### Summary

This is an instruction for delivery of shapefiles and statistical data to the Nordic Indexes webpage. The instruction is organized in the following chapters:

- **Chapter Fejl! Henvisningskilde ikke fundet.** - Introduction. Here, some background is given and a log of version changes is given.
- **Chapter Fejl! Henvisningskilde ikke fundet.** - Description of road network. Here it is stated which road network that should be used for different traffic parameters.
- **Chapter Fejl! Henvisningskilde ikke fundet.** – Shapefiles. Here it is described the content and layers of the shapefiles that should be delivered.
- **Chapter Fejl! Henvisningskilde ikke fundet.** – Statistical data. Here it is stated which traffic parameters that should be delivered, format for delivery and also a time plan for delivery.

Together with this instruction there is an Excel file template stating the format for delivery of statistical data.

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Delivery instructions for Nordic Indexes webpage

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1 Summary

This is an instruction for delivery of shapefiles and statistical data to the Nordic Indexes webpage. The instruction is organized in the following chapters:

- Chapter 2 - Introduction. Here, some background is given and a log of version changes is given.
- Chapter 3 - Description of road network. Here it is stated which road network should be used for different traffic parameters.
- Chapter 4 – Shapefiles. Here it is described the content and layers of the shapefiles that should be delivered.
- Chapter 5 – Statistical data. Here it is stated which traffic parameters that should be delivered, format for delivery and also a time plan for delivery.

Together with this instruction there is an Excel file template stating the format for delivery of statistical data.

2 Introduction

This is an instruction for delivery of shapefiles and statistical data to the Nordic Indexes webpage. At the project meeting at the Faroe Islands in May 2018 some changes regarding the delivery instruction version 1.0 (dated 2017-12-14) was decided. The current version (1.3) of the instructions, replace the earlier versions. The major changes between version 1.0 and version 1.3 can be described as:

- The road network used for vehicle mileage (VM) and change in VM on one hand and speed levels and speed index on the other hand can be on different road networks.
- Statistical data regarding VM and change in VM should be regarding the European road network (E-roads).
- Statistical data regarding speed levels and speed index should, as earlier in version 1.0, be regarding the appointed road network, where each country decide by themselves which road network that constitutes the appointed road network. The shape files should correspond to the appointed road network.

1 Or comparable road network if a country does not have E-roads.
Since E-roads are the network for VM and change in VM a new layer with road category (which can identify E-roads) should be added to the shape files.

The consequences of these changes are described more in detail in the text below. Delivery according to these new instructions should be done from 2019 an forward. That is, the first delivery 2019 (March) should be according to current version of the delivery instructions.

The instructions were preceded by a questionnaire where each country stated what could be delivered regarding shapefiles and statistical data. The replies have been taken into account in this instruction, and it is expected that each country delivers data and shapefiles in accordance with the replies in the questionnaire. (Some countries have stated they are not able to deliver all statistical data.)

The intention is that statistical data and shapefiles should be delivered once a year (in March).

The periodicity and schedule for the deliveries is described below. Chapter 3 is a description regarding the road network, chapter 4 is about shapefiles and chapter 5 is regarding statistical data with a time plan for deliveries.

The web page that will display the indexes is for the moment maintained by Trafkverket in Sweden. The plan in NorSIKT IP is to transfer the maintainence to the web page for the Nordic Council of Ministers (https://www.norden.org/en). If that goal is fulfilled there might be some revisions in the delivery instructions. The revisions will probably be regarding the delivery file format for statistical data.

Log of version changes:

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Major changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>2017-12-14</td>
<td>Final version</td>
</tr>
<tr>
<td>1.1</td>
<td>2019-01-24</td>
<td>Road network for VH should be based on E-roads whereas road network for speed index should be based on appointed road network (can be E-roads but can be different road network). A new layer with road category (which can identify E-roads) should be added to the shape files. Delivery of statistical data and shapefile is done once a year (in April).</td>
</tr>
<tr>
<td>1.2</td>
<td>2019-01-31</td>
<td>Delivery of statistical data and shapefile is done in March (instead of April). The shapefiles should show different road network depending on zoom level was omitted.</td>
</tr>
<tr>
<td>1.3</td>
<td>2019-09-25</td>
<td>Chapter with Summary added. Table with version log added.</td>
</tr>
</tbody>
</table>
3 Description of road network

The road network for VM and change in VM on one hand and speed level and speed index on the other hand can differ in a country. A country can, however, chose to have the same road network for all statistical data. Below the road network is described.

