Table of Contents

Chapter 13 Example Reports

This chapter will show examples of the reports IHSDM prepares and will give a brief description of how to read them. The next chapter will describe how to analyze and apply the results to the decision-making process.

Policy Review

The policy review model provides the following reports:

- Traveled Way and Auxiliary Lane Widths
- Shoulder Width
- Shoulder Type
- Normal Shoulder Slope
- Cross Slope Rollover
- Bridge Width
- Radius of Curve
- Superelevation
- Length of Curve
- Compound Curve Ratio
- Tangent Grade
- Vertical Curve
- Passing Sight Distance
- Stopping Sight Distance
- Decision Sight Distance

An example of each report follows:

Traveled Way and Auxiliary Lane Widths

4.1 Traveled Way Width Policy Check

[Through Traveled Way Width in the Policy Review Module (PRM) Engineer's Manual]
Processing Limits: 1+000.000 to 18+623.693
Traffic Volume Year: 2004
Design Vehicle: MH/B
Type Of Project: reconstruction

Traveled Way Width and Widening

Stations		Traveled Way Width and Widening (meters)		Comment	Attributes
Start	End	Road (width+widening)	Policy (width+widening)		
1+025.028	1+047.356	7.20 + 0.00	6.60 + 1.00	Road value varies from controlling criteria	Speed: 40 (km/h); class: arterial; terrain: mountainous; DHV: 140 (v/hr); ADT: 1,876 (v/day); radius: 200.00 (m); TWW:6.60 (m)
1+209.123	1+263.345	7.20 + 0.00	6.60 + ???	No policy values in AASHTO 2001 Metric: minimum curve widening	Speed: 40 (km/h); class: arterial; terrain: mountainous; DHV: 140 (v/hr); ADT: 1,876 (v/day); radius: 55.00 (m); TWW:6.60 (m)
1+284.606	1+400.306	7.20 + 0.00	6.60 + 1.00	Road value varies from controlling criteria	Speed: 40 (km/h); class: arterial; terrain: mountainous; DHV: 140 (v/hr); ADT: 1,876 (v/day); radius: 200.00 (m); TWW:6.60 (m)
1+453.724	1+533.639	7.20 + 0.00	6.60 + 2.55	Road value varies from controlling criteria	Speed: 40 (km/h); class: arterial; terrain: mountainous; DHV: 140 (v/hr); ADT: 1,876 (v/day); radius: 125.00 (m); TWW:6.60 (m); lanes: 3
1+580.228	1+781.660	7.20 + 0.00	6.60 + 0.70	Road value varies from controlling criteria	Speed: 40 (km/h); class: arterial; terrain: mountainous; DHV: 140 (v/hr); ADT: 1,876 (v/day); radius: 400.00 (m); TWW:6.60 (m)
1+831.131	1+949.954	7.20 + 0.00	6.60 + 1.40	Road value varies from controlling criteria	Speed: 40 (km/h); class: arterial; terrain: mountainous; DHV: 140 (v/hr); ADT: 1,876 (v/day); radius: 170.00 (m); TWW:6.60 (m)

This report checks the roadway width at each curve as well as at each change in width and will indicate if the design meets criteria. The table describes the location of change in width and curves at the P.C. (Start) and P.T (End), the design roadway width (Road), the policy rules for the roadway width (Policy), whether the design meets policy or not (Comment), and the design criteria used in determining the correct policy values. IHSDM will indicate where the design varies from policy.

