Microsoft’s Mapping and Geospatial Roadshow
Amsterdam
## Agenda

<table>
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<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
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<tr>
<td>13.40 – 14.25</td>
<td>Unleashing the Power of Azure Maps &amp; Bing Maps for Enterprise</td>
<td>Clemens Schotte (Microsoft)</td>
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<td>15.10 - 15.30</td>
<td>Break</td>
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<td>15.30 – 16.15</td>
<td>Mastering Logistics and Onsite Service with Dynamics Field-Service</td>
<td>Steven Vlaanderen Oldenzeel (Microsoft)</td>
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<td>16.15 – 17.00</td>
<td>Partner Spotlight: PTV's Journey with Bing Maps for Enterprise</td>
<td>Andreas Lehr (PTV)</td>
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<td>17.00 – 18.00</td>
<td>Networking &amp; Drinks</td>
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Microsoft's Mapping Journey
20+ years of empowering consumers and enterprises
Bring intelligent location-enabled experiences to life with Azure Maps

Clemens Schotte
Sr. Program Manager
Microsoft Enterprise Maps
Azure Maps is a suite of geospatial services that helps organizations easily incorporate location-based data into web and mobile solutions.
What is Azure Maps

- A geospatial developer platform
- Built in partnership with industry leaders
- Innovating for enterprise use cases
- Azure native
- Available for Web, iOS, Android and the Microsoft Power Platform
- Limit data residency to the European (EU) or United States (US) geographic areas (geos)
- Microsoft's Mapping Journey is more than 20+ years of empowering consumers and enterprises solutions
A platform of location-based services for the enterprise

**Maps**
Display objects, points of interest, and business listings on static map images or interactive vector map tiles.

**Search**
Create applications that provide details about a given location, nearby points of interest and address geocoding.

**Imagery**
Get high-resolution satellite and aerial imagery that's available worldwide and continually updated.

**Routing**
Calculate optimized routes for multiple modes of transportation such as auto and commercial vehicles, support for route matrix and isochrones.

**Spatial Operations**
Enhance your location intelligence with a library of common geospatial mathematical calculations.

**Time Zones**
Obtain time zone and current time information from any location.

**Traffic**
Real-time traffic flow and incident detail for display or for route calculations.

**Geolocation**
Convert IP address to location.

**Data Management**
Upload and store geospatial data for use with spatial operations.

**Creator**
Create and publish your private indoor maps maintaining control of design, distribution, scale and access.

**Weather services**
Historical, current and forecasted weather data, air quality, tropical storms, radar and infrared satellite maps.

**Power BI integration**
Integration with Power BI w/ rich data service and more powerful capabilities.

**US Gov Cloud support**
Azure Maps services availability through Azure US Government Cloud.
Render Maps & Imagery

- Vector and Raster tiles from Bing Maps
- Base maps & Satellite imagery
- Weather Radar & Infrared animated tiles
- Real-time traffic Flow & Incidents
- Several predefined styles also for accessibility
SDKs

- Map Controls for Web, Android and iOS
- REST SDKs for C#, Java, Python and TypeScript
- Support for WebGL (Babylon, Deck GL and Three)
- Hundreds of samples
- Extensible through Open Web SDK modules
Search

- Autocomplete
- Address and Place Geocoding
- Structured or Unstructured
- Restrict Results by Bounding Box or Country
- Reverse Geocode to Address or Cross Street
- Batch Geocoding (up to 10K requests with 1 call)
- POI Search (incl. along route and in geometry)
Routing

- Fastest, Shortest and Traffic-Based Routing
- Truck Routing (Height, Width, Weight, Hazmat)
- Combustion and Electric Engine Efficiency Routing
- Route Optimization
- Batch Routing
- Distance Matrix Routing
- Route Range (Isochrones) in time, kWh, fuel and distance
Traffic

- **Flow**
  Raster and Vector Tiles
  Updated Every Minute

- **Incidents**
  Vector Tiles and REST API
  Updated Every 2 Minutes
• Historic, Current and Forecasted Weather
• Weather Tiles (Radar and Infrared)
• Weather along a route
• Severe Weather Alerts
• Tropical Storms
• Current and Forecasted Air Quality
Time Zones

- Query by Coordinate or ID
- Uses Microsoft Compliance Polygons
- Powered by IANA and Windows Time Zones
- Provides Wall Clock Time, Daylight Savings and UTC Offsets
Geolocation

- Return country based on a specific IP address
- Identify customer geographic distribution
- Respect geopolitical boundaries and regulations
- Customize and/or block certain content and services based upon country

```
{
    "countryRegion": "",
    "isoCode": "US",
    "ipAddress": "172.58.46.229"
}
```
Spatial Operations

- **Geofence**
  - Entering or leaving a fence
  - Azure Event Grid integration
  - Time validation

- **Spatial Calculations**
  - Closest points
  - Buffer
  - Point in polygon
  - Great circle distance
Azure Maps Creator

- Private Maps
- Automated CAD Processing
- Render Vector Tiles
- Manage State for Operational Monitoring
- Routing on Private Maps (wayfinding)
- Query Features through WFS
- Plugin for QGIS
Azure Maps Authentication

1. Users access Azure Maps Demo Website.
2. Users request Azure Maps Key from Azure Maps Account.
Getting an Azure Maps Token and illustrating the usage of Azure Maps Web Control.
Bing Maps for Enterprise
Logistics and Fleet Management
Truck Routing
What is the best route for our trucks in the city?

