

ISO 17572 Geo-Referencing Standard and AGORA-C Patent Pool

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Overview

- Definition of Location Referencing
- Use cases for Location Referencing
- Traditional Methods
- Standardization of Location Referencing
- Patent pool
- AGORA-C Patent pool: Licensing scheme



Examples for location referencing



- Based on Names: Postal Address
- Based on Tables: Traffic Messages Channel (TMC)
- Based on Co-ordinates: WGS 84

Definition of Location Referencing

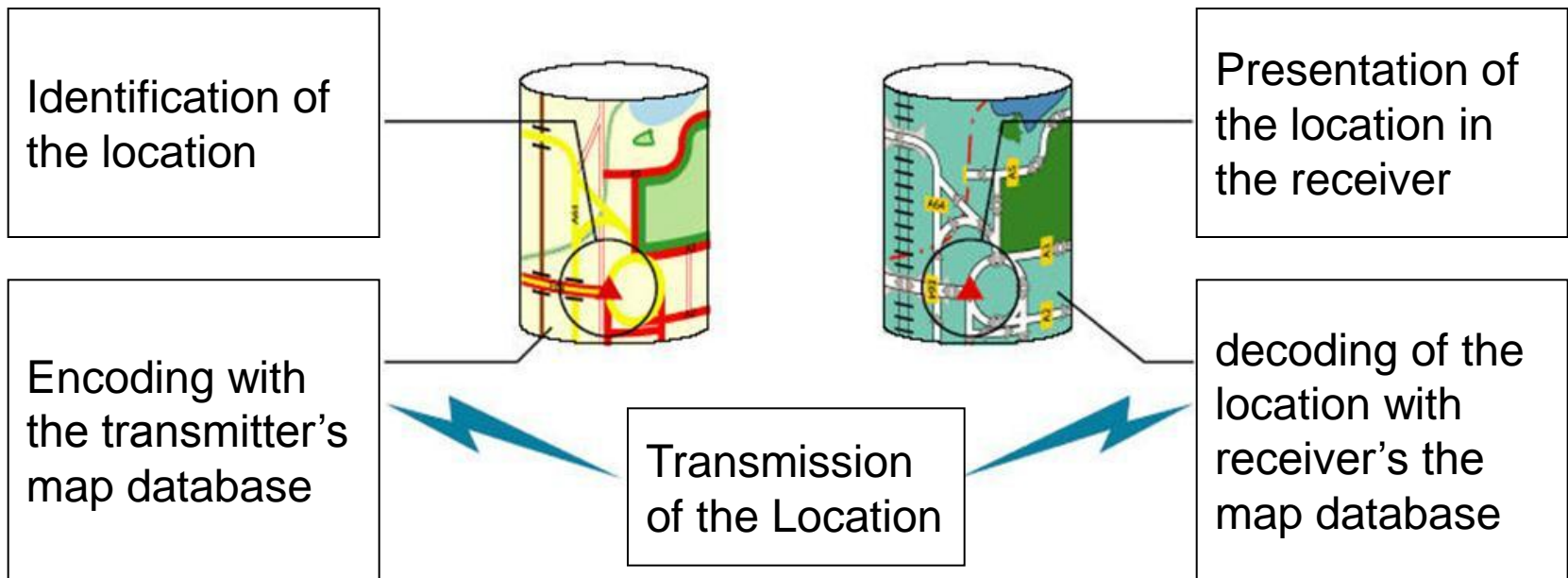
- A Location Referencing method provides means to answer questions like:
 - Where am I?
 - Where is the nearest restaurant?
 - Where is the accident?

in a structured way

- Location Referencing can be used for any kind of “what” has happened it just puts “where” it happened to it
- Location referencing methods provide a “language” for: “How to describe ” the “Where”

Definition of Location Referencing

- Description of an element in a digital map database
- Identifying this element in a second digital map database
- on-the-fly: create a location reference code on-demand and discard it after transmission



Use cases for Location Referencing 1 of 2

→ Safety

- Accident/incident support for traveler
- Accident/incident support for emergency public authorities
- Accident/incident reporting for traveler observer
- Breakdown call
- Mobile service or disaster crews

→ Track and Find

- Communicate with nearby cars or mobile people
- Locate a person
- Locate a vehicle
- Guidance to rendezvous with moving traveller
- Stolen vehicle tracking and reporting
- Tracking goods in transit
- Where am I?

