

# **ASIST-Asia Pacific**

*a programme for optimising sustainable employment in the  
construction and infrastructure sectors*

## **INTEGRATED RURAL ACCESSIBILITY PLANNING**



### **Guidelines for Transport Infrastructure Inventory Preparation of Transport Network Analysis**

**Internet Version 1**



**INTERNATIONAL LABOUR ORGANIZATION**  
**Regional Office for Asia and the Pacific**



## **BACKGROUND**

The Transport Infrastructure Inventory is a tool that allows the planner to obtain in a reasonable short time an overview of the extent and condition of the road and waterway network in a certain area. The tool is part of an area based planning process for rural infrastructure called Integrated Rural Accessibility Planning (IRAP).

### **Introduction to TII.**

The aim of the Transport Infrastructure Inventory (TII) is to come up with an overall assessment of the condition of the road and waterway network and its geographic distribution. It is quite different from the traditional road inventory, as it does not gather technical engineering information related to the design, the embankment or the surface of the road.

The TII verifies the existing network and then classifies the roads and waterways according to their condition. It gathers data on roadlength, trafficability and numbers of bridges. TII therefore presents a rapid tool for obtaining reliable data that can be used for planning and prioritising investments in road maintenance or new construction.

This manual will introduce TII through the following steps:

*Step 1: Prepare the draft Transport Infrastructure Map.*

*Step 2: Identify road links.*

*Step 3: Prepare the field survey form.*

*Step 4: Verify the existing network in the field.*

*Step 5: Correct the draft Transport Infrastructure Map.*

*Step 6: Discuss results with local officials.*

*Step 7. Making the final adjustments to the draft Transport Infrastructure Map.*

### **The TII steps:**

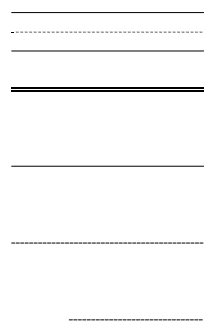
*Step 1: Prepare the draft Transport Infrastructure Map*

The preparation of a Transport Infrastructure Map (TIM) is explained in detail in the Guidelines for Manual Accessibility Mapping, chapter 3. The different steps are briefly repeated below:

First of all, the area of study has to be determined. Topographic maps have then to be obtained to make a base-line map.

The base-line map is laid over the topographic map, in a way that they exactly match. The road and waterway network can then be copied from the underlying topographic map, following the existing routes.

The following drawing symbols are used:



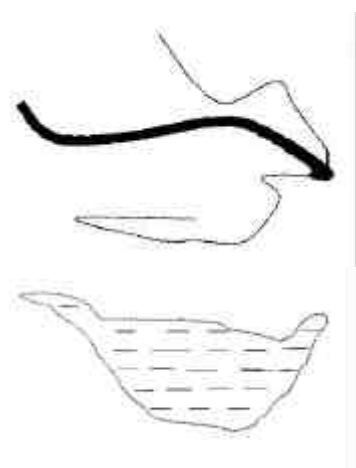
National Road.

Provincial Road.

Rural Road.

Ox cart Track.

Foot Path.



Rivers and canals.

Lakes.

The TIM is complete once the symbols are added to the legend and a title is placed on top of the map.

### ***Step 2: Identify road links***

Before doing the field survey it is necessary to identify the different road links. This can be done by looking at the hierarchical system of population centres. Population centres are divided into, in descending order: Provincial Centres, District Centres, Commune Centres and Village Centres. For identifying road links we will start from the highest order population centre downwards.

***Road Link:*** *A **Road Link** refers to an entire road from its origin to its destination. The origin has to be a population centre and the destination can either be another population centre, of the same or higher category or a road of a higher category. A road link always ends at a district boundary.*

For example, if there is a national road running through a survey district, then the part within the different district boundaries will be classified as a separate road link. The same holds for provincial roads.

Each road link can be subdivided into segments, where every segment refers to the part of the road between two identifiable points. These points include population centres, other road links, and district boundaries. For example, if there are 5 villages located at the provincial road in the survey district, we can divide the provincial road link into 6 segments.

*Road Segment: A **Road Segment** refers to the part of the road link between two identifiable points, such as population centres, other road links and district boundaries.*

First, we identify the road links that connect the district centre with other district centres. Each identified road will be labelled as a separate road link. Note however that although the road may be continuing into another district, it ends at the district boundary.

If a district road connects with a provincial road, then the intersection will be the final point of the road link, while the starting point will be the district centre. The segment from the intersection to the provincial capital has already been labelled as a provincial road link.

After having identified the roads originating from the district centre, we continue with the commune centres. First of all, we identify those roads that connect to other commune centres or that link to a road link of a higher order. After finishing the communes we use the same procedure for village center road links.

