GSGF Europe - Implementation guide for the Global Statistical Geospatial Framework in Europe

Annex 2: Good Practice Cases

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(C1.2) Geocoded address access points – data collection & provision (Austria)

Keywords: Principle 1, address register, building register, geospatial infrastructure, point-based foundation, routing

This use case refers to all of the recommendations provided within Principle 1, to use fundamental geospatial infrastructure and geocoding of statistical information. In addition, some recommendations concerning Principle 2, Geocoded unit record data in a data management environment are also addressed.

Introduction

The use of geocoded parcel addresses, as well as buildings, showed the need for precise access points. For purposes such as routing and navigation, it is essential that the "last mile" is routed correctly. Therefore, with the launch of the Austrian Graph Integration Platform GIP (the authoritative road network), the idea of meaningful address access points arose, to create operational coordinates for routing purposes. The solution was to move the address coordinate to a position on the driveway, close to the entrance, as address access point and deriving a new coordinate from that directly on the graph of the connecting road section (GIP coordinate).

Description of problem

With the start of the Address-, Buildings and Dwellings Register (A-BDR) in 2004, there were two types of coordinates: the "address coordinates" (referring to parcel addresses) and "building coordinates" (referring to building addresses). Originally, address coordinates were mostly used to identify the addresses and were automatically placed at the label points of the parcel. Equally building coordinates originally were placed anywhere inside the buildings or in some cases they were even identical to the corresponding address coordinates. This was a good start to get an almost complete set of geocoded addresses and buildings for the whole country, but through this automatisation the main meaning of the location of the coordinate was to be inside the unit.

The Address, Buildings and Dwellings Register is maintained by the municipalities. Within the application, there is a tool called GeoClient to set the coordinates for addresses and buildings. To make these coordinates meaningful for accessing and routing the rule was to set them close to the entrance within each building and address respectively. This worked well for the newly registered addresses and buildings, but the check of where the coordinates were put was not precise enough in the beginning and was not done for the initial data already in the system.

Over the years, these coordinates were used in a growing number of applications, both by the mapping agency and statistical office, but also by emergency services and for routing and planning purposes. It became obvious that the position of the coordinates was crucial, since it has an effect on the results. Routing applications often picked the wrong access road as e.g. the "calculate locations"-function snaps to the closest road section, even though this might not be the correct access road. So the location, precision and uniqueness of the coordinates became more and more important.

Routing problems before the change:

> Navigation tools usually route to the closest point on the road network, even if the parcel cannot be accessed from this street.

Address coordinate of parcel number 126/1 at label point is closer to road on the left, but access is from the top road.	Coordinate is closer to point A (on wrong road) than B (on correct access road).	This is particularly problematic in allotments, where access to the whole set of houses often is only from one single entrance.

Solution

A milestone for the improvements of these coordinates came hand in hand with the launch of the Austrian Graph Integration Platform GIP; a joint and nationwide transport graph providing a multimodal digital map of Austria's transport network available to all authorities. This transport graph is more than just a street network and is a success story on its own.

It was decided to start a mass update of the address coordinates by "marrying" the Address register and the Graph Integration Platform GIP, meaning to make the address coordinates useful for navigation based on the GIP. Routing needs more than geocoded address points, it needs logical links to the street network.

In December 2016 the former address coordinates (then still often in the centre of an address) were moved automatically within the parcel but close (1m) to the GIP road section considered to be the correct access road and renamed to be the **address access points**. From the location of this address access point, the associated GIP coordinate was calculated automatically as the closest point directly on the associated road section.

Optionally the automatically calculated address access points can be improved manually by moving it to the driveway, which results in a recalculation of the associated GIP coordinate on the access road. The building coordinates were not affected by this process and stayed where they were, ideally near the entrance of the building.

	Address coordinate of Bruckmühlgasse 2 (parcel number 126/1) at label point. The parcel is on the corner of two streets, so it has two addresses, but Bruckmühlgasse 2 is the main address, since it is the street from which the parcel is accessed.
	Bruckmühlgasse has the road ID 008146, which is also part of the official address, so it is included in both the address register as well as the GIP road section. The address coordinate is moved perpendicular to the road section with the correct road ID and placed within 1m of the road, but inside the parcel. It becomes the new **address access point**. The **GIP coordinate** is calculated as the closest point on this road section, so perpendicular and directly on the graph.
	The building coordinate is not effected by this process and stays the same. Remark: In this example it is placed in the centre of the building, so it does not correspond to the recommendation to place it near the entrance.
	The address access point can be improved manually, e.g. moved to the actual driveway. The GIP coordinate is automatically updated.

Result

The new address access points are meaningful coordinates, useful for routing purposes as the last mile is routed correctly. Emergency services such as ambulance and fire brigade now reach the desired address faster.

The address access points replaced former address coordinates and are included in the address, building and dwelling register. To ensure the maintenance and sustainability of this project, the road graph GIP is also included in the new version of the GeoClient (the tool to set the coordinates within the address, buildings and dwellings register) as street layer.

As from the statistics point of view, the address access points are a great improvement and will be used in conjunction with the building coordinates for future routing applications. However, the access for Statistics Austria to the new GIP coordinates directly on the road section has not been clarified yet.

The address access points are available as zip-file from the mapping agency for free (two "as-of-dates" per year) subject to some licensing conditions. Download link:
http://www.bev.gv.at/portal/page?_pageid=713,2601271&_dad=portal&_schema=PORTAL

More information

1) Addressregister Guidelines (in German)
2) Information about the GIP (Graph Integration Platform): Presentation "GeoGIP - Adressen und GIP" © Dangl, Mandl-Mair, Rabl, Westhauser
3) Webpage about GIP, GIP.at and GIP.gv.at: http://www.gip.gv.at/gipgvat-en.html
4) Factsheet about GIP– The collaborative digital traffic network for all authorities: http://www.gip.gv.at/downloads-219.html?file=tl_files/dynamic_dropdown/privateUploads/Downloads/Factsheets/Factsheet_Uebersicht_engl.pdf
5) GIP and GeoGIP – "marrying" the GIP with the Austrian address coordinates:
    a) http://www.gip.gv.at/downloads-219.html?file=tl_files/dynamic_dropdown/privateUploads/Downloads/Praesentationen/AGIT17%20Mandl-Mair_Verein%20OeVDAT-die%20GIP%20im%20Vollbetrieb.pdf
    b) http://www.gip.gv.at/downloads-219.html?file=tl_files/dynamic_dropdown/privateUploads/Downloads/Praesentationen/AGIT16_Unger%2BRedl_Adressregister%20und%20GIP.pdf
    c) http://www.gip.gv.at/downloads-220.html?file=tl_files/dynamic_dropdown/privateUploads/Downloads_engl/Presentations/AGIT14_GIPday_Redl_Zugangs-%20Geba%CC%88ude-%20und%20Grundstu%CC%88cksadresse_Umstzung%20in%20der%20VAO.pdf

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