→ Movement Management

- Commuting to regular activity
- Dispatching
- Fleet management
- Group travel support
- Guidance to parking
- Multimodal travelling
- Navigation/Routing
- Travelling across areas without roads
- Trip templates/guided routes
- Traveller encounter with unexpected events



Use cases for Location Referencing 2 of 2

→ Traveler Information

- Location sensitive message delivery
- Location sensitive pushed information
 - advertising
 - warnings
 - speed limits, etc
- Route commentary
- Service discovery
- Suggestions to traveller based on destination and geography
- Toll payments and other traveller user fees
- Traffic information delivery

→ Reverse Geocoding

- Contact generation from travel
- Location and time-dependent insurance charges

→ Personal Management

- Location sensitive appointments
- Tracking of progress to an appointment
- Location based diary

Traditional Methods 1 of 6 Postal Address



- changes in reality over time
- different spelling from one release to another of the same map vendor
- different spelling between map vendors
- typos
- in some countries not all street are addressed by a name: e.g. Japan and China
- **Street names are a very weak attributes**

Traditional Methods 2 of 6

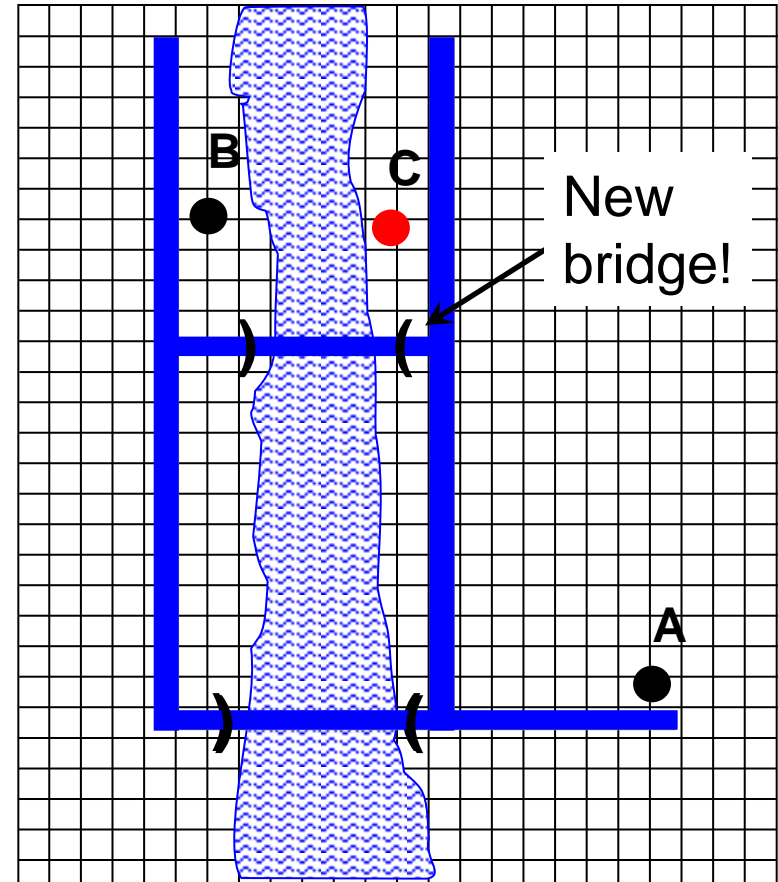
→ Based on Tables: Traffic Messages Channel (TMC)

requires

- pre-coding of locations
 - manual creation of location tables (location code + additional info)
 - maintenance of tables
- has limited addressability
- was not created for use with map-based systems
- needs location codes to be incorporated in the map database with a complex process
- gap of approx. one year between publishing a TMC table and availability in product

Traditional Methods 3 of 5

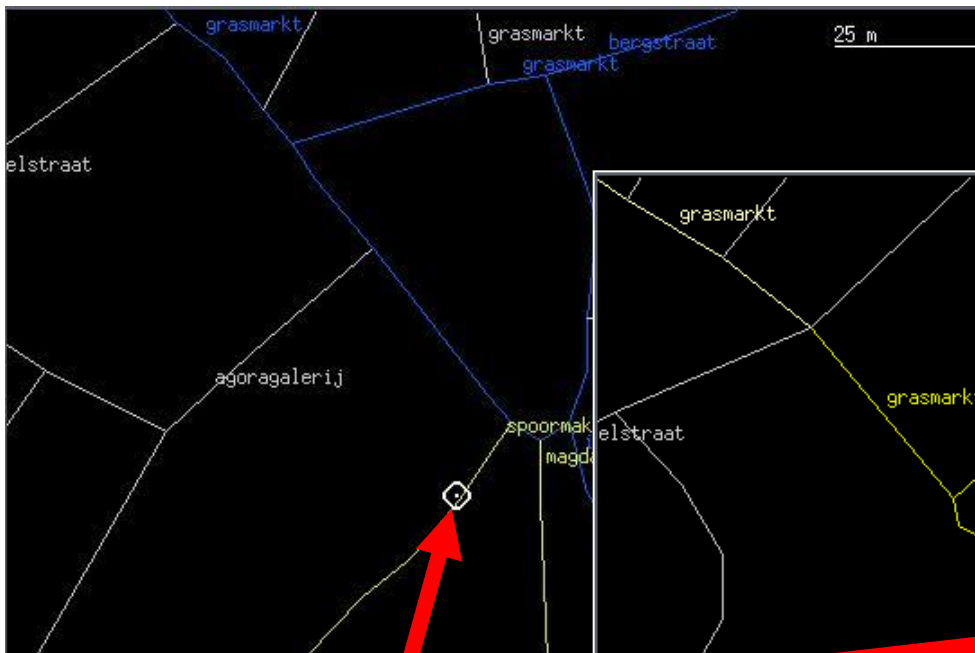
- Based on Co-ordinates: WGS 84
- co-ordinates are typically used to localize
- **we need more than co-ordinates only to find adequate and precisely the localisation**



Why one co-ordinate is not sufficient ?