Shoulder Width

4.3 Shoulder Width Policy Check

[Shoulder Width in the Policy Review Module (PRM) Engineer's Manual]
Processing Limits: 1+000.000 to 18+623.693
Traffic Volume Year: 2004

Shoulder Width

Station	Direction of Travel	Shoulder Width (meters)		Comment	Attributes
		Road	Policy		
1+000.000	left	1.00	1.80	Road value may vary from recommended values. Where volumes are low or a narrow section is needed to reduce construction impacts, the paved should may be reduced to 0.60 (m)	Functional class=arterial; ADT=1,876 (v/day) terrain=mountainous; material=paved
9+500.000	left	1.00	1.20	Road value may vary from recommended values. Where volumes are low or a narrow section is needed to reduce construction impacts, the paved should may be reduced to 0.60 (m)	Functional class=arterial; ADT=161 (v/day) terrain=mountainous; material=turf
9+600.000	left	0.30	1.20	Road value varies from controlling criteria	Functional class=arterial; ADT=161 (v/day) terrain=mountainous; material=turf
18+623.693	left	1.00	1.20	Road value may vary from recommended values. Where volumes are low or a narrow section is needed to reduce construction impacts, the paved should may be reduced to 0.60 (m)	Functional class=arterial; ADT=161 (v/day) terrain=mountainous; material=turf
1+000.000	right	1.00	1.80	Road value may vary from recommended values. Where volumes are low or a narrow section is needed to reduce construction impacts, the paved should may be reduced to 0.60 (m)	Functional class=arterial; ADT=1,876 (v/day) terrain=mountainous; material=paved

This report checks the shoulder width for the full length of the project. It will run down the left side of the alignment, then down the right. It breaks the stations where the shoulder width or materials change and where the shoulder width does not meet policy. Like the traveled way width table, it shows the design width, then the policy width, a comment on how the design compares to the policy and the values IHSDM used to determine the policy values.

Shoulder Type

4.4 Shoulder Type Policy Check

[Shoulder Type in the Policy Review Module (PRM) Engineer's Manual]
Processing Limits: 1+000.000 to 18+623.693

Shoulder Type

Stations		Direction of Travel	Shoulder Type		Comment	Attributes
Start	End		Road	Policy		
9+500.000	9+600.000	left	turf	paved	Road value varies from recommended values	Functional class=arterial; bike facility=no
9+600.000	18+623.693	left	turf	paved	Road value varies from recommended values	Functional class=arterial; bike facility=no
9+500.000	9+600.000	right	turf	paved	Road value varies from recommended values	Functional class=arterial; bike facility=no
9+600.000	18+623.693	right	turf	paved	Road value varies from recommended values	Functional class=arterial; bike facility=no

Normal Shoulder Slope

4.5 Normal Shoulder Slope Policy Check

[Normal Shoulder Slope in the Policy Review Module (PRM) Engineer's Manual]
Processing Limits: 1+000.000 to 18+623.693

Normal Shoulder Slope

Stations		Direction of Travel	Normal Shoulder Slope (%)		Comment	Attributes
Start	End		Road	Policy		
9+500.000	9+600.000	left	-2.00	-6.00 to -8.00	Road value varies from recommended values	Shoulder material=turf
9+600.000	18+623.693	left	-2.00	-6.00 to -8.00	Road value varies from recommended values	Shoulder material=turf
9+500.000	9+600.000	right	-2.00	-6.00 to -8.00	Road value varies from recommended values	Shoulder material=turf
9+600.000	18+623.693	right	-2.00	-6.00 to -8.00	Road value varies from recommended values	Shoulder material=turf

