

ภาคผนวก ก

IHSDM Tutorial

[Go back to: Table of Contents](#)

[Go to Lesson 1](#)

IHSDM Tutorial - Introduction

Purpose:

The purpose of this Tutorial is to provide users with a guided overview of the IHSDM software. Upon completing the self-paced tutorial, the user should have a basic understanding of the IHSDM software and its components, and experience in applying IHSDM to evaluate the safety of a highway design.

The Tutorial does not cover all details of the software. For more information, the user is encouraged to refer to the [IHSDM documentation](#), including the IHSDM Users Manual, the Basic Services Engineer's Manual and the Module Engineer's Manuals.

To access the IHSDM documentation summary:

1. Go to the IHSDM main interface
2. Click on "Help" from the menu bar
3. Click on "User Documentation Summary"

Structure:

The Tutorial uses a case study approach to illustrate the functionality and applicability of IHSDM. Each lesson includes a brief Overview with links to related documentation, and exercises that lead users through the software via step-by-step instructions. A work problem answer key is provided at the end of lessons 2-7 for questions posed in the exercises.

The Tutorial consists of:

- Introduction
- Lesson 1: Introduction to the IHSDM Pike Case Study
- Lesson 2: Overview of the IHSDM Basic Services
- Introduction to IHSDM Modules:
 - o Lesson 3: Policy Review Module
 - o Lesson 4: Crash Prediction Module
 - o Lesson 5: Design Consistency Module
 - o Lesson 6: Traffic Analysis Module
 - o Lesson 7: Intersection Review Module

In Lesson 1, the case study is introduced. Plan/profile sheets help to familiarize the user with IHSDM Pike – an existing highway used throughout the Tutorial to illustrate IHSDM capabilities.

In Lesson 2, the IHSDM “basic services” are introduced. Exercises lead the user through steps to create an IHSDM Project, Analysis and Highway for IHSDM Pike, which are prerequisites for the exercises in Lessons 3-7.

In Lessons 3-7, the exercises focus on running the IHSDM modules to evaluate the safety of IHSDM Pike and interpreting the output.

The lessons can be done in any order, with the exception that the Lesson 2 exercises (2.1, 2.2, and 2.3) must be completed before beginning the exercises in Lessons 3-7.

“Tutorial“ Folder Contents:

The IHSDM software home directory/folder contains a “Tutorial” folder, which includes:

- Index.html (a browser page that provides links to the IHSDM tutorial documents, and to the adobe website)
- Tutorial_Table-of-Contents.pdf
- Tutorial_Intro.pdf (this file)
- Lessons files (7 PDF files):
 - Includes step-by-step instructions for Lessons 1-7 (Tutorial_Lesson_#.pdf)
- “IHSDM_Pike-Plan_Profile” folder:
 - Plan/profile views of IHSDM Pike (9 PDF files)
 - Typical section for IHSDM Pike (1 PDF file)
- “Analysis_Reports” folder:
 - IHSDM output files corresponding to each exercise, labeled as “ExerciseX.Y_ModuleName-Report.htm” (e.g. Exercise_3.1_PRM_Report.htm)

Getting Started with the Tutorial:

Before beginning the Tutorial, the IHSDM software should be installed and configured (see “IHSDM Getting Started Guide” and “IHSDM Installation Manual”).

To begin the Tutorial with lesson 1 click on the “Go to the lesson 1” link below.

[Go back to: Table of Contents](#)

[Go to Lesson 1](#)

[Go back to: Table of Contents](#)

[Go to the next lesson](#)

Lesson 1: Introduction to the IHSDM Pike Case Study

Lesson 1 introduces IHSDM Pike - an existing 2-lane rural highway that serves as a case study for the Tutorial. The lesson contains an overview of IHSDM Pike, and an exercise that examines the horizontal alignment, vertical alignment and typical cross-section in more detail through a review of electronic plan/profile sheets. Lessons 3-7 show how the IHSDM evaluation modules could be used to evaluate IHSDM Pike.

Overview of IHSDM Pike:

IHSDM Pike is an arterial highway in rolling terrain. The State Highway Agency wants to identify potential safety and operational concerns on a 4.353 km section of the highway. Crash history data for the years 1993-1995 indicate that the section has a crash rate higher than the State average for 2-lane rural highways. The section to be analyzed has a design speed of 80 km/h, relatively narrow 3.3 m (11 ft) lanes and no shoulders. The horizontal alignment is generally curvilinear, including several compound curves and one reverse curve. Some sections have steep (over 5%) vertical grades. Two intersections are located along IHSDM Pike. Near the mid-point of the highway section is a five-leg intersection with Springfield Drive and Clinch Ave. Traffic control consists of stop control on the minor roads and no control on IHSDM Pike. A second intersection is located towards the end of the alignment, where IHSDM Pike crosses Route 1. This 4-leg intersection is skewed and signalized.

Summary:

- Length = 4.353 km
- Project limits: Station 0+000 to Station 4+353.00
- Functional classification = Arterial
- Terrain = Rolling
- Design speed = 80 km/h
- Cross-section:
 - 3.3 m wide travel lanes
 - No shoulders
- Average Daily Traffic (ADT):
 - In 2001: 5000 vpd
 - In 2010: 7000 vpd (projected)
- Intersections:
 - At Station 2+050: multi-leg (IHSDM Pike / Springfield Dr. / Clinch Ave.) with stop control on minor roads
 - At Station 3+920.12: skewed 4-leg signalized (IHSDM Pike / Route 1)

Work Problem**Exercise 1.1: Review IHSDM Pike**

In this exercise, you will examine IHSDM Pike by reviewing electronic plan/profile sheets and a typical cross-section of the 4.3 km long analysis section. Continue by following the step-by-step instructions below.

I. Review Plan/Profile sheets for existing IHSDM Pike

1. Go to the "Tutorial" folder within the IHSDM software
2. Go to the "IHSDM_Pike-Plan_Profile" sub-folder
3. Open ihsdmpike_ex_align.pdf to view a small scale plan/profile sheet of the existing highway
4. If desired, open ihsdmpike_pp#.pdf (where # = 1 thru 8) to view larger scale plan/profile sheets of the existing highway
5. Close files when done

II. Review Typical Section for existing IHSDM Pike

1. Open ihsdmpike_typ_sec1.pdf to view typical sections for existing IHSDM Pike and Route 1
2. Close file when done

[Go back to: Table of Contents](#)

[Go to the next lesson](#)

[Go back to: Table of Contents](#)

[Go to the next lesson](#)

Lesson 2: IHSDM Basic Services

Lesson 2 reviews the IHSDM Basic Services. After an overview of the Basic Services, exercises are provided to give hands-on experience in using the IHSDM software. An IHSDM "Project" and "Analysis" are created for the IHSDM Pike case study. Highway data are entered via importing an existing dataset and by "manual" entry of data into the Edit Highway interface.

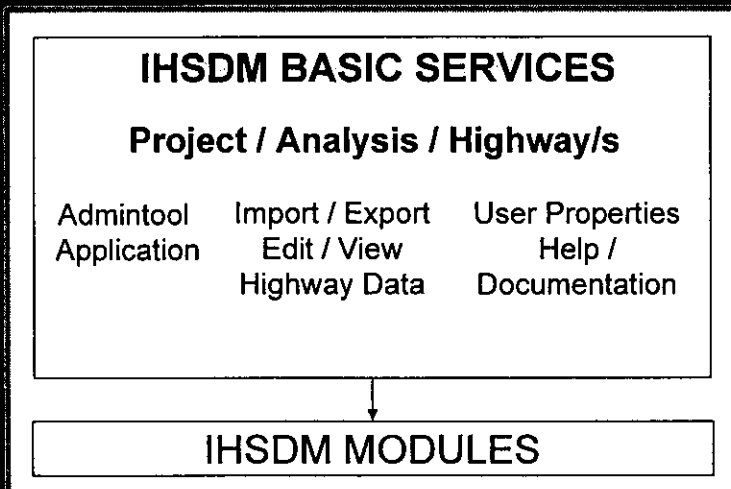
The Project and Analysis created in this lesson are used in lessons 3-7.

Overview

Components of the IHSDM Basic Services

The basic services are essentially the parts of the IHSDM software that are not safety evaluation modules. These services provide the means to create IHSDM "Projects" and "Analyses," to enter and manipulate data, to set user properties/preferences, to access Help and documentation, and to view the highway to be analyzed in a 2D graphics environment. A conceptual representation of the IHSDM structure is shown below.

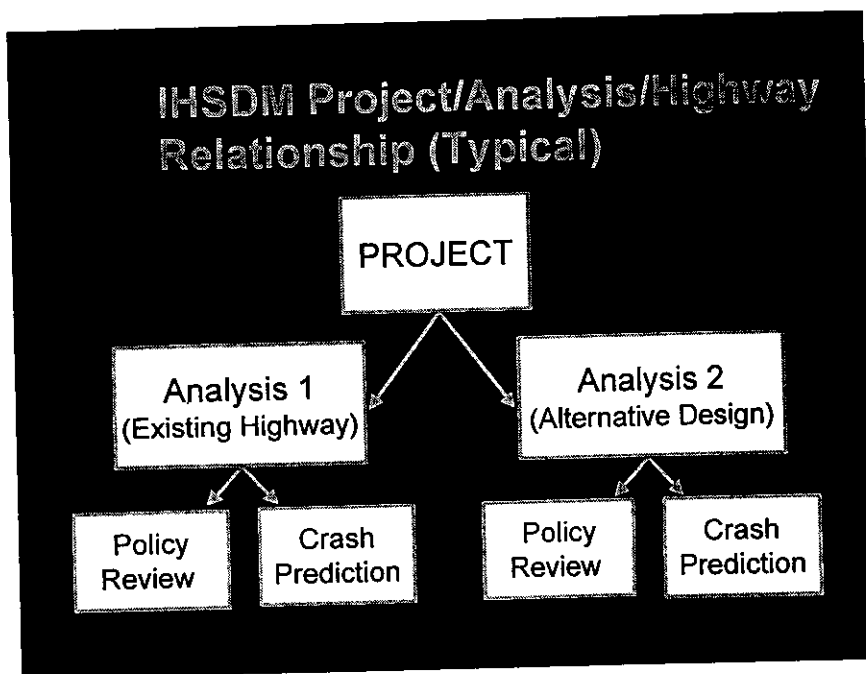
IHSDM Structure



Components of IHSDM Basic Services include:

1. The Project/Analysis/Highway structure
2. Import/editing/viewing of highway data
3. User properties
4. Help functions
5. Documentation
6. An "Administration Tool" (provided with IHSDM as a separate application)

The IHSDM user interface provides access to the Basic Services, as well as all IHSDM modules.



IHSDM Projects, Analyses and Highways:

An IHSDM Project is the top level of data organization, serving as container for all data related to the safety evaluation of a highway. A Project is analogous to a Windows folder or directory.

One or more Analyses can be defined for a Project. An Analysis is associated with a (Master) Highway, and defines the limits of the evaluation.

Once a Project and Analysis are created, and a Highway associated with the Analysis, one or more IHSDM modules can be used to evaluate the highway.

In this lesson, you will create a Project for IHSDM Pike, and an Analysis for the existing highway.

IHSDM Highway Data:

IHSDM highway data fall into three main categories:

- Highway segments
- Intersections
- Crash history

Highway segment and intersection data include geometric and non-geometric data.

IHSDM highway data can be viewed and edited via the IHSDM Edit Highway interface.

Not all data are required for all modules. The Engineer's Manuals and the Edit Highway interface indicate what data are used/required by each module.

See the "Basic Services Engineer's Manual", "Highway Model User's Manual", "IHSDM Intersection Model Manual", and "Highway Element Manual" for detail on IHSDM Data.

To access the IHSDM documentation summary:

1. Go to the IHSDM main interface
2. Click on "Help" from the menu bar
3. Click on "User Documentation Summary"

Methods to Input Highway Data:

Highway data can be entered into IHSDM in several ways, including:

1. Through the IHSDM Edit Highway interface
2. Importing data files in IHSDM (CSV) format
3. Using the GEOPAK-to-IHSDM Data Extractor, or
4. Importing LandXML files

Edit Highway interface

- The *Edit Highway* interface allows users to import highway files that are in *IHSDM (CSV)* or *LandXML 1.0* format, or to “manually” enter data. Once data are entered, the user can view and edit the values.

GEOPAK-to-IHSDM Data Extractor

- The *GEOPAK-to-IHSDM Data Extractor* provides the ability to extract horizontal alignment, vertical alignment and cross-slope data from GEOPAK (GPK and INP) files. Data beyond the edge of pavement (e.g., shoulder data, side slopes) cannot be extracted from GEOPAK, but can be entered into IHSDM “manually” through the Edit Highway interface.

LandXML

- *LandXML 1.0* files can be imported directly into IHSDM. LandXML is an XML-based data format for civil engineering and survey design data used in the “Land Development Industry,” including highway geometrics.

LandXML was developed by a consortium of civil design software vendors, State DOTs, consulting firms and FHWA. The standard format supports transfer of data between different vendor products, and assists in archiving data for future use by the same agency/organization.

Support for import of LandXML 1.0 data is provided within IHSDM. Most IHSDM roadway segment data elements are represented in LandXML. Some IHSDM intersection elements are represented in LandXML, but not all. An IHSDM “export to LandXML” capability may be added in the future.

The current versions of most major civil design vendor products currently support LandXML, including Autodesk (CAiCE and

e GEOPAK-to-
 User's Manual:
 e IHSDM main
 e
 n “Help” from
 u bar
 n “User
 entation
 ry”
 own and choose
 AK-to-IHSDM
 ation
 mer's Interface
 User's Manual”

Autodesk Land Development Desktop), Bentley Systems, Inc. (InRoads, GEOPAK, and MX), and Eaglepoint.

See www.landxml.org for more information about the LandXML data exchange standard, including a list of vendor products that support the standard.

Documentation:

The five categories of IHSDM documentation are:

1. *For system administrators* – for individuals responsible for installing, configuring and maintaining the software (i.e., not for “regular” users). Documentation includes the System Administrator’s Manual.
2. *User’s Manuals* – for the mechanics of installing and using the software (e.g., “what does this button do?”). Includes the IHSDM User’s Manual.
3. *IHSDM Data* – all data used in IHSDM are documented. Includes IHSDM Highway Model, IHSDM Intersection Model, LandXML Support, Highway Elements, and GEOPAK-to-IHSDM Data Extractor.
4. *Engineer’s Manuals* – provide background on the engineering models used within IHSDM, and help users to understand and interpret results. An Engineer’s Manual is provided for each module, as well as for IHSDM Basic Services.

Administration Tool:

IHSDM comes with a separate Administration Tool application for administrator-level users. The Administration Tool is a separate application (i.e., it is started outside of IHSDM and has its own interface), which allows administrators to perform functions such as:

1. Edit/maintain the policy files used in the Policy Review and Intersection Review Modules. Organizations can modify the AASHTO policy files resident in the software to reflect their own policy. There are limitations, which are described in the Policy Review Module Engineer’s Manual.
2. Calculate, enter and edit calibration factors that scale the Crash Prediction Module results to the data of a particular State/Agency.

3. Edit configuration files, which control items such as parameters used in simulation models (e.g., the Traffic Analysis Module)

4. Modify default values (e.g., for formatting IHSDM Analysis Reports)

Work Problem

In the work problem, you will use the IHSDM software to explore the Basic Services:

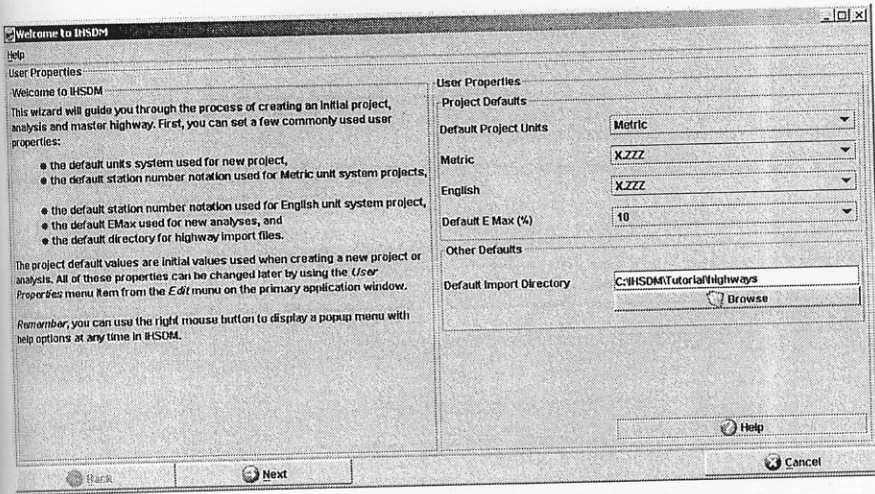
Exercises:

- 2.1: Project/Analysis/Highway -- Create a Project for IHSDM Pike and an Analysis for Existing IHSDM Pike, and import highway data for IHSDM Pike
- 2.2: User Properties -- Modify User Properties
- 2.3: Edit Highway -- Enter and review highway data via the Edit Highway interface
- 2.4: Help/Documentation -- Access IHSDM documentation
- 2.5: Highway Viewer -- Open the Highway Viewer and view IHSDM Pike

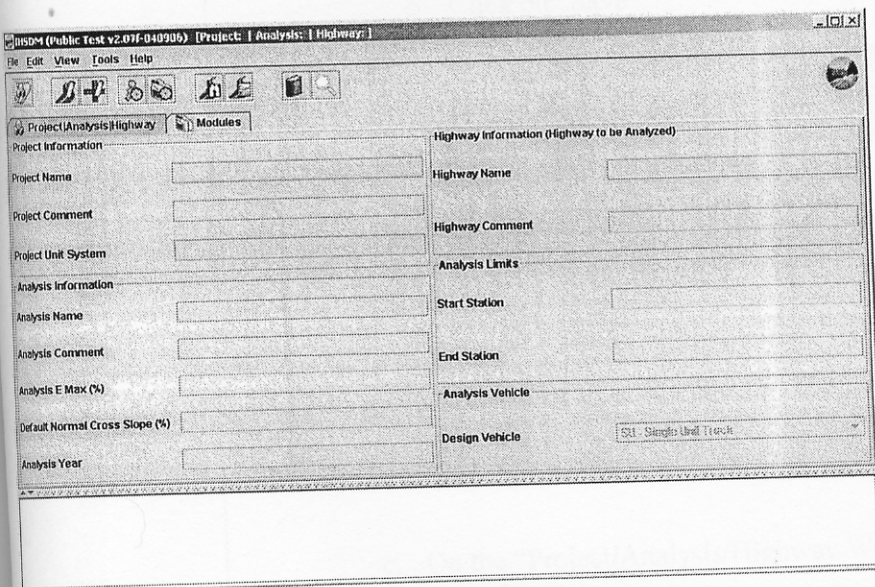
Exercise 2.1: IHSDM Basic Services - Project/Analysis/Highway

I. To start IHSDM

1. Start IHSDM by double clicking the shortcut icon on the computer screen
 - a. NOTE: By default, the "Project/Analysis/Highway Wizard" opens automatically when IHSDM is run (the "Welcome to IHSDM" screen will appear). The default can be changed through the "User Properties" interface.

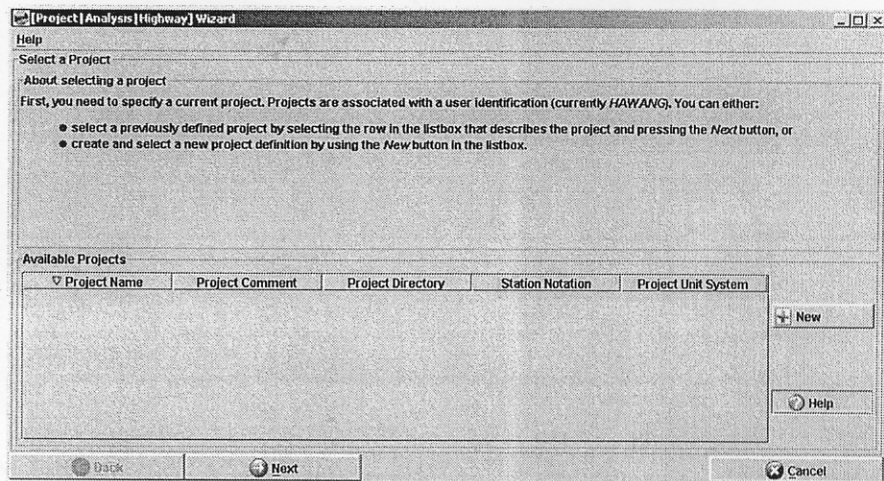


- b. For the purpose of this exercise, click on "Cancel" to close the Wizard. The main IHSDM interface should appear.

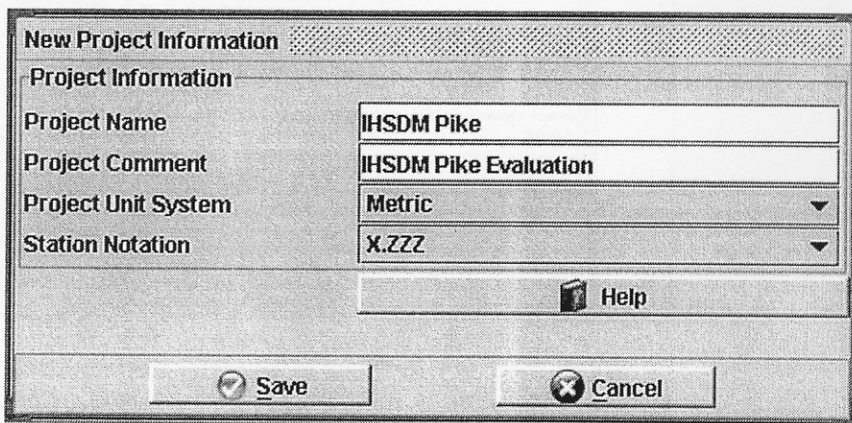


II. To create a Project/Analysis using the “Project/Analysis/Highway Wizard”

1. Select “File> Project/Analysis/Highway Wizard” from the pull-down menu



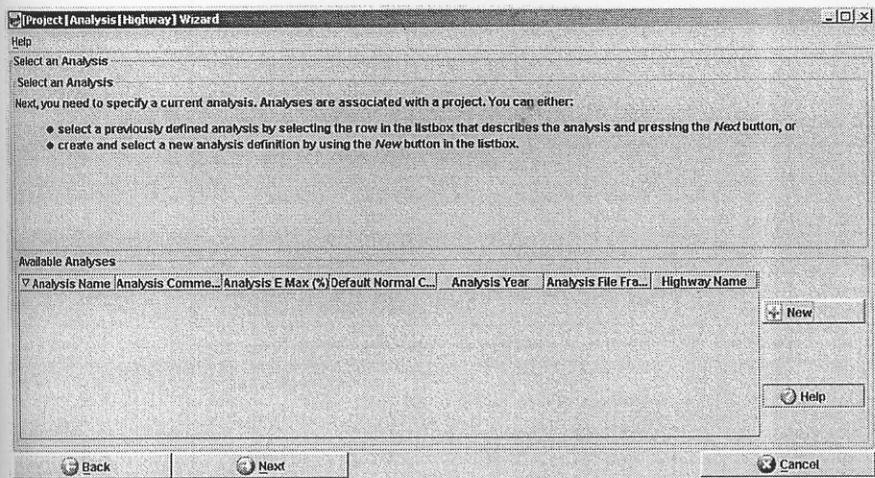
2. To create a new Project
 - a. On the “Project/Analysis/Highway Wizard” / “Select a Project” dialog, click on the “New” button
 - b. In the “New Project Information” dialog, fill in and/or select:
 - Project Name = “IHSDM Pike”
 - Project Comment = “IHSDM Pike Evaluation”
 - Project Unit System = Metric
 - Station Notation = X.ZZZ
 - Click on “Save”



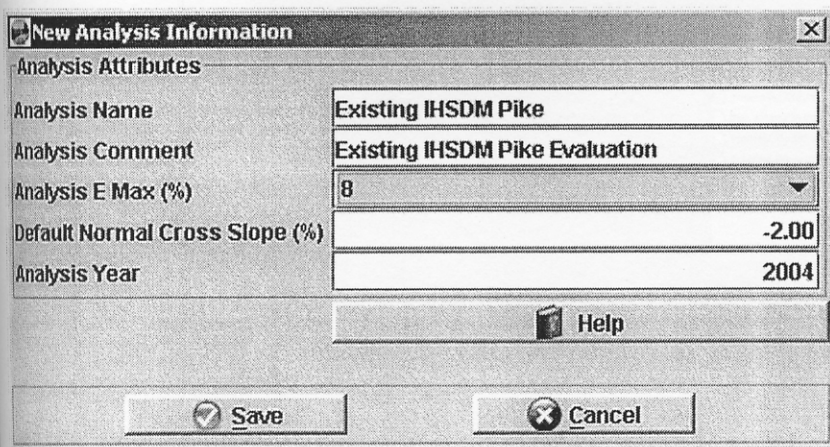
- c. On the “Project/Analysis/Highway Wizard” dialog, click on the “Next” button

