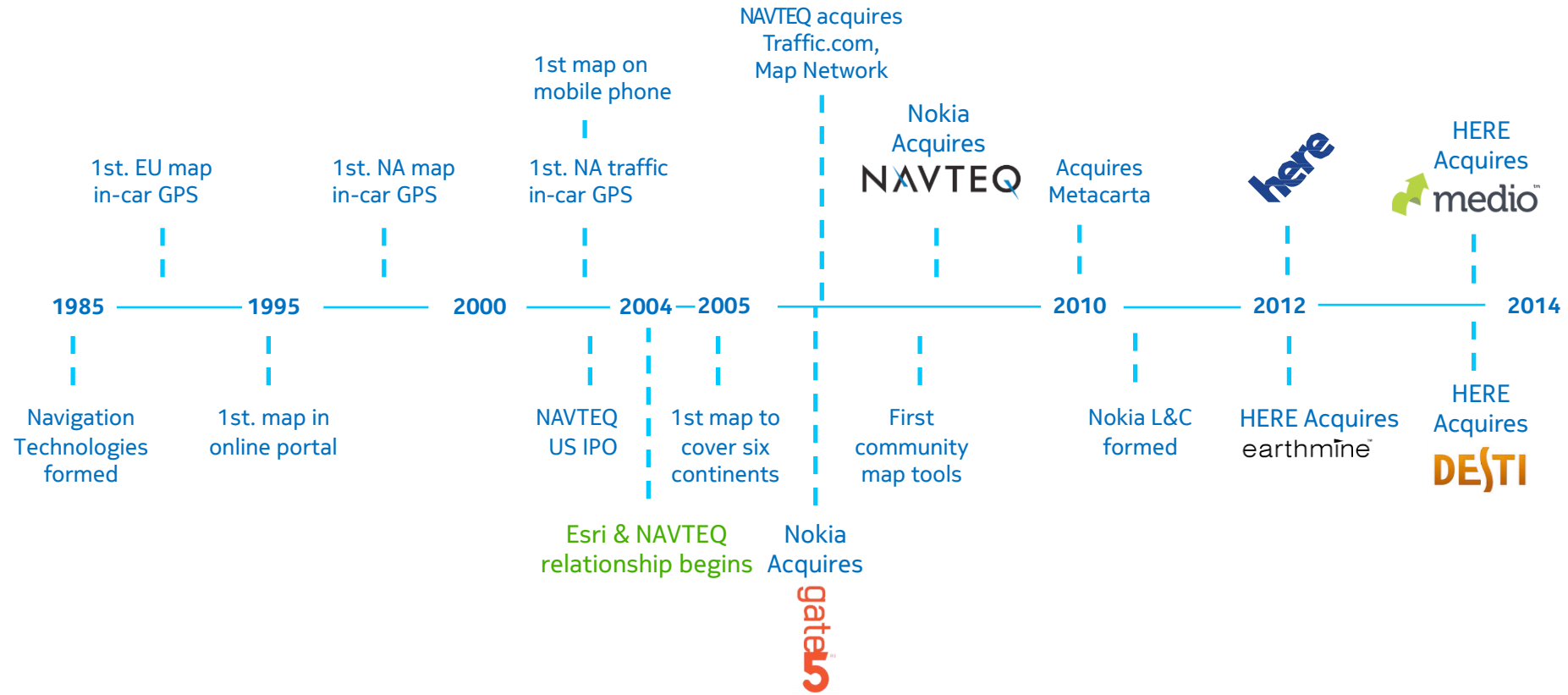
The Criticality of GIS Basemaps: *Quality as the Key to Success*

Prepared by Milton Ospina, HERE Global Business Development Manager

March 11, 2015

Company confidential

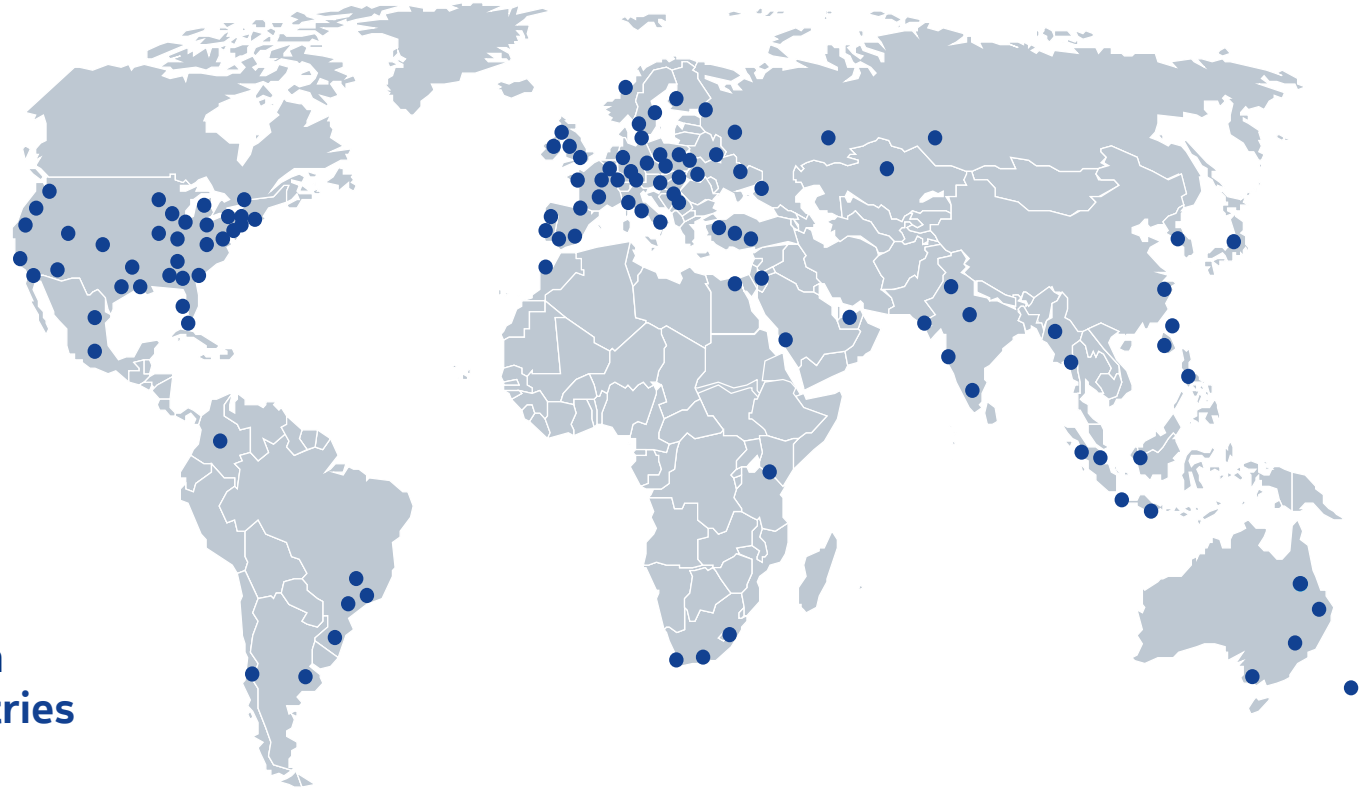
HERE has a map heritage that spans three decades



Formerly NAVTEQ

© 2015 HERE | Company confidential

Dedicated location-based company with global reach



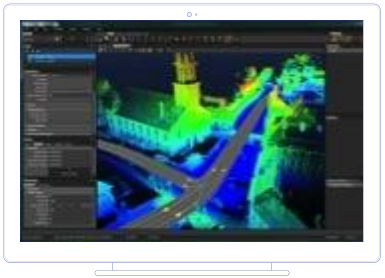
Employs **6,000 +** in **people in 55 countries**

