The Accelerating TomTom HD Map
Flywheel

NVIDIA GTC Europe, 11 October 2017
TomTom leads in HD Maps

4 out of top 5 OEMs

Largest coverage: 360,000 km
There are challenges to solve
Maps fulfill key role in autonomous driving

A to B route planning

Enabling perception and path planning

Increased safety and comfort by seeing where sensors can’t see, or by providing redundancy to sensor data

Infotainment

Autonomous driving
Autonomous driving map system

1. Route calculation can be in the cloud or in the vehicle
Single source map making

- Individual observation creation
- Observation aggregation
- Use in path planning and perception

Vehicle
Cloud
HD Map making needs multiple sources

- Single source 1, e.g. monocular cameras
- Single source 2, e.g. solid state LiDARs
- Aftermarket devices
- Mobile mapping vehicles
- Governmental sources
- GPS traces
- Legislation
- SD Map
- Human moderation

Observation aggregation → Fusion and map creation → Map use in path planning and perception
Road surface labelling AI

don-drivable road
solid line
dashed line with long dashes
dashed line with short dashes
 drivable road
emergency lane
Running the AI
Applying our technology to a dashcam
## Comparing map making approaches

<table>
<thead>
<tr>
<th>Single source map making</th>
<th>Multi-source, multi-sensor map making</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Coverage where many cars drive</td>
<td>- Coverage everywhere needed</td>
</tr>
<tr>
<td>- Many attributes</td>
<td>- All necessary attributes</td>
</tr>
<tr>
<td>- Very highly automated</td>
<td>- Highly automated</td>
</tr>
<tr>
<td>- High update frequency</td>
<td>- High update frequency</td>
</tr>
<tr>
<td>- Easy</td>
<td>- Hard</td>
</tr>
<tr>
<td>- Quick results</td>
<td>- Takes time to get right</td>
</tr>
<tr>
<td>- Cost efficient</td>
<td>- Cost efficient at scale</td>
</tr>
<tr>
<td>- Selective quality</td>
<td>- Safety-critical quality</td>
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</table>
THANK YOU
Any questions?