3. To create a new Analysis:

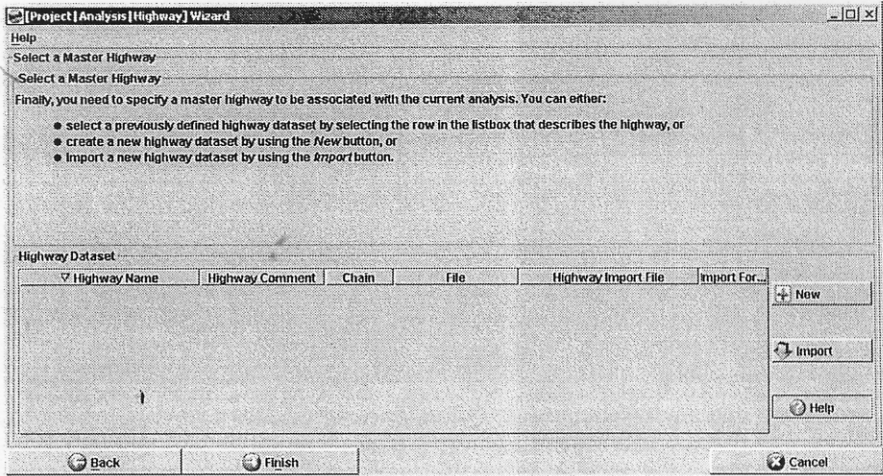
- a. On the “Project/Analysis/Highway Wizard”/ “Select an Analysis” dialog, click on the “New” button



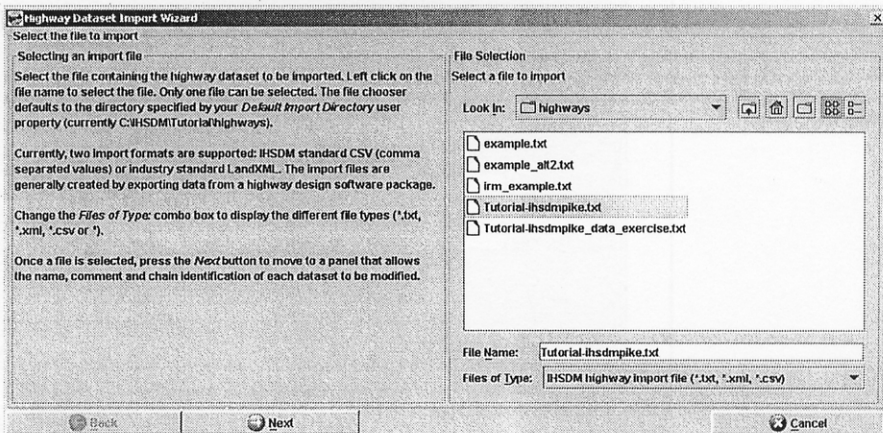
- b. In the “New Analysis Information” dialog, fill in and/or select:
 - o Analysis Name = “Existing IHSDM Pike”
 - o Analysis Comment = “Existing IHSDM Pike Evaluation”
 - o Analysis E Max (%) = 8
 - o Default Normal Cross Slope (%) = -2.00
 - o Analysis Year = 2004
 - o Click on “Save”



- c. On the “Project/Analysis/Highway Wizard” dialog, click on the “Next” button

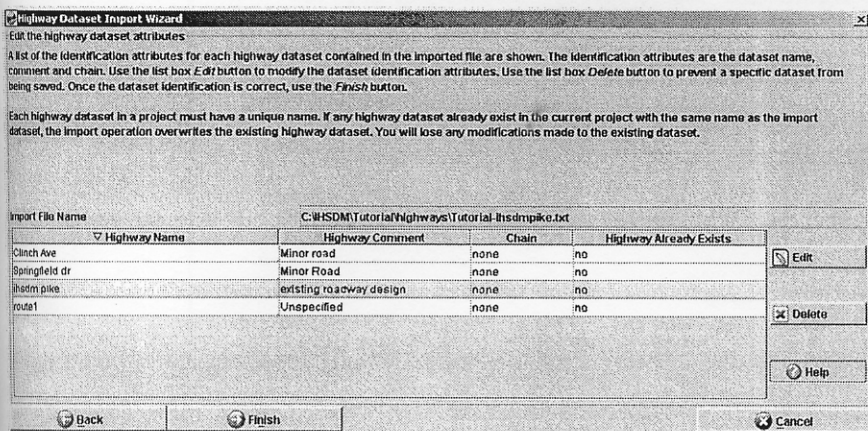


4. To import highway data for Existing IHSDM Pike and associate the highway with the “Existing IHSDM Pike” Analysis:
 - a. On the “Project/Analysis/Highway Wizard”/ “Select a Master Highway” dialog, click on the “Import” button
 - b. On the “Highway Dataset Import Wizard” dialog, under “File Selection,” find the “Highways” folder by using the “Look In” field to browse
 - c. Click on the **Tutorial-ihsdmpike.txt** file. The name should appear in the “File Name” field

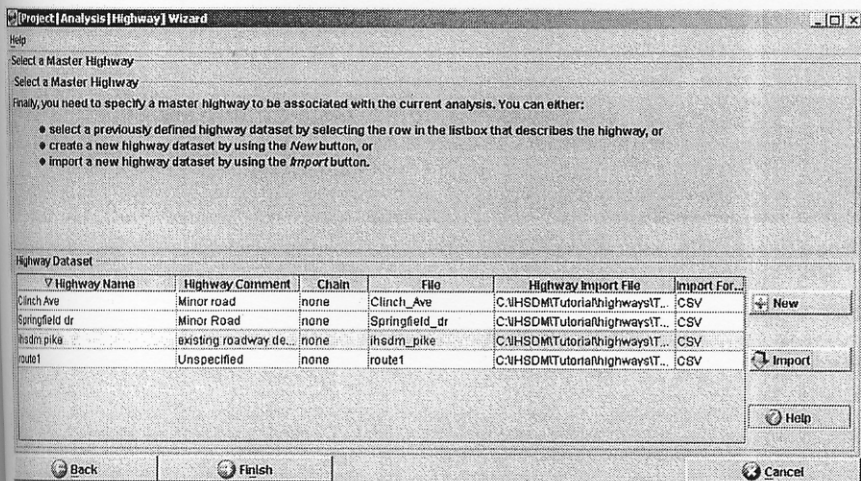


- d. Click on “Next”

- e. On the “Highway Dataset Import Wizard” dialog, under “Import File Name,” click to highlight the row for Highway Name = “ihsdm pike”



- f. Click on the “Finish” button
- g. On the “Select a Master Highway” dialog, click to highlight “ihsdm pike”



- h. Click on the “Finish” button

5. The Project, Analysis, Master Highway and Analysis Limits fields should now be filled in.
6. For this exercise, please select "SU- Single Unit Truck" as the design vehicle.

Your screen should look like this now:

The screenshot shows the IHSDM software interface with the following data:

Project Information		Highway Information (Highway to be Analyzed)	
Project Name	IHSDM Pike	Highway Name	ihsdm pike
Project Comment	IHSDM Pike Evaluation	Highway Comment	existing roadway design
Project Unit System	Metric		
Analysis Information		Analysis Limits	
Analysis Name	Existing IHSDM Pike	Start Station	0.000
Analysis Comment	Existing IHSDM Pike Evaluation	End Station	4353.060
Analysis E Max (%)	8	Analysis Vehicle	
Default Normal Cross Slope (%)	-2.00	Design Vehicle	SU - Single Unit Truck
Analysis Year	2004		

Below the form, a list of actions is visible:

- Loading highway Clinch Ave
- Loading highway Springfield dr
- Loading highway route1
- Importing intersections definitions
- Selecting highway dataset ihsdm pike

Exercise 2.2: IHSDM Basic Services - User Properties

I. Edit User Properties

1. Select Edit>Edit User Properties from main menu
2. Select "General" tab
3. Set "Program Startup" to "Start with none" (Note: this will start an empty main interface every time IHSDM is started)
4. Set "Highway Element Checking/Query User" to "None" (Note: this will prevent IHSDM from querying for missing data elements);

The screenshot shows the 'User Properties' dialog box with the 'General' tab selected. The dialog has a title bar with a close button (X) and a menu bar with 'Reporting', 'Executables', 'Identification', and 'Directories'. Below the menu bar are three sub-tabs: 'General', 'Data Entry', and 'Display'. The 'General' sub-tab is active and contains the following settings:

- Program Startup:** Specify IHSDM start procedure at program startup.
 - Start with Wizard
 - Start with Previous
 - Start with none
- Program Exit:** Specify window close procedure.
 - Always Save Before Closing
 - Ask To Save Before Closing
 - Never Save Before Closing
- Highway Element Checking:**
 - Query User:
 - Check Frequency:
- Other:**
 - Default Project Units:
 - Output Level:
 - ISD Data Reset:
 - Submit PR/CR Reports to Web Site

At the bottom of the dialog, there is a 'Help' button and a 'Save' button, and a 'Cancel' button.

5. Select "Reporting" Tab
6. Set "Segment Conditional Display" to "Show All Elements"
(NOTE: this affects how Policy Review Module results are displayed)
7. Set "Start New Report" to "For new safety analysis" (Note: a new report file will be generated for each "run" of analysis.)

User Properties

Reporting Executables Identification Directories

General Data Entry Display

Reporting Policy

Segment Conditional Display: Show all elements

Warning Row Background: Change Color

Warning Comment Foreground: Change Color

Show Each Analysis Point

Analysis Report (AR)

Analysis Report Viewer: Browser

Analysis Report Template: C:\IHSDM\Tutorial\templates\report_htm.template

Browse

Start Section on New Page

Include IRM Intersection Diagram

Show Dialog for Analysis Results

Start New Report

On project/analysis or highway change

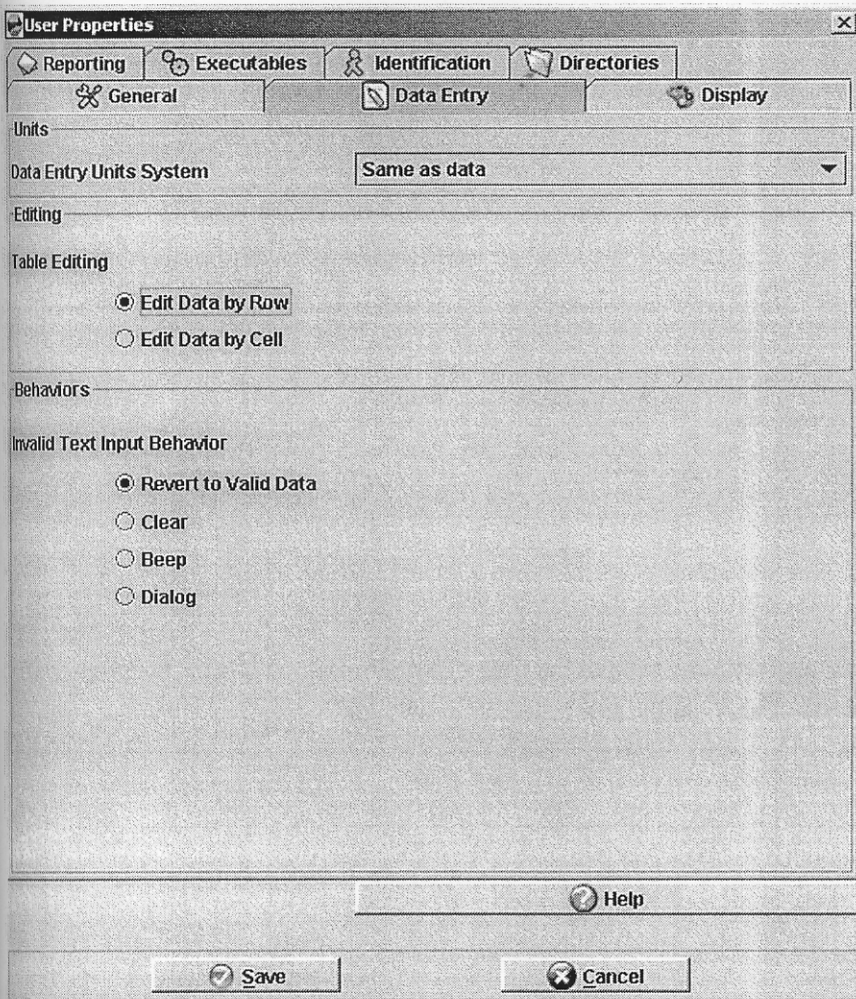
For new safety analysis

Query at new safety analysis

Help

Save Cancel

8. Select "Data Entry" Tab, set "Table Editing" to "Edit Data by row". This would provide a separate window for each row of a table when you edit the table.

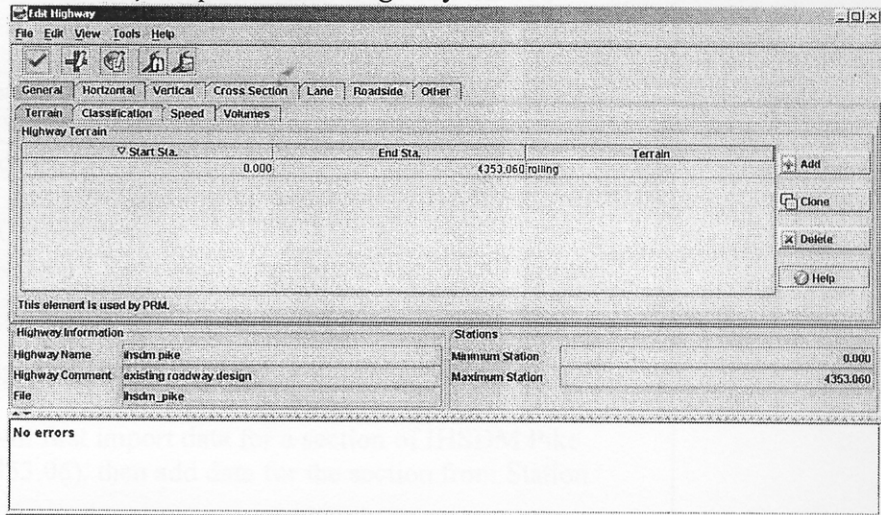


9. Click "Save"

Exercise 2.3: IHSDM Basic Services - Edit Highway

I. To View Highway Segment Data:

1. Click on the “Edit the current highway” button (second from the left) to open the Edit Highway interface



2. Use the tabs to scroll through the highway data for IHSDM Pike
 - **Q 2.3.1:** Find the values for the following:
 - i. Design Speed (General>Speed>Design tabs)
 - ii. ADT for 2001 (General>Volumes>Daily tabs)
 - iii. Through Lane Width (Lane>Thru tabs)
 - iv. Shoulder Width (Cross Section>Shoulder>Definition tabs)

Design Speed	
ADT (2001)	
Through Lane Width	
Shoulder width	

3. Click on the “Horizontal” tab
4. Double-click on any row with Element Type = “Simple Curve” to bring up the “Add/Edit Simple Curve” dialog
 - **Q 2.3.2:** What are the radii of the curves that begin at stations 1373.877 and 1391.33?

Curve Start Station	
1373.877	
1391.330	

5. Click on the “Cancel” button
6. Click on the “Vertical” tab

7. Double-click on any row with Element Type = “VPI” to bring up the “Add/Edit VPI” dialog

- **Q 2.3.3:** For the vertical curve with VPI at station 1300, what is the length of vertical curve (Back Length + Forward Length)? Back Grade? Forward Grade?

Length of Vertical Curve (m)	
Back Grade (%)	
Forward Grade (%)	

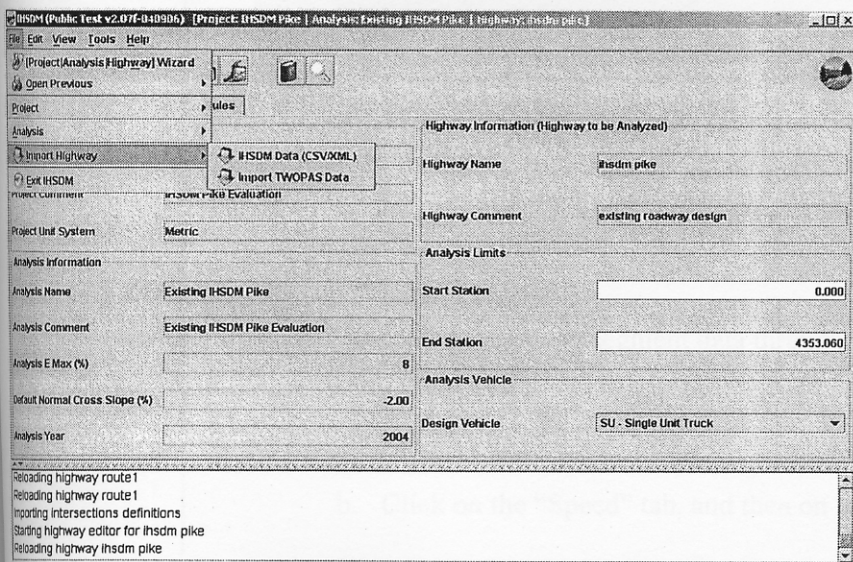
8. Click on the “Cancel” button

9. Click on “File->Don’t Save and Close” to exit the “Edit Highway” interface

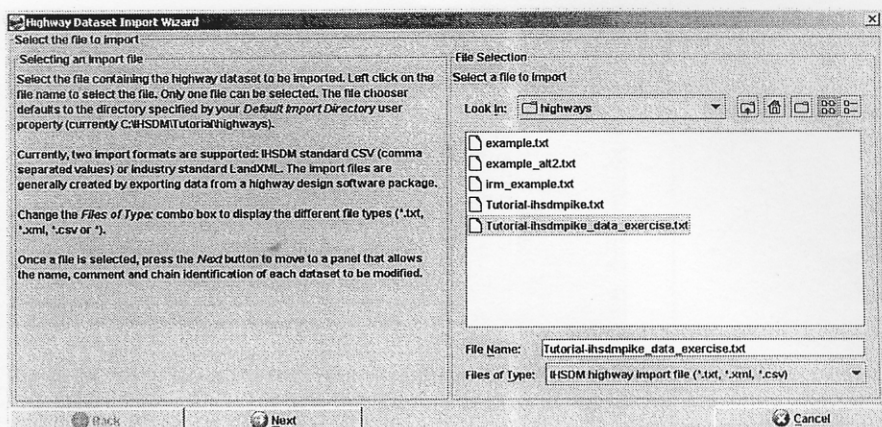
II. To Enter/Edit Highway Segment Data

In this exercise, you will first import data for a section of IHSDM Pike (Station 614.932 to 4353.06), then add data for the section from Station 0.000 to 614.932.

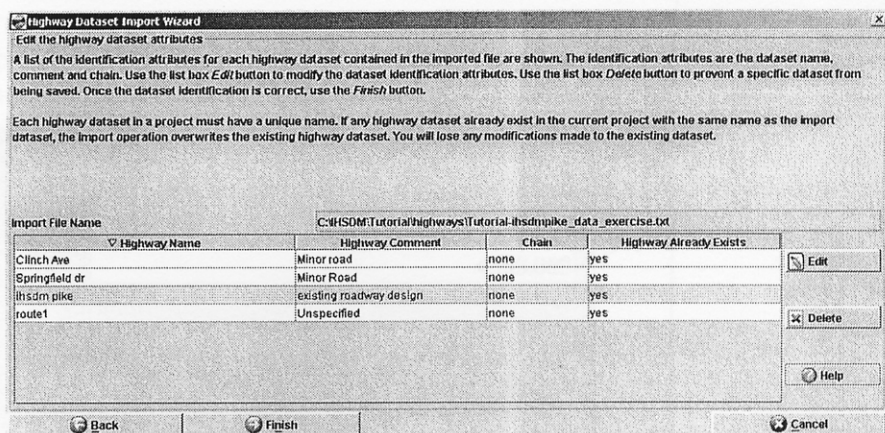
1. To import a highway data file for the portion of IHSDM Pike from Station 614.932 to 4353.06:
 - a. Choose “File/Import Highway/IHSDM Data (CSV/XML)” from the IHSDM main interface



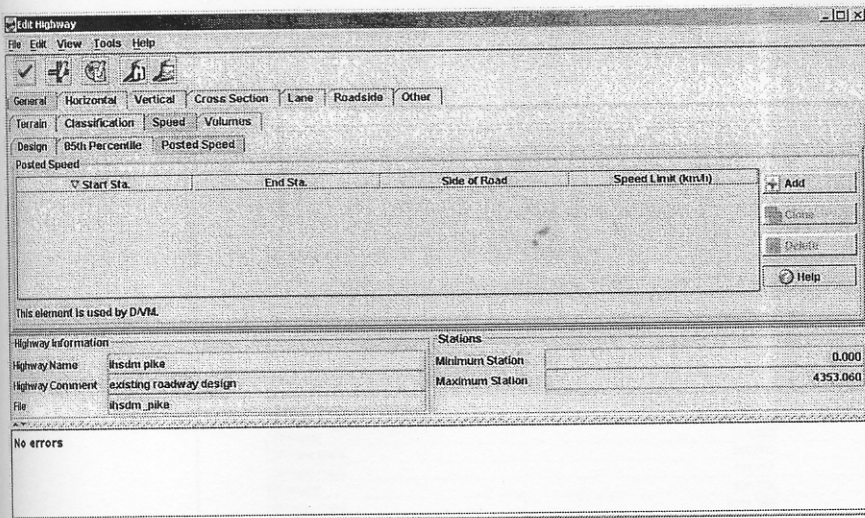
- b. Select “Tutorial_ihsdmpike_data_exercise.txt” from the file list



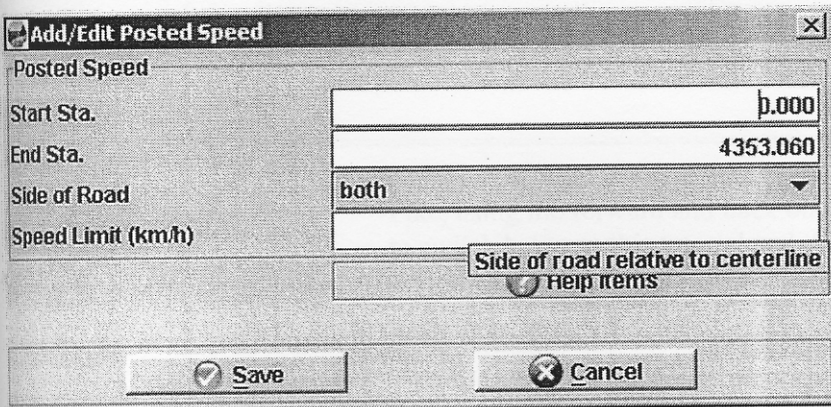
- c. Click on “Next” to bring up the “Highway Dataset Import Wizard”



- d. Make sure IHSDM Pike is the highlighted highway, and click on “Finish”.
- e. Click on the “Edit the current highway” button to open the Edit Highway interface
2. To add/edit highway segment data through the IHSDM Edit Highway interface:
- Click on the “General” tab
 - Click on the “Speed” tab, and then on the “Posted Speed” tab.



- c. There was no data specified for posted speed on IHSDM Pike in the imported highway file. Click on the “Add” button to bring up the “Add/Edit Posted Speed” data entry window



- d. Fill the table as follows:

Start Sta.	0.000
End Sta.	4353.060
Side of Road	Both
Speed Limit (km/h)	80

- e. Click on “Save”
- f. Select “File/Save” from the pull-down menu to Update your dataset.

3. To add highway segment data by using Data Entry Assistant Tool to enter, then copy/paste data from a spreadsheet file:
 - a. Click on the "Horizontal" tab in the Edit Highway interface. Notice that the first horizontal element (Tangent) starts at station "614.932". You will add the horizontal element data from 0.000 to 614.932 in this exercise. Keep the Edit Highway interface open.