We are passionate about making maps & we have a unique vision for what a map can be and do

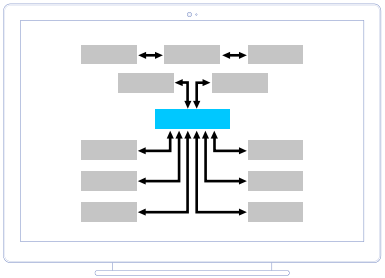
Unmatched capabilities and global scale enable automotive grade quality maps

Technology Leadership

Best-of-breed automation



Consistent Specification

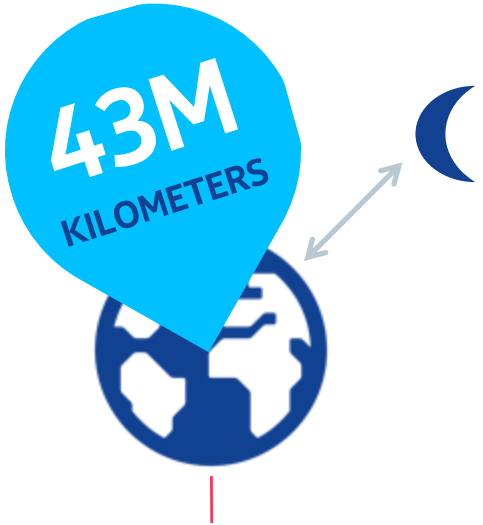


Field Operations with local insight

The broadest global coverage enables more consistent experiences wherever your customers are

Maps for every country on the planet

Auto grade quality navigation



113 x the distance between earth and moon

The most extensive content enables flexibility to differentiate across multiple use cases

42

countries real time traffic

800

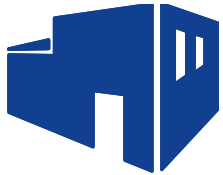
cities public transit

430

cities natural guidance

50k

buildings with venue maps



153

cities with street level imagery

… and many more …

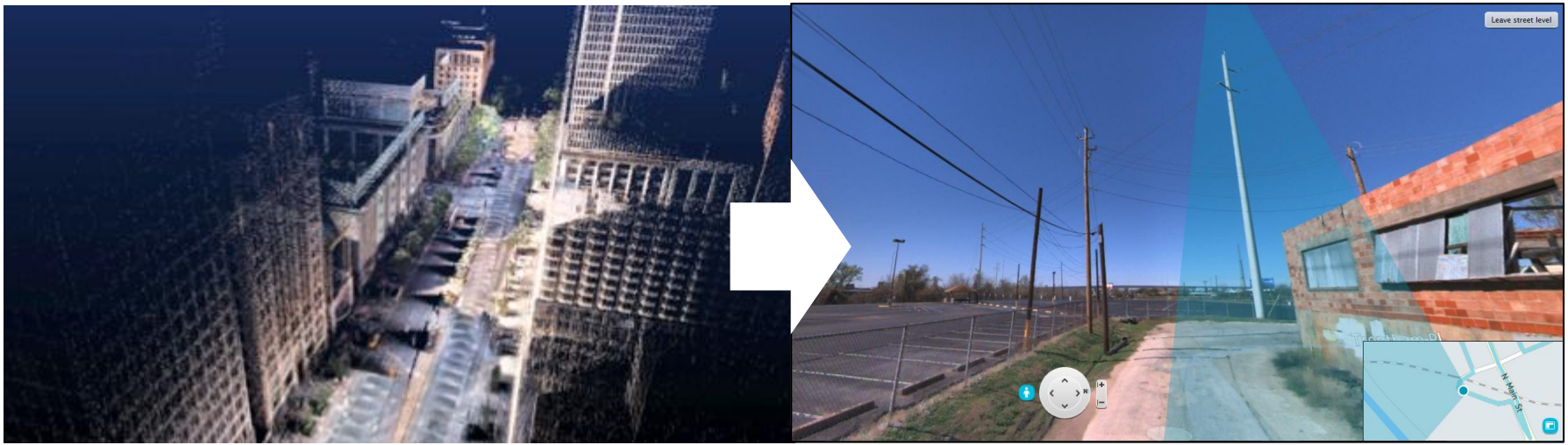
HERE Map Index

HERE enables a staggering array of use cases, including navigation in the car, on public transit and on foot.

We provide the freshest, most accurate and reliable map in the world. We capture the richest and most precise models of the real world and 2.7 million changes to them each day.

© 2015 HERE | Company confidential

Advanced technology for the most accurate and detailed maps: Reality Lens



Mobile LIDAR capture
for 3-D rendering

10-20 cm accuracy for
attributes including lane
width and height of assets
+
Street-Level Imagery

We are passionate about our customers and the value of true partnership

ACURA
AISIN
alk
A TRIMBLE COMPANY
ALPINE
amazon
ASTON MARTIN
at&t
Audi
BENTLEY
BOSCH
BUICK
Cadillac
CHEVROLET
CHRYSLER
CITROËN
Continental
DELPHI
DENSO
DODGE
Elektrobit
esri
FedEx
Ferrari
FIAT
Finder
FLEETBOARD
Ford
GARMIN
GM
HARMAN
HYUNDAI
INFINITI
JAGUAR
Jeep
Johnson Controls
KIA
LANCIA
LAMBORGHINI
LAND-ROVER
LEXUS
LG
LINCOLN
MAGNETI MARELLI
mazda
Microsoft
MINI
navigation solutions
NISSAN
NNG
ORACLE
Panasonic
PEUGEOT
PORSCHE
PTV GROUP
the mind of movement
QUALCOMM
RAND McNALLY
ROLLS ROYCE
RouteSmart TECHNOLOGIES
SAAB
SAMSUNG
SAP
SPOKEO
SUBARU
SUZUKI
TCS
TechniSat
TELENAV
Telogis
teletrac
terra
TimoCom
ups
VAUXHALL
verizon
Visteon
VOLVO
VoyagesSNCF.com
YAHOO!

Strong Leadership in Fleet Management and Logistics

Navigation

- teletrac fleet director
- Telogis
- RAND McNALLY
- DDS DIGITAL DISPATCH
- GARMIN
- TELETYPE GPS

Fleet Tracking

- NexTraq
- esri
- teletrac fleet director
- IMS
- Datacom
- Omnitracs a Qualcomm company
- Telogis
- ruta movistar
- PHH
- inthinc
- GPS TELCEL
- webtech wireless
- OnTerra INTEGRATED LOCATION SOLUTIONS
- unicomm
- GPS INSIGHT
- Trimble
- astus
- SeriousGPS

Optimization

- DESCARTES
- esri
- LIS software solutions
- tyler technologies
- roadnet technologies
- netLogistiK
- Telogis
- GCM BUSINESS CONSULTING & TECHNOLOGY
- ORTEC
- Paragon
- traffic mobility logistics.
- WM WASTE MANAGEMENT
- Trapeze
- RouteSmart TECHNOLOGIES
- PTI-TIME
- ClickSoftware Making Service Click
- SKU LOGISTICS

Driver Safety/ADAS

- Telogis
- inthinc
- SPEEDGAUGE
- teletrac fleet director
- Cummins
- RAND McNALLY
- ZONAR Systems
- GEOTAB management by measurement
- NAVISTAR

