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Confidentiality level

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Dataset for rescue vehicle navigation

Date	Type of change	Author
2023-02-28	Frist version	T Norlin
2024-11-06	Added attributes for emergency thru pass	T Norlin
2025-01-08	Added attribute for turning point for road maintenance vehicles	T Norlin

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1 Background

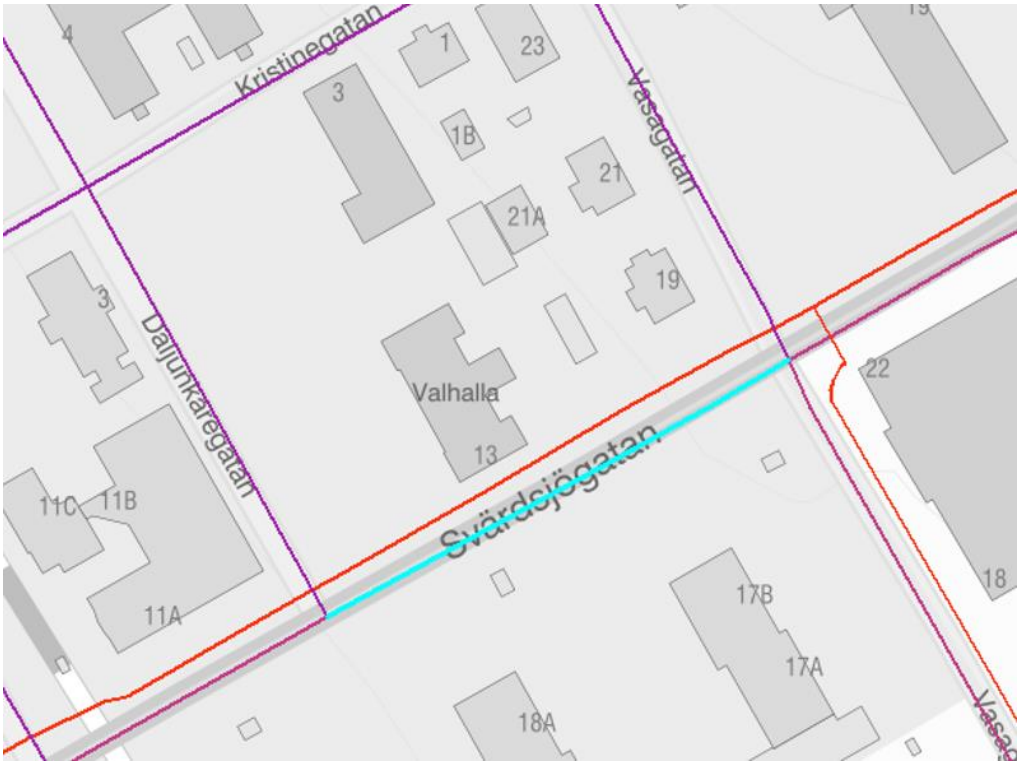
This dataset is designed for routing of rescue vehicles. Since the traffic situation and road construction among other dynamic features have a dramatic impact on the route a driver of a rescue vehicle choses, only a minimum amount of features have be included in the dataset. If more information is needed there is a dataset called “Vägdata för transportplanering” on Trafikverkets delivery node Lastkajen 6.0 (trafikverket.se)

2 Data model

The data model used in NVDB is not designed for the routing primarily. Instead, the aim is to create a database where links and their identities are stable over time and registered features do not need to recalculate their position if a new road link is connected to an existing road link. In the picture below shows a linksequence highlighted.

In order to make data usable for routing the original linksequences and selected feature types are segmented to create new links with all feature information as attributes. In other words the linksequences will cut at all junctions to create a network with an end-to-end connectivity. Level crossings will not be affected. Since some feature types might change value between

junctions, for example speed limits, the linksequences will be cut at that position as well even if there isn't a formal junction.



3 Data preparation

In a post process the segmented dataset will be cleaned from some data errors and unnecessary cuts in the network will be joined together to create as long road segments as possible.

In order to reduce the volume of data the number of vertices of the links have been reduced with the Douglas-Peucker algorithm (tolerance set to 0,7 meter). Some roundabouts and curves might appear jagged but it will have no effect on the routing. Furthermore all segments have been set to 2D with no measure values.