The last set of roads we can identify are those roads that start from a population centre and end up in the field. We could classify these as agricultural roads as they are only used to go to the field.

It is important to have the different road links classified to minimise confusion in the field and afterwards. It needs to be emphasised however that the classification of some road links might change and new ones might be identified while doing the field survey.

### ***Step 3: Prepare the Field Survey Form.***

After the road links have been identified, a field survey form needs to be completed. Before doing this the person completing the form needs to understand it. A brief explanation follows below.

The Transport Infrastructure Form will record the most important data we need to know to be able to assess the condition of the road (a similar process will be followed for waterways).

**Transport Infrastructure Form**

\_\_\_\_\_

Commune \_\_\_\_\_

Date: \_\_\_\_\_

Road Link	Origin/destination		Approx. Length in Km	Road Classification	Road Width	Road condition	Additional Information
	Starts at:	Ends at:					
Segment Number							

<p><b>Road Classification:</b></p> <p>Pr = National and Asian Roads</p> <p>Sp = Linking to provincial town</p> <p>St1 = Linking to district town</p> <p>St2 = Linking to Commune</p> <p>St3 = Linking to village centre</p> <p>St4 = Linking to the field</p>	<p><b>Road Width:</b></p> <p>1 = When width is 3.5 meter or more</p> <p>2 = When width is between 2.0 and 3.5 meter</p> <p>3 = When width is less than 2.0 meter</p>	<p><b>Road Condition:</b></p> <p>a = Accessible all year round.</p> <p>b = Accessible only in dry season.</p> <p>n = Never Accessible</p>
---	--	---

**Title:** Name of the district, commune and the date of survey have to be recorded.

**Name of Road Link:** Describe the origin and the destination of the road link.

**Length of the Road Link:** Record the length of the road.

**Road Segment Number:** Assign a number to each segment.

**Road Segment Name:** Describe where each segment starts and where it ends.

**Length:** Record the length of each segment.

**Classification:** Enter the road classification code:

- Pr = Asian and National highways.
- Sp = roads between Provincial Centres.
- St1 = roads between District Centres.
- St2 = roads between Commune centres.
- St3 = roads to or between villages.
- St4 = roads to the agricultural hinterland.

**Road Width:** Record the approximate width of the road.

**Condition:** Describe the condition of the different road segments as follows:

A = All year round trafficable by a remorque.

D = Trafficable only during the dry season.

N = Never trafficable.

**Additional Information:** Describe why the condition is “D” or “N”.

***Step 4: Verify the existing network in the field.***

Once the road network map is ready, it is time to go out to the field and verify of what is being drawn in the map also exists and under what condition it is. First go to the commune office to interview the commune chief and other knowledgeable people on the existence and condition of the road network. We use the survey form for recording data. Surprising things can happen, for example some villages might not be drawn in the right location or do not exist anymore. This should be written down as additional information. For the interviewing it is necessary to use special forms. After the interview some doubts might raise about the location of some roads, tracks or villages. If this happens, one might start using the GPS to verify the coordinates before going go back to the office. The field survey is only completed after all possible doubts have been taken away and questions have been answered.

***Step 5: Redraw of the Transport Infrastructure Map.***

Once back in the office, the next step is to add all the gathered information to the manual map.

The draft map prepared before going to the field needs to be corrected. This can be done by laying a transparent copy over the Transport Infrastructure Map.

This map should be copied using specific colours and line thickness to transfer the gathered information to the Transport Infrastructure Map to show the condition of each and every road link (and waterway).

We use three different colours for roads:

a) **black**, if the road is passable all year round.



b) **green**, if the road is only trafficable in the dry season.



c) **red**, if the road is never passable.



For waterways we use two different colours:

a) **blue**, if the waterway is all year round passable.



b) **red**, if the waterway is not passable in the dry season.



***Step 6: Discussion with local officials.***

After the Road Infrastructure Map has been completed it needs to be discussed with the local officials and policy makers. Not only to verify the accuracy of the TII but also to introduce the map and to familiarise local officials with the map so that it can be used for identification and prioritisation of road links for maintenance or rehabilitation by the local officials themselves.

***Step 7: Final adjustments to the Transport Infrastructure Map.***

The meeting with local officials, district officials and commune leaders, will surely result in some modification. New roads might be identified, some alignments might change, and even location of villages might be shifted, all according to the detailed knowledge of these people. If necessary, GPS readings can be taken afterwards to clarify possible doubts.

With this new information final changes and adjustments can be made to the Transport Infrastructure Map. With these last modifications the TIM is finally ready for reproduction and use in the next steps of the IRAP planning process.

***Note:***

Besides the TIM that shows the condition of the rural transport infrastructure alternative maps can be made such as:

the **dry season transport infrastructure map** showing the entire infrastructure that can be used during that particular season, and

the **wet season transport infrastructure map** showing those roads that are usable during the rainy season.