The screenshot shows the 'Edit Highway' software interface. The 'Horizontal' tab is selected. The 'Horizontal Alignment' table lists the following elements:

Element Type	Start Sta.	End Sta.
Heading	0.000	
Tangent	614.932	696.005
Simple Curve	696.005	765.917
Simple Curve	765.917	876.269
Tangent	876.269	1006.264
Simple Curve	1006.264	1128.815
Simple Curve	1128.815	1217.657
Tangent	1217.657	1373.877
Simple Curve	1373.877	1391.330

Below the table, the 'Highway Information' section is visible:

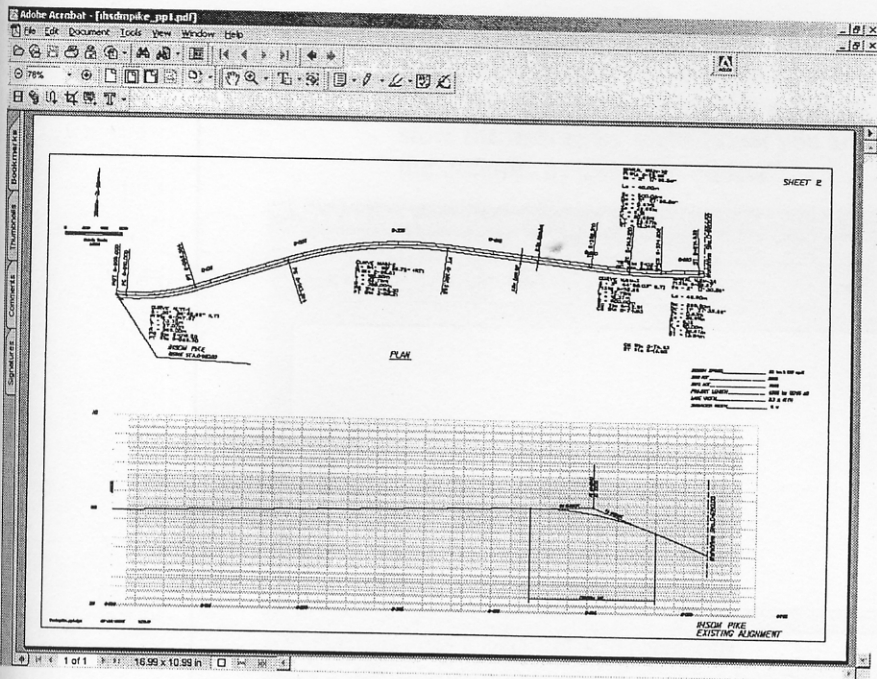
Highway Information		Stations	
Highway Name	ihsdm_pike	Minimum Station	0.000
Highway Comment	existing roadway design	Maximum Station	4353.060
File	ihsdm_pike		

The status bar at the bottom indicates 'No errors'.

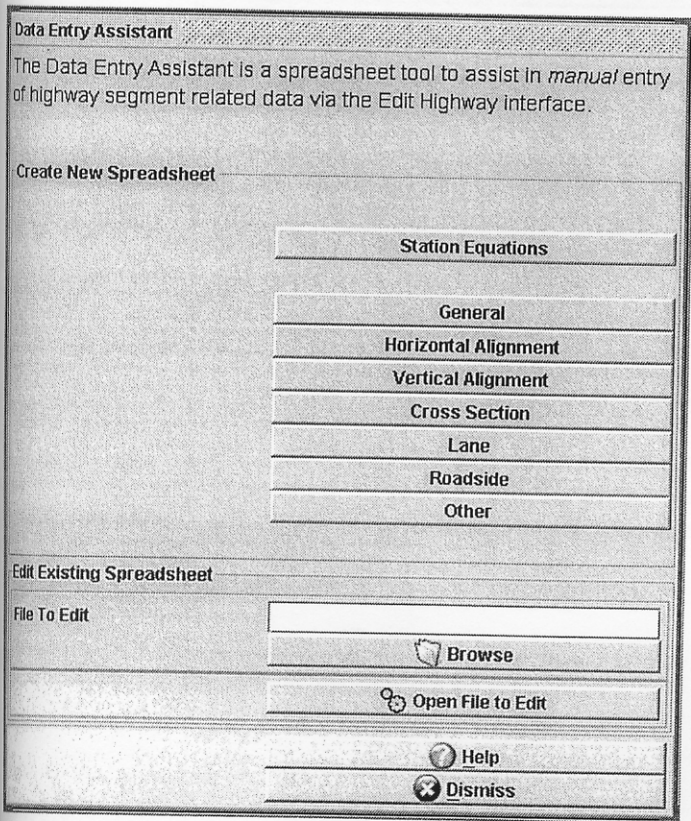
- b. Click on the link below to open a plan/profile view of IHSDM Pike, using the forward and back buttons in the PDF interface to switch between this tutorial and the plan/profile as you desire.

[ihsdmpike_pp1.pdf](#)

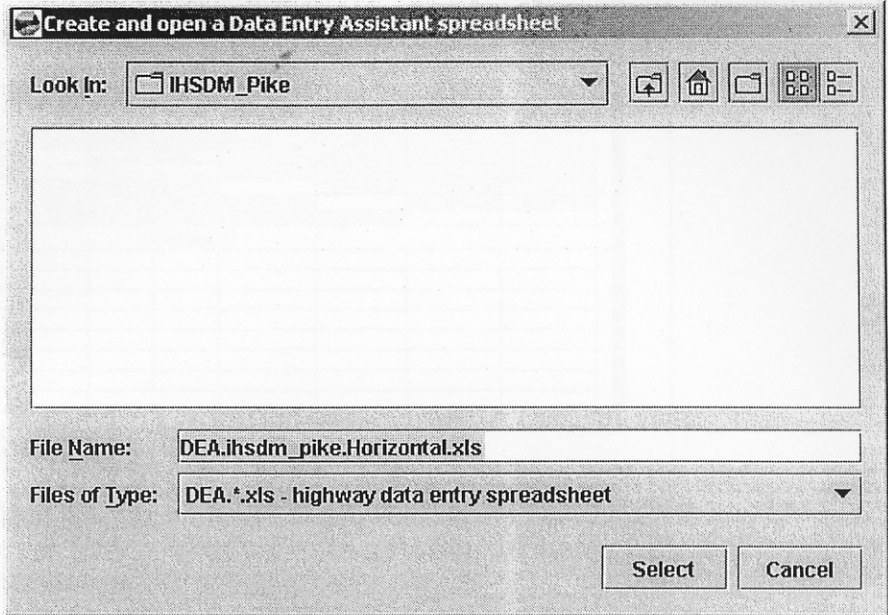
This file provides all the information needed to fill-in the missing data for IHSDM Pike (which you will do in the following steps)



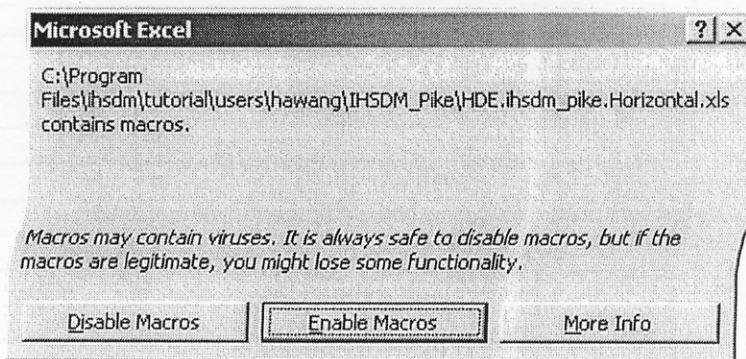
- c. Go to the IHSDM main interface and select “Tools/Data Entry Assistant” from the pull-down menu.



- d. Click on the “Horizontal Alignment” button, to create and open a spreadsheet that will assist in entering horizontal alignment data. The next screen provides a default name and directory to store the data entry spreadsheet you are about to open. Accept the defaults by clicking “Select”.



- e. Click on “Enable Macros” when prompted.

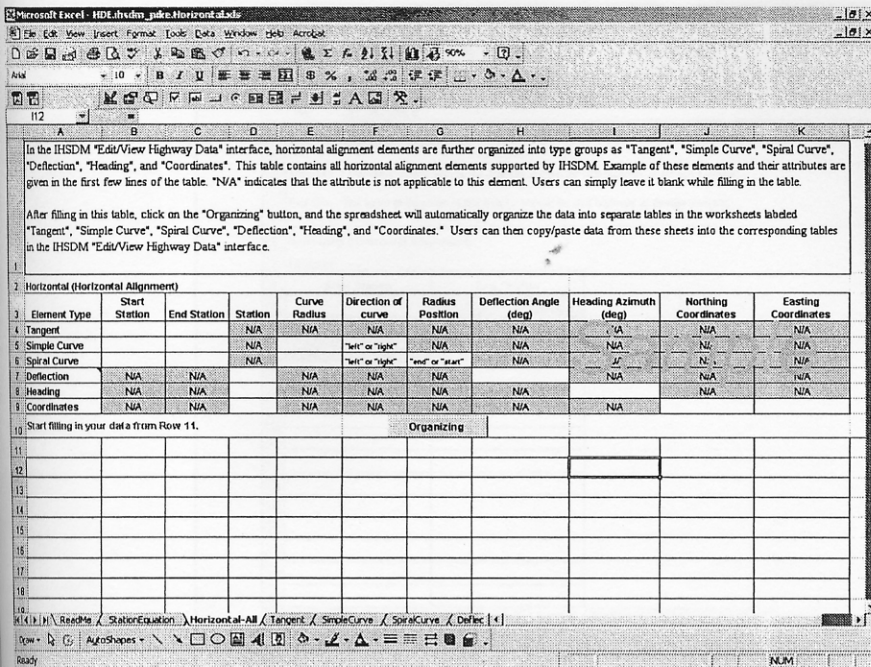


- f. The data entry assistant spreadsheet should now be open. Review the “Readme” sheet and then go to the “Horizontal-All” sheet by clicking the tab at the bottom of the spreadsheet.

highly encouraged to
the Data Entry
Assistant (DEA)
if you are first
of the DEA.

documentation:
to the IHSDM main
interface
on “Tool/Data Entry
Assistant” from the menu

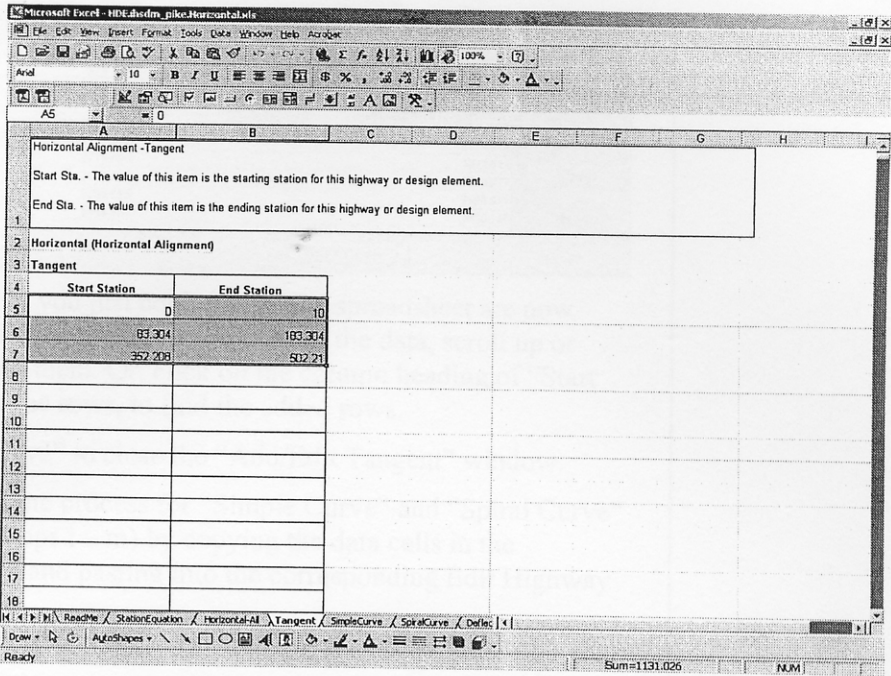
on “Help” on the
Data Entry Assistant
interface.



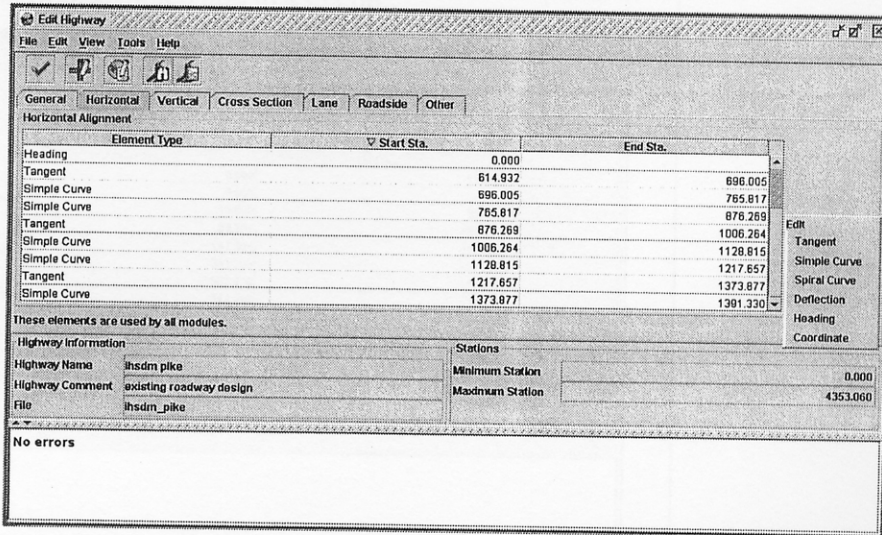
- g. Fill in the form **starting on Row 11** using the IHSDM Pike plan/profile pdf file you opened previously (use the forward and back buttons to switch between the tutorial and the plan/profile) to gather the information you need. Did you get the same data items as those in the table below?

Element Type	Start Station	End Station	Station	Curve Radius	Direction of Curve	Radius Position	Deflection Angle (deg)	Heading Azimuth (deg)	Northing Coordinates	Easting Coordinates
Tangent	0.000	10.000								
Simple Curve	10.000	83.304		200	Left					
Tangent	83.304	183.304								
Simple Curve	183.304	352.208		395	Right					
Tangent	352.208	502.210								
Spiral Curve	502.210	542.210		500	Left	End				
Simple Curve	542.210	574.932		500	Left					
Spiral Curve	574.932	614.932		500	Left	Start				

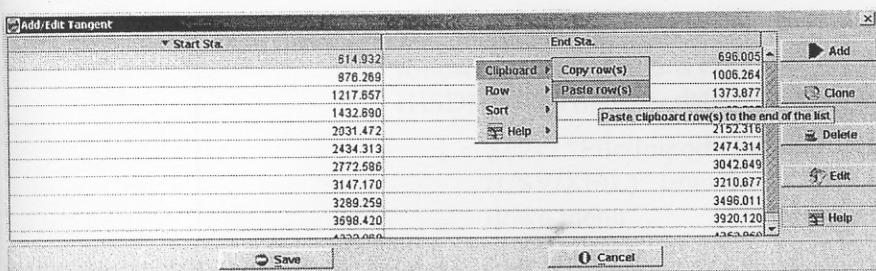
- h. After you fill in the data form, click on the “Organizing” button within the spreadsheet. This will automatically organize the data into separate sheets according to the element type.
- i. Go to the “Tangent” sheet, highlight the data cells (3 rows), and click on “Edit/Copy”.



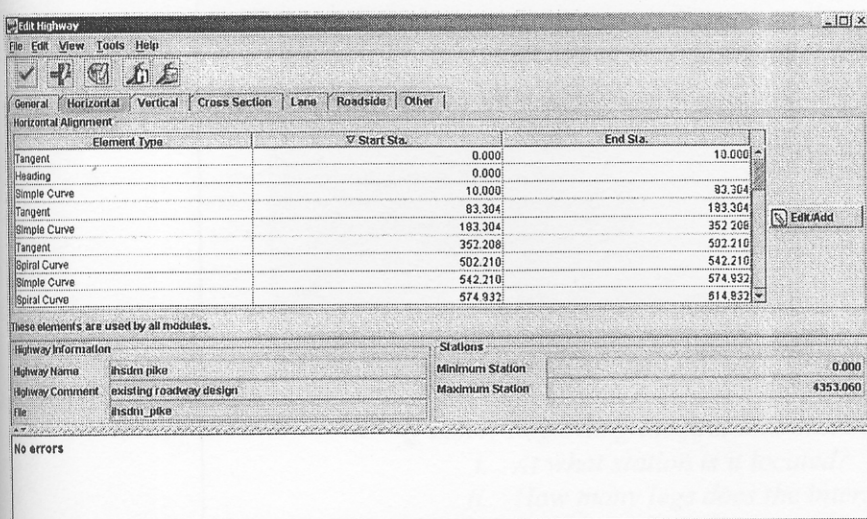
j. Return to IHSDM “Edit Highway” interface, click on the “Edit/Add” button and choose “Tangent”



k. Highlight any line, right click and choose “Clipboard/Paste Rows”



- l. The data that you just copied from the spreadsheet are now pasted into the table. If you do not see the data, scroll up or down to find them. Or, click on the column heading of “Start Sta” to sort the rows, to find the added rows.
- m. Click on “Save” to close the “Add/Edit Tangent” window.
- n. Now repeat the process for “Simple Curve” and “Spiral Curve” (similar to steps i – m) by copying the data cells in the spreadsheets and pasting into the corresponding Edit Highway interface.
- o. Once you have added all the data into IHSDM, select “File/Save” from the Edit Highway interface pull-down menu. On the “Horizontal” tab, you should see the horizontal element information from station 0.000 to 4353.06.

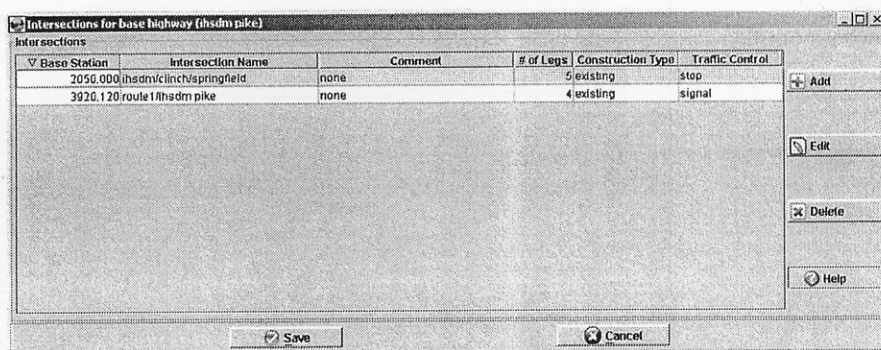


- p. Export this data file by choosing “File/Export” from the pull-down menu, then naming the output CSV Text file “My_ihsdmpike.txt” in the default directory. Click on “Export”
- q. Close the “Edit Highway” interface.
- r. Dismiss the Data Entry Assistant interface.
- s. Close the Horizontal alignment (data entry assistant) spreadsheet, save the changes for future reference.

- t. To ensure that you have the correct highway dataset for the following lessons, in this exercise we will reload the complete IHSDM Pike Highway dataset. Forgot how to do it?
 - i. Select “File/Import Highway Data/IHSDM Data (CSV/XML)” from the IHSDM main interface pull-down menu
 - ii. Select “Tutorial_ihdsmpike.txt” from the file list
 - iii. Click on “Next” to bring up the “Highway Dataset Import Wizard”
 - iv. Make sure IHSDM Pike is the highlighted highway, and click on “Finish”.
 - v. Click on the “Edit the current highway” button to open the Edit Highway interface

III. To View/Edit Intersection Data:

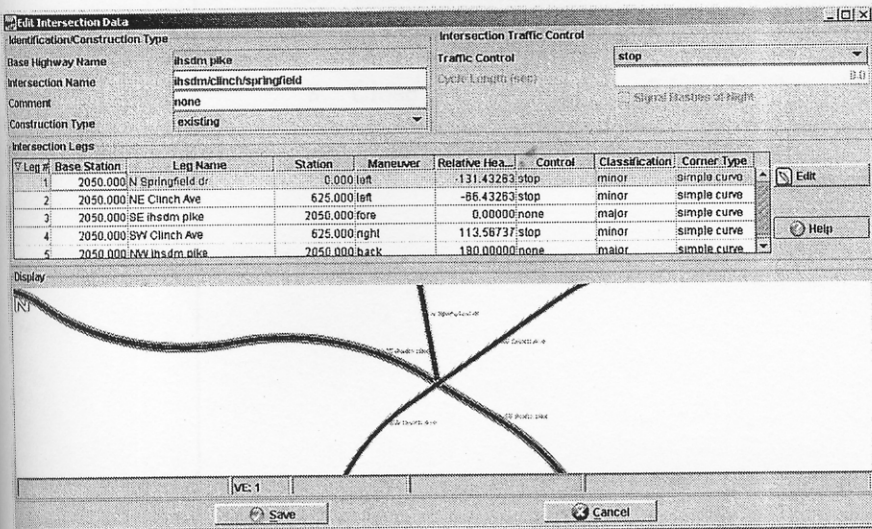
1. Click on the “Edit Intersection...” button (second from left) to open the Edit Intersections Interface. The “Intersections for base highway (ihsdm pike)” dialog should appear.



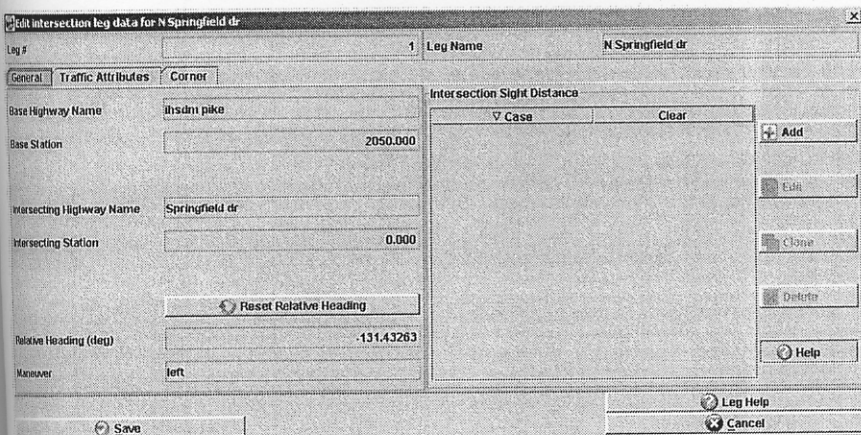
- **Q 2.3.4:** Regarding the first intersection on IHSDM Pike:
 - i. At what station is it located?
 - ii. How many legs does the intersection have?
 - iii. What type of traffic control?

Intersection location	
Number of legs	
Traffic control	

- Highlight the intersection name and select Edit. The “Edit Intersection Data” dialog should appear.



- Highlight leg 1 and select “Edit.” The “Edit intersection leg data for N Springfield Dr.” dialog should appear
- Select the “Traffic Attributes” tab



- Q 2.3.5: What is the percentage of vehicles turning left onto SE IHSDM Pike (shown in the “Traffic Turn Data” section of the dialog)?