E-roads for VM

Regarding VM and change in VM the road network should be E-roads. If a country does not have E-roads, a corresponding road network can be chosen.

Appointed road network for speed

For statistical data regarding speel level and speed index a different road network than E-roads can be used. If so, the appointed road network will not be the same in each country. The possibility to understand the differences and similarities between countries is therefore beneficial to a user of the Nordic Indexes webpage. Each country should provide a document that describes both the E-roads and the appointed road network in text and figures. The description can be short and should include the criteria used to delimit the appointed road network.

A description in figures regarding the length of E-roads as well as the length for the the appointed road network should be provided in the document according to the template in table 1, i.e. two tables if E-roads and the appointed road network differs. Please fill out the table with figures and note that the date regarding the road length can be stated in the table.

Remark: in table 1 “barrier” is center barrier (not barriers on the side of the roads). In version 1.0 of the instructions there was a category “Ordinary with median”. That category was removed in version 1.2 and following versions. Very few countries have that category. If a country has roads “Ordinary with median” they can be grouped together with “Ordinary with barrier”. Also note that roads of type 1+2 is considered “Ordinary” if it has no barrier, but if it has barrier it is considered “Ordinary with barrier”.

Table 1. Template for table with length in km for the E-roads and the appointed road network divided into speed limit and road type

<table>
<thead>
<tr>
<th>Date: 20YY-MM-DD</th>
<th>Speed limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed limit</td>
<td>30 35 40 50 60 70 80 90 100 110 120 130 Variable Unknown</td>
</tr>
<tr>
<td>Road type</td>
<td>Motorway Motor traffic road (expressway) Ordinary Ordinary with barrier</td>
</tr>
<tr>
<td></td>
<td>Sum</td>
</tr>
</tbody>
</table>
If there are some special considerations or aspects regarding the appointed road network worth mentioning, please do so in the document.

The preferred format for the document is Word or Excel.

The naming convention for the file with the document is

- Country_ Road_Network_20YY-MM-DD

The date should refer to the date when the document is written. Country should be replaced with e.g. Iceland.

The delivery of the document can be together with the delivery of the shapefiles and statistical data, se next chapter.

New and updated shapefiles should be delivered in each year, se next chapter for time plan. If the definition of the appointed road network changes or the road length differs by a notable amount, the document can be updated and delivered. Each country decides what constitutes a notable amount. The same aspect applies regarding E-roads.
4 Shapefiles

The shape files should correspond to the road network used for Nordic parameters. For VM and change in VM the shape files should be able to identify E-roads. For speed parameters the shape files should encompass the appointed road network.

4.1 Layers

The following layers to display on the Nordic Indexes webpage should be delivered as separate shapefiles:

- Road type Motorway
- Road type Motor traffic road (expressway)
- Road type Ordinary
- Road type Ordinary with barrier
- Road category E-roads (to identify road network for VM)
- Measurepoint – Used for VM in E-roads (or appointed road network)
- Measurepoint – Used for speed for appointed road network

Each of the five shapefiles regarding road type (motorway, ..., ordinary with barrier) and road category E-roads should also contain information regarding speed limit with possible values 30, 35, 40, 50, 60, 70, 80, 90, 100, 110, 120 and 130\(^2\). For variable speed limit the code 1000 should be used and for unknown speed limit use code 999.

In both shapefiles regarding measurepoints there should be an associated table with the following fields regarding the points:

- Name of point, road number, speed limit and road type

The purpose of this information is that when viewing the measure point on the map, clicking on the point will show the information.

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\(^2\) All values do not need to be in the file, only those sped limits that are actually used should be in the file.
4.2 The idea behind how to display Nordic indexes together with road map

New in version 1.2 and following versions: In version 1.0 of the delivery instructions the shape files should show different road network depending on zoom level. When looking at all countries (highest zoom level) only E-roads should be visible, but when zooming in more of the road network should be visible. In version 1.2 and following versions of the delivery instruction this is no longer true! The new proposed functionality is that depending on which statistics that are displayed the whole associated road network is shown. For example: If a country chooses all state owned road network as the appointed road network for speed parameters, then when speed indexes are displayed the associated map with roads should display all state owned road network. When vehicle mileage indexes is displayed the E-road network should be displayed in the associated road map. This is summarized on table 2.

