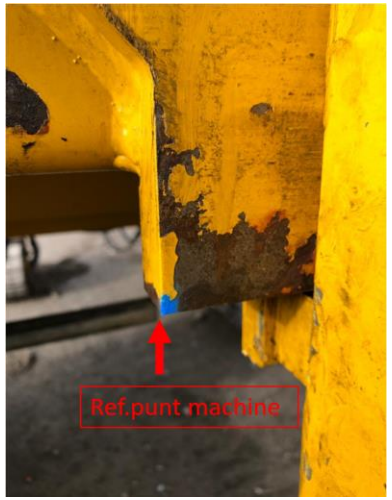
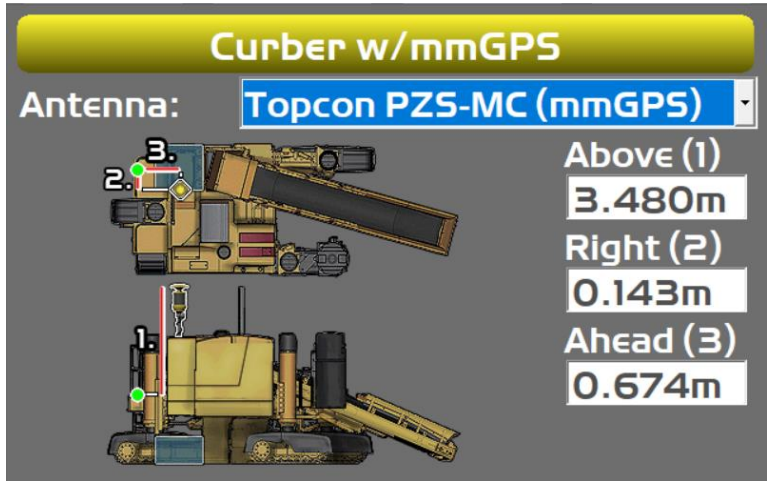
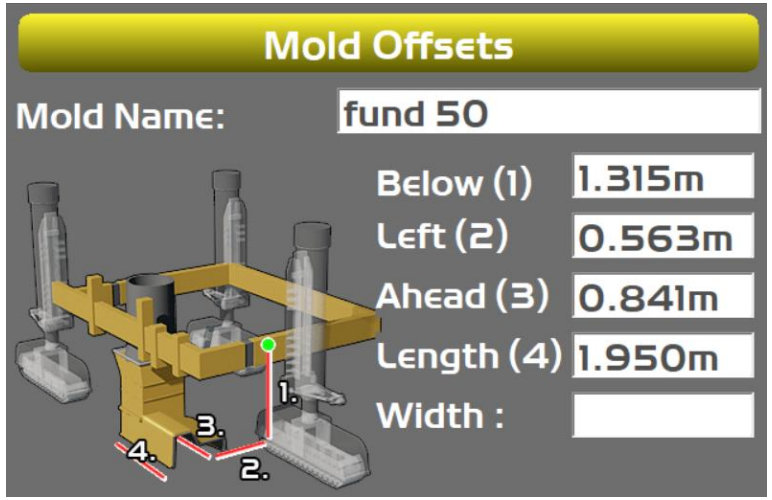
Reference point on machine