Parcel Delivery

- FedEx
- UPS

© 2015 HERE | Company confidential

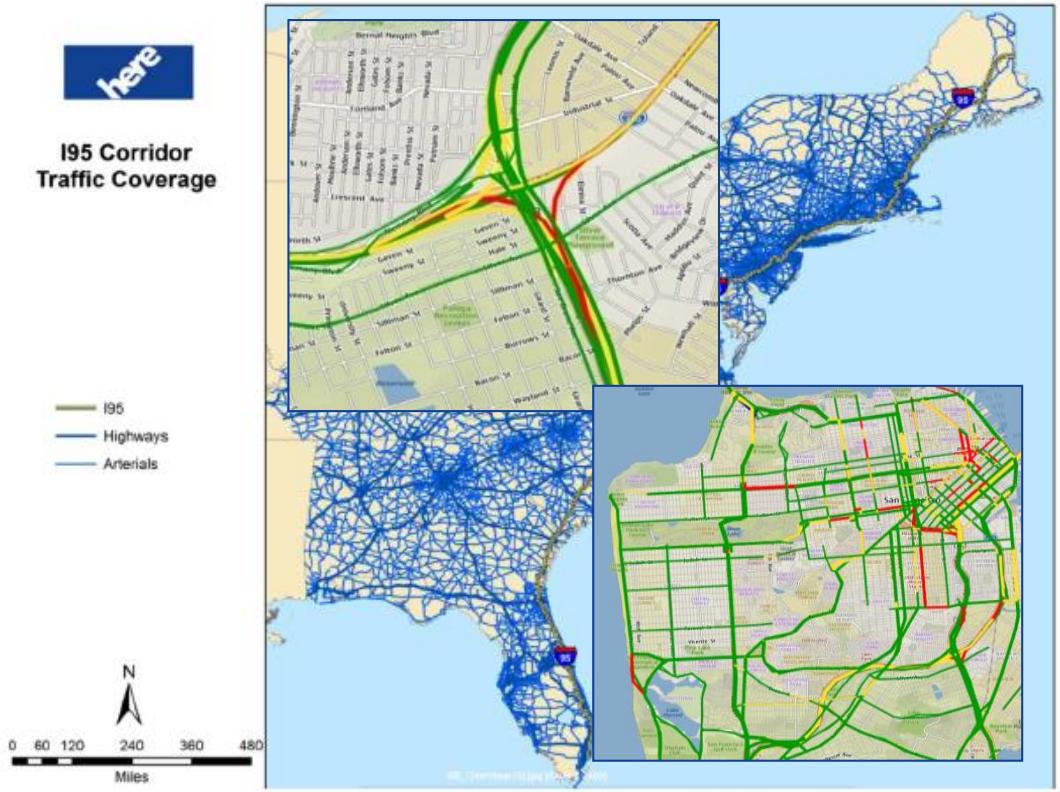
Federal Government Clients

Success Stories: US State Departments of Transportation (DOTs)

Recent Wins
- I-95 Corridor Coalition
- Missouri DOT
- Michigan DOT
- Florida DOT
- TRANSCOM (NY, NJ, CT)
- Penn Turnpike

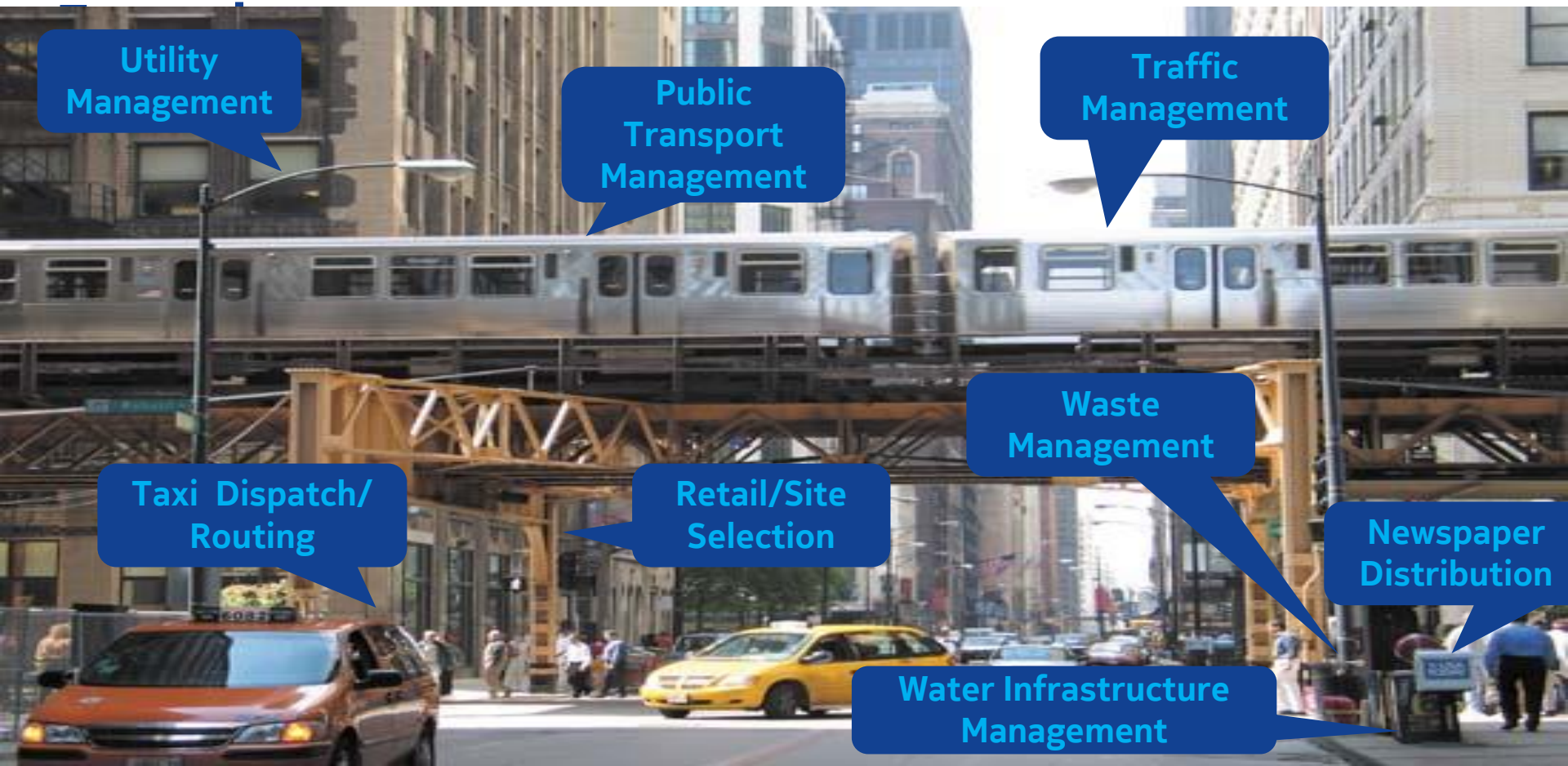
HERE Products
- HERE Map Data
- HERE Real-Time Traffic
- HERE Traffic Patterns

HERE Products Use Cases
- 511 Info distribution
- Agency planning
- Traffic monitoring and operations



© 2015 HERE | Company confidential

Helping Increase Efficiency and Productivity



Serving a Variety of Vertical's GIS Needs

Utilities

Management of fixed and mobile assets (power lines, gas mains, poles and towers) including outage management

Telecom

Economic development analysis, Call-Before-You-Dig, Network Management and CRM

Retail

Business process improvement including market analysis, site selection and logistics management

Insurance

Risk analysis and mitigation, portfolio assessment, claims management, Pay-as-you-Drive

State & Local Govt

Agency-wide data sharing, which enhances workflow, decision making, and coordination

HERE & Esri: Strategic Data Provider

esri Partner Network Platinum

ArcGIS Online
for Routing, Geocoding & Network Services
(HERE Real-Time Traffic, Traffic Patterns, Pedestrian)