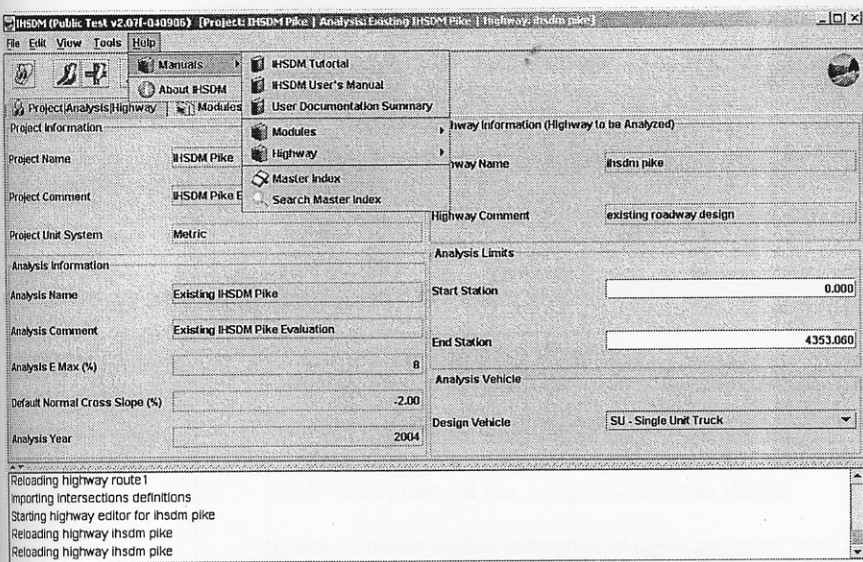
% of vehicles turning left onto SE IHSDM Pike from N Springfield Dr.	
--	--

5. Click the "Cancel" button on the "Edit intersection leg data for N Springfield Dr." dialog
6. Click the "Cancel" button on the "Edit Intersection Data" dialog
7. Click the "Cancel" button on the "Intersections for base highway (ihsdm pike)" dialog
8. Close the "Edit Highway" interface by selecting "File> Close" from the pull-down menu

Exercise 2.4: IHSDM Basic Services - Help/Documentation

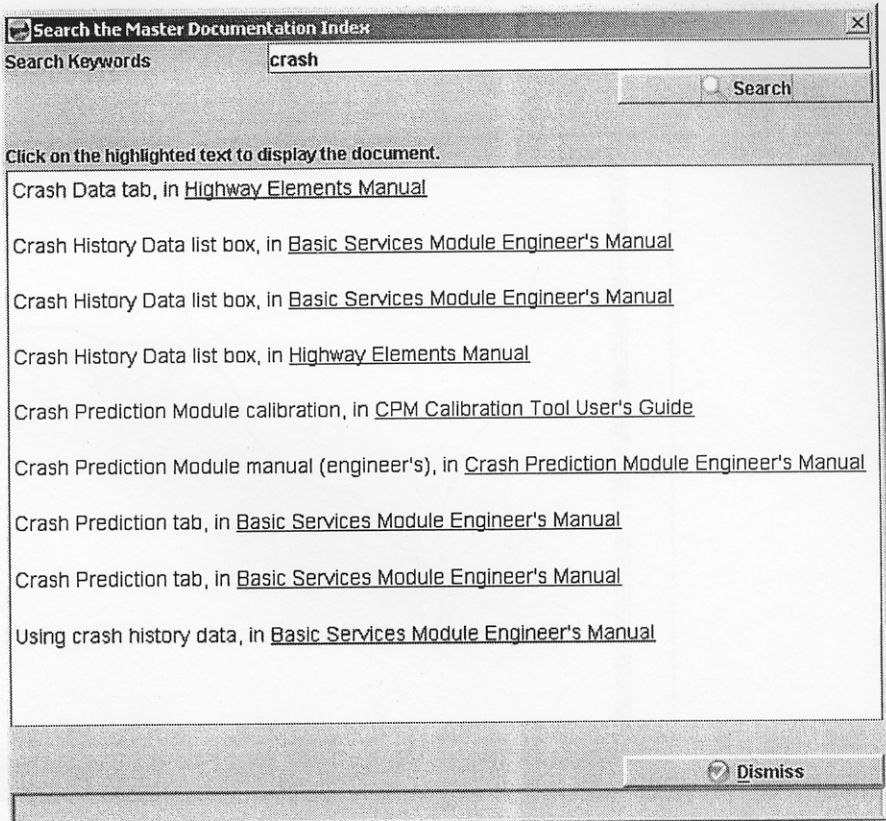
I. Access Help/Documentation

1. Access the IHSDM User Documentation Summary via the Help pull-down menu



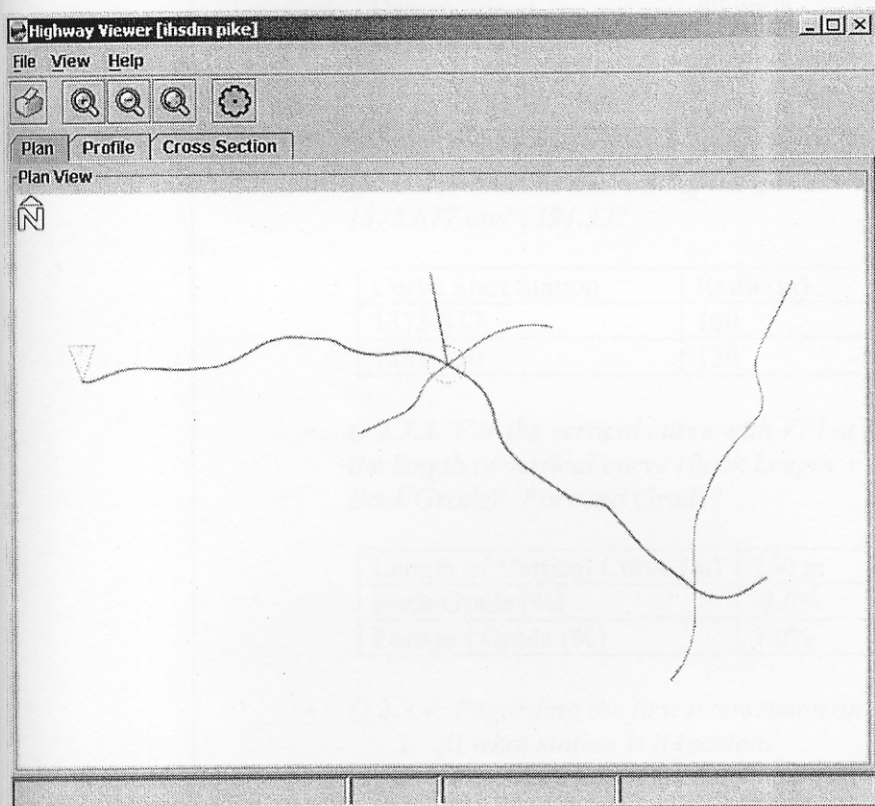
2. Open the "IHSDM User's Manual" using the link in the IHSDM User Documentation Summary.
3. Close the "IHSDM User's Manual" by selecting "File"> "Close" from the pull-down menu

4. Use the "Search Master Documentation Index" function:
 - a. Select Help->Search Master Index
 - b. In the "Search Master Documentation Index" dialog, type 'crash' in the "Search Keywords" field
 - c. Click on the "Search" button
 - d. Click on the highlighted text to display a document referencing 'crash'
 - e. Click on 'Dismiss' to close the dialog
 - f. Close the document you opened.



Exercise 2.5: IHSDM Basic Services - Highway Viewer

1. Open the Highway Viewer using the icon on the main interface (sixth from left)
2. Examine the plan and profile by choosing the respective tabs
3. In Plan View, zoom in on the first intersection by holding down the right mouse button and dragging to form a rectangle (when button is released, view will zoom to show extent of rectangle)
4. Zoom out to full view by selecting the fourth icon from the left.



Exit the Highway Viewer by clicking "File->Close" from the menu.

Exit IHSDM by clicking "File->Exit IHSDM" from the menu.

Lesson 2 Work Problem – Answer Key

Exercise 2.3

- *Q 2.3.1: Find the values for the following:*
 - i. *Design Speed (General>Speed>Design tabs)*
 - ii. *ADT for 2001 (General>Volumes>Daily tabs)*
 - iii. *Through Lane Width (Lane>Thru tabs)*
 - iv. *Shoulder Width (Cross Section>Shoulder>Width tabs)*

Design Speed	80 km/h
ADT (2001)	5000 vpd
Through Lane Width	3.3 m
Shoulder width	0.0 m

- *Q 2.3.2: What are the radii of the curves that begin at stations 1373.877 and 1391.33?*

Curve Start Station	Radii (m)
1373.877	100
1391.330	150

- *Q 2.3.3: For the vertical curve with VPI at station 1300, what is the length of vertical curve (Back Length + Forward Length)? Back Grade? Forward Grade?*

Length of Vertical Curve (m)	250 m
Back Grade (%)	-2.0%
Forward Grade (%)	7.0%

- *Q 2.3.4: Regarding the first intersection on IHSDM Pike:*
 - i. *At what station is it located?*
 - ii. *How many legs does the intersection have?*
 - iii. *What type of traffic control?*

Intersection location	2050.000
Number of legs	5
Traffic control	Stop

- *Q 2.3.5: What is the percentage of vehicles turning left onto SE IHSDM Pike (shown in the "Traffic Turn Data" section of the dialog)?*

% of vehicles turning left onto SE IHSDM Pike from N Springfield Dr.	15%
--	-----

[Go back to: Table of Contents](#)

[Go to the next lesson](#)

[Go back to: Table of Contents](#)

[Go to the next lesson](#)

Lesson 3: Policy Review Module (PRM)

Overview

The basic functionality of the Policy Review Module is to automate the process of checking geometric design elements against relevant design policy documents.

For more details, see the [Policy Review Module Engineer's Manual](#).

In the work problem, you will use the Policy Review Module to check several geometric design elements of IHSDM Pike against 2001 AASHTO "Green Book" policy.

Work Problem

Exercise:

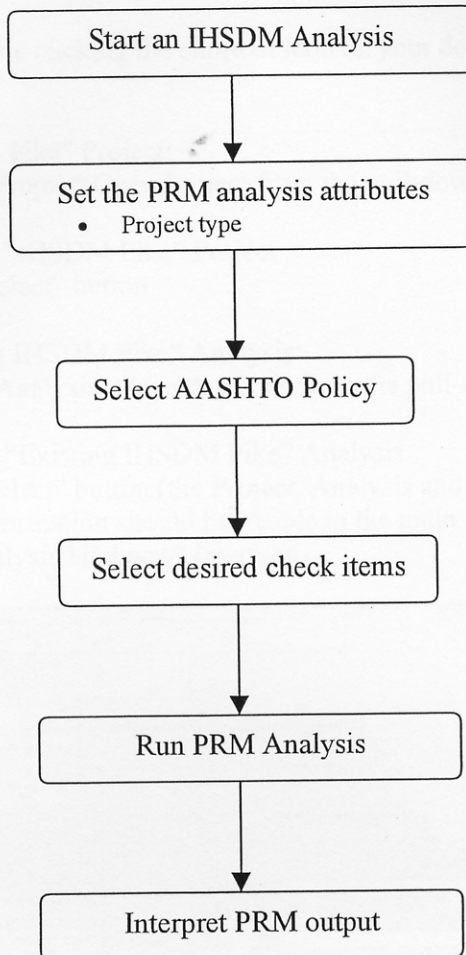
- 3.1: Evaluate Existing IHSDM Pike

See the flowchart below for a summary of the work problem.

To access the [Policy Review Module Engineer's Manual](#):

1. Go to the IHSDM main interface
2. Click on "Help" from the menu bar
3. Click on "User Documentation Summary"
4. Scroll down and choose the [Policy Review Module \(PRM\) Engineer's Manual](#)

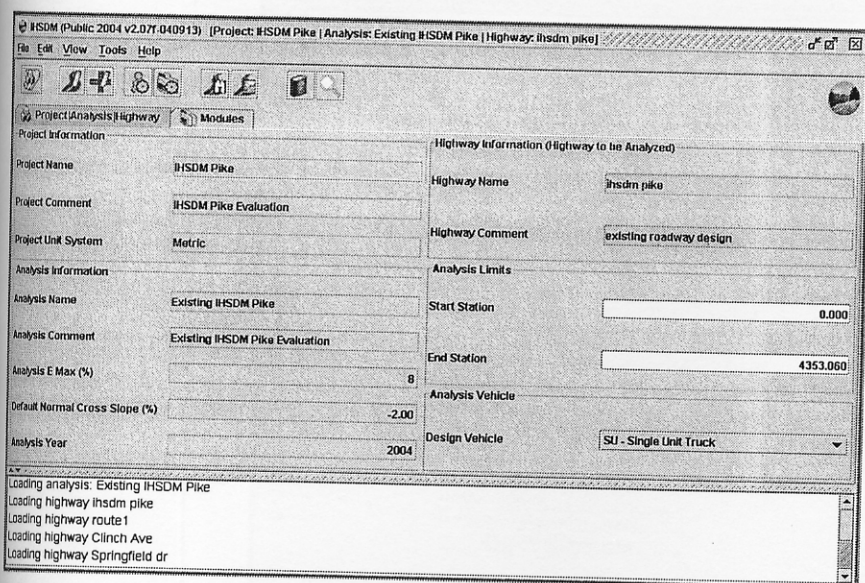
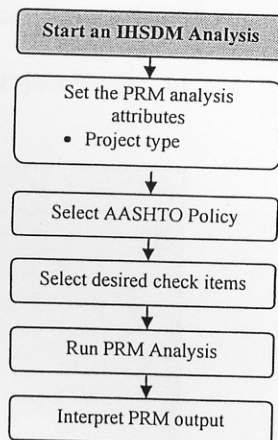
PRM work problem workflow:

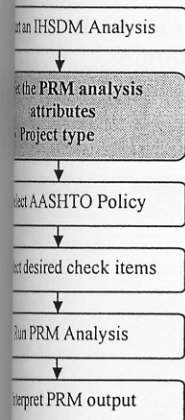


Exercise 3.1: Evaluate Existing IHSDM Pike

I. Open the “Existing IHSDM Pike” analysis

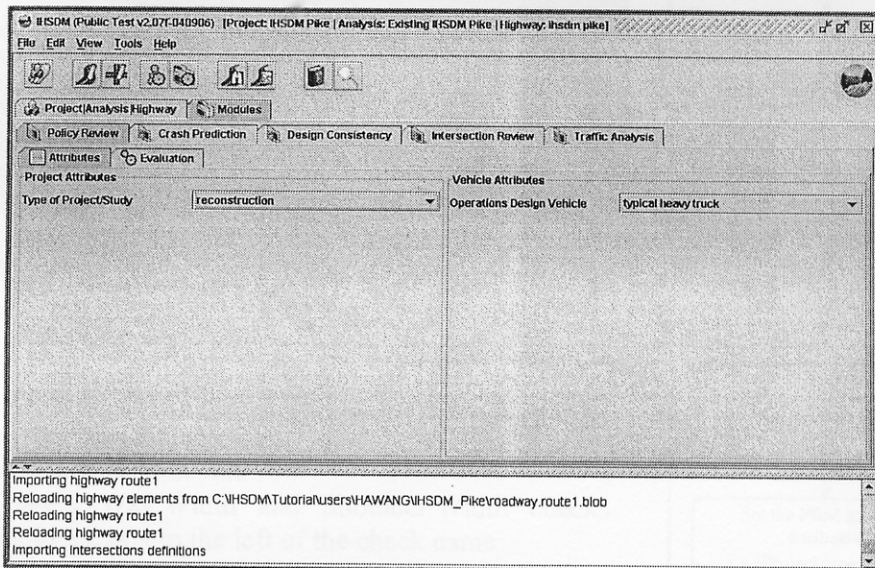
1. Start IHSDM by double clicking the shortcut icon on your desktop screen
2. To open the “IHSDM Pike” Project:
 - a. Select File>Project>Open Project from the pull-down menu
 - b. Click on the “IHSDM Pike” Project
 - c. Click the “Select” button
3. To open the “Existing IHSDM Pike” Analysis:
 - a. Select File>Analysis>Open Analysis from the pull-down menu
 - b. Click on the “Existing IHSDM Pike” Analysis
 - c. Click the “Select” button (the Project, Analysis and Highway information should be visible in the main (Project/Analysis/Highway) interface)





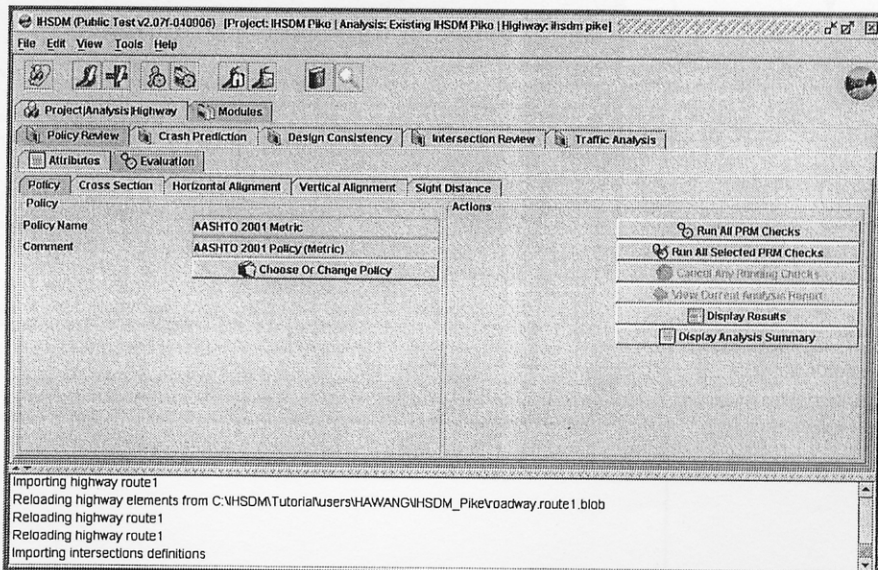
II. Setting the PRM analysis attributes

1. From the main (Project/Analysis/Highway) interface, choose the “Modules” tab, then the “Policy Review” tab
2. Select the “Attributes” sub-tab. Set the “Type of Project/Study” to “reconstruction.”

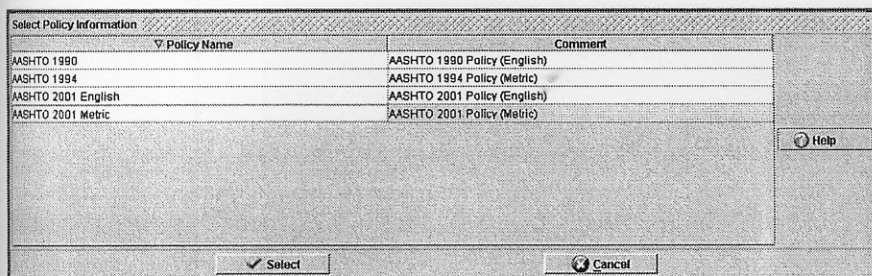


III. PRM Evaluation

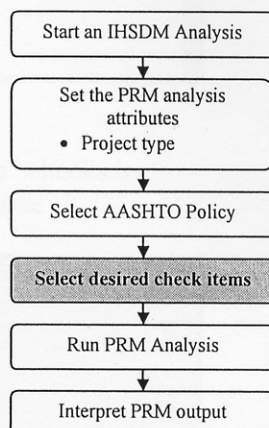
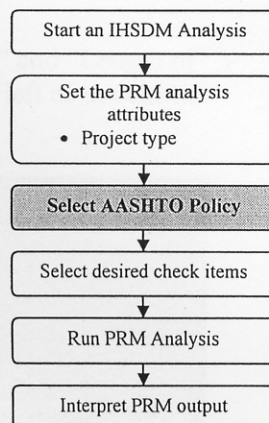
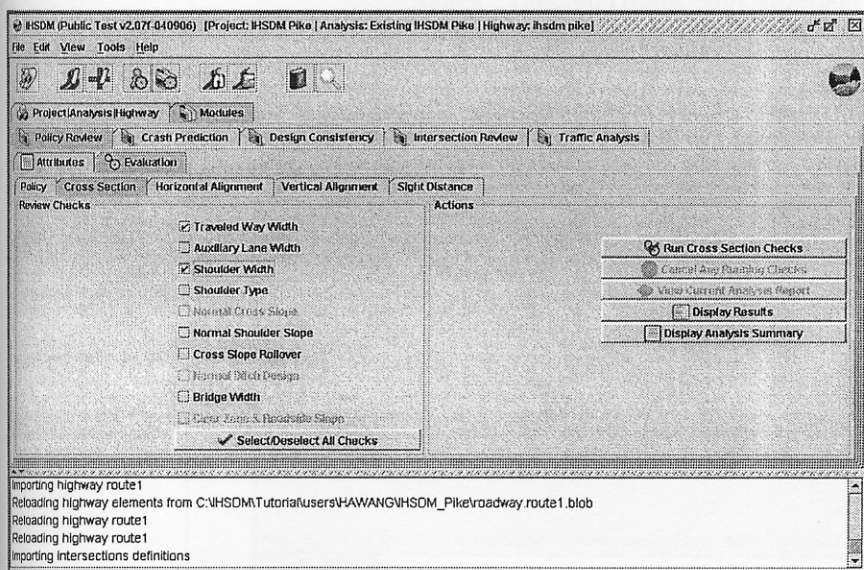
1. Select the “Evaluation” sub-tab



2. From the "Policy" tab, click on the "Choose or Change Policy" button
 - a. Select "AASHTO 2001 Metric"
 - b. Click on the Select button



3. To select the desired check items:
 - a. Select the "Cross Section" tab
Select "Traveled Way Width" and "Shoulder Width" checks by clicking in the box to the left of the check name

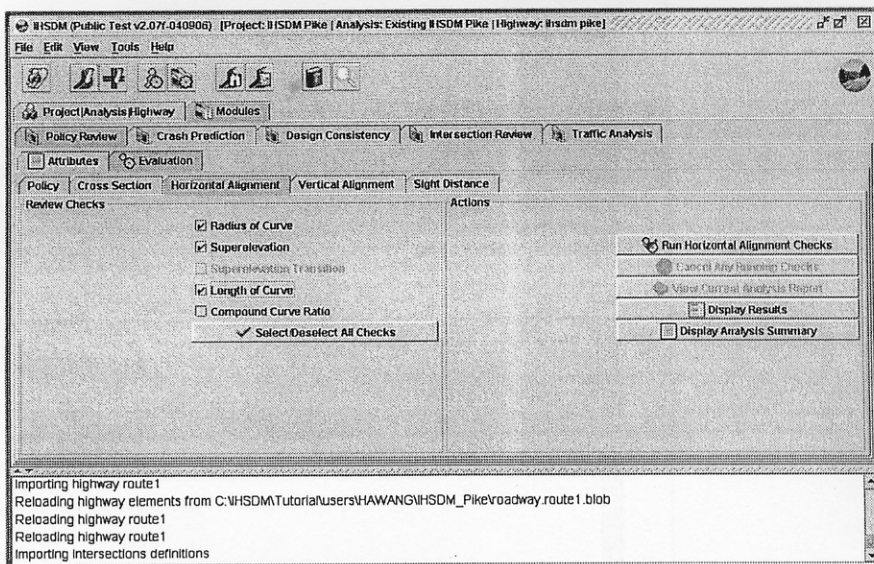


The check items are organized in 4 groups:

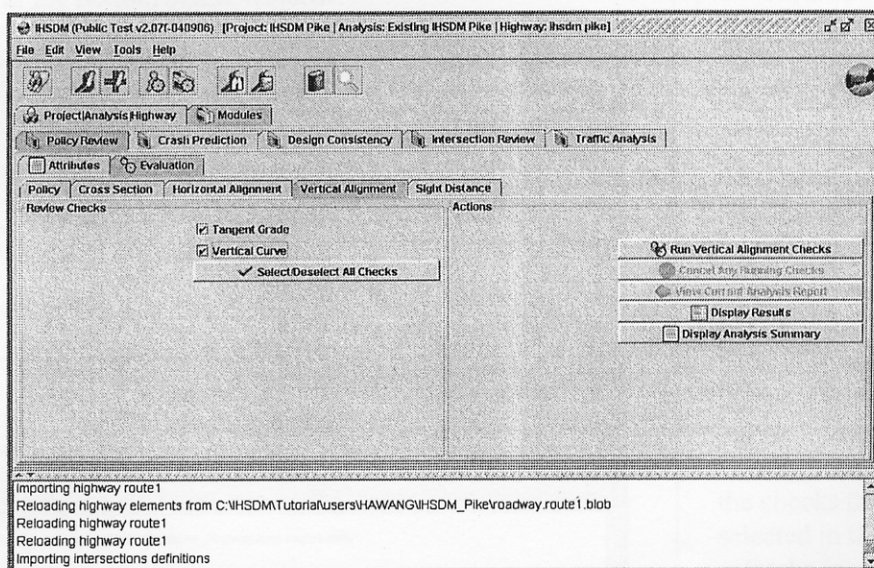
- Cross Section
- Horizontal Alignment
- Vertical Alignment
- Sight Distance

Each group is represented by one sub-tab under PRM Evaluation

- b. Select the “Horizontal Alignment” tab
 Select “Radius of Curve,” “Superelevation,” and “Length of Curve” checks by clicking in the box to the left of the check name

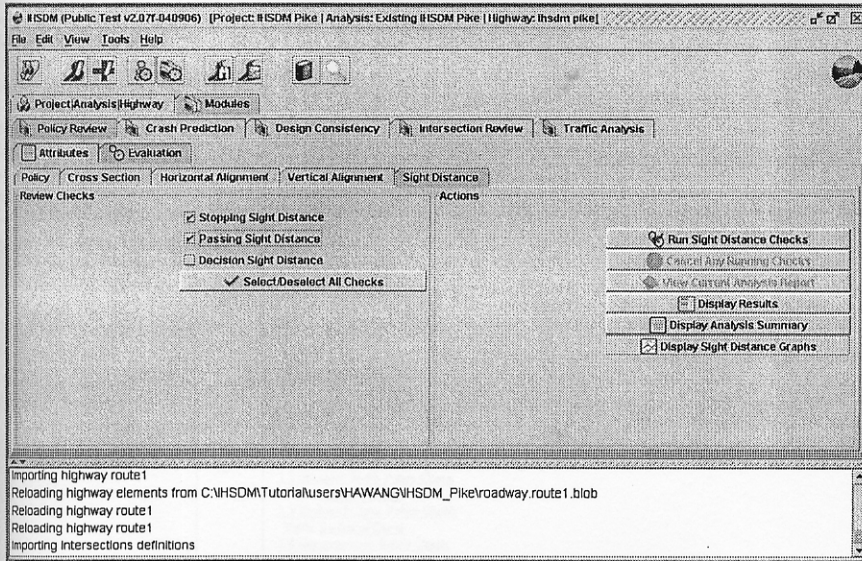


- c. Select the “Vertical Alignment” tab
 Select “Tangent Grade” and “Vertical Curve” checks by clicking in the box to the left of the check name

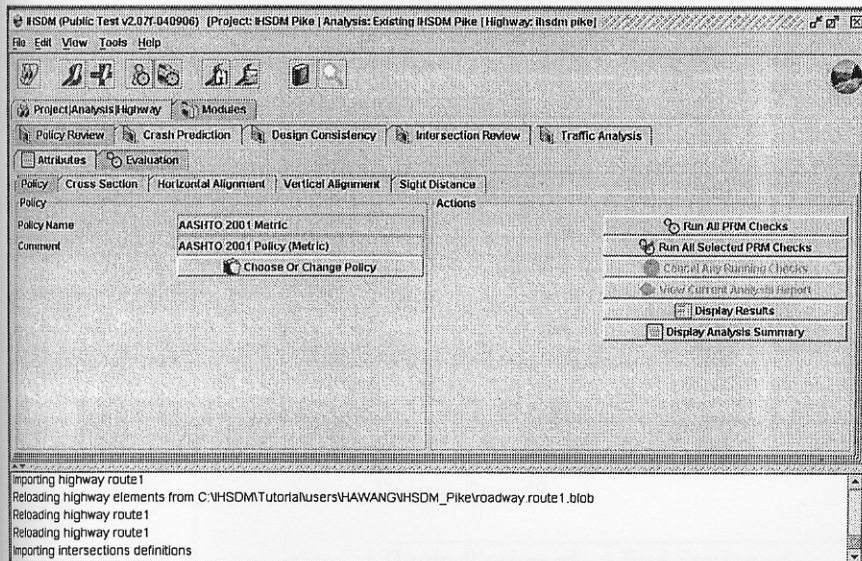


check items are
 ized in 4 groups:
 Cross Section
 Horizontal Alignment
 Vertical Alignment
 Sight Distance
 group is represented by
 -tab under PRM
 tion

- d. Select the “Sight Distance” tab
 Select “Stopping Sight Distance” and “Passing Sight Distance” checks by clicking in the box to the left of the check name



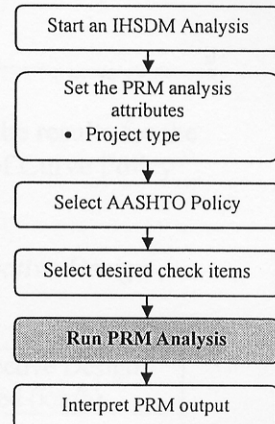
4. Select the “Policy” tab and choose “Run All Selected PRM Checks”. When finished, a “PRM analysis finished” message would appear in the bottom status window.