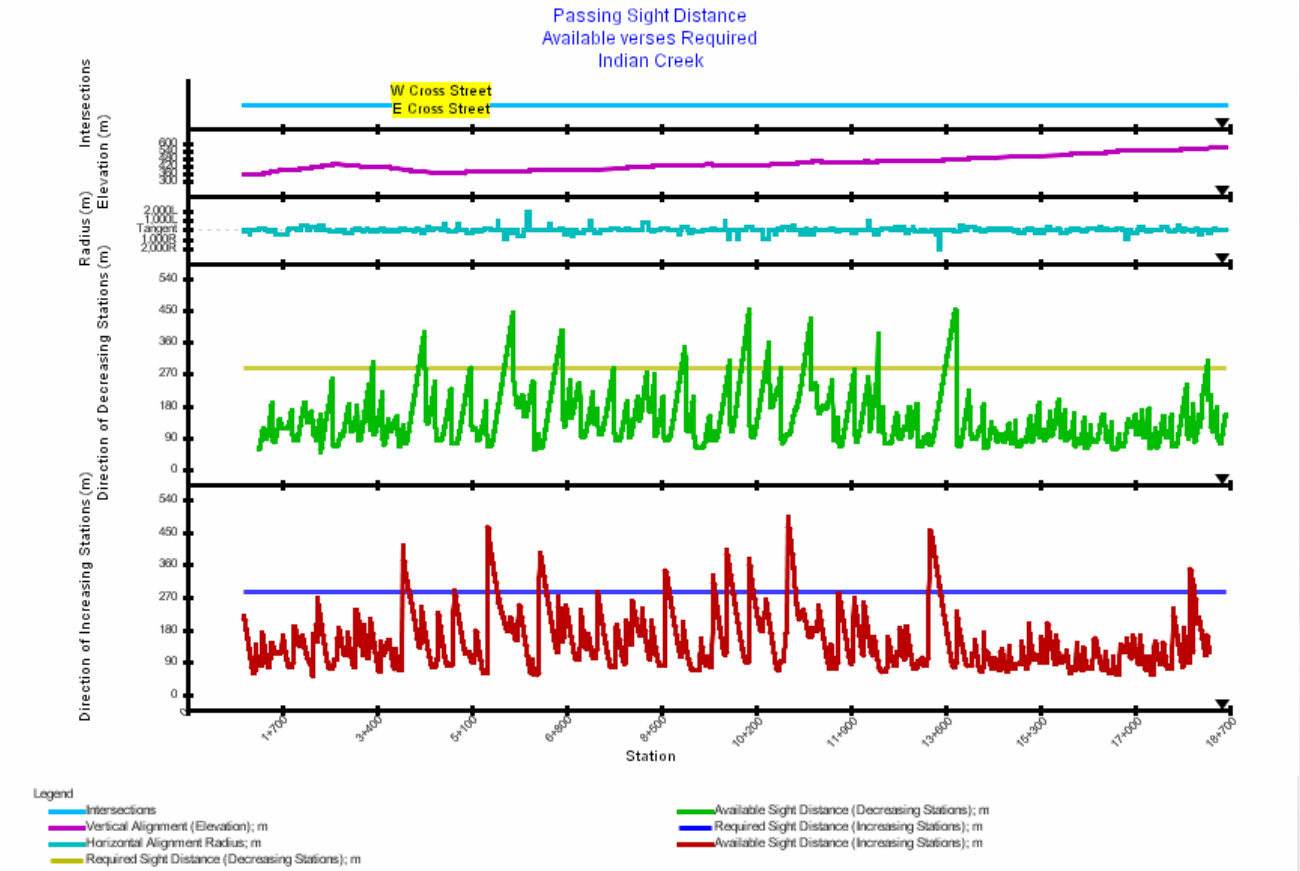
Passing Sight Distance

IHSDM creates two reports for Passing sight distance, a Passing Sight Distance Policy Check graph and a Passing Site Distance tabular report.

1.2 Passing Sight Distance Policy Check

[Passing Sight Distance in the Policy Review Module (PRM) Engineer's Manual]
Processing Limits: 1+000.000 to 18+623.693
Object height: 1,300.0 millimeters
Driver eye height: 1,070.0 millimeters
Driver Increment: 2.00 meters
Policy Table Bounds: 30 (km/h) to 120 (km/h)

Graph: Passing Sight Distance



This graph will show the location of any intersections, the profile, horizontal curve radiuses, and recommended passing sight distance along the highway. Sight distance limitations due to constraints in both the horizontal and vertical alignments are considered by IHSDM in determining available sight distances.