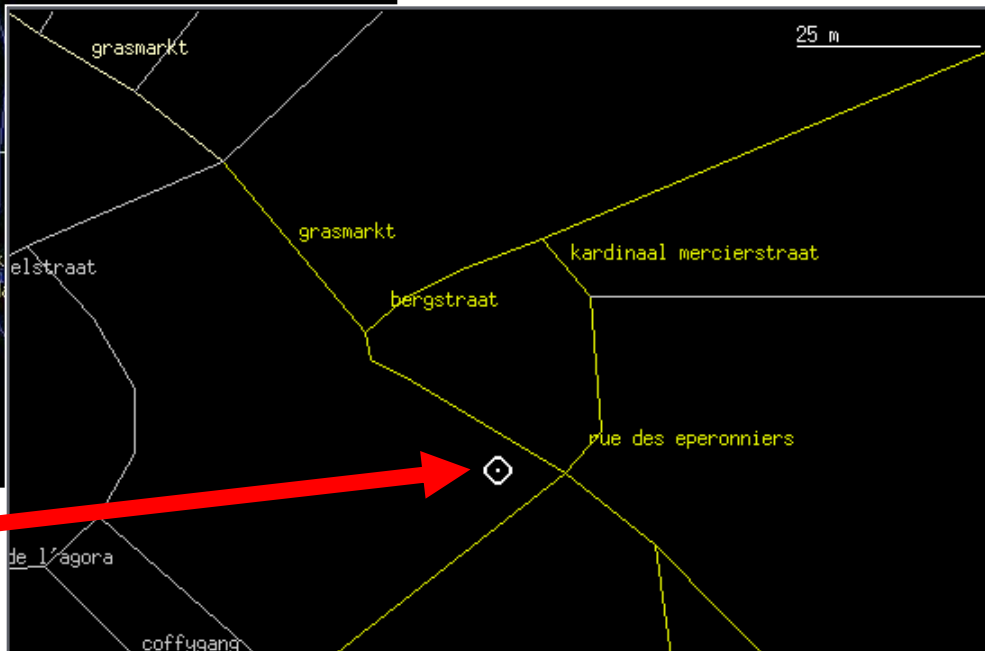
- Example real-world location nearby in Brussels

Brussels; spoormakerstraat (close to Agoragalerij)



map based on provider 1 data

map based on provider 2 data



Is this the same location ?

Traditional Methods 5 of 6

- Based on Co-ordinates: WGS 84
- Map database from providers are different because of different processes in map recognition
- Map databases from same map provider differ between releases because of evolvments in the network



Traditional Methods 6 of 6

- Based on Co-ordinates: WGS 84
- map data often do not match with real street characteristics
- difficult to match a street with co-ordinates



Picture: Highway intersection “Frankfurter Kreuz”, Germany
Yellow lines indicate street geometry as available on map-data

Objectives for any location referencing method

- Technical feasibility, don't additional attributes to map database, only basis are standard GDF attributes
- Applicability for different objects from road network
- Usability for any place on the roads
- Independence of coverage area with comparable results
- Applicability for TMC codes
- Reliability with a hit rate of 95%
- Robustness against database deviations
- Average message size less than 50 bytes