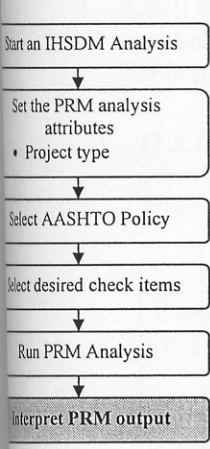
The check items are organized in 4 groups:

- Cross Section
- Horizontal Alignment
- Vertical Alignment
- Sight Distance

Each group is represented by one sub-tab under PRM Evaluation

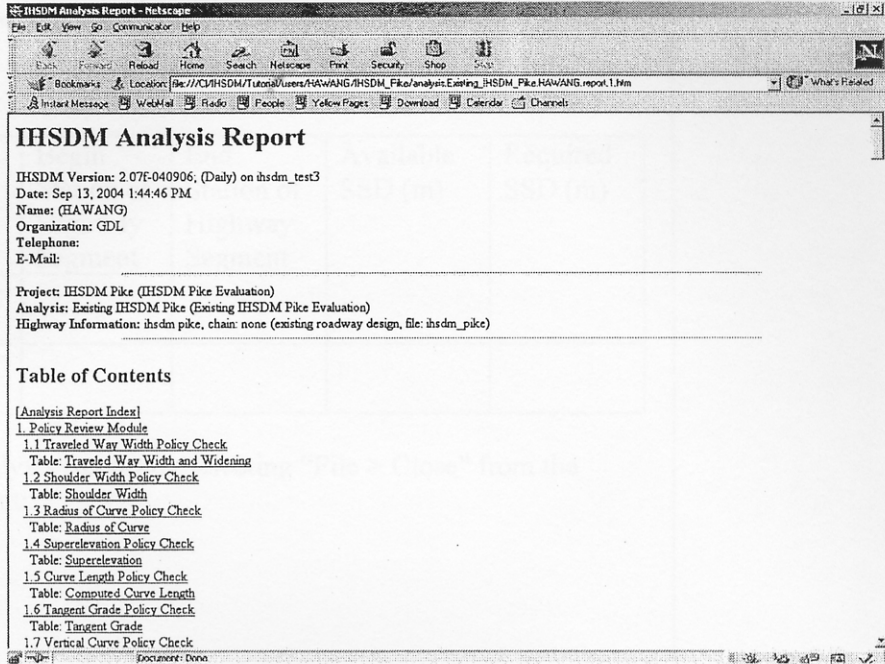


Note: the “Run All Selected PRM Checks” button located on the “Policy” tab will run all the checks that are selected in the 4 other sub-tabs (e.g., Cross Section).



IV. View/Interpret PRM Output

1. When the PRM is finished running (it will take a minute or two), select “View Current Analysis Report”



2. After the Analysis Report opens, scroll down to the results for the Radius of Curve check (or click on the “Radius of Curve Policy Check” link in the Table of Contents)

- *Q 3.1.1: Which two curves have the lowest Effective Design Speed?*

Begin Station of Curve	End Station of Curve	Effective Design Speed (km/h)

3. Scroll down to the results for the Vertical Curve check (or click on the “Vertical Curve Policy Check” link in the Table of Contents)

- *Q 3.1.2: Which two vertical curves have the lowest Effective Design Speed?*

Begin Station of Vertical Curve	End Station of Vertical Curve	Effective Design Speed (km/h)

4. Scroll down to the results for the Stopping Sight Distance check (or click on the “Stopping Sight Distance Policy Check” link in the Table of Contents)
 - *Q 3.1.3: In each direction of travel (decreasing and increasing), identify the segment with the shortest available Stopping Sight Distance:*

Direction of Travel	Begin Station of Highway Segment	End Station of Highway Segment	Available SSD (m)	Required SSD (m)
Decreasing Stations				
Increasing Stations				

5. Close the Analysis Report by selecting “File > Close” from the pull-down menu.

Exit IHSDM

Lesson 3 Work Problem – Answer Key

Exercise 3.1

- **Q 3.1.1:** Which two curves have the lowest Effective Design Speed?

Begin Station of Curve	End Station of Curve	Effective Design Speed (km/h)
1373.877	1391.330	54
3210.677	3289.259	54

- **Q 3.1.2:** Which two vertical curves have the lowest Effective Design Speed?

Begin Station of Vertical Curve	End Station of Vertical Curve	Effective Design Speed (km/h)
2250	2350	52
2450	2550	40

- **Q 3.1.3:** In each direction of travel (decreasing and increasing), identify the segment with the shortest available Stopping Sight Distance:

Direction of Travel	Begin Station of Highway Segment	End Station of Highway Segment	Available SSD (m)	Required SSD (m)
Decreasing Stations	3076	3240	62	130
Increasing Stations	3104	3264	56	130

[Go back to: Table of Contents](#)

[Go to the next lesson](#)

[Go back to: Table of Contents](#)

[Go to the next lesson](#)

Lesson 5: Design Consistency Module (DCM)

Overview

The Design Consistency Module evaluates operating speed consistency through a speed-profile model that estimates expected 85th percentile, free-flow, passenger vehicle speeds along a highway.

For more details, see the [Design Consistency Module Engineer's Manual](#).

In the work problem, you will use the Design Consistency Module to evaluate the operating speed consistency of IHSDM Pike.

Work Problem

Exercise:

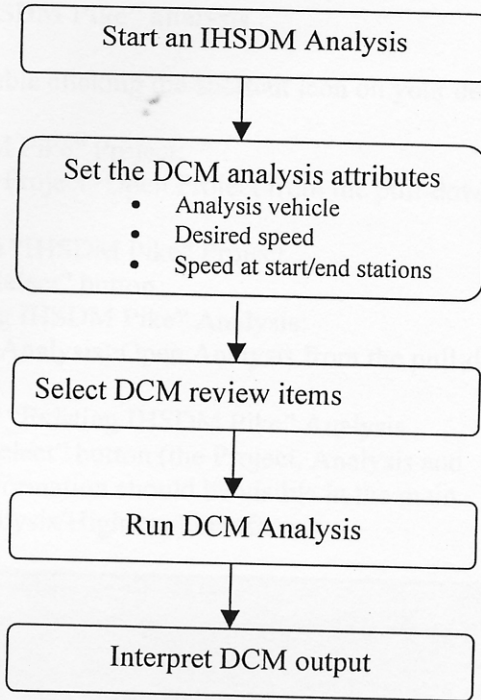
- 5.1: Evaluate the Design Consistency of IHSDM Pike

See the flowchart below for a summary of the work problem.

To access the [Design Consistency Module Engineer's Manual](#):

1. Go to the IHSDM main interface
2. Click on "Help" from the menu bar
3. Click on "User Documentation Summary"
4. Scroll down and choose the [Design Consistency Module \(DCM\) Engineer's Manual](#)

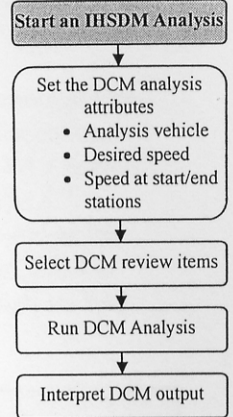
DCM work problem workflow:



Exercise 5.1: Evaluate the Design Consistency of Existing IHSDM Pike

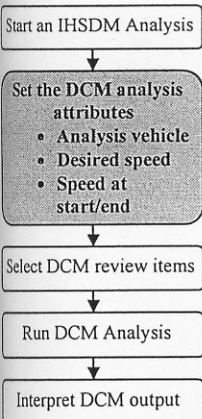
I. Open the “Existing IHSDM Pike” analysis

1. Start IHSDM by double clicking the shortcut icon on your desktop screen
2. To open the “IHSDM Pike” Project:
 - a. Select File>Project>Open Project from the pull-down menu
 - b. Click on the “IHSDM Pike” Project
 - c. Click the “Select” button
3. To open the “Existing IHSDM Pike” Analysis:
 - a. Select File>Analysis>Open Analysis from the pull-down menu
 - b. Click on the “Existing IHSDM Pike” Analysis
 - c. Click the “Select” button (the Project, Analysis and Highway information should be visible in the main (Project/Analysis/Highway) interface)



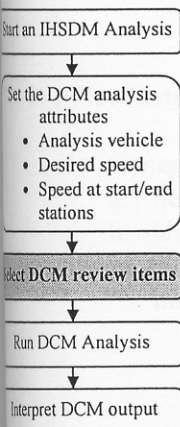
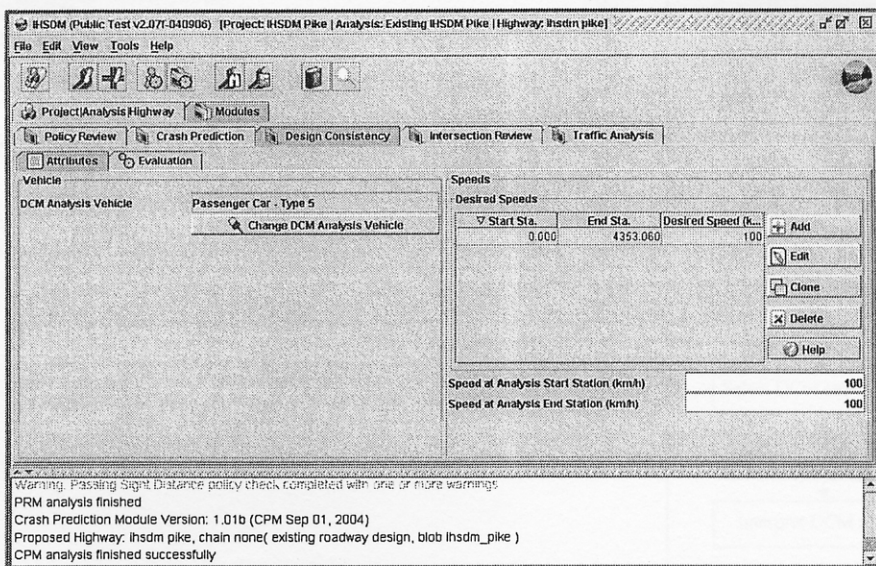
Project Information		Highway Information (Highway to be Analyzed)	
Project Name	IHSDM Pike	Highway Name	ihsdm pike
Project Comment	IHSDM Pike Evaluation	Highway Comment	existing roadway design
Project Unit System	Metric		
Analysis Information		Analysis Limits	
Analysis Name	Existing IHSDM Pike	Start Station	0.000
Analysis Comment	Existing IHSDM Pike Evaluation	End Station	4353.060
Analysis E Max (%)	8	Analysis Vehicle	
Default Normal Cross Slope (%)	-2.00	Design Vehicle	SU - Single Unit Truck
Analysis Year	2004		

Warning: Passing Sight Distance policy check completed with one or more warnings
 PRM analysis finished
 Crash Prediction Module Version: 1.01b (CPM Sep 01, 2004)
 Proposed Highway: ihsdm pike, chain none(existing roadway design, blob ihsdm_pike)
 CPM analysis finished successfully



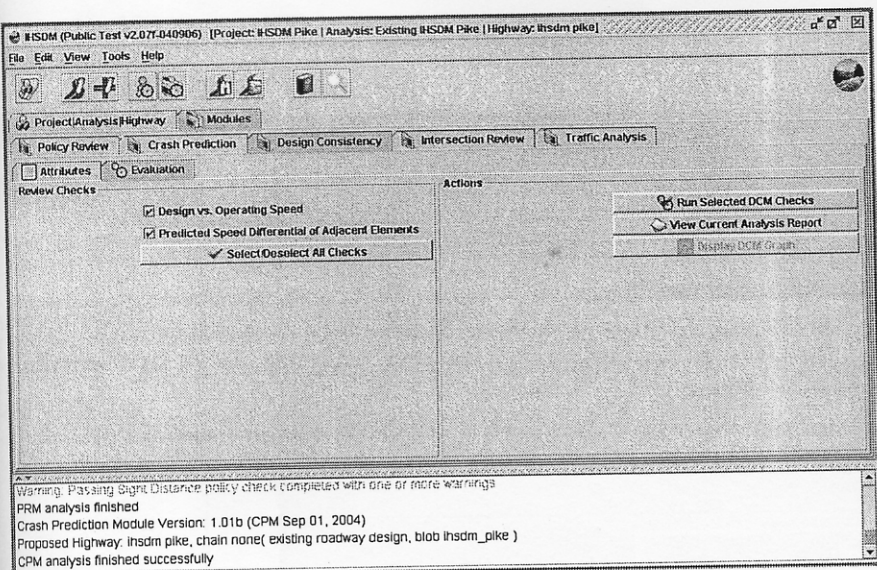
II. Setting the DCM analysis attributes

1. From the main (Project/Analysis/Highway) interface, choose the “Modules” tab, then the “Design Consistency” tab
2. Select the “Attributes” sub-tab:
 - a. Verify that the “DCM Analysis Vehicle” is “Passenger Car – Type 5” (the vehicle type that represents the most common passenger car). If not, click on the “Change DCM Analysis Vehicle” button and select “Passenger Car – Type 5.”
 - b. Verify that the default value of 100 km/h is entered as the Desired Speed for the entire analysis section, and that the Speed at Analysis Start Station and Speed at Analysis End Station are 100 km/h.



III. DCM Evaluation

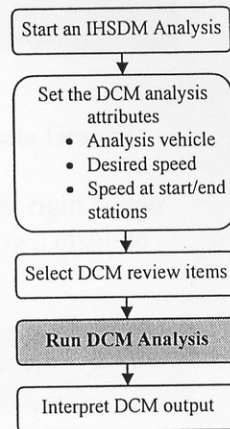
1. Select the “Evaluation” tab
2. Verify that both “Review Checks” are selected (checked)



3. Click on the “Run Selected DCM Checks” button to run the DCM

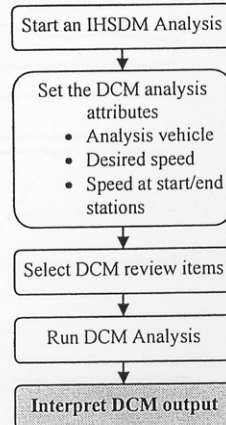
When finished running, a “DCM Completed” message will appear in the bottom status reporting area.

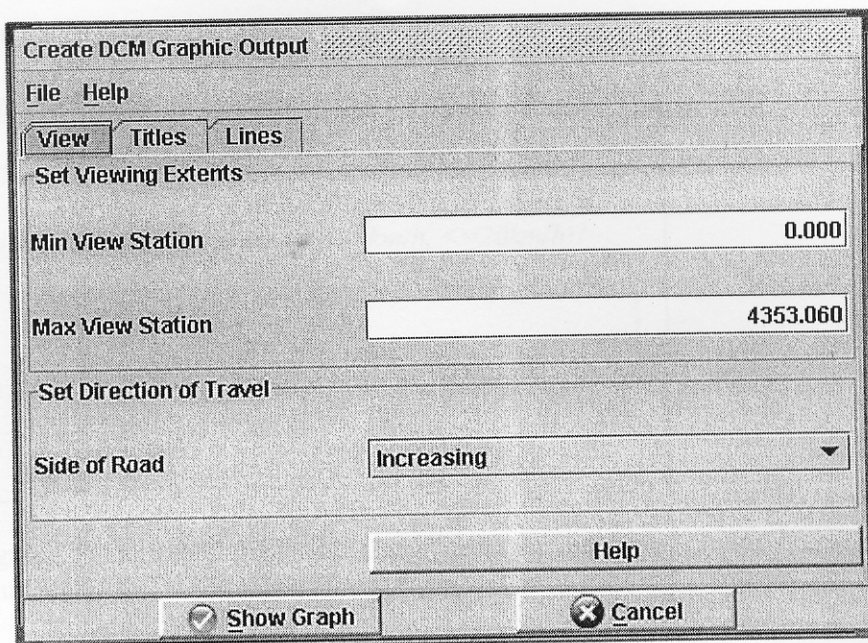
For details regarding the review items, please refer to the DCM Engineer’s Manual



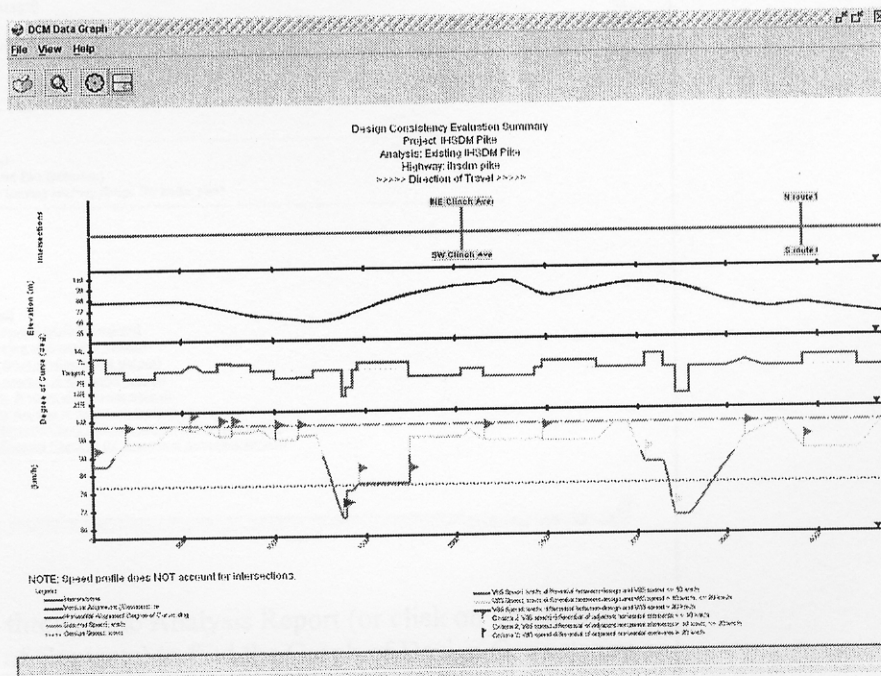
IV. View/Interpret DCM Output

1. Generate a DCM graph outside of the analysis report:
 - a. Select “Display DCM Graph”
 - b. Under “Set Direction of Travel,” set the “Side of Road” to “Increasing” to evaluate the highway in the direction of increasing stations





- c. Click on the "Show Graph" button. A "DCM Data Graph" window should appear
- d. Click on the maximize window icon in the upper right corner
- e. Select "View>Toggle Legend" from the pull-down menu to display the legend below the graph



- **Q 5.1.1:** What are the approximate locations of any red “flags” on the speed profile (indicating speed differentials between adjacent design elements of >20 km/h)?
- **Q 5.1.2:** What are the approximate locations of any yellow “flags” on the speed profile (indicating speed differentials between adjacent design elements of >10 km/h, <=20km/h)?

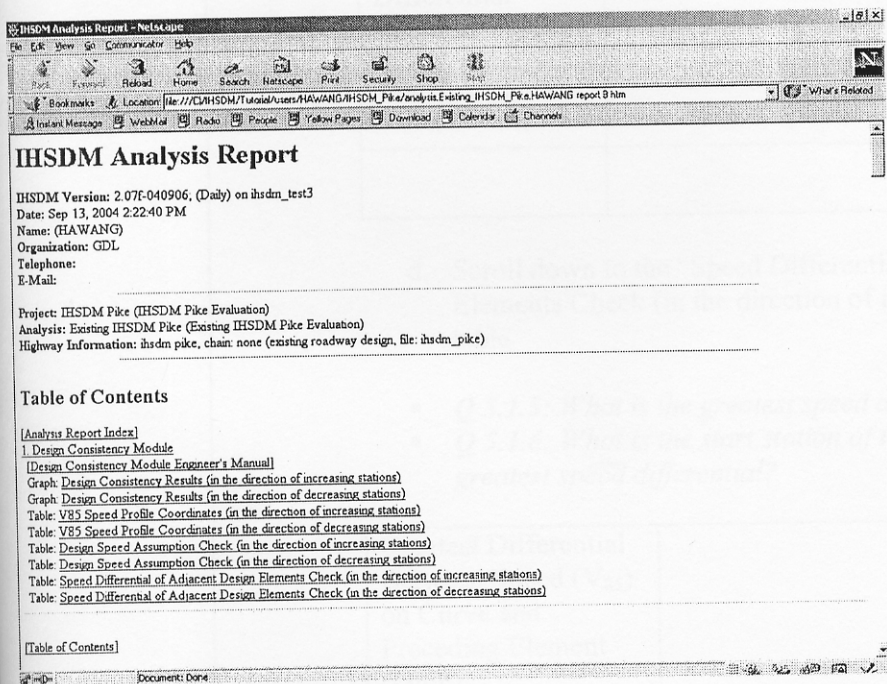
Locations of Red Flags (Station)	
Locations of Yellow Flags (Station)	

f. Close the graph by selecting “File” and “Close” from the pull-down menu on the “DCM Data Graph” window

2. View/Interpret the DCM analysis report:

- a. Click the “View Current Analysis Report” button

Graphs are also in the analysis report with a default format.



- b. Scroll through the Analysis Report (or click on link in the Table of Contents) to find the Graph of Design Consistency Results in the directions of increasing and decreasing stations

- *Q 5.1.3: How do the speed profiles differ by direction of travel?*

<i>How do the speed profiles differ by direction of travel?</i>	
---	--

- Scroll down to the “Design Speed Assumption Check (in the direction of decreasing stations)” table
 - *Q 5.1.4 Which two sections have the greatest differential between the estimated operating speed (V_{85}) and the design speed (V_{design})? Where does this occur?*

Greatest Differential Between V_{85} and V_{design} (km/h)	Station (From)	Station (To)

- Scroll down to the “Speed Differential of Adjacent Design Elements Check (in the direction of increasing stations)” table
 - *Q 5.1.5: What is the greatest speed differential?*
 - *Q 5.1.6: What is the start station of the curve with the greatest speed differential?*

Greatest Differential Between Speed (V_{85}) on Curve and Preceding Element (km/h)	
Start Station of Curve	

- Close the Analysis Report

Exit IHSDM

Lesson 5 Work Problem – Answer Key

Exercise 5.1

- **Q 5.1.1:** What are the approximate locations of any red “flags” on the speed profile (indicating speed differentials between adjacent design elements of >20 km/h)?
- **Q 5.1.2:** What are the approximate locations of any yellow “flags” on the speed profile (indicating speed differentials between adjacent design elements of >10 km/h, ≤ 20 km/h)?

Locations of Red Flags (Station)	1370
Locations of Yellow Flags (Station)	3020, 3200

- **Q 5.1.3:** How do the speed profiles differ by direction of travel?

How do the speed profiles differ by direction of travel?	<p>Possible answers include:</p> <ul style="list-style-type: none"> - For compound curve beginning at sta. 1378: red flag for increasing stations, green flag for decreasing stations - For curve beginning near sta. 3210: yellow flag for increasing stations, red flag for decreasing stations
--	---

- **Q 5.1.4** Which two sections have the greatest differential between the estimated operating speed (V_{85}) and the design speed (V_{design})? Where does this occur?