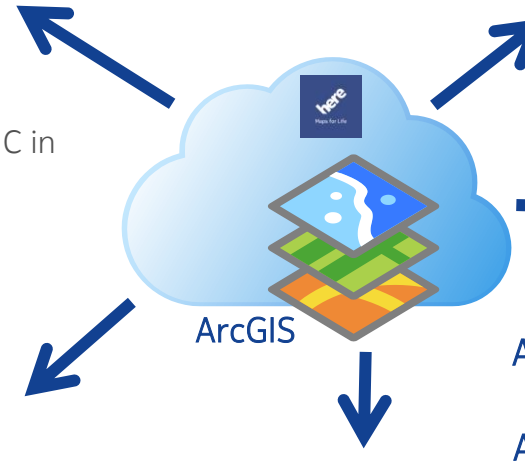
Business Analyst

Business Analyst Online

Esri Business Solutions that leverage HMC in ArcGIS Online for geocoding/routing:

- *Esri Maps for Office*
- *Esri Maps for IBM Cognos*
- *Esri Maps for SharePoint*
- *Esri Maps for Dynamic CRM*
- *Esri Maps for MicroStrategy*

StreetMap Premium



ArcGIS Data Appliance

Esri Coder

Esri Community Analyst

ArcGIS for Transportation Analytics

ArcGIS Mobile

MapStudio

here

Building the world’s best map

The building blocks of a premier solution

Data Quality is a Major Problem

Poor data quality costs U.S. businesses more than **$600 billion** each year

The cost of bad data for an individual business can be put at **15% to 20% of revenues.**

Individual address data has an information quality **decay rate of 17% per year** in the U.S.

10-25% of data records contain inaccuracies

Actual data errors in a typical customer base may range from **25% to 30%**

Poor data quality is the most common reason why organizations **do not realize the benefits** of their data platform investments including: **CRM, BI and Data Warehousing.**

Source: Informatica Corporation/The Data Warehouse Institute

Some Facts About Data Quality

91% of businesses suffer from common data errors.

On average, U.S. organizations believe 25% of their data is inaccurate.

Human error is the most common cause of inaccurate data.

77% believe their bottom line is affected by inaccurate and incomplete contact data.

81% encounter problems when trying to generate meaningful business intelligence.

66% lack a coherent, centralized data quality strategy.

31% state a lack of internal communications between departments causes inaccurate data.

30% feel duplicates are within their top 3 data quality problems.