ISO Standard 17572 Synopsis 1/3

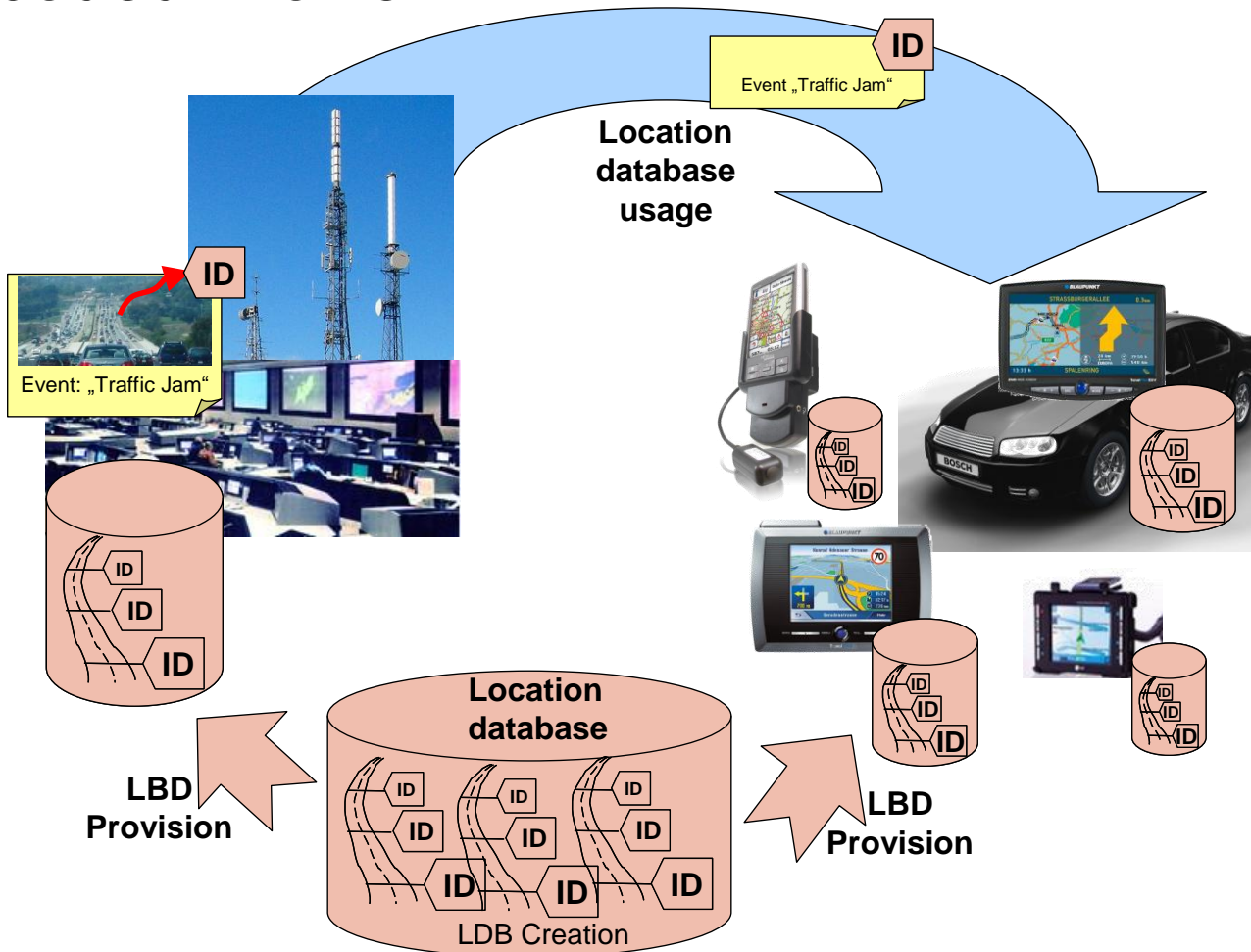
- Name: Location Referencing for Geographic Databases
 - Location Reference for specific geographic phenomena, corresponding to objects in different geographic databases, in a standard, unambiguous manner.
 - Japan, Korea, Australia, Canada, the US and European ITS bodies are all supporting activities of Location Referencing.
- Separated into three parts
 - Part 1, *General Requirements and Conceptual Model*, contains
 - General terms used by part 1, 2 and 3
 - Requirements to a Location Referencing Method
 - A Conceptual Data Model
 - Examples of existing location referencing methods
 - A Comparison of terms used also TC211 to ensure consistency
 - An informative proposal for a physical format (general part)

ISO Standard 17572 Synopsis 2/3

→ Part 2, *Pre-coded Location References (Pre-coded Profile)* contains

- The General Concept of pre-coded location references
- A description of systems identified by the group and currently in use (TMC, VICS and KoreanRoadLinkId System)
- Informative specifications of logical and physical formats for the different systems.
- This part functions as an integrator for existing specifications, because most of the historically existing methods standardized in various ISO Standards were pre-coded. Part two refers to the different specifications in use and explains their position in relation to each other.