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







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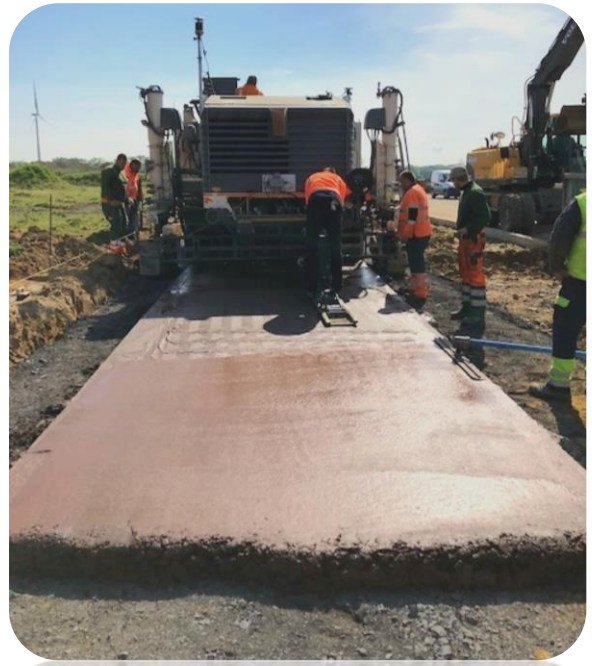
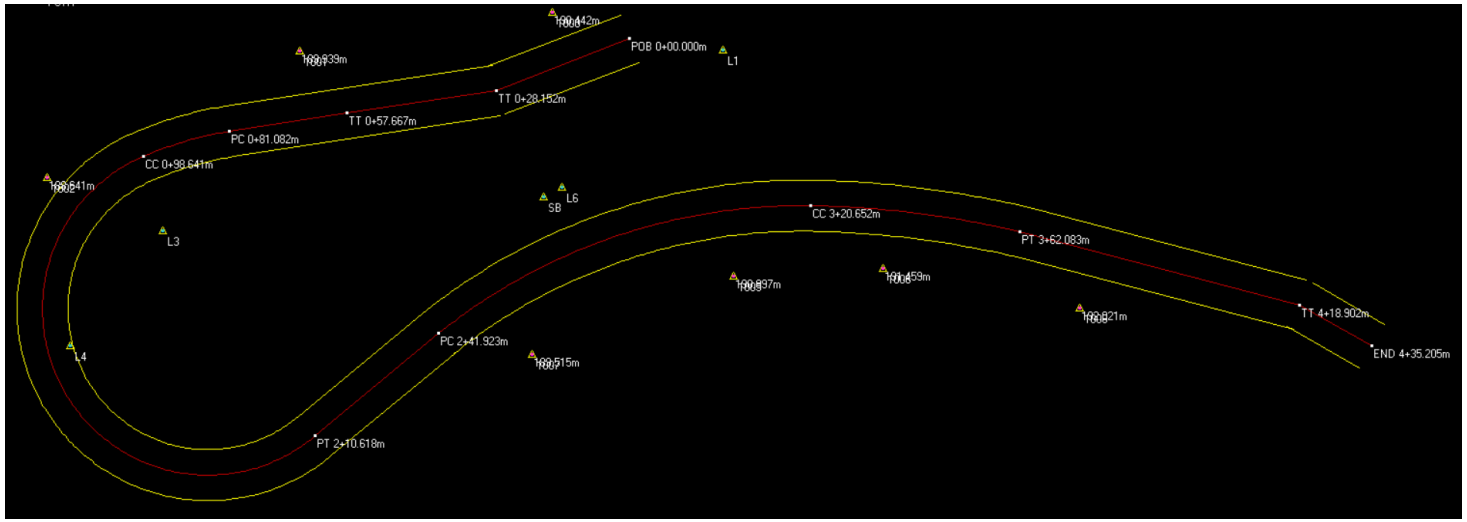


Workflow

3D Sensor input → Define position reference point → Calculate offset to alignment → Output data to machine