Source: Informatica Corporation/The Data Warehouse Institute

Delivering the freshest maps ensures the best possible experience

80K

LOCAL SOURCES

22B

PROBES PER MONTH

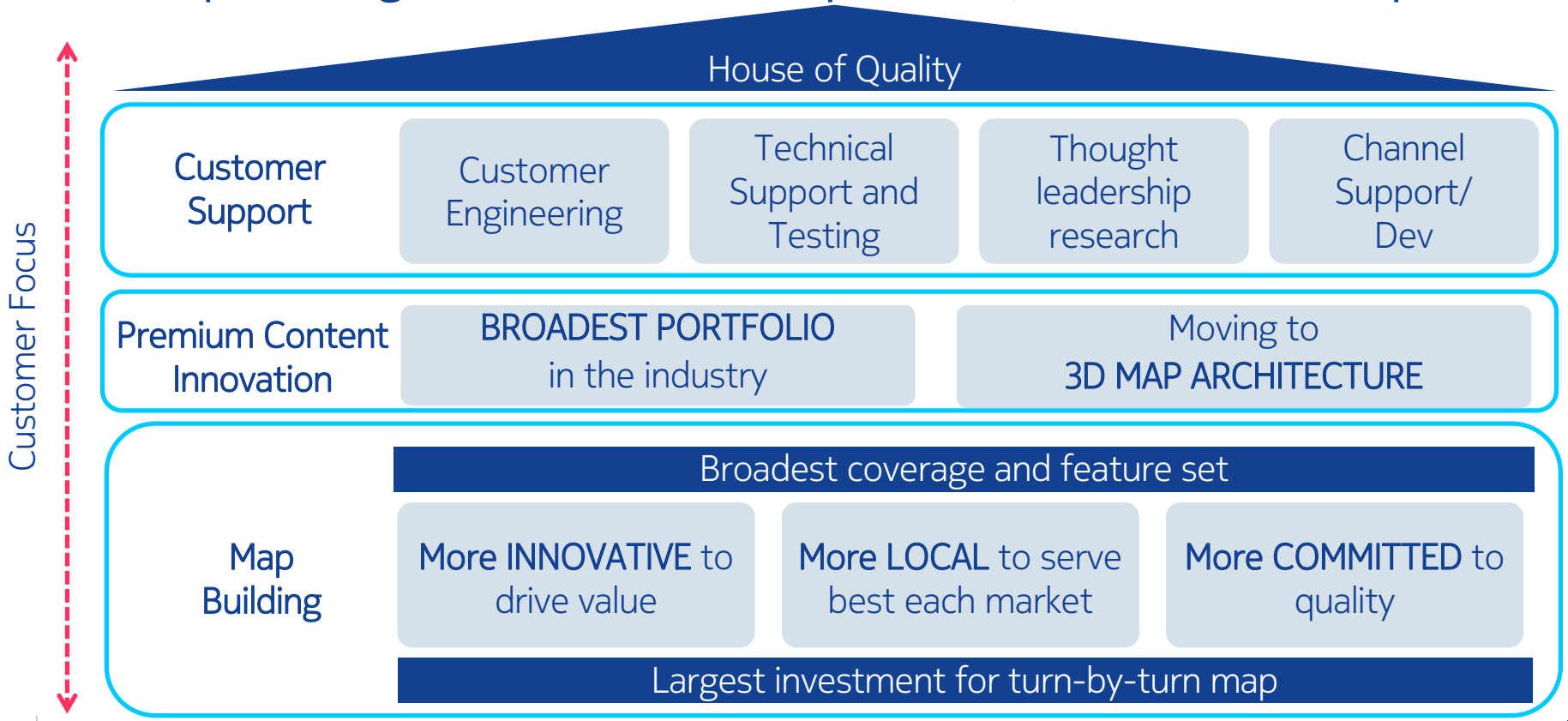
2.7M

MAP UPDATES PER DAY

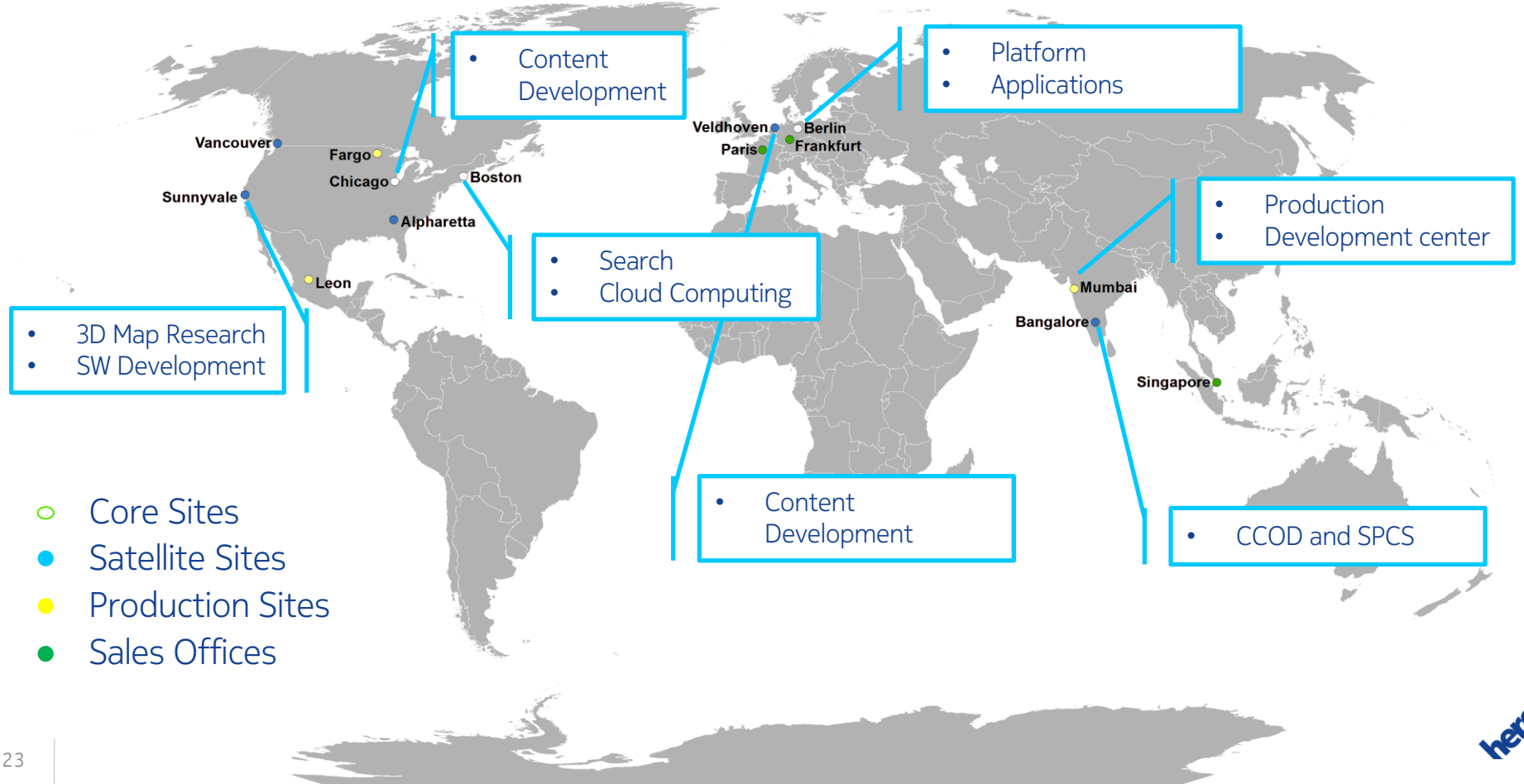
HERE provides real-time big data processing scale and flexibility needed for connected solutions

The building blocks of a premier solution

Best map building and maintenance capabilities, best customer experience



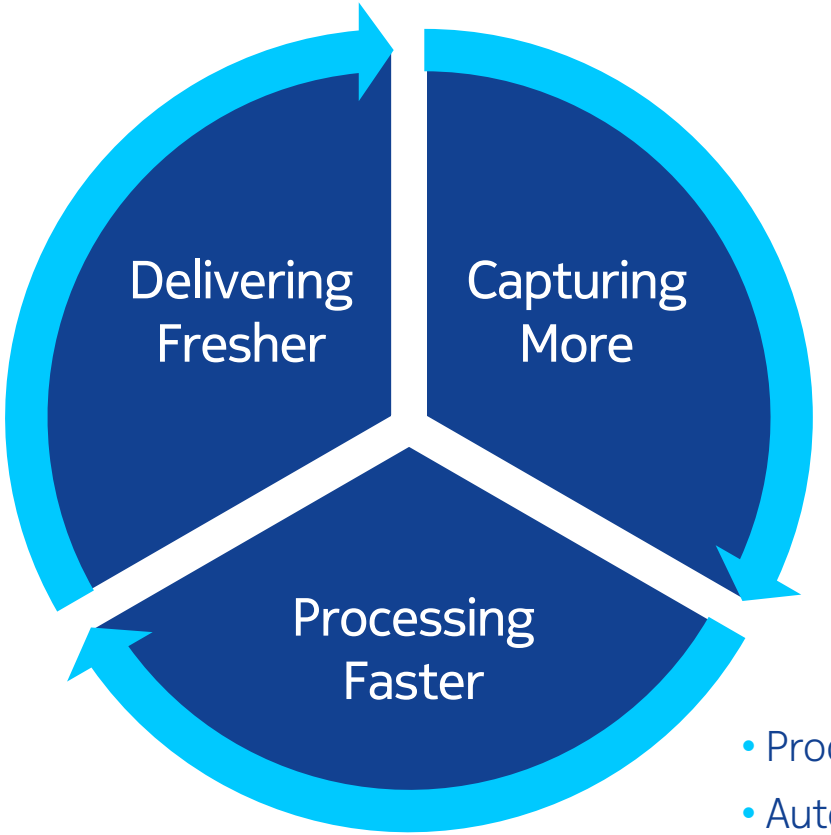
Extensive and global R&D presence



New innovative tool deployment

Hundreds of millions of dollars are invested every year

- Rapid Refresh



- Community Mapping Program
- Probe data
- TRUE: Mobile LiDAR

- Production
- Automation

Introducing next generation TRUE

2012

- Added 100 Multi Camera Vehicles
- 930,000 KM of TRUE data collected

2013-2014

- Joining forces with earthmine
  - More modular and portable
  - Enhanced reliability and uptime
  - Enhanced quality of footage
  - Enhanced LiDAR

+ 200
Vehicles

~30%
In Emerging Markets

Benefits from advanced collection

Navigation: High-quality footage from TRUE is used to improve maintenance of key attributes like speed limits, warning signs, traffic signals and lane markings

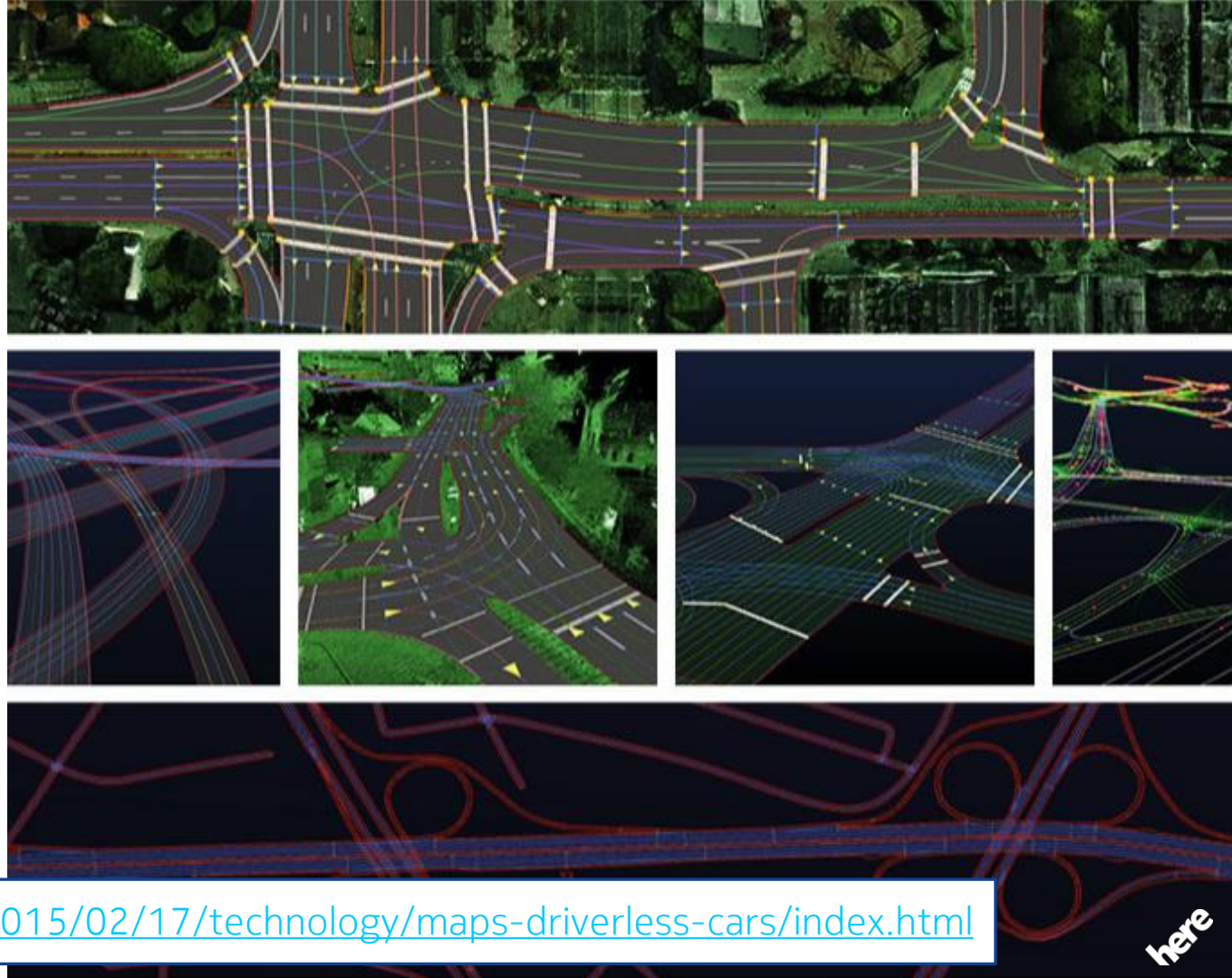
ADAS: Data captured for height, slope and curvature enable Advanced Driver Assistance Systems that are much more accurate — and advanced