Pre-coded Profile



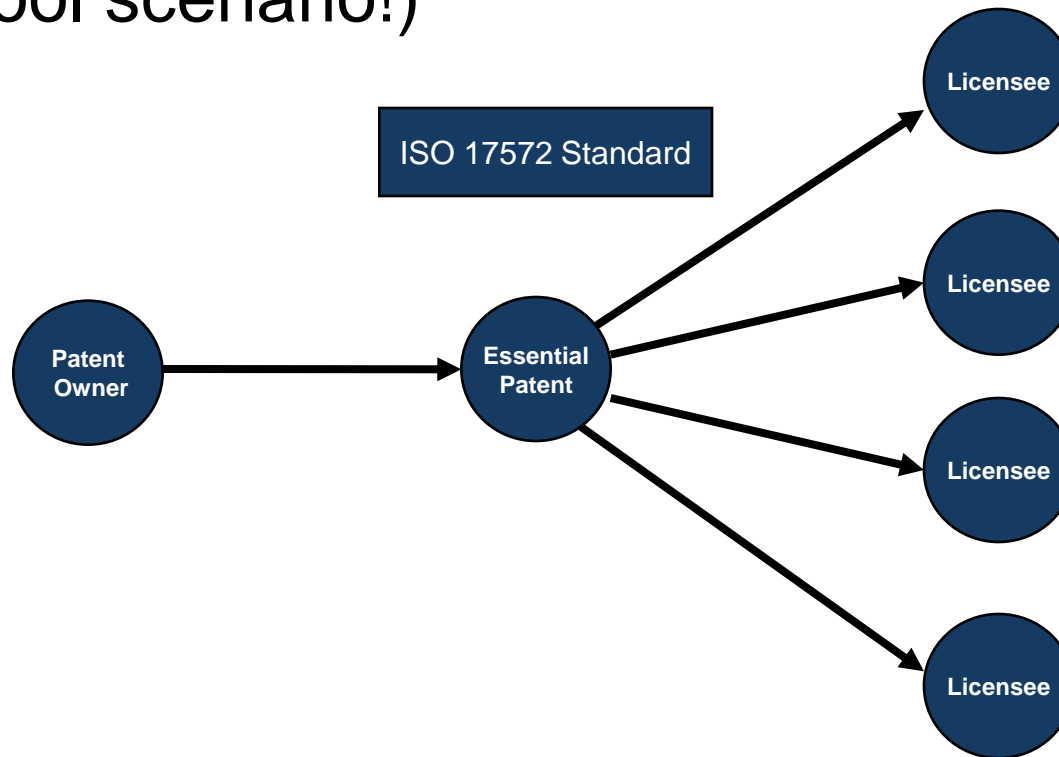
ISO Standard 17572 Synopsis 3/3

→ Part 3, *Dynamic Location References (Dynamic Profile)*, contains

- A general specification of Dynamic Location References
- The building blocks of such a Dynamic Location Reference
- A list of encoding rules specifying how a Dynamic Location Reference is built up from the digital map.
- A logical data model requirement specification
- A first informative physical format
- A second informative highly compressed binary format for transmission between infrastructure and vehicles.
- Coding Guidelines for Dynamic Location References to help implementers of encoders to produce an encoder.

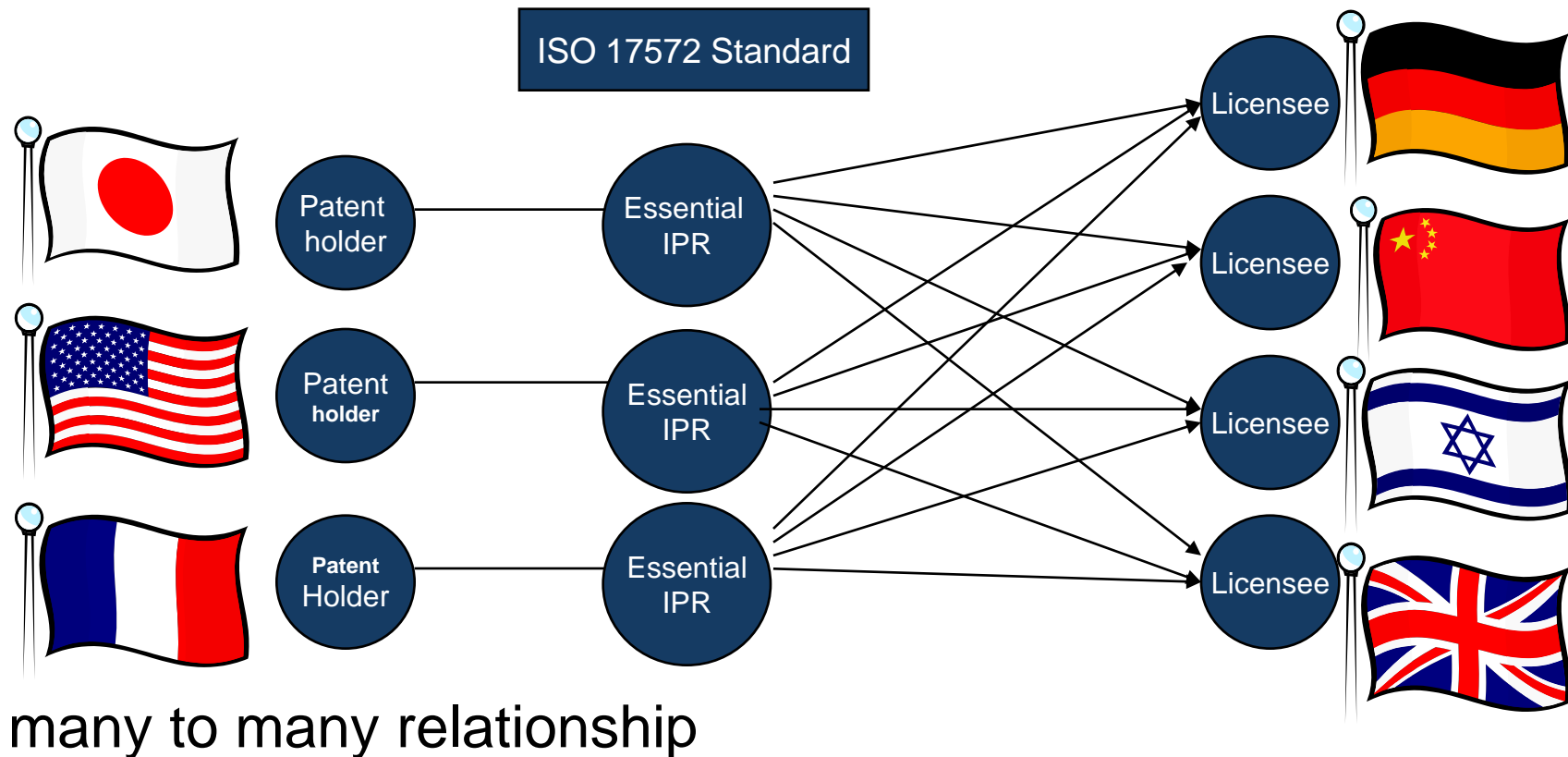
✓ AGORA-C

Standard individual licensing models (no pool scenario!)