Greatest Differential Between V_{85} and V_{design} (km/h)	Station (From)	Station (To)
20	4353.060	3398.454
20	1128.815	102.944

To access a pre-produced copy of the analysis report for Exercise 5.1:

1. Go to the “Tutorial/Analysis_Reports” folder under your IHSDM directory.
2. Choose “Exercise_5.1_DCM_Report.htm”

- *Q 5.1.5: What is the greatest speed differential?*
- *Q 5.1.6: What is the start station of the curve with the greatest speed differential?*

Greatest Differential Between Speed (V_{85}) on Curve and Preceding Element (km/h)	28.2
Start Station of Curve	1373.877

[Go back to: Table of Contents](#)

[Go to the next lesson](#)

ภาคผนวก ข

ข้อมูลเรขาคณิตทางหลวง 410 กม.2+665.000 ถึง 37+544.350

1. ปริมาณการจราจร

ปี พ.ศ.2545 ADT = 8,431 คัน/วัน

ปี พ.ศ.2546 ADT = 8,844 คัน/วัน

2. **Classification** กำหนดเป็นประเภท Collector

3. **Terrain** กำหนดเป็นประเภท Level

4. ความกว้างของไหล่ทาง = 2.25 เมตร

5. ความกว้างของช่องทางเดินรถ = 3.25 เมตร

6. การขยายไหล่ทาง

ตารางที่ 1 ความกว้างของการขยายไหล่ทาง

Start station	End station	Side of Road	Widening (m)	Begin Full width station	End Full width station
4+685.322	4+872.278	left	0.3	4+720.370	4+837.230
6+889.219	7+051.718	right	0.3	6+918.760	7+022.090
7+051.718	7+190.486	right	0.5	7+078.887	7+160.881
8+146.345	8+282.140	left	0.75	8+169.745	8+258.120
8+563.625	8+727.816	left	0.3	8+591.510	8+699.280
9+761.725	9+950.866	right	0.75	9+788.270	9+924.360
12+210.533	12+388.184	left	0.75	12+241.857	12+356.857
13+356.230	13+629.640	left	0.3	13+382.940	13+602.040
16+763.340	17+140.100	left	0.3	16+792.300	17+111.150
17+157.677	17+309.707	right	0.3	17+188.840	17+289.480
17+309.707	17+434.990	right	0.3	17+332.350	17+432.714
18+289.892	18+463.241	left	0.3	18+325.480	18+427.580
18+590.007	19+076.458	right	0.3	18+624.040	19+046.420
19+143.552	19+340.065	right	0.3	19+173.480	19+310.140
19+612.723	19+891.573	left	0.3	19+643.880	19+860.410
20+664.228	20+809.679	right	0.75	20+708.767	20+770.520
21+175.225	21+533.487	left	0.3	21+204.156	21+474.390
22+468.760	22+590.010	right	0.3	22+480.000	22+570.000
27+227.363	27+408.272	left	0.3	27+259.270	27+377.360
29+457.141	29+626.429	left	0.3	29+491.520	29+592.050
31+670.890	31+830.850	left	0.3	31+694.890	31+806.850
33+780.750	33+945.250	right	0.3	33+804.780	33+921.250
35+079.170	35+358.350	right	0.3	35+105.636	35+319.759
35+838.934	35+991.423	right	0.75	35+858.500	35+948.000
35+991.423	36+190.188	left	0.3	36+009.960	36+150.290
36+419.376	36+649.204	left	0.5	36+448.510	36+620.070
36+691.156	36+857.850	right	0.5	36+727.660	36+829.730

7. แนวทางราบ (Horizontal Alignment)

ตารางที่ 2 แนวทางราบ

Element Type	Start Station	End Station	Radius (m)	Design Speed (km/h)	Deflection Angle (degree)	Direction
Tangent	2+665.000	3+149.880	-	-		-
Simple Curve	3+149.880	3+368.210	2,804.790	60		Right
Tangent	3+368.210	3+672.820				
Deflection	3+672.820				2° 13' 00"	Right
Tangent	3+672.820	3+825.000				
Deflection	3+825.000				0° 33' 00"	Right
Tangent	3+825.000	4+446.030				
Deflection	4+446.030				0° 28' 00"	Right
Tangent	4+446.030	4+720.370				
Simple Curve	4+720.370	4+837.230	220.308	60		Left
Tangent	4+837.230	4+923.420				
Simple Curve	4+923.420	5+054.460	716.198	60		Left
Tangent	5+054.460	5+234.480				
Deflection	5+234.480				2° 05' 00"	Left
Tangent	5+234.480	6+570.200				
Simple Curve	6+570.200	6+775.020	716.198	60		Left
Tangent	6+775.020	6+918.760				
Simple Curve	6+918.760	7+022.090	409.256	60		Right
Simple Curve	7+078.887	7+160.831	190.986	50		Right
Tangent	7+160.831	7+420.760				
Simple Curve	7+420.760	7+569.090	2,864.790	60		Left
Tangent	7+569.090	7+702.360				
Simple Curve	7+702.360	7+811.360	572.950	60		Left
Tangent	7+811.360	8+169.745				
Simple Curve	8+169.745	8+258.120	143.240	40		Left
Tangent	8+258.120	8+591.510				
Simple Curve	8+591.510	8+699.280	477.465	60		Left
Tangent	8+699.280	8+925.760				
Simple Curve	8+925.760	9+146.590	2,864.790	60		Left
Tangent	9+146.590	9+788.270				
Simple Curve	9+788.270	9+924.360	106.100	40		Right
Tangent	9+924.360	10+312.740				
Simple Curve	10+312.740	10+554.820	716.198	60		Right
Tangent	10+554.820	10+696.350				
Deflection	10+696.350				2° 47' 00"	Left
Tangent	10+696.350	10+932.370				
Simple Curve	10+932.370	11+115.510	636.620	60		Left
Tangent	11+115.510	11+209.960				

ตารางที่ 2 (ต่อ)

Element Type	Start Station	End Station	Radius (m)	Design Speed (km/h)	Deflection Angle (degree)	Direction
Simple Curve	11+209.960	11+338.290	1,909.86	60		Right
Tangent	11+338.290	11+395.970				
Simple Curve	11+395.970	11+523.740	954.930	60		Right
Tangent	11+523.740	11+587.670				
Simple Curve	11+587.670	11+771.000	1,432.395	60		Right
Tangent	11+771.000	11+928.480				
Simple Curve	11+928.480	12+039.810	572.958	60		Left
Tangent	12+039.810	12+241.857				
Simple Curve	12+241.857	12+356.857	121.91	40		Left
Simple Curve	12+388.184	12+497.706	1,232.578	60		Left
Tangent	12+497.706	12+609.590				
Simple Curve	12+609.590	12+759.920	1,145.916	60		Right
Tangent	12+759.920	13+382.940				
Simple Curve	13+382.940	13+602.040	440.737	60		Left
Tangent	13+602.040	13+699.600				
Simple Curve	13+699.600	13+817.930	876.922	60		Right
Tangent	13+817.930	14+106.831				
Simple Curve	14+106.831	14+184.550	716.197	60		Right
Tangent	14+184.550	14+446.140				
Deflection	14+446.140				1° 47' 00"	Right
Tangent	14+446.140	14+707.340				
Simple Curve	14+707.340	14+947.340	1,145.916	60		Right
Tangent	14+947.340	15+106.580				
Simple Curve	15+106.580	15+207.460	381.972	30		Left
Tangent	15+207.460	15+238.450				
Simple Curve	15+238.450	15+346.150	716.198	40		Right
Tangent	15+346.150	15+400.820				
Simple Curve	15+400.820	15+518.200	818.511	40		Left
Tangent	15+518.200	15+626.910				
Simple Curve	15+626.910	15+842.460	1,909.800	60		Right
Tangent	15+842.460	15+991.230				
Simple Curve	15+991.230	16+153.730	2,864.790	60		Right
Tangent	16+153.730	16+792.300				
Simple Curve	16+792.300	17+111.150	358.099	60		Left
Tangent	17+111.150	17+188.840				
Simple Curve	17+188.840	17+289.480	440.737	60		Right
Simple Curve	17+332.350	17+432.714	337.034	60		Right
Simple Curve	17+434.990	17+562.280	751.904	60		Left
Tangent	17+562.280	17+673.430				

ตารางที่ 2 (ต่อ)

Element Type	Start Station	End Station	Radius (m)	Design Speed (km/h)	Deflection Angle (degree)	Direction
Simple Curve	17+673.430	17+812.760	1,145.916	60		Right
Tangent	17+812.760	18+141.980				
Simple Curve	18+141.980	18+195.180	1,145.916	60		Right
Tangent	18+195.180	18+325.480				
Simple Curve	18+325.480	18+427.580	318.310	60		Left
Tangent	18+427.580	18+624.040				
Simple Curve	18+624.040	19+046.420	477.465	60		Right
Tangent	19+046.420	19+173.480				
Simple Curve	19+173.480	19+310.140	337.034	60		Right
Tangent	19+310.140	19+643.880				
Simple Curve	19+643.880	19+860.410	440.737	60		Left
Tangent	19+860.410	20+194.440				
Deflection	20+194.440				1° 20' 00"	Left
Tangent	20+194.440	20+708.767				
Simple Curve	20+708.767	20+770.520	92.413	40		Right
Tangent	20+770.520	21+204.156				
Simple Curve	21+204.156	21+474.390	440.740	60		Left
Tangent	21+474.390	21+949.150				
Simple Curve	21+949.150	22+046.650	1,432.395	60		Left
Tangent	22+046.650	22+217.800				
Simple Curve	22+217.800	22+392.800	2,864.790	60		Right
Tangent	22+392.800	22+468.760				
Simple Curve	22+468.760	22+590.010	477.465	60		Right
Tangent	22+590.010	23+190.160				
Deflection	23+190.160				1° 24' 00"	Left
Tangent	23+190.160	23+437.970				
Simple Curve	23+437.970	23+621.300	2,864.790	60		Left
Tangent	23+621.300	23+945.050				
Simple Curve	23+945.050	24+062.130	716.198	60		Right
Tangent	24+062.130	24+655.450				
Deflection	24+655.450				0° 41' 00"	Left
Tangent	24+655.450	25+333.100				
Simple Curve	25+333.100	25+528.450	954.930	60		Left
Tangent	25+528.450	26+252.750				
Deflection	26+252.750				1° 25' 00"	Left
Tangent	26+252.750	26+746.000				
Simple Curve	26+746.000	26+868.160	572.958	60		Left
Tangent	26+868.160	27+259.270				
Simple Curve	27+259.270	27+377.360	409.260	60		Left

ตารางที่ 2 (ต่อ)

Element Type	Start Station	End Station	Radius (m)	Design Speed (km/h)	Deflection Angle (degree)	Direction
Tangent	27+377.360	28+058.916				
Simple Curve	28+058.916	28+170.820	818.511	60		Right
Tangent	28+170.820	28+452.410				
Simple Curve	28+452.410	28+608.240	2,864.790	60		Right
Tangent	28+608.240	29+052.960				
Simple Curve	29+052.960	29+233.460	572.958	60		Right
Tangent	29+233.460	29+491.520				
Simple Curve	29+491.520	29+592.050	229.183	60		Left
Tangent	29+592.050	29+877.787				
Simple Curve	29+877.787	30+088.453	954.930	60		Right
Tangent	30+088.453	30+362.560				
Simple Curve	30+362.560	30+519.220	716.198	60		Right
Tangent	30+519.220	30+889.600				
Simple Curve	30+889.600	31+061.540	954.930	60		Right
Tangent	31+061.540	31+694.890				
Simple Curve	31+694.890	31+806.850	337.034	60		Left
Tangent	31+806.850	32+137.540				
Deflection	32+137.540				1° 00' 00"	Right
Tangent	32+137.540	32+581.890				
Simple Curve	32+581.890	32+713.000	954.930	60		Left
Tangent	32+713.000	32+869.740				
Simple Curve	32+869.740	33+143.070	954.930	60		Left
Tangent	33+143.070	33+225.610				
Simple Curve	33+225.610	33+352.770	572.958	60		Left
Tangent	33+352.770	33+804.780				
Simple Curve	33+804.780	33+921.250	337.034	60		Right
Tangent	33+921.250	34+156.420				
Deflection	34+156.420				1° 24' 00"	Left
Tangent	34+156.420	34+554.268				
Simple Curve	34+554.268	34+935.120	2,291.831	60		Left
Tangent	34+935.120	35+105.636				
Simple Curve	35+105.636	35+319.759	301.556	60		Right
Tangent	35+319.759	35+619.259				
Simple Curve	35+619.259	35+836.759	572.958	60		Left
Simple Curve	35+858.500	35+948.000	163.702	60		Right
Simple Curve	36+009.960	36+150.290	337.034	60		Left
Tangent	36+150.290	36+253.210				
Simple Curve	36+253.210	36+372.370	572.958	60		Left
Tangent	36+372.370	36+448.510				

ตารางที่ 2 (ต่อ)

Element Type	Start Station	End Station	Radius (m)	Design Speed (km/h)	Deflection Angle (degree)	Direction
Simple Curve	36+448.510	36+620.070	190.986	40		Left
Tangent	36+620.070	36+727.660				
Simple Curve	36+727.660	36+829.730	173.624	50		Right
Tangent	38+829.730	37+050.000				
Deflection	37+050.000				0° 52' 00"	Left
Tangent	37+050.000	37+544.350				

8. หน้าตัดถนน (Cross Section)

ตารางที่ 3 หน้าตัดถนน

Station	Side of Road	Cross Slope (%)	Station	Side of Road	Cross Slope (%)
2+665.000	both	-2.5	7+140.760	left	5.2
3+149.880	both	-2.5	7+140.760	right	-5.2
3+368.210	both	-2.5	7+190.486	both	-2.5
4+685.322	both	-2.5	7+420.760	both	-2.5
4+739.241	left	-5.5	7+569.090	both	-2.5
4+739.241	right	5.5	7+670.180	both	-2.5
4+818.360	left	-5.5	7+710.399	left	-2.5
4+818.360	right	5.5	7+710.399	right	2.5
4+872.278	both	-2.5	7+803.011	left	-2.5
4+891.249	both	-2.5	7+803.011	right	2.5
4+931.464	left	-2.5	7+843.530	both	-2.5
4+931.464	right	2.5	8+146.345	both	-2.5
5+046.413	left	-2.5	8+175.595	left	-3.2
5+046.413	right	2.5	8+175.595	right	3.2
5+086.632	both	-2.5	8+252.270	left	-3.2
6+538.025	both	-2.5	8+252.270	right	3.2
6+578.244	left	-2.5	8+282.140	both	-2.5
6+578.244	right	2.5	8+563.625	both	-2.5
6+767.776	left	-2.5	8+606.516	left	-3
6+767.776	right	2.5	8+606.516	right	3
6+807.995	both	-2.5	8+684.283	left	-3
6+889.219	both	-2.5	8+684.283	right	3
6+934.712	left	3.5	8+727.816	both	-2.5
6+934.712	right	-3.5	8+925.760	both	-2.5
7+006.136	left	3.5	9+146.590	both	-2.5
7+006.136	right	-3.5	9+761.725	both	-2.5
7+098.821	left	5.2	9+809.980	left	6
7+098.821	right	-5.2	9+809.980	right	-6

ตารางที่ 3 (ต่อ)

Station	Side of Road	Cross Slope (%)	Station	Side of Road	Cross Slope (%)
9+893.157	left	6	12+617.630	right	-2.5
9+893.157	right	-6	12+751.820	left	2.5
9+950.866	both	-2.5	12+751.820	right	-2.5
10+280.557	both	-2.5	12+792.100	both	-2.5
10+323.458	left	2.5	13+356.230	both	-2.5
10+323.458	right	-2.5	13+400.740	left	-3.3
10+544.091	left	2.5	13+400.740	right	3.3
10+544.091	right	-2.5	13+585.130	left	-3.3
10+568.992	both	-2.5	13+585.130	right	3.3
10+902.205	both	-2.5	13+629.640	both	-2.5
10+942.424	left	-2.5	13+670.100	both	-2.5
10+942.424	right	2.5	13+710.320	left	2.5
11+105.455	left	-2.5	13+710.320	right	-2.5
11+105.455	right	2.5	13+807.230	left	2.5
11+145.674	both	-2.5	13+807.230	right	-2.5
11+209.960	both	-2.5	13+847.440	both	-2.5
11+338.290	both	-2.5	14+074.660	both	-2.5
11+365.801	both	-2.5	14+144.880	left	2.5
11+406.020	left	2.5	14+144.880	right	-2.5
11+406.020	right	-2.5	14+176.810	left	2.5
11+513.419	left	2.5	14+176.810	right	-2.5
11+513.419	right	-2.5	14+216.730	both	-2.5
11+553.628	both	-2.5	14+675.135	both	-2.5
11+587.670	both	-2.5	14+715.354	left	2.5
11+771.000	both	-2.5	14+715.354	right	-2.5
11+898.313	both	-2.5	14+939.296	left	2.5
11+938.532	left	-2.5	14+939.296	right	-2.5
11+938.532	right	2.5	14+979.515	both	-2.5
12+029.755	left	-2.5	15+106.580	both	-2.5
12+029.755	right	2.5	15+207.460	both	-2.5
12+069.970	both	-2.5	15+238.450	both	-2.5
12+210.530	both	-2.5	15+346.150	both	-2.5
12+255.283	left	-5.2	15+400.820	both	-2.5
12+255.283	right	5.2	15+518.200	both	-2.5
12+343.431	left	-5.2	15+626.910	both	-2.5
12+343.431	right	5.2	15+842.460	both	-2.5
12+388.184	both	-2.5	15+991.230	both	-2.5
12+497.706	both	-2.5	16+153.730	both	-2.5
12+577.410	both	-2.5	16+763.340	both	-2.5
12+617.630	left	2.5	16+811.610	left	-4

ตารางที่ 3 (ต่อ)

Station	Side of Road	Cross Slope (%)	Station	Side of Road	Cross Slope (%)
16+811.610	right	4	19+033.557	right	-3
17+091.840	left	-4	19+076.458	both	-2.5
17+091.840	right	4	19+143.552	both	-2.5
17+140.100	both	-2.5	19+193.424	left	4.3
17+157.677	both	-2.5	19+193.424	right	-4.3
17+202.193	left	3.3	19+290.193	left	4.3
17+202.193	right	-3.3	19+290.193	right	-4.3
17+267.226	left	3.3	19+340.065	both	-2.5
17+267.226	right	-3.3	19+612.723	both	-2.5
17+357.014	left	4.2	19+657.232	left	-3.3
17+357.014	right	-4.2	19+657.232	right	3.3
17+410.325	left	4.2	19+847.000	left	-3.3
17+410.325	right	-4.2	19+847.000	right	3.3
17+455.013	left	-2.5	19+891.573	both	-2.5
17+455.013	right	2.5	20+664.228	both	-2.5
17+552.213	left	-2.5	20+716.440	left	6.9
17+552.213	right	2.5	20+716.440	right	-6.9
17+592.450	both	-2.5	20+756.570	left	6.9
17+641.252	both	-2.5	20+756.570	right	-6.9
17+681.471	left	2.5	20+809.679	both	-2.5
17+681.471	right	-2.5	21+175.225	both	-2.5
17+804.715	left	2.5	21+219.734	left	-3.3
17+804.715	right	-2.5	21+219.734	right	3.3
17+844.935	both	-2.5	21+487.674	left	-3.3
18+109.805	both	-2.5	21+487.674	right	3.3
18+150.024	left	2.5	21+533.487	both	-2.5
18+150.024	right	-2.5	21+949.150	both	-2.5
18+240.264	left	2.5	22+046.650	both	-2.5
18+240.264	right	-2.5	22+217.800	both	-2.5
18+280.483	both	-2.5	22+392.800	both	-2.5
18+289.892	both	-2.5	22+468.760	left	3
18+340.836	left	-4.5	22+468.760	right	-3
18+340.836	right	4.5	22+590.010	left	3
18+412.297	left	-4.5	22+590.010	right	-3
18+412.297	right	4.5	23+190.160	both	-2.5
18+463.241	both	-2.5	23+437.970	both	-2.5
18+590.007	both	-2.5	23+621.300	both	-2.5
18+632.908	left	3	23+912.875	both	-2.5
18+632.908	right	-3	23+953.094	left	2.5
19+033.557	left	3	23+953.094	right	-2.5

ตารางที่ 3 (ต่อ)

Station	Side of Road	Cross Slope (%)	Station	Side of Road	Cross Slope (%)
24+054.086	left	2.5	29+626.429	both	-2.5
24+054.086	right	-2.5	29+845.612	both	-2.5
24+094.305	both	-2.5	29+885.831	left	2.5
25+302.711	both	-2.5	29+885.831	right	-2.5
25+342.930	left	-2.5	30+081.409	left	2.5
25+342.930	right	2.5	30+081.409	right	-2.5
25+524.342	left	-2.5	30+121.628	both	-2.5
25+524.342	right	2.5	30+343.060	both	-2.5
25+564.561	both	-2.5	30+382.060	left	2.5
26+713.825	both	-2.5	30+382.060	right	-2.5
26+754.044	left	-2.5	30+499.720	left	2.5
26+754.044	right	2.5	30+499.720	right	-2.5
26+860.116	left	-2.5	30+538.720	both	-2.5
26+860.116	right	2.5	30+870.100	both	-2.5
26+900.335	both	-2.5	30+909.100	left	2.5
27+227.363	both	-2.5	30+909.100	right	-2.5
27+272.945	left	-3.5	31+042.040	left	2.5
27+272.945	right	3.5	31+042.040	right	-2.5
27+362.685	left	-3.5	31+081.040	both	-2.5
27+362.685	right	3.5	31+670.890	both	-2.5
27+408.272	both	-2.5	31+718.890	left	-4.3
28+026.741	both	-2.5	31+718.890	right	4.3
28+086.960	left	2.5	31+782.850	left	-4.3
28+086.960	right	-2.5	31+782.850	right	4.3
28+162.776	left	2.5	31+830.850	both	-2.5
28+162.776	right	-2.5	32+562.390	both	-2.5
28+202.995	both	-2.5	32+601.390	left	-2.5
28+452.410	both	-2.5	32+601.390	right	2.5
28+608.240	both	-2.5	32+693.500	left	-2.5
29+020.785	both	-2.5	32+693.500	right	2.5
29+061.004	left	2.5	32+732.500	both	-2.5
29+061.004	right	-2.5	32+850.240	both	-2.5
29+225.416	left	2.5	32+889.240	left	-2.5
29+225.416	right	-2.5	32+889.240	right	2.5
29+265.535	both	-2.5	33+123.570	left	-2.5
29+457.141	both	-2.5	33+123.570	right	2.5
29+510.032	left	-5.3	33+162.570	both	-2.5
29+510.032	right	5.3	33+206.110	both	-2.5
29+573.538	left	-5.3	33+245.110	left	-2.5
29+573.538	right	5.3	33+245.110	right	2.5

ตารางที่ 3 (ต่อ)

Station	Side of Road	Cross Slope (%)	Station	Side of Road	Cross Slope (%)
33+333.270	left	-2.5	35+933.199	right	-8.8
33+333.270	right	2.5	36+019.874	left	-4.3
33+372.270	both	-2.5	36+019.874	right	4.3
33+780.780	both	-2.5	36+140.316	left	-4.3
33+828.780	left	4.3	36+140.316	right	4.3
33+828.780	right	-4.3	36+190.188	both	-2.5
33+897.250	left	4.3	36+221.075	both	-2.5
33+897.250	right	-4.3	36+261.294	left	-2.5
33+945.250	both	-2.5	36+261.294	right	2.5
34+554.268	both	-2.5	36+364.286	left	-2.5
34+935.120	both	-2.5	36+364.286	right	2.5
35+079.170	both	-2.5	36+404.505	both	-2.5
35+128.170	left	4.7	36+419.376	both	-2.5
35+128.170	right	-4.7	36+455.793	left	-3.3
35+309.350	left	4.7	36+455.793	right	3.3
35+309.350	right	-4.7	36+612.787	left	-3.3
35+358.350	both	-2.5	36+612.787	right	3.3
35+587.084	both	-2.5	36+649.204	both	-2.5
35+627.305	left	-2.5	36+691.156	both	-2.5
35+627.305	right	2.5	36+736.787	left	5.8
35+798.715	left	-2.5	36+736.787	right	-5.8
35+798.715	right	2.5	36+820.604	left	5.8
35+873.301	left	8.8	36+820.604	right	-5.8
35+873.301	right	-8.8	36+857.850	both	-2.5
35+933.199	left	8.8	37+544.350	both	-2.5

9. แนวทางตั้ง (Vertical Alignment)

ตารางที่ 4 ระดับ (Elevation)

Station	Elevation (m)
2+800.000	3.00

ตารางที่ 5 Vertical Point of Intersection (VPI)