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

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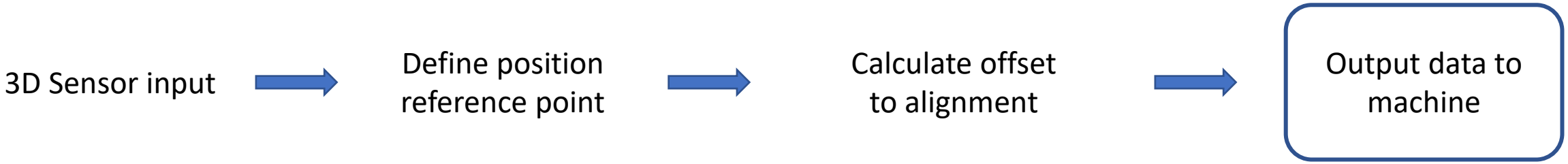
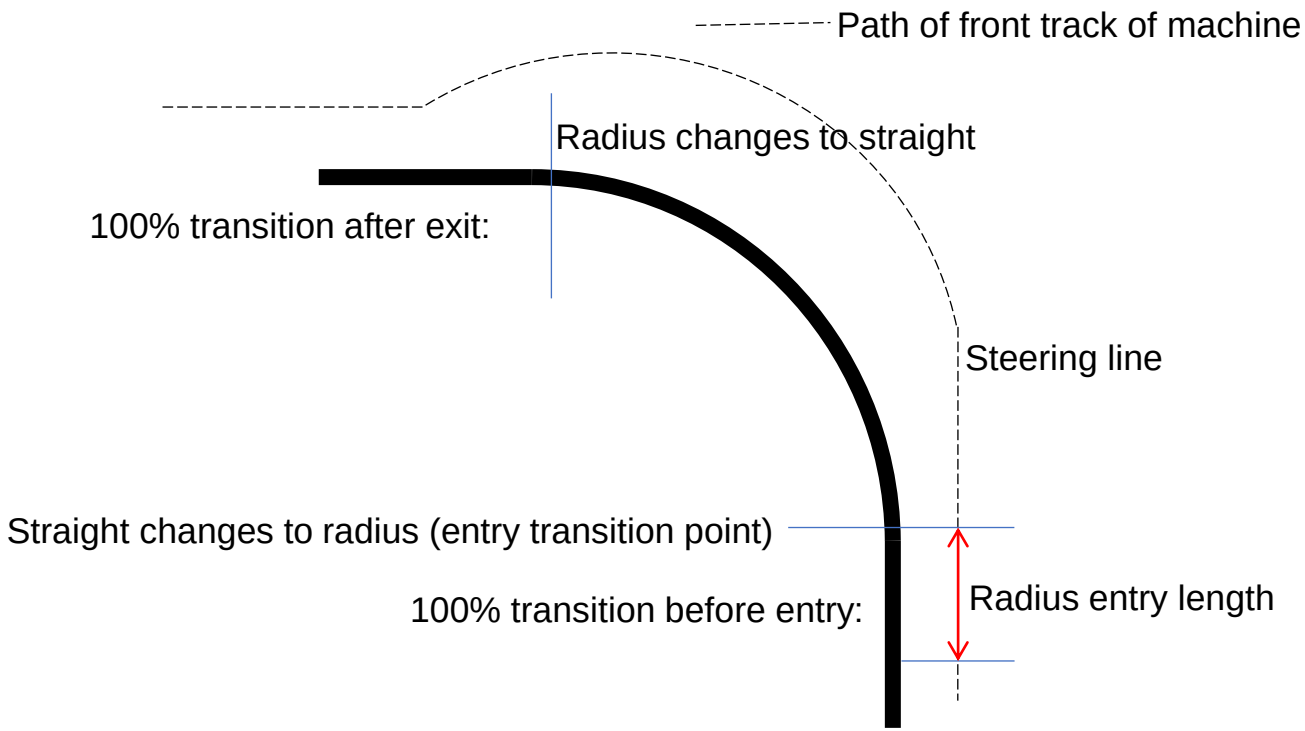
Workflow

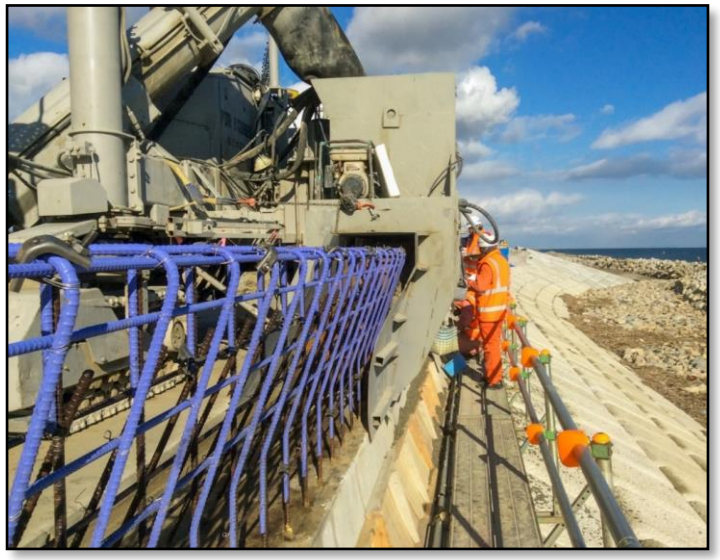


Output data to machine

- 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~~

< COSTS

  - Auto transition from straight to radius
  - Difficult situations
  - Difficult shapes
- Exchangeable hardware LPS and mmGPS

Training

- Jobsite preparation
  - Control points
  - Design (alignment)
  - Calibrate mold
    - On jobsite preparation possible

- Training is a step-by-step process

Topcon University

Questions?


TOPCON