4 Attributes

The attributes in this data package has been chosen in collaboration with rescue application developers and rescue vehicle operators. Attributes might vary over time if the steering committee of the National Road Database decides on changes.

4.1 Segments

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Attribute name	Description	Valid values if present
Road_name	Name of road/street	
Other_road_name	Road names not to be found in addresses	
Road_number	Road number. Mostly present on state owned or maintained roads. Might be present at the same time as road names	4-5000
F_speedLimit	Speed limit in the forward direction of the link (direction of the link is defined by the order of vertices Since rescue vehicles under certain circumstances can use the bicycle network a default speed limit is set to 1 km/h	5=(pedestrian speed) 10,20,30,40,50,60,70,80,90,100,110,120 1000=(variable speed depending on weather, traffic situation etc.)
B_speedLimit	Speed limit in the backward (reveres) direction of the link Since rescue vehicles under certain circumstances can use the bicycle network a default speed limit is set to 1 km/h	5=(pedestrian speed) 10,20,30,40,50,60,70,80,90,100,110,120 1000=(variable speed depending on weather, traffic situation etc.)
Number_of_lanes	Number of lanes on the link representing the carriage way in direction of travel. Mostly present on the state owned or maintained roads	

F_one_way_street	Prohibited driving in the forward direction of the link	-1=prohibited driving
B_one_way_street	Prohibited driving in the backward (revers) direction of the link	-1=prohibited driving
Roundabout	Roundabout	-1 if present
Access_exit_road	Access or exit road on motorway	-1 if present
Form_of_way	Form of way for the car network derived from a number of feature classes in NVDB. The feature type is mainly used for cartography at the National land survey (Lantmäteriet) but could also be used as a hierarchy in the network.	10= major connecting link (for cartographic used mainly ,se:övergipande länk) 20=main street (huvudgata) 30=local street, major (se:lokalgata stor) 40=local street, minor (se:lokalgata liten) 50=neighborhood road (se:kvartersväg) 60=road on parking lot (se:parkeringsområdesväg) 70=access road in residential area (se:infarts-/utfartsväg) 80=delivery road (se:leveransväg) 90=bus road (se:bussgata) 100=motorway (se:motorväg) 110=freeway (se:motortrafikled) 120=dual carriage way (se:mötesfri väg) 130=single carriage way, major (synonym:major country road) (se:landsväg större) 140=single carriage way, minor (synonym:minor country road) (se:landsväg mindre) 150=small road (se:småväg)

		160=small road, primitive standard (se:småväg, enkel standard)
Road_width	Width of the road in meters	
Bridge_and_tunnel	Bridge, tunnel or other construction on the road	1=bridge or overpass 2=underpass 3=tunnel 4=overpass and overpass
Type_of_network		1=car network 2=bicycle network 4=pedestrian network
Functional_road_class	Hierarchy in the road network. Lower values indicates more important roads.	0-9
Densly_populated_area		-1 if present
Ferry_route	Scheduled ferry route	-1 if present
Maximum_total_weight	Maximum total weigh allowed for vehicles measured in tons	
Maximum_axis_pressure_value	Value for maximum axis pressure measured in tons	
Maximum_axis_pressure_type	Type of pressure	1=single axis 2=boggy axis 3=triple axis
Maximum_width	Maximum width for vehicles in meters	
Maximum_length	Maximum length for vehicles in meters	

Maintenance_turnaround	Turning point for road maintenance vehicles.	-1 if present
Bearing_capacity		1=BK1 (up to 2=BK2 (up to 3=BK3 (up to 4=BK4 (up to 74 tons)
Main_road	Connecting roads must give way	-1 if present
Recommended_route_hazmat	Recommended route for hazardous materials	1=recommended primary route 2=recommended secondary route
Limitation_route_hazmat	Limitations on route for hazardous materials	
Road_surface_type		1=asphalt 2=gravel
Maintenance_road	Road designed for maintenance. Can sometimes be used for u-turns on motorways.	-1 if present
Linksequence_OID	Identity of linked network element (linksequence)	
Blocking		
Stairs	Stairs might be present on bicycle- and pedestrian roads	-1 if present

4.2 Point features

A number of blocking or speed reducing object types will be delivered as separate point feature classes in the geopackage database.