VPI Station	Back Grade (%)	Back Length (m)	Forward Grade (%)	Forward Length (m)
2+800.000	0.75	75	0	75
8+400.000	0.11	50	-0.32	50
8+650.000	-0.32	50	0.12	50
8+975.000	0.12	50	-0.04	50
9+950.000	-0.04	50	0.18	50
10+225.000	0.18	50	0.37	50
10+400.000	0.37	50	-0.03	50
14+950.000	-0.03	50	0.44	50
15+050.000	0.44	50	-0.01	50
18+450.000	0.07	50	-0.06	50
21+825.000	-0.05	100	0.17	100
22+125.000	0.17	100	0.03	100
24+400.000	0.04	100	0.15	100
24+650.000	0.15	100	-0.08	100
24+900.000	-0.08	100	0.04	100
27+550.000	-0.04	50	0.17	50

ตารางที่ 6 ความลาดชัน (Tangent Grade)

Start Stion	End Station	Tangent Grade (%)	Start Stion	End Station	Tangent Grade (%)
2+875.000	4+850.000	0	25+678.000	25+800.000	-0.1
4+850.000	5+375.000	0.15	25+800.000	26+225.000	0
5+375.000	5+750.000	0	26+225.000	27+025.000	-0.02
5+750.000	6+250.000	0.08	28+150.000	28+850.000	0
6+250.000	7+125.000	0.06	28+850.000	29+000.000	-0.13
7+125.000	7+525.000	0	29+000.000	29+025.000	-3.52
7+525.000	8+350.000	0.11	29+025.000	29+050.000	0.16
11+100.000	11+875.000	0	29+050.000	29+075.000	0
11+875.000	12+575.000	0.02	29+075.000	29+100.000	-0.12
12+575.000	13+375.000	0.12	29+100.000	29+125.000	0.04
13+375.000	14+200.000	0	29+125.000	29+150.000	0.12
15+525.000	16+200.000	0	29+150.000	29+175.000	0.04
16+200.000	16+475.000	0.22	29+175.000	29+200.000	-0.24
16+475.000	17+775.000	0.05	29+200.000	29+225.000	-0.12
19+225.000	20+325.000	0.14	29+225.000	29+250.000	-0.24
20+325.000	21+096.500	0.11	29+250.000	29+275.000	0
21+096.500	21+142.100	0	29+275.000	29+300.000	0.04
23+025.000	24+100.000	0.02	29+300.000	29+325.000	0.12
25+450.000	25+636.000	0.23	29+325.000	29+350.000	0.12
25+636.000	25+678.000	0	29+350.000	29+375.000	-0.16

ตารางที่ 6 (ต่อ)

Start Stion	End Station	Tangent Grade (%)	Start Stion	End Station	Tangent Grade (%)
29+375.000	29+400.000	-0.28	30+375.000	30+400.000	0.2
29+400.000	29+425.000	0.08	30+400.000	30+425.000	-0.36
29+425.000	29+450.000	0.04	30+425.000	30+450.000	0.44
29+450.000	29+475.000	-0.2	30+450.000	30+475.000	-0.16
29+475.000	29+500.000	-0.4	30+475.000	30+500.000	0.16
29+500.000	29+525.000	0.24	30+500.000	30+525.000	-0.28
29+525.000	29+550.000	1.32	30+525.000	30+550.000	-0.44
29+550.000	29+575.000	1.84	30+550.000	30+575.000	-0.48
29+575.000	29+600.000	2.04	30+575.000	30+600.000	-0.08
29+600.000	29+625.000	1.4	30+600.000	30+625.000	0
29+625.000	29+650.000	1.28	30+625.000	30+650.000	-0.24
29+650.000	29+675.000	0.96	30+650.000	30+675.000	-0.24
29+675.000	29+700.000	0.72	30+675.000	30+700.000	-0.12
29+700.000	29+725.000	0.4	30+700.000	30+725.000	0.16
29+725.000	29+750.000	0.04	30+725.000	30+750.000	0.24
29+750.000	29+775.000	0.16	30+750.000	30+775.000	1.44
29+775.000	29+800.000	0.16	30+775.000	30+800.000	1.4
29+800.000	29+825.000	-0.28	30+800.000	30+825.000	2.12
29+825.000	29+850.000	0.08	30+825.000	30+850.000	1.92
29+850.000	29+875.000	0.4	30+850.000	30+875.000	1.84
29+875.000	29+900.000	-0.36	30+875.000	30+900.000	-0.16
29+900.000	29+925.000	0.36	30+900.000	30+925.000	4
29+925.000	29+950.000	-0.16	30+925.000	30+950.000	1.36
29+950.000	29+975.000	0.08	30+950.000	30+975.000	0.8
29+975.000	30+000.000	0.16	30+975.000	31+000.000	0.04
30+000.000	30+025.000	0.08	31+000.000	31+025.000	-0.04
30+025.000	30+050.000	0	31+025.000	31+050.000	-0.72
30+050.000	30+075.000	0.08	31+050.000	31+075.000	-1.12
30+075.000	30+100.000	0	31+075.000	31+100.000	-1.8
30+100.000	30+125.000	-0.04	31+100.000	31+125.000	-2.08
30+125.000	30+150.000	0.04	31+125.000	31+150.000	-2.16
30+150.000	30+175.000	0.72	31+150.000	31+175.000	-2.04
30+175.000	30+200.000	0.56	31+175.000	31+200.000	-1.4
30+200.000	30+225.000	0.44	31+200.000	31+225.000	-0.8
30+225.000	30+250.000	0.36	31+225.000	31+250.000	-0.52
30+250.000	30+275.000	0.32	31+250.000	31+275.000	0.32
30+275.000	30+300.000	0.44	31+275.000	31+300.000	0.52
30+300.000	30+325.000	-0.04	31+300.000	31+325.000	1.2
30+325.000	30+350.000	0.08	31+325.000	31+350.000	1.76
30+350.000	30+375.000	-0.28	31+350.000	31+375.000	-1.08

ตารางที่ 6 (ต่อ)

Start Stion	End Station	Tangent Grade (%)	Start Stion	End Station	Tangent Grade (%)
31+375.000	31+400.000	6.56	32+375.000	32+400.000	-0.08
31+400.000	31+425.000	1.2	32+400.000	32+425.000	0
31+425.000	31+450.000	-0.64	32+425.000	32+450.000	0
31+450.000	31+475.000	-2.36	32+450.000	32+475.000	0.2
31+475.000	31+500.000	-3.36	32+475.000	32+500.000	-0.12
31+500.000	31+525.000	-2.48	32+500.000	32+525.000	0.12
31+525.000	31+550.000	-1.84	32+525.000	32+550.000	0.04
31+550.000	31+575.000	-0.76	32+550.000	32+575.000	-0.04
31+575.000	31+600.000	-0.24	32+575.000	32+600.000	0.12
31+600.000	31+625.000	0.16	32+600.000	32+625.000	0.04
31+625.000	31+650.000	0.08	32+625.000	32+650.000	-0.04
31+650.000	31+675.000	0.16	32+650.000	32+675.000	0.04
31+675.000	31+700.000	0.08	32+675.000	32+700.000	0.16
31+700.000	31+725.000	-0.16	32+700.000	32+725.000	-0.08
31+725.000	31+750.000	0	32+725.000	32+750.000	-0.08
31+750.000	31+775.000	0.16	32+750.000	32+775.000	0.08
31+775.000	31+800.000	0.08	32+775.000	32+800.000	0
31+800.000	31+825.000	-0.44	32+800.000	32+825.000	-0.08
31+825.000	31+850.000	-0.68	32+825.000	32+850.000	0.2
31+850.000	31+875.000	-1.16	32+850.000	32+875.000	0.04
31+875.000	31+900.000	-0.24	32+875.000	32+900.000	0.04
31+900.000	31+925.000	0	32+900.000	32+925.000	0.04
31+925.000	31+950.000	0	32+925.000	32+950.000	-0.36
31+950.000	31+975.000	0.08	32+950.000	32+975.000	0.16
31+975.000	32+000.000	0	32+975.000	33+000.000	-0.04
32+000.000	32+025.000	-0.04	33+000.000	33+025.000	0.04
32+025.000	32+050.000	0.04	33+025.000	33+050.000	0.08
32+050.000	32+075.000	-0.04	33+050.000	33+075.000	-0.04
32+075.000	32+100.000	0.04	33+075.000	33+100.000	0.12
32+100.000	32+125.000	0.76	33+100.000	33+125.000	0.08
32+125.000	32+150.000	1.04	33+125.000	33+150.000	-0.04
32+150.000	32+175.000	0.68	33+150.000	33+175.000	-0.04
32+175.000	32+200.000	0.2	33+175.000	33+200.000	0.24
32+200.000	32+225.000	-0.04	33+200.000	33+225.000	-0.2
32+225.000	32+250.000	0	33+225.000	33+250.000	0.08
32+250.000	32+275.000	0.16	33+250.000	33+275.000	-0.16
32+275.000	32+300.000	0.08	33+275.000	33+300.000	0.12
32+300.000	32+325.000	0	33+300.000	33+325.000	-0.8
32+325.000	32+350.000	-0.8	33+325.000	33+350.000	0.96
32+350.000	32+375.000	0.84	33+350.000	33+375.000	-0.16

ตารางที่ 6 (ต่อ)

Start Stion	End Station	Tangent Grade (%)	Start Stion	End Station	Tangent Grade (%)
33+375.000	33+400.000	0.16	34+375.000	34+400.000	0.12
33+400.000	33+425.000	-0.04	34+400.000	34+425.000	0.12
33+425.000	33+450.000	0	34+425.000	34+450.000	0
33+450.000	33+475.000	0.08	34+450.000	34+475.000	0
33+475.000	33+500.000	-0.04	34+475.000	34+500.000	0
33+500.000	33+525.000	0.12	34+500.000	34+525.000	0.12
33+525.000	33+550.000	-0.04	34+525.000	34+550.000	-0.08
33+550.000	33+575.000	0.08	34+550.000	34+575.000	0.08
33+575.000	33+600.000	0.08	34+575.000	34+600.000	0.12
33+600.000	33+625.000	-0.08	34+600.000	34+625.000	0.04
33+625.000	33+650.000	0.08	34+625.000	34+650.000	0.04
33+650.000	33+675.000	-0.04	34+650.000	34+675.000	-0.04
33+675.000	33+700.000	0.04	34+675.000	34+700.000	0
33+700.000	33+725.000	0.12	34+700.000	34+725.000	-0.16
33+725.000	33+750.000	0.72	34+725.000	34+750.000	0.24
33+750.000	33+775.000	1.16	34+750.000	34+775.000	0.04
33+775.000	33+800.000	1.72	34+775.000	34+800.000	0.28
33+800.000	33+825.000	1.8	34+800.000	34+825.000	-0.24
33+825.000	33+850.000	1.76	34+825.000	34+850.000	-0.2
33+850.000	33+875.000	1	34+850.000	34+875.000	0.12
33+875.000	33+900.000	0.44	34+875.000	34+900.000	0.04
33+900.000	33+925.000	-0.76	34+900.000	34+925.000	0.04
33+925.000	33+950.000	-1.2	34+925.000	34+950.000	0.04
33+950.000	33+975.000	-2.28	34+950.000	34+975.000	-0.04
33+975.000	34+000.000	-1.64	34+975.000	35+000.000	0.04
34+000.000	34+025.000	-1.28	35+000.000	35+025.000	-0.08
34+025.000	34+050.000	-0.76	35+025.000	35+050.000	0.08
34+050.000	34+075.000	-0.44	35+050.000	35+075.000	0.12
34+075.000	34+100.000	0.28	35+075.000	35+100.000	-0.04
34+100.000	34+125.000	-0.32	35+100.000	35+125.000	0.04
34+125.000	34+150.000	-0.04	35+125.000	35+150.000	-0.6
34+150.000	34+175.000	0.08	35+150.000	35+175.000	0.32
34+175.000	34+200.000	-0.08	35+175.000	35+200.000	0.12
34+200.000	34+225.000	0.16	35+200.000	35+225.000	0.16
34+225.000	34+250.000	-0.08	35+225.000	35+250.000	-0.08
34+250.000	34+275.000	0.08	35+250.000	35+275.000	0.32
34+275.000	34+300.000	-0.12	35+275.000	35+300.000	0.4
34+300.000	34+325.000	0.04	35+300.000	35+325.000	-0.16
34+325.000	34+350.000	-0.08	35+325.000	35+350.000	0.04
34+350.000	34+375.000	0.08	35+350.000	35+375.000	-0.04

ตารางที่ 6 (ต่อ)

Start Stion	End Station	Tangent Grade (%)	Start Stion	End Station	Tangent Grade (%)
35+375.000	35+400.000	-0.2	36+375.000	36+400.000	-0.28
35+400.000	35+425.000	0.04	36+400.000	36+425.000	-0.32
35+425.000	35+450.000	0.04	36+425.000	36+450.000	-0.32
35+450.000	35+475.000	0.04	36+450.000	36+475.000	-0.32
35+475.000	35+500.000	0	36+475.000	36+500.000	-0.28
35+500.000	35+525.000	0.04	36+500.000	36+525.000	-0.32
35+525.000	35+550.000	0.04	36+525.000	36+550.000	-0.32
35+550.000	35+575.000	0.04	36+550.000	36+575.000	-0.28
35+575.000	35+600.000	0.04	36+575.000	36+600.000	-0.32
35+600.000	35+625.000	0	36+600.000	36+625.000	-0.32
35+625.000	35+650.000	0.04	36+625.000	36+650.000	-0.28
35+650.000	35+675.000	0.04	36+650.000	36+675.000	-0.32
35+675.000	35+700.000	0.04	36+675.000	36+700.000	-0.32
35+700.000	35+725.000	0.04	36+700.000	36+725.000	-0.28
35+725.000	35+750.000	0.04	36+725.000	36+750.000	-0.32
35+750.000	35+775.000	0	36+750.000	36+775.000	-0.32
35+775.000	35+800.000	0.04	36+775.000	36+800.000	-0.28
35+800.000	35+825.000	0.08	36+800.000	36+825.000	-0.44
35+825.000	35+850.000	-0.04	36+825.000	36+850.000	-0.2
35+850.000	35+875.000	0.08	36+850.000	36+875.000	-0.08
35+875.000	35+900.000	0.04	36+875.000	36+903.550	0
35+900.000	35+925.000	0	36+903.550	36+925.000	-2.68
35+925.000	35+950.000	0.04	36+925.000	36+950.000	-0.08
35+950.000	35+975.000	0.04	36+950.000	36+975.000	0.04
35+975.000	36+000.000	0.04	36+975.000	37+000.000	0
36+000.000	36+025.000	0.32	37+000.000	37+025.000	1
36+025.000	36+050.000	0.28	37+025.000	37+050.000	0.2
36+050.000	36+075.000	0.32	37+050.000	37+075.000	0.2
36+075.000	36+100.000	0.28	37+075.000	37+100.000	0.2
36+100.000	36+125.000	0.32	37+100.000	37+125.000	-0.08
36+125.000	36+150.000	0.28	37+125.000	37+150.000	-0.12
36+150.000	36+175.000	0.32	37+150.000	37+175.000	0.16
36+175.000	36+200.000	0.28	37+175.000	37+200.000	-0.04
36+200.000	36+225.000	0.32	37+200.000	37+225.000	0.04
36+225.000	36+250.000	0.28	37+225.000	37+250.000	0.04
36+250.000	36+275.000	0.32	37+250.000	37+275.000	-0.28
36+275.000	36+300.000	0.28	37+275.000	37+300.000	-0.08
36+300.000	36+325.000	-0.32	37+300.000	37+325.000	-0.16
36+325.000	36+350.000	-0.28	37+325.000	37+350.000	0.68
36+350.000	36+375.000	-0.32	37+350.000	37+374.350	0

ตารางที่ 6 (ต่อ)

Start Stion	End Station	Tangent Grade (%)	Start Stion	End Station	Tangent Grade (%)
37+374.350	37+399.350	-0.72	37+474.350	37+499.350	0.16
37+399.350	37+424.350	0.04	37+499.350	37+524.350	-0.36
37+424.350	37+449.350	-0.08	37+524.350	37+544.350	-0.5
37+449.350	37+474.350	-0.16			

10. ระยะสิ่งบดบังการมองเห็น (Obstruction)

ตารางที่ 7 ระยะสิ่งบดบังการมองเห็น (Obstruction offset)

Start Station	End Station	Side of Road	Centerline Offset (m)
2+665.000	37+544.350	both	6

11. ความกว้างของสะพาน (Bridge Elements)

ตารางที่ 8 ความกว้างของสะพาน

Start Station	End Station	Bridge Width (m)
21+119.300	21+164.900	10.00
25+657.000	25+699.000	10.00
31+997.000	32+039.200	10.00
36+880.850	36+926.850	10.00
37+363.850	37+384.850	10.00

ภาคผนวก ค
รายงานผลการตรวจสอบโดย Policy Review Module (PRM)

ตารางที่ 1 ความกว้างของถนน (Traveled Way Width Policy Check)

Stations		Traveled Way Width and Widening		Comment	Attributes
Start	End	Road (width+widening)	Policy (width+widening)		
4+720.370	4+837.230	6.50 + 0.30	7.20 + 0.00	Road value varies from controlling criteria	Speed: 60 (km/h); class: collector; terrain: level; DHV: 1,061 (v/hr); ADT: 8,844 (v/day); radius: 220.31 (m); TWW:7.20 (m)
7+078.887	7+160.831	6.50 + 0.50	7.20 + 0.00	Road value varies from controlling criteria	Speed: 50 (km/h); class: collector; terrain: level; DHV: 1,061 (v/hr); ADT: 8,844 (v/day); radius: 190.99 (m); TWW:7.20 (m)
8+169.745	8+258.120	6.50 + 0.75	7.20 + 0.00	Road value is within controlling criteria	Speed: 40 (km/h); class: collector; terrain: level; DHV: 1,061 (v/hr); ADT: 8,844 (v/day); radius: 143.24 (m); TWW:7.20 (m)
9+788.270	9+924.360	6.50 + 0.75	7.20 + 0.00	Road value is within controlling criteria	Speed: 40 (km/h); class: collector; terrain: level; DHV: 1,061 (v/hr); ADT: 8,844 (v/day); radius: 106.10 (m); TWW:7.20 (m)
12+241.857	12+356.857	6.50 + 0.75	7.20 + 0.00	Road value is within controlling criteria	Speed: 40 (km/h); class: collector; terrain: level; DHV: 1,061 (v/hr); ADT: 8,844 (v/day); radius: 121.91 (m); TWW:7.20 (m)
16+792.300	17+111.150	6.50 + 0.30	7.20 + 0.00	Road value varies from controlling criteria	Speed: 60 (km/h); class: collector; terrain: level; DHV: 1,061 (v/hr); ADT: 8,844 (v/day); radius: 358.10 (m); TWW:7.20 (m)
20+708.767	20+770.520	6.50 + 0.75	7.20 + 0.60	Road value varies from controlling criteria	Speed: 50 (km/h); class: collector; terrain: level; DHV: 1,061 (v/hr); ADT: 8,844 (v/day); radius: 92.41 (m); TWW:7.20 (m)
29+491.520	29+592.050	6.50 + 0.30	7.20 + 0.00	Road value varies from controlling criteria	Speed: 60 (km/h); class: collector; terrain: level; DHV: 1,061 (v/hr); ADT: 8,844 (v/day); radius: 229.18 (m); TWW:7.20 (m)
31+694.890	31+806.850	6.50 + 0.30	7.20 + 0.00	Road value varies from controlling criteria	Speed: 60 (km/h); class: collector; terrain: level; DHV: 1,061 (v/hr); ADT: 8,844 (v/day); radius: 337.03 (m); TWW:7.20 (m)

ตารางที่ 1 (ต่อ)

Stations		Traveled Way Width and Widening		Comment	Attributes
Start	End	Road (width+widening)	Policy (width+widening)		
33+804.780	33+921.250	6.50 + 0.30	7.20 + 0.00	Road value varies from controlling criteria	Speed: 60 (km/h); class: collector; terrain: level; DHV: 1,061 (v/hr); ADT: 8,844 (v/day); radius: 337.03 (m); TWW:7.20 (m)
35+105.636	35+319.759	6.50 + 0.30	7.20 + 0.00	Road value varies from controlling criteria	Speed: 60 (km/h); class: collector; terrain: level; DHV: 1,061 (v/hr); ADT: 8,844 (v/day); radius: 301.56 (m); TWW:7.20 (m)
35+858.500	35+948.000	6.50 + 0.75	7.20 + 0.00	Road value is within controlling criteria	Speed: 60 (km/h); class: collector; terrain: level; DHV: 1,061 (v/hr); ADT: 8,844 (v/day); radius: 163.70 (m); TWW:7.20 (m)
36+727.660	36+829.730	6.50 + 0.50	7.20 + 0.00	Road value varies from controlling criteria	Speed: 60 (km/h); class: collector; terrain: level; DHV: 1,061 (v/hr); ADT: 8,844 (v/day); radius: 173.62 (m); TWW:7.20 (m)

ตารางที่ 2 ความกว้างของไหล่ทาง (Shoulder Width Policy Check)

Station		Side of Road	Shoulder Width (meters)		Comment	Attributes
start	end		Road	Policy		
2+665.000	37+544.350	both	2.25	2.4	Road value varies from controlling criteria	Functional class=collector; ADT=8,844 (v/day) terrain=level; material=paved

ตารางที่ 3 รัศมีโค้ง (Radius of Curve Policy Check)

Stations		Radius of Curve (meters)		Effective design speed	Comment	Attributes
Start	End	Road	Policy	kilometers/hour		
4+720.370	4+837.230	220.31	115	70	Road value is within controlling criteria	Superelevation=3.50 (%); design speed=60 (km/h)
7+078.887	7+160.831	190.99	75	68	Road value is within controlling criteria	Superelevation=5.20 (%); design speed=50 (km/h)
8+169.745	8+258.120	143.24	45	60	Road value is within controlling criteria	Superelevation=5.20 (%); design speed=40 (km/h)
9+788.270	9+924.360	106.1	45	53	Road value is within controlling criteria	Superelevation=6.00 (%); design speed=40 (km/h)
12+241.857	12+356.857	121.91	45	57	Road value is within controlling criteria	Superelevation=6.00 (%); design speed=40 (km/h)
16+792.300	17+111.150	358.1	115	86	Road value is within controlling criteria	Superelevation=3.30 (%); design speed=60 (km/h)
20+708.767	20+770.520	92.41	75	51	Road value is within controlling criteria	Superelevation=6.90 (%); design speed=50 (km/h)
29+491.520	29+592.050	229.18	115	73	Road value is within controlling criteria	Superelevation=4.30 (%); design speed=60 (km/h)
31+694.890	31+806.850	337.03	115	86	Road value is within controlling criteria	Superelevation=4.30 (%); design speed=60 (km/h)
33+804.780	33+921.250	337.03	115	86	Road value is within controlling criteria	Superelevation=4.30 (%); design speed=60 (km/h)
35+105.636	35+319.759	301.56	115	82	Road value is within controlling criteria	Superelevation=4.70 (%); design speed=60 (km/h)
35+858.500	35+948.000	163.7	115	69	Road value is within controlling criteria	Superelevation=8.80 (%); design speed=60 (km/h)
36+727.660	36+829.730	173.62	115	66	Road value is within controlling criteria	Superelevation=5.80 (%); design speed=60 (km/h)

ตารางที่ 4 ค่าอัตรายกโค้ง (Superelevation Policy Check)

Stations		Superelevation (percent)		Comment	Attributes
Start	End	Road	Policy		
4+720.370	4+837.230	5.5	7.75	Road value varies from controlling criteria	$E_{max}=10.00$ (%); design speed=60 (km/h); radius=220.31 (m)
7+078.887	7+160.831	5.2	6.78	Road value varies from controlling criteria	$E_{max}=10.00$ (%); design speed=50 (km/h); radius=190.99 (m)
8+169.745	8+258.120	3.2	6.34	Road value varies from controlling criteria	$E_{max}=10.00$ (%); design speed=40 (km/h); radius=143.24 (m)
9+788.270	9+924.360	6	7.52	Road value varies from controlling criteria	$E_{max}=10.00$ (%); design speed=40 (km/h); radius=106.10 (m)
12+241.857	12+356.857	5.2	6.94	Road value varies from controlling criteria	$E_{max}=10.00$ (%); design speed=40 (km/h); radius=121.91 (m)
16+792.300	17+111.150	4	5.54	Road value varies from controlling criteria	$E_{max}=10.00$ (%); design speed=60 (km/h); radius=358.10 (m)
20+708.767	20+770.520	6.9	9.73	Road value varies from controlling criteria	$E_{max}=10.00$ (%); design speed=50 (km/h); radius=92.41 (m)
29+491.520	29+592.050	5.3	7.56	Road value varies from controlling criteria	$E_{max}=10.00$ (%); design speed=60 (km/h); radius=229.18 (m)
31+694.890	31+806.850	4.3	5.82	Road value varies from controlling criteria	$E_{max}=10.00$ (%); design speed=60 (km/h); radius=337.03 (m)
33+804.780	33+921.250	4.3	5.82	Road value varies from controlling criteria	$E_{max}=10.00$ (%); design speed=60 (km/h); radius=337.03 (m)
35+105.636	35+319.759	4.7	6.28	Road value varies from controlling criteria	$E_{max}=10.00$ (%); design speed=60 (km/h); radius=301.56 (m)
35+858.500	35+948.000	8.8	9.07	Road value varies from controlling criteria	$E_{max}=10.00$ (%); design speed=60 (km/h); radius=163.70 (m)
36+727.660	36+829.730	5.8	8.83	Road value varies from controlling criteria	$E_{max}=10.00$ (%); design speed=60 (km/h); radius=173.62 (m)