The idea is that depending on which index that is displayed the road map should display the road network that correspond to the indexes. With this feature it will be easier to understand graphically which road network the indexes cover. The zoom functionality will still be available, but when zooming in no new layers of roads will be shown.

Table 2. Connection between Nordic indexes displayed and road network displayed

<table>
<thead>
<tr>
<th>Nordic index displayed</th>
<th>Road network displayed on map</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed parameters</td>
<td>The appointed road network</td>
</tr>
<tr>
<td>VM parameters</td>
<td>E-road network</td>
</tr>
</tbody>
</table>

4.3 Coordinate system

The preferred coordinate system is WGS84 (EPSG:4326) for all shapefiles. If another coordinate system is used it must be clearly stated with the delivery.
4.4 Naming of shapefiles

The naming convention for the shapefiles is

- Country_layer_date.extension

The date should be the date the road network is represented by the shapefile.

Example: the shapefiles for Sweden should have the following names

- Sweden_Road_type_Motorway_20YY-MM-DD.extension
- Sweden_Road_type_Motor_traffic_road_20YY-MM-DD.extension
- Sweden_Road_type_Ordinary_20YY-MM-DD.extension
- Sweden_Road_type_Ordinary_with_barrier_20YY-MM-DD.extension
- Sweden_Road_category_E_roads_20YY-MM-DD.extension
- Sweden_Measurepoint_Change_in_total_VM_20YY-MM-DD.extension
- Sweden_Measurepoint_Speed_20YY-MM-DD.extension

4.5 Time plan and periodicity for deliveries

The deliveries are made once a year together with delivery of statistical data, se table 4 in section 5.5. Preferably, the extraction of shapefiles should be done as close to January 1 as possible (each year).

4.6 Delivery

All deliveries are done to Statisticon. Regarding statistical data and description of the road network the files can be sent by mail to mats.nyfjall@statisticon.se. Regarding shapefiles, if they are relatively small (say less than 5 Mbyte), they can be sent by email to mats.nyfjall@statisticon.se. Larger files can be delivered by an FTP-solution. Please contact Statisticon for the matter.

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3 A shapefile consists of, at least, three files. All files for each layer should follow the same naming convention, but will have different extensions.

4 If the Nordic Indexes becomes a part of Nordic Council of Ministers the delivery address will be more formalized.
5 Statistical data

The statistical data that should be delivered for the Nordic Indexes webpage is described below. Each variable is discussed and described separately. The format for delivery is given in an Excel-file template (attached to this file) with variable names that should be used. The sheet names and order of variables must not be altered.

If a certain variable cannot be provided or is not applicable the column should be left blank (not deleted).

5.1 Speed

Regarding speed, table 3 contains information on what should be delivered. That is, monthly figures for speed levels and speed index for roads on the appointed road network divided into speed limits 50, 60, 70, 80, 90, 100, 110 and 120 km/h. If there are roads with e.g. 130 km/h on the appointed road network, statistical data regarding that speed limit need not be delivered. The row Total in table 3 indicates that a speed index for the whole appointed road network should also be delivered. However, speed level for the total appointed road network should not be delivered.

Table 3. Statistical data to be delivered regarding speed for the appointed road network

<table>
<thead>
<tr>
<th>Speed limit</th>
<th>Speed level</th>
<th>Speed index</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>60</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>70</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>80</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>90</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>100</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>110</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>120</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Total</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

For example, if there are no roads with speed limit 120 km/h on the appointed road network the column is left blank

In the Total estimate, roads with speed limit 130, as well as 40 km/h if such roads exist, is included even though no separate estimate for that speed limit should be provided.

5 For example, if there are no roads with speed limit 120 km/h on the appointed road network the column is left blank

6 In the Total estimate, roads with speed limit 130, as well as 40 km/h if such roads exist, is included even though no separate estimate for that speed limit should be provided.
The data for speed level should be the monthly estimate of speed in km/h for the appointed road network on roads with given speed limit, e.g. 50 km/h.