3D: Accurate 3D view of the world is revolutionizing map imagery and fueling Augmented Reality products that, much more than visually appealing, are genuinely useful.

Utilities/Urban Planning/Asset Management: An ocean of LIDAR data captured by TRUE will allow us in the future to explore the use of raw LIDAR data to support a variety of use cases based on accurate infrastructure mapping.

HERE is reinventing the map for simpler and safer modern urban living

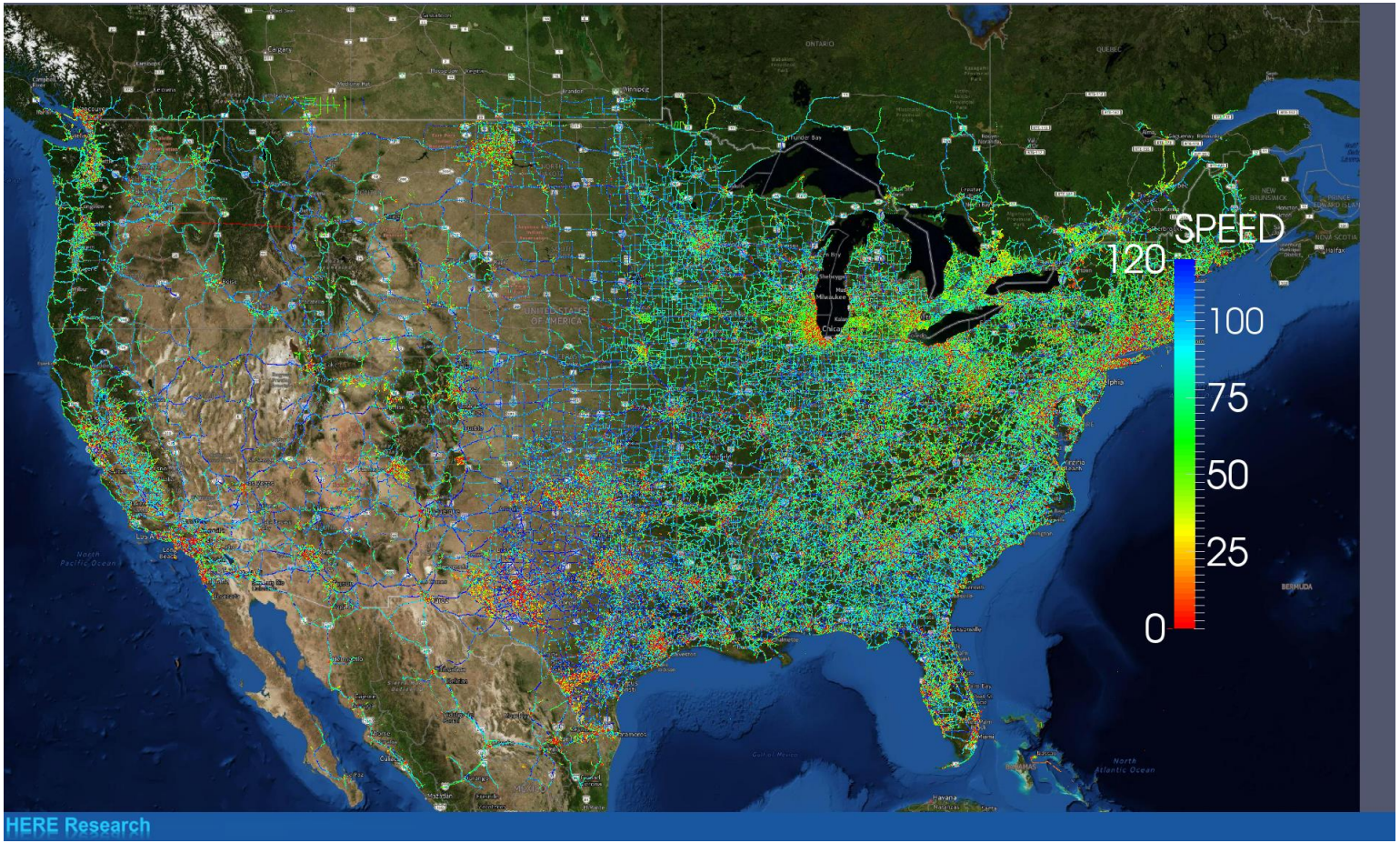
We help people navigate their lives with ease and confidence by providing the worlds best maps and location experiences across multiple screens and operating systems.



http://money.cnn.com/2015/02/17/technology/maps-driverless-cars/index.html

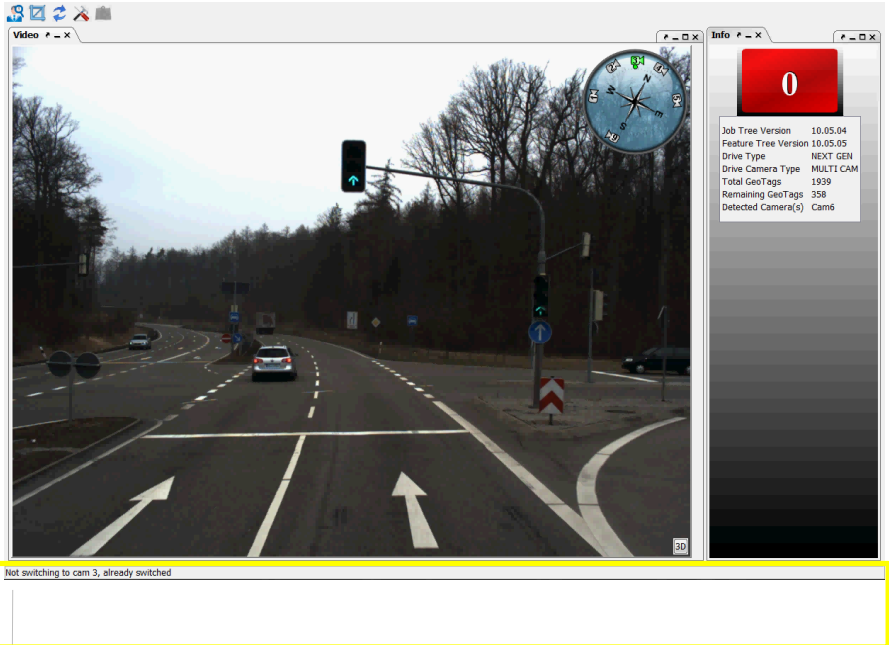
Harnessing the power of 22B probe points