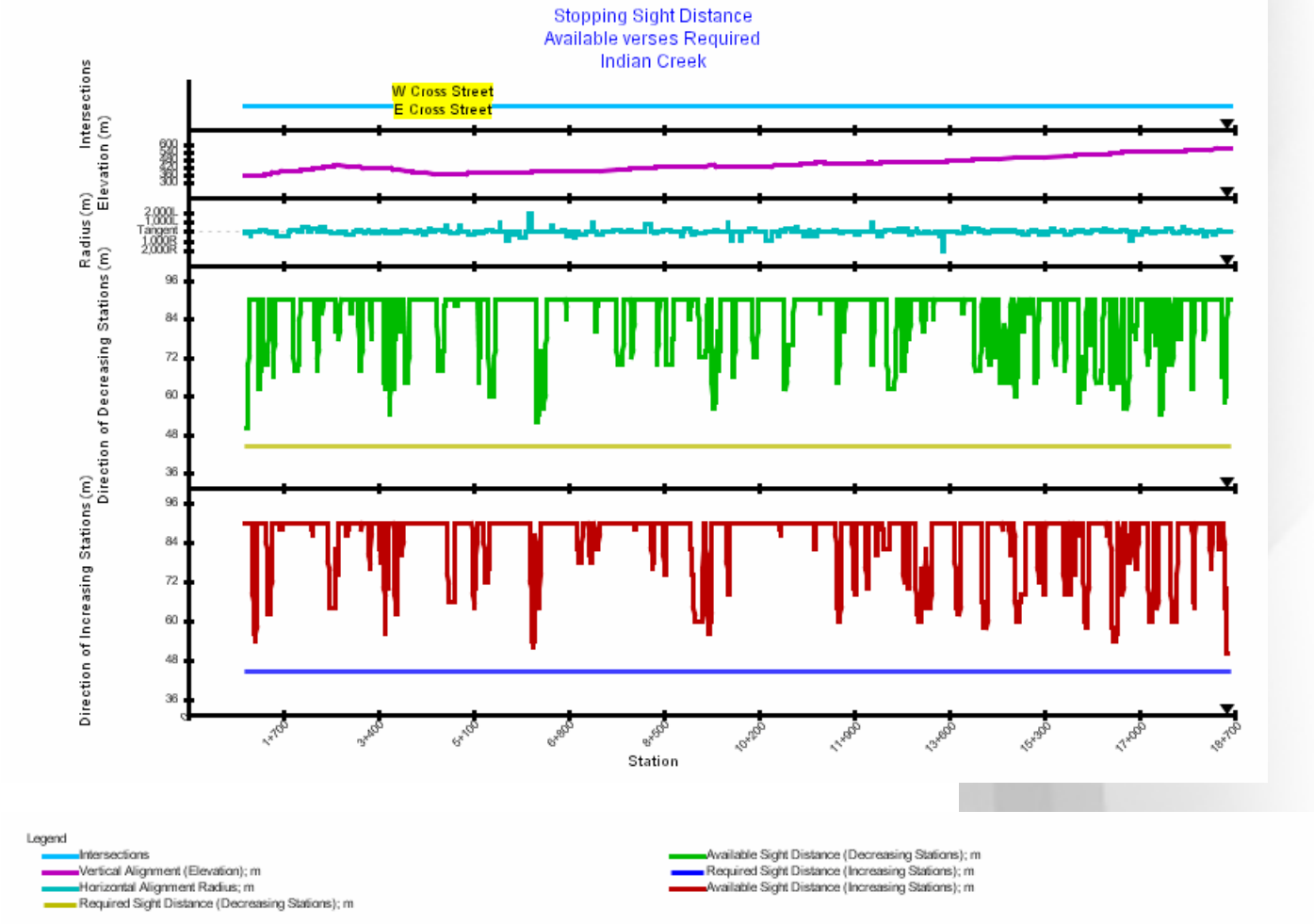
Notice how the majority of the curves show the passing sight distance is below policy. IHSDM only shows the sight line to the width that is input into the system. In the example project, no obstruction offsets were input, so IHSDM only calculates to the edge of shoulder.