The data for speed index should be the estimate of change in speed a certain month current year compared to the same month previous year on roads with given speed limit, e.g. 50 km/h. The index should be delivered on format 1,012, 0,978 etc. where 1,012 means an increase with 1,2 percent and 0,978 means a decrease with 2,2 percent.

In the file template (see section 5.4 below) the variable names for the speed variables are

- **Speed level:**
  - SLevel50, SLevel60, SLevel70, SLevel80, SLevel90, SLevel100, SLevel110 and SLevel120 (sheet name is Speedlevel)

- **Speed index:**
  - SIndex50, SIndex60, SIndex70, SIndex80, SIndex90, SIndex100, SIndex110, SIndex120 and SIndexTotal (sheet name is Speedindex)

### 5.2 Change in vehicle mileage (monthly figures)

Note that change in vehicle mileage should be regarding E-roads. The monthly estimate of two different parameters regarding change in vehicle mileage should be delivered

- **The monthly change in vehicle mileage when one month current year is compared to the same month previous year.**
  - Starting period is January 2012 which is compared to January 2011.
  - Variable name in file template: VMChangeMonth

- **The monthly change in vehicle mileage when a 12-month period current year is compared to the same 12-month period previous year.**
  - Starting period is January 2012.
  - Variable name in file template: VMChange12Month

Both variables should be delivered in sheet ChangeVehicleMileage in the file template.

The change (index) should be delivered on format 1,012, 0,978 where 1,012 means an increase with 1,2 percent and 0,978 means a decrease with 2,2 percent.

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7 A 12-month period current year can encompass months from year t as well as year t-1. For example the monthly estimate for February 2018 encompass March 2017 to February 2018.
5.3 Total vehicle mileage (yearly figures)

Note that vehicle mileage should be regarding E-roads. A yearly estimate regarding the following parameters should be delivered:

- Total vehicle mileage, expressed as millions vehicle kilometers
  
  - Variable name in file template: VMTotal

- Change in total vehicle mileage, expressed on format 1,012, 0,978 where 1,012 means an increase with 1,2 percent and 0,978 means a decrease with 2,2 percent
  
  - Variable name in file template: VMChangeTotal

- Road length for the E-roads, expressed in km
  
  - Variable name in file template: RoadLength

- Total vehicle mileage per km, calculated as millions vehicle kilometer divided by road length. These figures will be express in unit millions vehicle kilometer per kilometer
  
  - Variable name in file template: VMTotalPerKm

- All four variables should be delivered in sheet VehicleMileage in the file template

Note that only point estimates should be delivered, not interval estimates (confidence intervals).

5.4 File format, file name and row content

Together with these delivery instructions there is an Excel file template with filename NorSIKT_IP_File_template_Statistical_data_Nordic_Index_webpage_(version_x.x).xlsx. This template should be used for delivery of statistical data. In each delivery all sheets and variables should be as in the original file, even if some variables are not provided. The sheet names and variable names should not be altered.

When delivered to Trafikverket the naming convention for file with statistical data is

- Country_NorSIKT_20YY.xlsx

The year (YY) should refer to the year most recently updated in the delivery. For example, when delivering data for (the whole) 2018 the file name for e.g. Norway should be

- Norway_NorSIKT_2018.xlsx

Row content in the file

In the first delivery, which was made in 2018, all estimates from 2011 (or 2012) should be delivered in the file. In forthcoming deliveries it is preferred that every time series remain
in the file and that new values are added to the bottom of each table. Corresponding values for year and month should then be added.

5.5 Time plan and periodicity of delivery

The delivery plan has changed between version 1.0 and 1.2 (and following versions) of the instructions. In version 1.0 deliveries should be done each quarter. In version 1.2 the delivery is done once a year according to table 4.

Table 4. Periodicity of delivery for statistical data to Nordic Indexes webpage, 2019 and forthcoming years

<table>
<thead>
<tr>
<th>Statistical data regarding</th>
<th>Delivery no later than</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous year</td>
<td>March current year</td>
</tr>
</tbody>
</table>

5.6 Delivery

All deliveries are done to Statisticon. Regarding statistical data and description of the road network the files can be sent by mail to mats.nyfjall@statisticon.se. Regarding shapefiles, if they are relatively small (say less than 5 Mbyte), they can be sent by email to mats.nyfjall@statisticon.se. Larger files can be delivered by an FTP-solution. Please contact Statisticon for the matter.

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