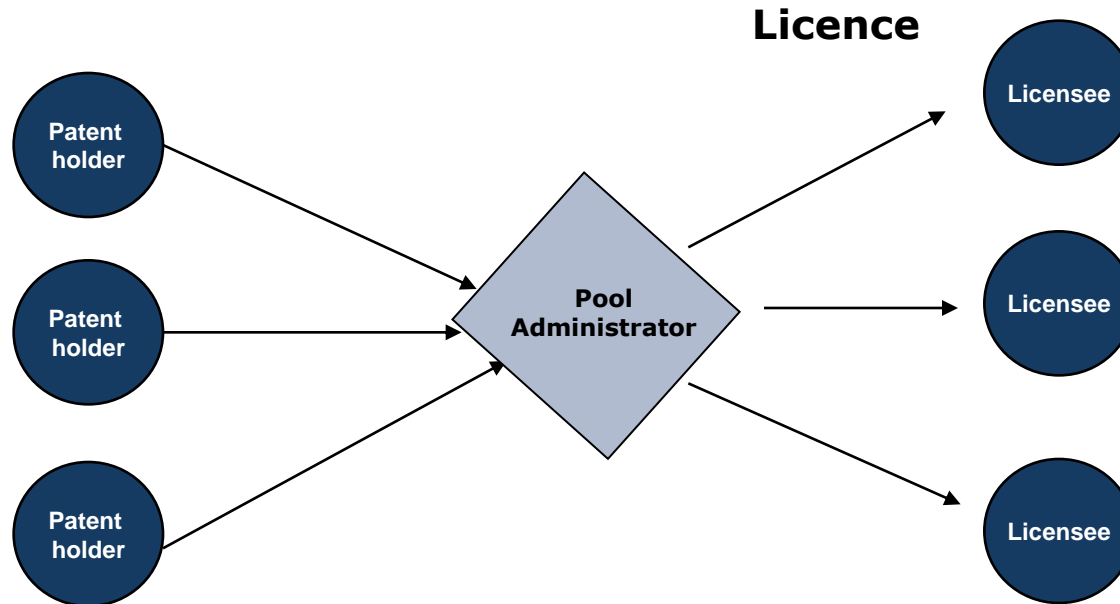


One to many relationship

Individual licensing of essential IPRs (no pool scenario!)



Solution: Mandate to the licensing administrator



Mandate to the Licensing Administrator (2)

- Agency to the Licensing Administrator
- Non-exclusive rights
- Offering licenses on FRAND terms
(worst case licensing scenario for licensee is the pool license)
- Only essential patents can be pooled

Advantages of Open Patent Licensing Programs

- Provides **cost effective** licensing of essential IP
 - Lowers transaction costs for Licensees and Licensors
- Enables markets through **independent IP access**
 - Licensees don't have to deal with competitors
- More **consistent** application of IP licensing
 - Fair, reasonable, and non-discriminatory
- License offered as an “all in” rate
 - Provides **cost stability** and reduces uncertainty
 - Establishes the **value** of the technology

AGORA-C licensing terms

Four categories of license fees:

- For AGORA-C Devices
- Subscription Based Services
- Free-to-Air Broadcast Services
- Other Services

Complete licensing terms are publicly available

www.vialicensing.com

License Fees for AGORA-C Devices

Volume Bands (reset to zero annually)	Per Unit Fee
1 - 50,000	0.50 €
50,001 - 500,000	0.40 €
500,001 - 1,000,000	0.30 €
1,000,001 - 5,000,000	0.20 €
5,000,001 - 10,000,000	0.10 €
Above 10,000,001	0.05 €

License Fees for AGORA-C Services

- AGORA-C Subscription Based Services:
Per subscriber/calendar quarter 0.025 €

“Subscription-Based Service” means any Licensed Service provided pursuant to or against a Subscription

- Free-To-Air Broadcast Services :
Yearly fee per service 5,000.00 €

“Free-to-Air Broadcast Service” means any Licensed Service that is not a Subscription-Based Service and that is broadcasted through terrestrial, satellite, cable or internet protocol which is sent unencrypted and may be received by a Licensed Product.”

Other AGORA-C Services (Cont'd)

License Fees for Other AGORA-C Services:

# of References/Year	Fees
0 – 1,000	0.00 €
1,001 - 100,000	100.00 €
100,001 - 1,000,000	500.00 €
1,000,001 - 10,000,000	2,500.00 €
10,000,001 - 100,000,000	12,500.00 €
100,000,001 - 200,000,000	18,000.00 €
200,000,001 - 500,000,000	43,000.00 €
500,000,001 - 1,000,000,000	62,000.00 €
1,000,000,001 - 2,000,000,000	93,000.00 €
2,000,000,001 - 5,000,000,000	217,000.00 €
5,000,000,001 - 10,000,000,000	310,000.00 €