Stopping Sight Distance

IHSDM creates two stopping sight distance stopping sight distance reports, a graph and a tabular report.

[Stopping Sight Distance in the Policy Review Module (PRM) Engineer's Manual]
Processing Limits: 1+000.000 to 18+623.693
Type of Project: new construction
Policy Table Bounds: 30 (km/h) to 120 (km/h)
Object height: 150.0 millimeters
Driver eye height: 1,070.0 millimeters
Driver Increment: 2.00 meters

Graph: Stopping Sight Distance



Like the passing sight distance, this graph shows the locations of the intersections, profile, horizontal curve radiuses, and actual stopping sight distance compared to the policy.

Stopping Sight Distance

Stations		Direction of Travel	Stopping Sight Distance (meters)		Comment	Attributes
Start	End		Road (minimum)	Policy		
1+000.000	1+050.000	Decreasing Stations			Can't calculate available vertical SD	Design speed=40 (km/h)
18+572.000	18+622.000	Increasing Stations			Can't calculate available vertical SD	Design speed=40 (km/h)

This table will only show the locations where the stopping sight distance does not meet policy or where it cannot calculate the sight distance because it is at the beginning or ending of the alignment.

Crash Prediction Module

The crash prediction model report contains a maximum of 9 tables and 1 graph. The first 5 tables describe the segments that the alignment was broken into and the information used to calculate the accident rates. This chapter will not describe these tables. The following will describe the other four tables and graphs:

Expected Crash Frequencies

1.2 Expected Crash Rates and Frequencies

Analysis Date:	September 22, 2004
Project Name:	Indian Creek
Project Comment:	This is the existing alignment
Analysis Name:	Existing Alignment
Analysis Comment:	This is to test the existing alignment
Proposed Highway:	Indian Creek
Chain:	none
Comment:	unspecified
Analysis Limits:	1+000.000 to 18+623.694
Analysis Length:	17.6237 kilometers
Analysis Period:	2005 to 2008 (4 years)
Crash History Data:	None
Unit System:	Metric

Expected Crash Frequencies and Rates (Summary)

Total Crashes	36.0
Fatal and Injury Crashes (32%)	11.6
Property-damage-only Crashes (68%)	24.4
Average Future Road ADT (vehicles/day)	1118.0
Crash Rate per kilometers per year	0.51
Fatal and Injury Crash Rate per kilometers per year	0.16
Property-damage-only Crash Rate per kilometers per year	0.35
Total travel (million vehicle-kilometers)	28.77
Crash Rate per million vehicle-kilometers	1.25
Fatal and Injury Crash Rate per million vehicle-kilometers	0.4
Property-damage-only Crash Rate per million vehicle-kilometers	0.85

This table gives a summary of the expected crash rates for the analysis period shown. The total crashes are broken into Fatal and Injury Crashes and Property-damage-only Crashes. The Crash Rate per kilometer per year is based on the Average Future ADT and is also broken into Fatal and Injury Crashes and Property-damage-only

Crashes. The Crash Rate per million vehicle-kilometers is based on the Total Travel (million vehicle-kilometers) and is also broken into Fatal and Injury Crashes and Property-damage-only Crashes.

Expected Crash Type Distribution

1.3 Expected Crash Type Distribution

Analysis Date: September 22, 2004
Project Name: Indian Creek
Project Comment: This is the existing alignment
Analysis Name: Existing Alignment
Analysis Comment: This is to test the existing alignment
Proposed Highway: Indian Creek
Chain: none
Comment: unspecified
Analysis Limits: 1+000.000 to 18+623.694
Analysis Length: 17.6237 kilometers
Analysis Period: 2005 to 2008 (4 years)
Crash History Data: None
Unit System: Metric