ตารางที่ 5 ความยาวโค้งแนวนอน (Length of Horizontal Curve Policy Check)

Stations		Computed Curve Length (meters)		Comment	Attributes
Start	End	Road	Policy		
4+720.370	4+837.230	116.86	-	Not applicable: design check not required	Functional classification=collector; design speed=60 (km/h); Central angle=30.39 (deg)
7+078.887	7+160.831	81.94	-	Not applicable: design check not required	Functional classification=collector; design speed=50 (km/h); Central angle=24.58 (deg)
8+169.745	8+258.120	88.38	-	Not applicable: design check not required	Functional classification=collector; design speed=40 (km/h); Central angle=35.35 (deg)
9+788.270	9+924.360	136.09	-	Not applicable: design check not required	Functional classification=collector; design speed=40 (km/h); Central angle=73.49 (deg)
12+241.857	12+356.857	115	-	Not applicable: design check not required	Functional classification=collector; design speed=40 (km/h); Central angle=54.05 (deg)
16+792.300	17+111.150	318.85	-	Not applicable: design check not required	Functional classification=collector; design speed=60 (km/h); Central angle=51.02 (deg)
20+708.767	20+770.520	61.75	-	Not applicable: design check not required	Functional classification=collector; design speed=50 (km/h); Central angle=38.29 (deg)
29+491.520	29+592.050	100.53	-	Not applicable: design check not required	Functional classification=collector; design speed=60 (km/h); Central angle=25.13 (deg)
31+694.890	31+806.850	111.96	-	Not applicable: design check not required	Functional classification=collector; design speed=60 (km/h); Central angle=19.03 (deg)

ตารางที่ 5 (ต่อ)

Stations		Computed Curve Length (meters)		Comment	Attributes
Start	End	Road	Policy		
33+804.780	33+921.250	116.47	-	Not applicable: design check not required	Functional classification=collector; design speed=60 (km/h); Central angle=19.8 (deg)
35+105.636	35+319.759	214.12	-	Not applicable: design check not required	Functional classification=collector; design speed=60 (km/h); Central angle=40.68 (deg)
35+858.500	35+948.000	89.5	-	Not applicable: design check not required	Functional classification=collector; design speed=60 (km/h); Central angle=31.33 (deg)
36+727.660	36+829.730	102.07	-	Not applicable: design check not required	Functional classification=collector; design speed=60 (km/h); Central angle=33.68 (deg)

ตารางที่ 6 ความลาดชันของแนวทางตั้ง (Vertical Tangent Grade Policy Check)

Stations		Tangent Grade (percent)		Comment	Attributes
Start	End	Road	Policy		
4+720.370	4+837.230	0	0.30 to 7.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=1,975.00 (m)
7+078.887	7+125.000	0.06	0.30 to 7.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=50 (km/h); length=875.00 (m)
8+169.745	8+258.120	0.11	0.30 to 7.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=40 (km/h); length=825.00 (m)
9+788.270	9+900.000	0.04	0.30 to 7.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=40 (km/h); length=875.00 (m)
12+241.857	12+356.857	0.02	0.30 to 7.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=40 (km/h); length=700.00 (m)
16+475.000	17+775.000	0.05	0.30 to 7.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=1,300.00 (m)
20+708.767	20+770.520	0.11	0.30 to 7.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=50 (km/h); length=771.50 (m)
29+491.520	29+500.000	0.4	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)

ตารางที่ 6 (ต่อ)

Stations		Tangent Grade (percent)		Comment	Attributes
Start	End	Road	Policy		
29+500.000	29+525.000	0.24	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
29+525.000	29+550.000	1.32	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
29+550.000	29+575.000	1.84	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
29+575.000	29+592.050	2.04	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
31+675.000	31+700.000	0.08	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
31+700.000	31+725.000	0.16	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)

ตารางที่ 6 (ต่อ)

Stations		Tangent Grade (percent)		Comment	Attributes
Start	End	Road	Policy		
31+725.000	31+750.000	0	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
31+750.000	31+775.000	0.16	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
31+775.000	31+800.000	0.08	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
31+800.000	31+825.000	0.44	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
33+800.000	33+825.000	1.8	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
33+825.000	33+850.000	1.76	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)

ตารางที่ 6 (ต่อ)

Stations		Tangent Grade (percent)		Comment	Attributes
Start	End	Road	Policy		
33+850.000	33+875.000	1	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
33+875.000	33+900.000	0.44	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
33+900.000	33+925.000	0.76	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
35+100.000	35+125.000	0.04	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
35+125.000	35+150.000	0.6	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
35+150.000	35+175.000	0.32	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)

ตารางที่ 6 (ต่อ)

Stations		Tangent Grade (percent)		Comment	Attributes
Start	End	Road	Policy		
35+175.000	35+200.000	0.12	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
35+200.000	35+225.000	0.16	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
35+225.000	35+250.000	0.08	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
35+250.000	35+275.000	0.32	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
35+275.000	35+300.000	0.4	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
35+300.000	35+325.000	0.16	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)

ตารางที่ 6 (ต่อ)

Stations		Tangent Grade (percent)		Comment	Attributes
Start	End	Road	Policy		
35+850.000	35+875.000	0.08	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
35+875.000	35+900.000	0.04	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
35+900.000	35+925.000	0	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
35+925.000	35+950.000	0.04	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
36+727.660	36+750.000	0.32	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
36+750.000	36+775.000	0.32	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)

ตารางที่ 6 (ต่อ)

Stations		Tangent Grade (percent)		Comment	Attributes
Start	End	Road	Policy		
36+775.000	36+800.000	0.28	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
36+800.000	36+825.000	0.44	0.30 to 9.00	Road value is within controlling criteria	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)
36+825.000	36+829.730	0.2	0.30 to 9.00	Road value may vary from recommended values, check drainage	Functional classification=collector; design speed=60 (km/h); length=25.00 (m); ADT=8,844 (v/day); additional policy allowance=2.00 (%)

ตารางที่ 7 ความโค้งทางตั้ง (Vertical Curvature Policy Check)

Stations		K value (meters/%)		effective design speed	Comment	Attributes
Start	End	Road	Policy	kilometers/hour		
2+875.000	5+375.000				Road value varies from controlling criteria, grade break without a curve	2+875.000 to 4+850.000, grade=0.00 (%); 4+850.000 to 5+375.000, grade=0.15 (%)
6+250.000	7+525.000				Road value varies from controlling criteria, grade break without a curve	6+250.000 to 7+125.000, grade=0.06 (%); 7+125.000 to 7+525.000, grade=0.00 (%)
7+125.000	8+350.000				Road value varies from controlling criteria, grade break without a curve	7+125.000 to 7+525.000, grade=0.00 (%); 7+525.000 to 8+350.000, grade=0.11 (%)
7+125.000	8+350.000				Road value varies from controlling criteria, grade break without a curve	7+125.000 to 7+525.000, grade=0.00 (%); 7+525.000 to 8+350.000, grade=0.11 (%)
8+925.000	9+025.000	625	11	130	Road value is within controlling criteria	Design speed=60 (km/h); type of curve=crest; project type=reconstruction
9+900.000	10+000.000	454.55	9	130	Road value is within controlling criteria	Design speed=40 (km/h); type of curve=sag; project type=reconstruction
11+100.000	12+575.000				Road value varies from controlling criteria, grade break without a curve	11+100.000 to 11+875.000, grade=0.00 (%); 11+875.000 to 12+575.000, grade=0.02 (%)
11+875.000	13+375.000				Road value varies from controlling criteria, grade break without a curve	11+875.000 to 12+575.000, grade=0.02 (%); 12+575.000 to 13+375.000, grade=0.12 (%)

ตารางที่ 7 (ต่อ)

Stations		K value (meters/%)		effective design speed	Comment	Attributes
Start	End	Road	Policy	kilometers/hour		
16+200.000	17+775.000				Road value varies from controlling criteria, grade break without a curve	16+200.000 to 16+475.000, grade=0.22 (%); 16+475.000 to 17+775.000, grade=0.05 (%)
19+225.000	21+096.500				Road value varies from controlling criteria, grade break without a curve	19+225.000 to 20+325.000, grade=0.14 (%); 20+325.000 to 21+096.500, grade=0.11 (%)
20+325.000	21+142.100				Road value varies from controlling criteria, grade break without a curve	20+325.000 to 21+096.500, grade=0.11 (%); 21+096.500 to 21+142.100, grade=0.00 (%)
29+375.000	29+425.000				Road value varies from controlling criteria, grade break without a curve	29+375.000 to 29+400.000, grade=-0.28 (%); 29+400.000 to 29+425.000, grade=0.08 (%)
29+400.000	29+450.000				Road value varies from controlling criteria, grade break without a curve	29+400.000 to 29+425.000, grade=0.08 (%); 29+425.000 to 29+450.000, grade=0.04 (%)
29+425.000	29+475.000				Road value varies from controlling criteria, grade break without a curve	29+425.000 to 29+450.000, grade=0.04 (%); 29+450.000 to 29+475.000, grade=-0.20 (%)
29+450.000	29+500.000				Road value varies from controlling criteria, grade break without a curve	29+450.000 to 29+475.000, grade=-0.20 (%); 29+475.000 to 29+500.000, grade=-0.40 (%)
29+475.000	29+525.000				Road value varies from controlling criteria, grade break without a curve	29+475.000 to 29+500.000, grade=-0.40 (%); 29+500.000 to 29+525.000, grade=0.24 (%)

ตารางที่ 7 (ต่อ)

Stations		K value (meters/%)		effective design speed	Comment	Attributes
Start	End	Road	Policy	kilometers/hour		
29+500.000	29+550.000				Road value varies from controlling criteria, grade break without a curve	29+500.000 to 29+525.000, grade=0.24 (%); 29+525.000 to 29+550.000, grade=1.32 (%)
29+525.000	29+575.000				Road value varies from controlling criteria, grade break without a curve	29+525.000 to 29+550.000, grade=1.32 (%); 29+550.000 to 29+575.000, grade=1.84 (%)
29+550.000	29+600.000				Road value varies from controlling criteria, grade break without a curve	29+550.000 to 29+575.000, grade=1.84 (%); 29+575.000 to 29+600.000, grade=2.04 (%)
29+575.000	29+625.000				Road value varies from controlling criteria, grade break without a curve	29+575.000 to 29+600.000, grade=2.04 (%); 29+600.000 to 29+625.000, grade=1.40 (%)
31+675.000	31+725.000				Road value varies from controlling criteria, grade break without a curve	31+675.000 to 31+700.000, grade=0.08 (%); 31+700.000 to 31+725.000, grade=-0.16 (%)
31+700.000	31+750.000				Road value varies from controlling criteria, grade break without a curve	31+700.000 to 31+725.000, grade=-0.16 (%); 31+725.000 to 31+750.000, grade=0.00 (%)
31+725.000	31+775.000				Road value varies from controlling criteria, grade break without a curve	31+725.000 to 31+750.000, grade=0.00 (%); 31+750.000 to 31+775.000, grade=0.16 (%)
31+750.000	31+800.000				Road value varies from controlling criteria, grade break without a curve	31+750.000 to 31+775.000, grade=0.16 (%); 31+775.000 to 31+800.000, grade=0.08 (%)

ตารางที่ 7 (ต่อ)

Stations		K value (meters/%)		effective design speed	Comment	Attributes
Start	End	Road	Policy	kilometers/hour		
31+775.000	31+825.000				Road value varies from controlling criteria, grade break without a curve	31+775.000 to 31+800.000, grade=0.08 (%); 31+800.000 to 31+825.000, grade=-0.44 (%)
35+100.000	35+150.000				Road value varies from controlling criteria, grade break without a curve	35+100.000 to 35+125.000, grade=0.04 (%); 35+125.000 to 35+150.000, grade=-0.60 (%)
35+125.000	35+175.000				Road value varies from controlling criteria, grade break without a curve	35+125.000 to 35+150.000, grade=-0.60 (%); 35+150.000 to 35+175.000, grade=0.32 (%)
35+150.000	35+200.000				Road value varies from controlling criteria, grade break without a curve	35+150.000 to 35+175.000, grade=0.32 (%); 35+175.000 to 35+200.000, grade=0.12 (%)
35+175.000	35+225.000				Road value varies from controlling criteria, grade break without a curve	35+175.000 to 35+200.000, grade=0.12 (%); 35+200.000 to 35+225.000, grade=0.16 (%)
35+200.000	35+250.000				Road value varies from controlling criteria, grade break without a curve	35+200.000 to 35+225.000, grade=0.16 (%); 35+225.000 to 35+250.000, grade=-0.08 (%)
35+225.000	35+275.000				Road value varies from controlling criteria, grade break without a curve	35+225.000 to 35+250.000, grade=-0.08 (%); 35+250.000 to 35+275.000, grade=0.32 (%)
35+250.000	35+300.000				Road value varies from controlling criteria, grade break without a curve	35+250.000 to 35+275.000, grade=0.32 (%); 35+275.000 to 35+300.000, grade=0.40 (%)
35+275.000	35+325.000				Road value varies from controlling criteria, grade break without a curve	35+275.000 to 35+300.000, grade=0.40 (%); 35+300.000 to 35+325.000, grade=-0.16 (%)

ตารางที่ 7 (ต่อ)

Stations		K value (meters/%)		effective design speed	Comment	Attributes
Start	End	Road	Policy	kilometers/hour		
35+825.000	35+875.000				Road value varies from controlling criteria, grade break without a curve	35+825.000 to 35+850.000, grade=-0.04 (%); 35+850.000 to 35+875.000, grade=0.08 (%)
35+850.000	35+900.000				Road value varies from controlling criteria, grade break without a curve	35+850.000 to 35+875.000, grade=0.08 (%); 35+875.000 to 35+900.000, grade=0.04 (%)
35+875.000	35+925.000				Road value varies from controlling criteria, grade break without a curve	35+875.000 to 35+900.000, grade=0.04 (%); 35+900.000 to 35+925.000, grade=0.00 (%)
35+900.000	35+950.000				Road value varies from controlling criteria, grade break without a curve	35+900.000 to 35+925.000, grade=0.00 (%); 35+925.000 to 35+950.000, grade=0.04 (%)
36+675.000	36+725.000				Road value varies from controlling criteria, grade break without a curve	36+675.000 to 36+700.000, grade=-0.32 (%); 36+700.000 to 36+725.000, grade=-0.28 (%)
36+700.000	36+750.000				Road value varies from controlling criteria, grade break without a curve	36+700.000 to 36+725.000, grade=-0.28 (%); 36+725.000 to 36+750.000, grade=-0.32 (%)
36+750.000	36+800.000				Road value varies from controlling criteria, grade break without a curve	36+750.000 to 36+775.000, grade=-0.32 (%); 36+775.000 to 36+800.000, grade=-0.28 (%)
36+775.000	36+825.000				Road value varies from controlling criteria, grade break without a curve	36+775.000 to 36+800.000, grade=-0.28 (%); 36+800.000 to 36+825.000, grade=-0.44 (%)

ตารางที่ 7 (ต่อ)

Stations		K value (meters/%)		effective design speed	Comment	Attributes
Start	End	Road	Policy	kilometers/hour		
36+800.000	36+850.000				Road value varies from controlling criteria, grade break without a curve	36+800.000 to 36+825.000, grade=-0.44 (%); 36+825.000 to 36+850.000, grade=-0.20 (%)
36+825.000	36+875.000				Road value varies from controlling criteria, grade break without a curve	36+825.000 to 36+850.000, grade=-0.20 (%); 36+850.000 to 36+875.000, grade=-0.08 (%)

ตารางที่ 8 ระยะมองเห็นสำหรับการหยุด (Stopping Sight Distance Policy Check)

Stations		Direction of Travel	Stopping Sight Distance (meters)		Comment	Attributes
Start	End		Road (minimum)	Policy		
2+753.000	7+077.000	Decreasing Stations	>>85	85	Road value is within controlling criteria	Design speed=50 (km/h)
7+079.000	7+159.000	Decreasing Stations	>>65	65	Road value is within controlling criteria	Design speed=60 (km/h)
8+171.000	8+257.000	Decreasing Stations	>>50	50	Road value is within controlling criteria	Design speed=60 (km/h)
9+789.000	9+923.000	Decreasing Stations	>>50	50	Road value is within controlling criteria	Design speed=60 (km/h)
12+243.000	12+355.000	Decreasing Stations	>>50	50	Road value is within controlling criteria	Design speed=60 (km/h)
15+519.000	20+707.000	Decreasing Stations	>>85	85	Road value is within controlling criteria	Design speed=50 (km/h)
20+709.000	20+769.000	Decreasing Stations	>>65	65	Road value is within controlling criteria	Design speed=60 (km/h)
20+805.000	31+445.000	Decreasing Stations	>>85	85	Road value is within controlling criteria	Design speed=60 (km/h)
31+483.000	36+447.000	Decreasing Stations	>>85	85	Road value is within controlling criteria	Design speed=40 (km/h)
36+643.000	37+543.000	Decreasing Stations	>>85	85	Road value is within controlling criteria	Design speed=60 (km/h)

ตารางที่ 8 (ต่อ)

Stations		Direction of Travel	Stopping Sight Distance (meters)		Comment	Attributes
Start	End		Road (minimum)	Policy		
2+665.000	7+057.000	Increasing Stations	>>85	85	Road value is within controlling criteria	Design speed=60 (km/h)
7+079.000	7+159.000	Increasing Stations	>>65	65	Road value is within controlling criteria	Design speed=60 (km/h)
8+171.000	8+257.000	Increasing Stations	>>50	50	Road value is within controlling criteria	Design speed=60 (km/h)
9+789.000	9+923.000	Increasing Stations	>>50	50	Road value is within controlling criteria	Design speed=60 (km/h)
12+243.000	12+355.000	Increasing Stations	>>50	50	Road value is within controlling criteria	Design speed=60 (km/h)
15+519.000	20+655.000	Increasing Stations	>>85	85	Road value is within controlling criteria	Design speed=60 (km/h)
20+709.000	20+769.000	Increasing Stations	>>65	65	Road value is within controlling criteria	Design speed=60 (km/h)
20+771.000	31+363.000	Increasing Stations	>>85	85	Road value is within controlling criteria	Design speed=60 (km/h)
31+389.000	35+825.000	Increasing Stations	>>85	85	Road value is within controlling criteria	Design speed=60 (km/h)
35+887.000	36+447.000	Increasing Stations	>>85	85	Road value is within controlling criteria	Design speed=40 (km/h)
36+621.000	36+697.000	Increasing Stations	>>85	85	Road value is within controlling criteria	Design speed=60 (km/h)
36+699.000	36+765.000	Increasing Stations	78	85	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
36+767.000	37+455.000	Increasing Stations	>>85	85	Road value is within controlling criteria	Design speed=60 (km/h)

ตารางที่ 9 ระยะมองเห็นสำหรับการแซง (Passing Sight Distance Policy Check)

Stations		Direction of Travel	Passing Sight Distance (meters)		Comment	Attributes
Start	End		Road (minimum)	Policy		
3+485.000	4+769.000	Decreasing Stations	>>410	410	Road value is within recommended values	Design speed=60 (km/h)
4+771.000	5+369.000	Decreasing Stations	100	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
7+079.000	7+159.000	Decreasing Stations	96	345	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
8+171.000	8+211.000	Decreasing Stations	>>270	270	Road value is within recommended values	Design speed=40 (km/h)
8+213.000	8+257.000	Decreasing Stations	84	270	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
9+789.000	9+831.000	Decreasing Stations	>>270	270	Road value is within recommended values	Design speed=40 (km/h)
9+833.000	9+923.000	Decreasing Stations	70	270	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)

ตารางที่ 9 (ต่อ)

Stations		Direction of Travel	Passing Sight Distance (meters)		Comment	Attributes
Start	End		Road (minimum)	Policy		
12+243.000	12+279.000	Decreasing Stations	>>270	270	Road value is within recommended values	Design speed=40 (km/h)
12+281.000	12+355.000	Decreasing Stations	80	270	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
16+079.000	16+855.000	Decreasing Stations	>>410	410	Road value is within recommended values	Design speed=60 (km/h)
16+857.000	17+819.000	Decreasing Stations	128	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
20+709.000	20+747.000	Decreasing Stations	>>345	345	Road value is within recommended values	Design speed=50 (km/h)
20+749.000	20+769.000	Decreasing Stations	70	345	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
29+155.000	29+973.000	Decreasing Stations	102	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)

ตารางที่ 9 (ต่อ)

Stations		Direction of Travel	Passing Sight Distance (meters)		Comment	Attributes
Start	End		Road (minimum)	Policy		
31+453.000	32+141.000	Decreasing Stations	74	410	Road value varies from recommended values; source of SD limitation is vertical alignment	Design speed=60 (km/h)
33+665.000	33+879.000	Decreasing Stations	>>410	410	Road value is within recommended values	Design speed=60 (km/h)
33+881.000	34+267.000	Decreasing Stations	124	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
34+773.000	35+109.000	Decreasing Stations	326	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
35+111.000	35+179.000	Decreasing Stations	>>410	410	Road value is within recommended values	Design speed=60 (km/h)
35+181.000	35+671.000	Decreasing Stations	116	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
35+705.000	36+447.000	Decreasing Stations	86	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=40 (km/h)

ตารางที่ 9 (ต่อ)

Stations		Direction of Travel	Passing Sight Distance (meters)		Comment	Attributes
Start	End		Road (minimum)	Policy		
36+621.000	37+197.000	Decreasing Stations	88	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
4+359.000	4+957.000	Increasing Stations	100	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
7+079.000	7+113.000	Increasing Stations	98	345	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=50 (km/h)
7+115.000	7+159.000	Increasing Stations	>>345	345	Road value is within recommended values	Design speed=60 (km/h)
8+171.000	8+207.000	Increasing Stations	80	270	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=40 (km/h)
8+209.000	8+257.000	Increasing Stations	>>270	270	Road value is within recommended values	Design speed=60 (km/h)

ตารางที่ 9 (ต่อ)

Stations		Direction of Travel	Passing Sight Distance (meters)		Comment	Attributes
Start	End		Road (minimum)	Policy		
9+789.000	9+887.000	Increasing Stations	76	270	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=40 (km/h)
9+889.000	9+923.000	Increasing Stations	>>270	270	Road value is within recommended values	Design speed=60 (km/h)
12+243.000	12+331.000	Increasing Stations	74	270	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=40 (km/h)
12+333.000	12+355.000	Increasing Stations	>>270	270	Road value is within recommended values	Design speed=60 (km/h)
16+445.000	17+431.000	Increasing Stations	128	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
20+709.000	20+737.000	Increasing Stations	76	345	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=50 (km/h)
20+739.000	20+769.000	Increasing Stations	>>345	345	Road value is within recommended values	Design speed=60 (km/h)

ตารางที่ 9 (ต่อ)

Stations		Direction of Travel	Passing Sight Distance (meters)		Comment	Attributes
Start	End		Road (minimum)	Policy		
28+743.000	29+561.000	Increasing Stations	102	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
29+563.000	29+601.000	Increasing Stations	>>410	410	Road value is within recommended values	Design speed=60 (km/h)
31+079.000	31+729.000	Increasing Stations	84	410	Road value varies from recommended values; source of SD limitation is vertical alignment	Design speed=60 (km/h)
31+731.000	32+285.000	Increasing Stations	>>410	410	Road value is within recommended values	Design speed=60 (km/h)
33+469.000	33+855.000	Increasing Stations	124	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
33+857.000	34+359.000	Increasing Stations	>>410	410	Road value is within recommended values	Design speed=60 (km/h)
34+771.000	35+259.000	Increasing Stations	116	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
35+261.000	35+293.000	Increasing Stations	>>410	410	Road value is within recommended values	Design speed=60 (km/h)

ตารางที่ 9 (ต่อ)

Stations		Direction of Travel	Passing Sight Distance (meters)		Comment	Attributes
Start	End		Road (minimum)	Policy		
35+295.000	36+447.000	Increasing Stations	88	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=40 (km/h)
36+621.000	36+783.000	Increasing Stations	90	410	Road value may vary from recommended values, check obstructions beyond <i>Obstruction Offset</i> ; source of SD limitation is horizontal alignment	Design speed=60 (km/h)
36+785.000	37+129.000	Increasing Stations	>>410	410	Road value is within recommended values	Design speed=60 (km/h)