Harnessing the power of probe data



Getting scale faster through feature recognition

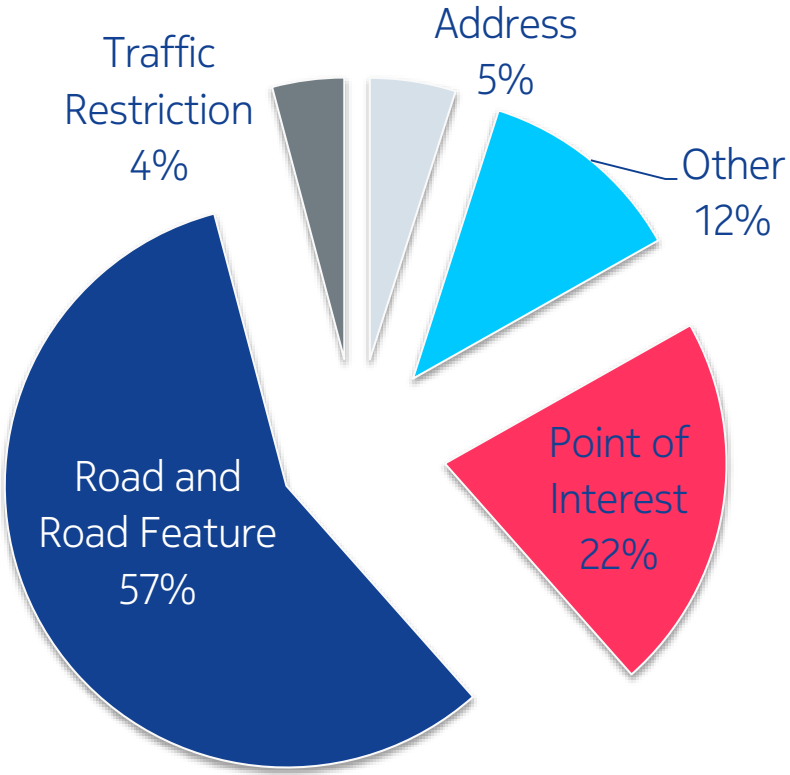
- Automatically detect and extract signs
- Low confidence items are validated by an analyst to ensure quality



← *embedded video animation*

We are resolving Map Reports faster than ever

- Most important categories:
  - Road features
  - POI
- Average resolution time decreased by half between 2012 and 2013 (YTD)
- More than 30% of all MRs are already reflected in the database or not a change we can make
- Number of MRs declining due to improved database freshness



Total Map Reports by category

HERE Community Mapping Program

COMMUNITY MAPPING

THE LOOP

COLLECTION

With 6000 mapping experts in over 56 countries today, and the potential of millions of end users of HERE powered properties in future, together we can build the freshest and richest maps.

MODERATION

Community self-moderation, voting, and automated validation processes ensure the highest quality community data before ingestion into the map

INTEGRATION

HERE imposes strict practices on how community data is collected and processed to ensure the resulting quality meets and exceeds the needs of our consumers and customers, from outdoor to automotive, and everything in-between.

DELIVERY

Our intent is to deliver community changes back to consumers and customers timely, aiming at below 24 hours lead time for high priority changes and even enabling 'live maps' where professional validation is not needed

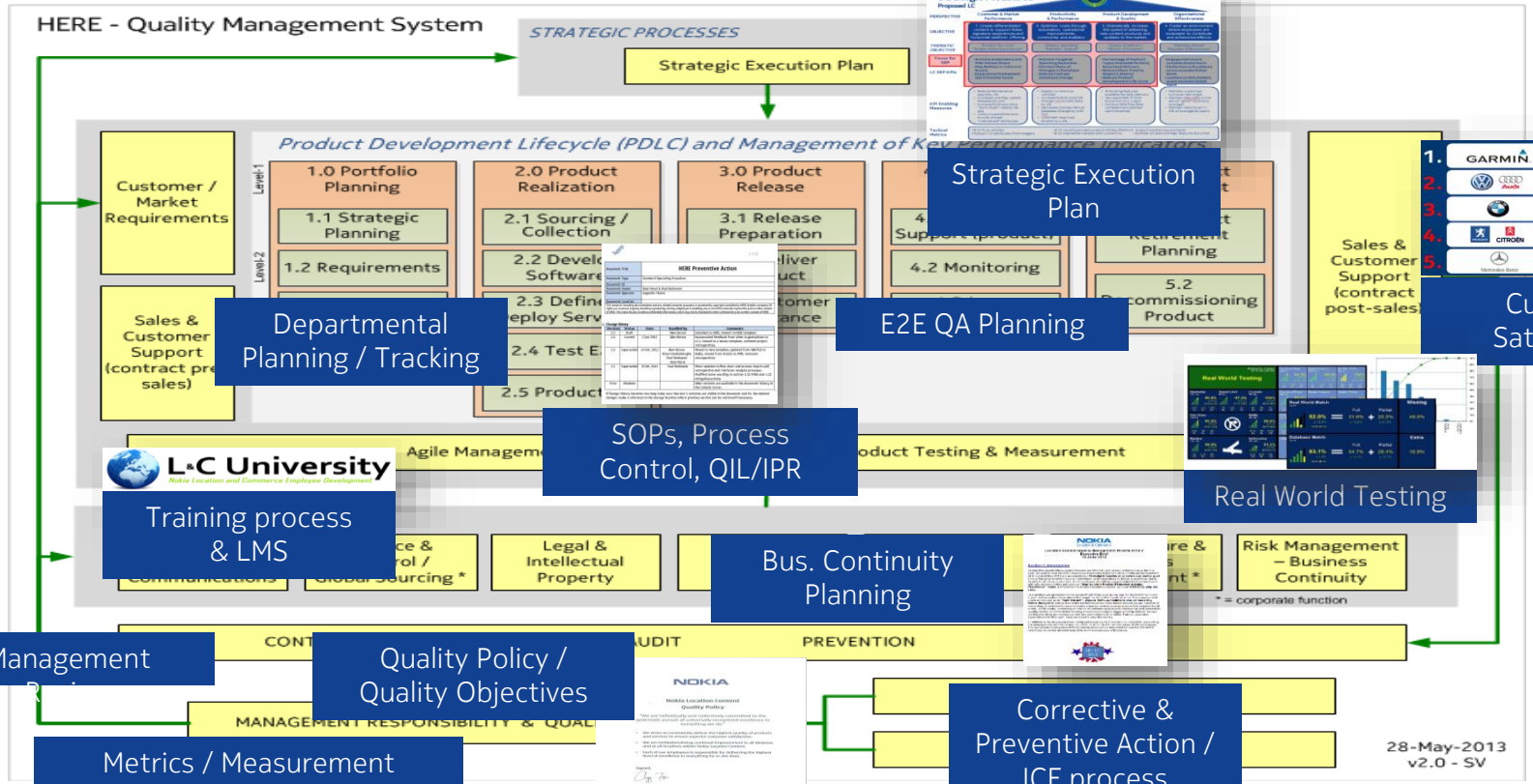
Quality is in our DNA

We have an unmatched Quality Management System (QMS)