ISO 17572 Geo-Referencing Standard and AGORA-C Patent Pool



backup



mobile.info Partners

→ Car manufactures

- BMW
- VW
- AUDI
- Daimler

→ Device manufactures

- Blaupunkt
- Siemens VDO

→ Map suppliers

- NAVTEQ
- TeleAtlas

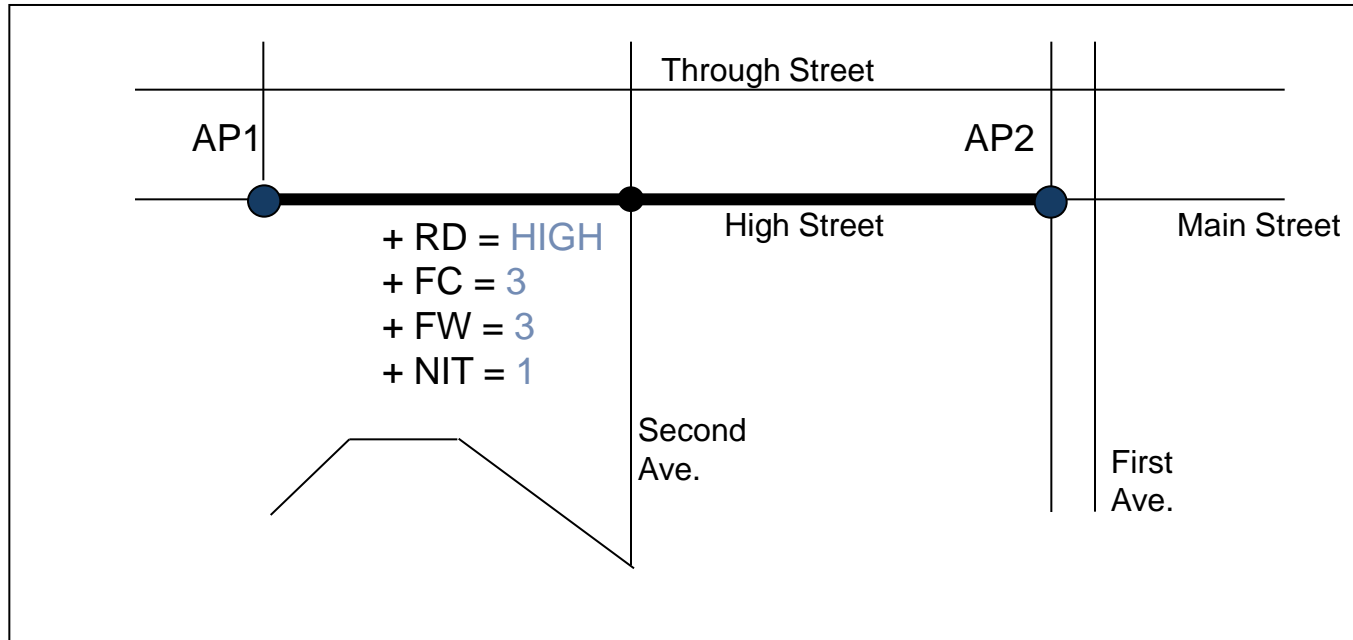
→ Service Providers

- DDG
- WDR (public broadcaster)
- T-Systems Media Broadcast
- Bayern Digital Radio