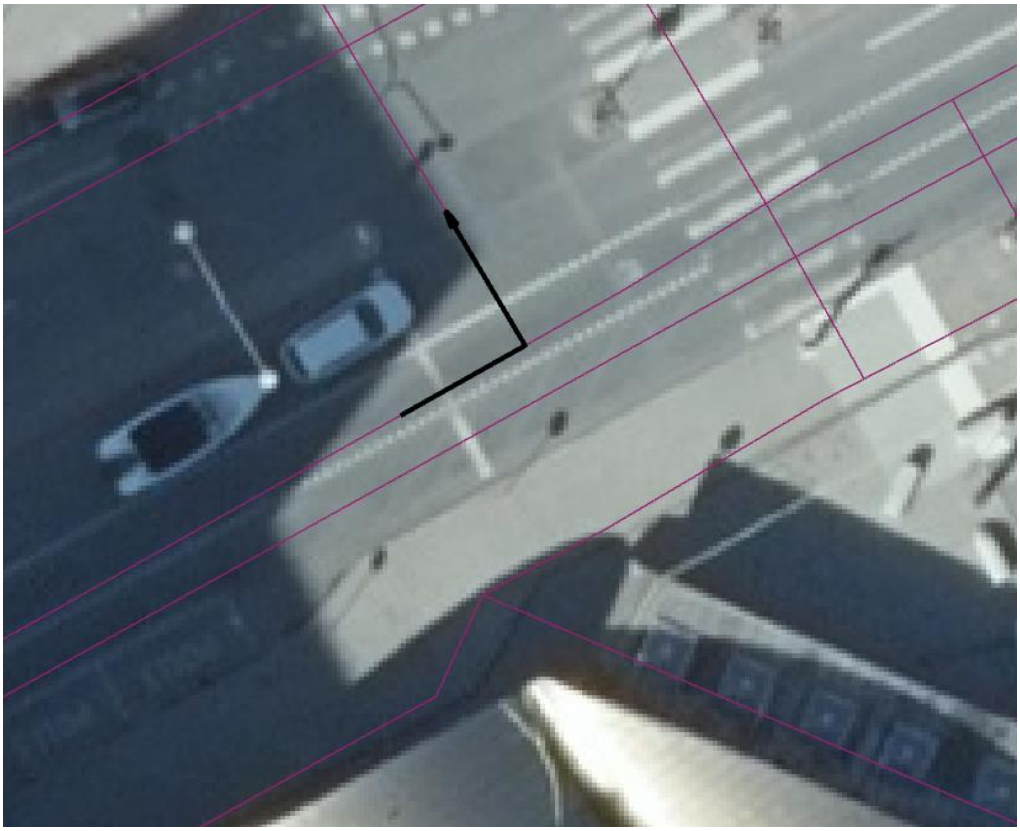
Table name /Attribute name	Description	Valid values if present
Blocking		

Road_block/type	Different types of road blocks. Illustration can be found in Väghinder (trafikverket.se)	1=bollard (se:pollare) 2=soft (passable) gate (se: eftergivlig grind) 3=non passable gate (se: ej öppningsbar grind eller cykelfälla) 4=locked gate or boom (se:låst grind eller bom) 5=concrete obstacle (se:betonghinder) 6=gauge obstacle (se:spårviddshinder) 7=rock obstacle (se:stenhinder)
Road_block/width	Passable width (optional)	
Road_block/Linksequence_OID	Identity of linked network element (linksequence)	
Limited_height/height	Limited height for passing with vehicles	
Limited_height/Linksequence_OID	Identity of linked network element (linksequence)	
Speed reducing objects		
Speed_reducers/no attributes	Objects that have an impact on vehicle speed, for example speed bumps or a pincushion on the road.	
Speed_reducers/Linksequence_OID	Identity of linked network element (linksequence)	
Other		
Emergency_thrupass/Obstacle	Thru passes in for example wire railings	1 = None 2 = Forceable 3 = Not forceable, possible to dismantle

Emergency_thrupass/FEATURE_OID	Identity of feature. Thrupasses between links are registered as two point extents with the same FEATURE_OID	
Speed_reducers/Linksequence_OID	Identity of linked e network element (linksequence)	

4.3 Turns

Forbidden turns are delivered as geometrical features with three vertices.



This feature class has been historically difficult to control. There might be errors in the dataset. On example is valid turns that points on road links that have been terminated.