Management System				
ISO 9001:2008 Quality	ISO/TS16949:2009 Quality (automotive)	ISO/TS16949:2009 Quality (automotive)	ISO 14001:2004 Environmental	OHSAS 18001:2007 Occupational, Health & Safety
Scope				
Design, create, manage, distribute and maintain enhanced digital map products, related software and services used for automotive, consumer, enterprise and governmental applications.	Manufacture (create) enhanced digital map products and services used for vehicle applications.	Manufacture (create) enhanced digital map products and services used for vehicle applications.	Create, manage, distribute and maintain enhanced digital map products and services used for automotive, consumer, enterprise and governmental applications.	Create, manage, distribute and maintain enhanced digital map products and services used for automotive, consumer, enterprise and governmental applications.
Applicable location				
Worldwide	Chicago (USA)	Veldhoven (NLD)	Veldhoven (NLD)	Veldhoven (NLD)

The HERE Quality Management System

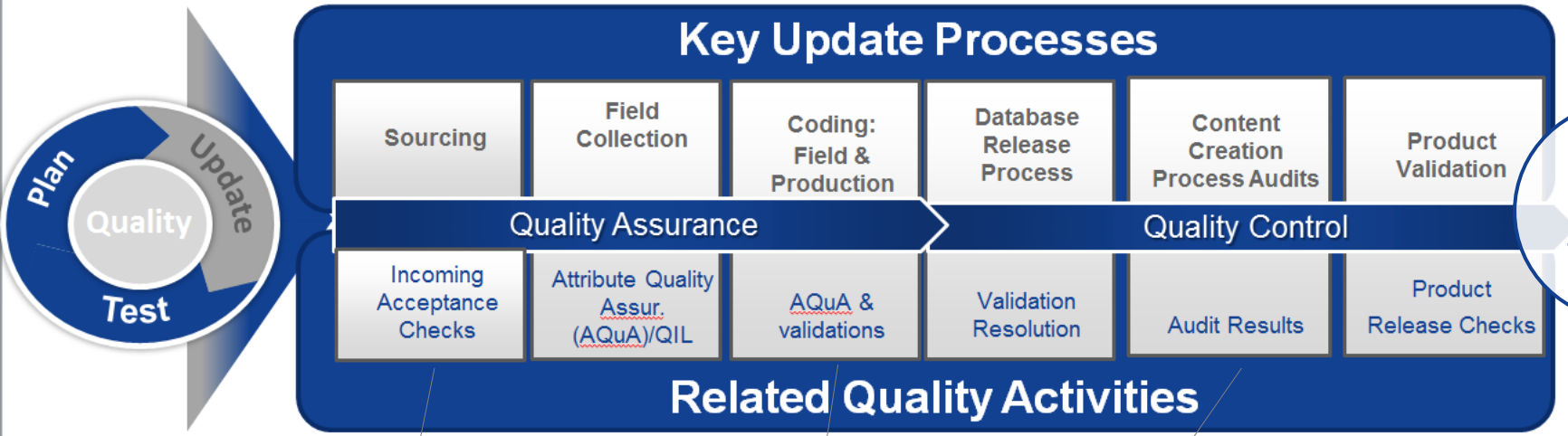
Our QMS enables continuous improvement

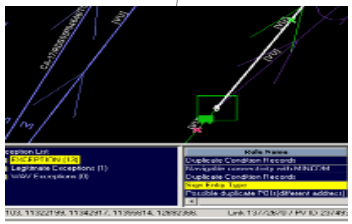


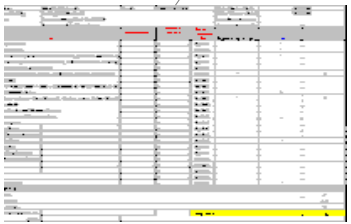
© 2015 HERE | Company confidential

Map building – test at every step of the way

Key activities and quality processes







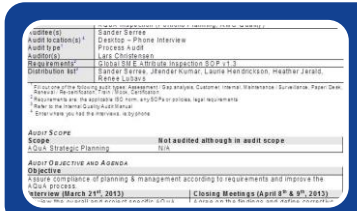
Real World Testing

© 2015 HERE I Company confidential

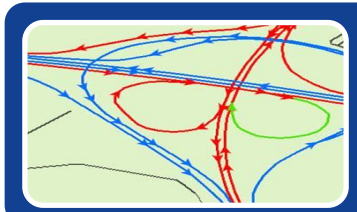
Map content validation & audits

Map Content Validations - comprehensive validation processes ensure consistency, quality and accuracy during the build process.

1,900+ validations



Content Creation Process Audits - check process compliance and effectiveness of corrective actions, to proper process improvement. It helps identify the issues prior to customers.

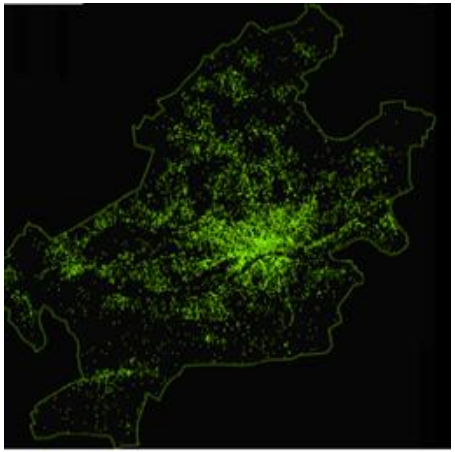


Map Content Containment Checks - focused on addressing the risks (new features/inclusions, missing validations) and mitigation implementation for each database release or extract shipment to a customer.

Unique testing capabilities that set an industry quality standard for map making

Real World Testing Data

Activity Data



= 97.3%

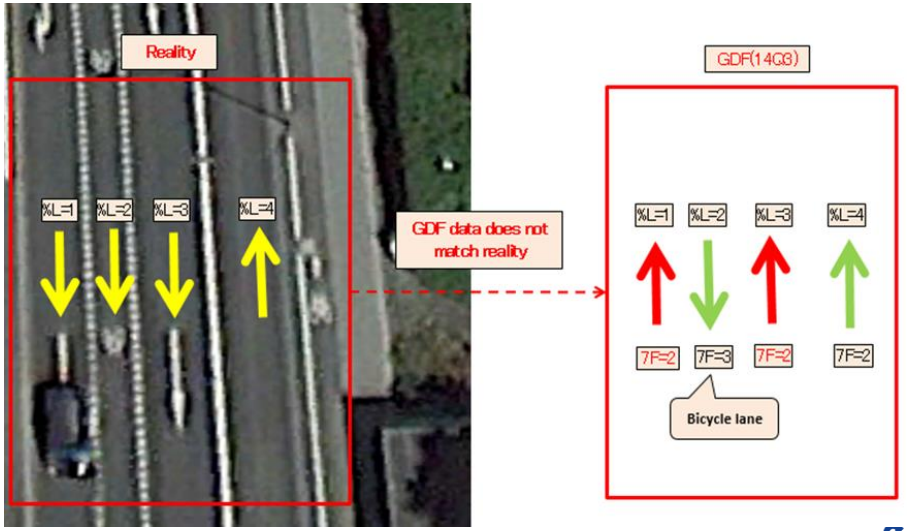
Total Route Score

© 2015 HERE I Company confidential

So… Do we ever make mistakes?

Elektrobit Compilation Q4-2011 (missing ocean in red circle)

EDGE ID 832630717 in Germany: The 2 drivable southbound lanes were erroneously published as northbound lanes in Q3-2014 GDF



© 2015 HERE I Company confidential

In summary

Best Content
Largest portfolio & coverage
Innovative use cases
Services opportunity

Best Map
More change than ever before
Higher accuracy
More value

Innovation
Deepest toolbox
“Right fit” approach
3D Layered database
Rapid Refresh

Quality
Continued investment
Empowered local presence
Real World Testing

milton.ospina@here.com
www.here.com
http://360.here.com/

Thank you

Milton.Ospina@here.com