→ others

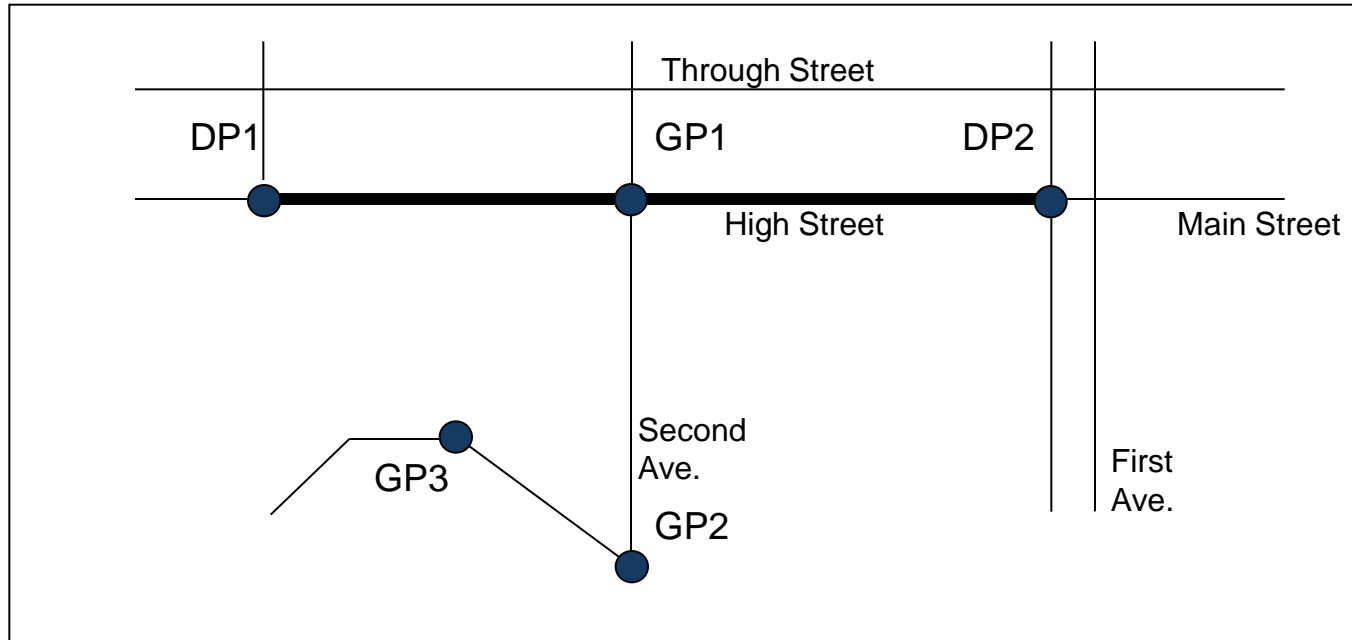
- IRT
- GEWI
- Fraunhofer-IIS

AGORA-C - 1/4 Attribute Building Block



- AP = Attribute Point (marks begin of road section)
- RD = Road Descriptor (significant part of the street name)
- FC = Functional Road Class (importance of the street)
- FW = Form of Way (type of the street)
- NIT = Number of Intermediate Intersections

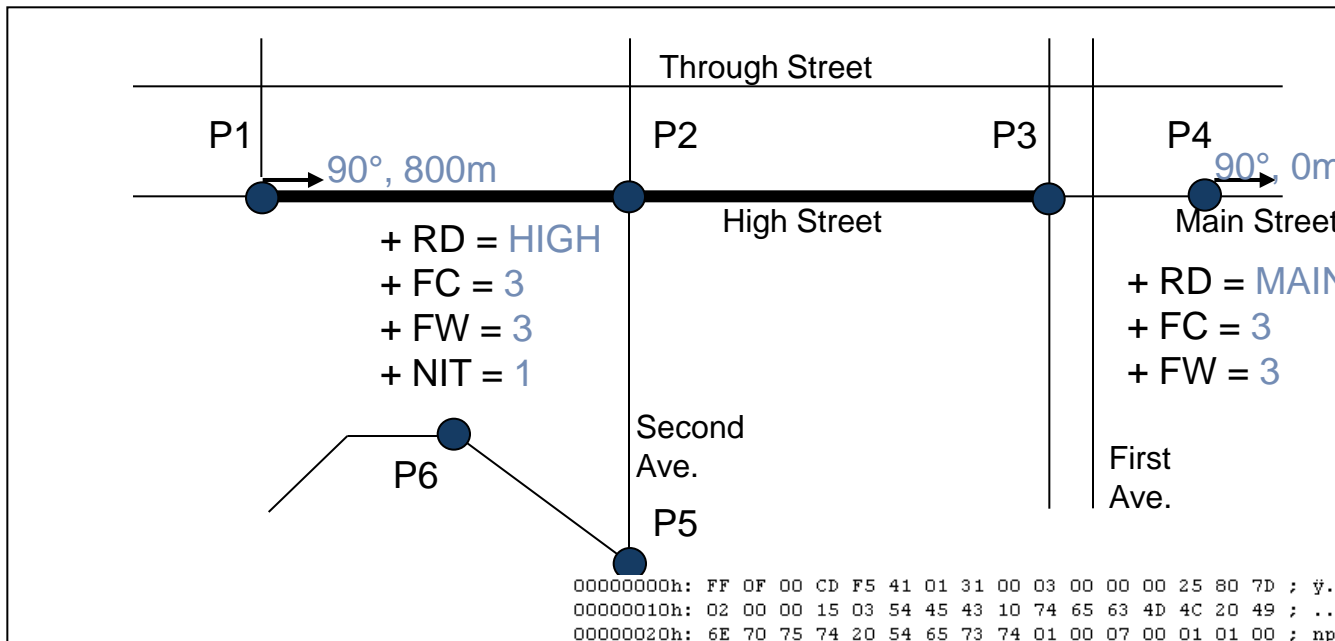
AGORA-C - 3/4 Geometry Building Block



GP = Geometry Point (geometric unique pattern)

DP = Desired Point

AGORA-C - 1/4 a location code



RD = Road Descriptor
 FC = Functional Road Class
 FW = Form of Way
 NIT = Intermediate Intersections
 P = Point (co-ordinates)

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00000020h: 6E 70 75 74 20 54 65 73 74 01 00 07 00 01 01 00 ; nput Test.....
00000030h: 00 00 05 82 67 01 00 9A 81 6C 00 01 01 00 93 00 ; ...,g..şö1.....
00000040h: 02 00 0E 0D 06 8E 30 01 45 98 40 F0 46 30 5E 25 ; .....žO.E~0&FO^%
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Implementation of AGORA-C: Project mobile.info

- **Goals:** Establish a new platform for radio based traffic information services capable of satisfying future requirements.
- **Duration:** June 2004 – November 2007
- **Final report and results:** www.mobile-info.org
- **Regular service:** Germany by end of 2008
- Request for implementation
 - UK: Trafficmaster, ITIS
 - China: OPG
 - US: Clearchannel, HD Radio