Navigating a semi-truck is challenging
• Low or narrow bridges / Tunnels
• Tight turns
• Steep gradient
• Cargo / Regulator restrictions
• Road closures
• Strong crosswinds
• Traffic conditions
Truck Routing API
Optimized Routing for Commercial Vehicles

• Extension to our existing routing APIs
• Calculates the route between waypoints (from point A to point B), supporting up to 25 waypoints per call
• Vehicle’s height, width, length and weight
• Number of axles
• Number of trailers
• Maximum gradient
• Turn radius
• Avoid tolls, highways, border crossing
• Avoid cross winds and grounding risk
• Transportation of hazardous materials
• Hazardous permits
• Historic traffic data
• Speed limitations
Next-level routing logistics

A commercial routing tool that calculates routes optimized for trucks and other commercial vehicles.

Optimized Routing for Professional Transportation

With the Bing Maps Truck Routing API, you can determine a safe and efficient route for your commercial vehicles, saving time and money, as well as avoiding unsafe conditions and legal restrictions. In addition, use the Streetside Imagery capabilities of the Bing Maps platform to view why your vehicle needs to take a different route, such as a low bridge, deep pothole, wet roadway, and more.
Snap to Road
Snap to Road

Users can track an asset’s route by snapping its GPS points to the nearest roads for display purposes. They can also view data for each point, including associated road names and posted speed limits.

• Interpolate GPS points and get a path that smoothly follows the geometry of the road for advanced data visualization.

• Determine if a driver is adhering to the posted speed limits and monitor if they go off-route.

• Assess how much time the asset has been traveling, and look at overlapping routes to optimize deliveries.
Multi-stop Route Planning
Multi-stop Route Planning
Automate itineraries for multiple agents and optimize all their routes

- Multiple delivery stops
- Time windows when the customer is available,
- Different priorities for each of the stops,
- Multiple delivery agents with different shifts,
- Traffic conditions,
- Travel time between stops,
- How long the delivery is expected to take
- Input Parameters:
  - Agent (Name, shifts)
  - Agent Shift (StartTime, EndTime, StartLocation (optional), EndLocation (optional))
  - ItineraryItem (Name, OpeningTime(optional), ClosingTime (optional), DwellTime (optional), Priority (optional), Location)
  - Type (Simple Request, TrafficRequest)
  - CostValue (TravelTime, Distance)
Multi-Itinerary Optimization Demo

Click the scenario and select parameters below to see how the API handles route optimization for:
- Multiple agents and multiple shifts
- Service time windows
- Dwell times (i.e., how long an agent needs to be at a location)
- Capacity constraints
- Service ordering restrictions
- Priority of stops
- Traffic
- Price optimization objective

Click to Load Scenario

2 AGENTS 5 STOPS
Optimize for Travel Time Use traffic information

4 AGENTS 40 STOPS

Agents

<table>
<thead>
<tr>
<th>Agent</th>
<th>Shift Start</th>
<th>Start Location</th>
<th>Shift End</th>
<th>End Location</th>
<th>Capacity</th>
<th>Fixed Price</th>
<th>Price/KM</th>
<th>Price/Hour</th>
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<tbody>
<tr>
<td>Driver 1</td>
<td>2020-01-01</td>
<td>47.687718</td>
<td>2020-01-01</td>
<td>47.68678</td>
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<td>50</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Driver 2</td>
<td>2020-01-01</td>
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<td>2020-01-01</td>
<td>47.68647</td>
<td>10</td>
<td>100</td>
<td>1</td>
<td>5</td>
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Itinerary Stops

<table>
<thead>
<tr>
<th>Step</th>
<th>Name</th>
<th>Opening</th>
<th>Closing</th>
<th>Dwell</th>
<th>Priority</th>
<th>Location</th>
<th>Quantity</th>
<th>Drop Off</th>
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<tbody>
<tr>
<td>0</td>
<td>Node 1</td>
<td>2020-01-01</td>
<td>00:00:00</td>
<td>00:00:00</td>
<td>00:00:00</td>
<td>47.687118</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Customer</td>
<td>2020-01-01</td>
<td>00:00:00</td>
<td>00:00:00</td>
<td>00:00:00</td>
<td>47.68678</td>
<td>1</td>
<td>2</td>
</tr>
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GET ROUTES

Optimized Itinerary
We would like to target local customers
Isochrone
Calculates the area that can be traveled to within a specified distance or time

- Calculates a travel-time or travel-distance polygon array of latitude/longitude points that describe the isoline
- Supports drawing a shape on a map and using the shape in spatial queries
- API inputs:
  - **startPoint** Latitude/Longitude or address
  - **routeMode** (driving, walking or public transportation)
  - **road types** to minimize or avoid (highway-minimizeHighways, tolls-, minimizeTolls)
  - **maxDistance** for which the polygon shall be created
  - **maxTime** for which the polygon shall be created
  - **departTime**
- Historic traffic data will be used in calculating the routes if the date and time are specified in the call
Visualize what’s near and far

You can use the Bing Maps Isochrone API to plan the area that can be reached from a designated starting point within a set time period. Try the demo to see how it works.

Isochrone Demo

An Isochrone is the shape representing travel time or distance. They can be very useful in filtering search results. Try it:

Select Travel Mode
   Walking

Select Business Category
   Gas Station

Travel Time (minutes)
   15
Thank you!

Microsoft.com/Maps