Expected Crash Type Distribution

Crash Type	Highway Segments	Intersections	Total
Single-vehicle accidents			
Collision with animal	11.0 (30.69%)	0.0 (0.0%)	11.0 (30.7%)
Collision with bicycle	0.1 (0.3%)	0.0 (0.0%)	0.1 (0.3%)
Collision with parked vehicle	0.3 (0.7%)	0.0 (0.0%)	0.3 (0.7%)
Collision with pedestrian	0.2 (0.5%)	0.0 (0.0%)	0.2 (0.5%)
Overturned	0.8 (2.28%)	0.0 (0.0%)	0.8 (2.29%)
Ran off road	10.0 (27.91%)	0.0 (0.03%)	10.0 (27.94%)
Other single-vehicle accident	1.3 (3.58%)	0.0 (0.01%)	1.3 (3.59%)
Total single-vehicle accidents	23.7 (65.95%)	0.0 (0.05%)	23.7 (66.0%)
Multiple-vehicle accidents			
Angle collision	1.4 (3.87%)	0.1 (0.35%)	1.5 (4.22%)
Head-on collision	0.7 (1.89%)	0.0 (0.01%)	0.7 (1.9%)
Left-turn collision	1.5 (4.17%)	0.0 (0.04%)	1.5 (4.21%)
Right-turn collision	0.2 (0.6%)	0.0 (0.0%)	0.2 (0.6%)
Rear-end collision	5.0 (13.81%)	0.0 (0.12%)	5.0 (13.92%)
Sideswipe opposite-direction	0.9 (2.38%)	0.0 (0.01%)	0.9 (2.4%)
Sideswipe same-direction	0.9 (2.58%)	0.0 (0.03%)	0.9 (2.61%)
Other multiple-vehicle collision	1.5 (4.07%)	0.0 (0.07%)	1.5 (4.14%)
Total multiple-vehicle collisions	12.0 (33.37%)	0.2 (0.62%)	12.2 (34.0%)
Total accidents	35.7 (99.33%)	0.2 (0.67%)	36.0 (100.0%)

This report shows the expected crash type distribution. CPM applies a default distribution (see CPM Engineers Manual, section 9), which can be modified via the Administration Tool (AdminTool).

Expected Crash Rates and Frequencies

1.4 Expected Crash Rates and Frequencies

Analysis Date: September 22, 2004
Project Name: Indian Creek
Project Comment: This is the existing alignment
Analysis Name: Existing Alignment
Analysis Comment: This is to test the existing alignment
Proposed Highway: Indian Creek
Chain: none
Comment: unspecified
Analysis Limits: 1+000.000 to 18+623.694
Analysis Length: 17.6237 kilometers
Analysis Period: 2005 to 2008 (4 years)
Crash History Data: None
Unit System: Metric

Expected Crash Frequencies and Rates (Segment)

Intersection Name/Cross Road	Stations		Length (km)	Expected no. of Crashes for analysis period	Expected Crash Rate			Expected no. of crashes/year for intersection
	From	To			/km/yr	/million-veh-km	/million entering veh	
	1+000.000	1+006.500	0.0065	0.0143	0.5499	0.7097		
	1+006.500	1+025.028	0.0185	0.0380	0.5124	0.6614		
	1+025.028	1+045.800	0.0208	0.2238	2.6934	3.4764		
	1+045.800	1+047.356	0.0016	0.0169	2.7144	3.5034		
	1+047.356	1+124.949	0.0776	0.1603	0.5164	0.6665		
	1+124.949	1+132.214	0.0073	0.0400	1.3764	1.7765		
	1+132.214	1+141.520	0.0093	0.0192	0.5164	0.6665		

This table indicates the expected crash frequencies and rates for homogeneous highway segments. The table shows crashes/km/yr and crashes/million vehicle-km for segments, as well as crashes/million entering vehicles and crashes/yr for each intersection.

Expected Crash Frequencies and Rates by Horizontal Design Element

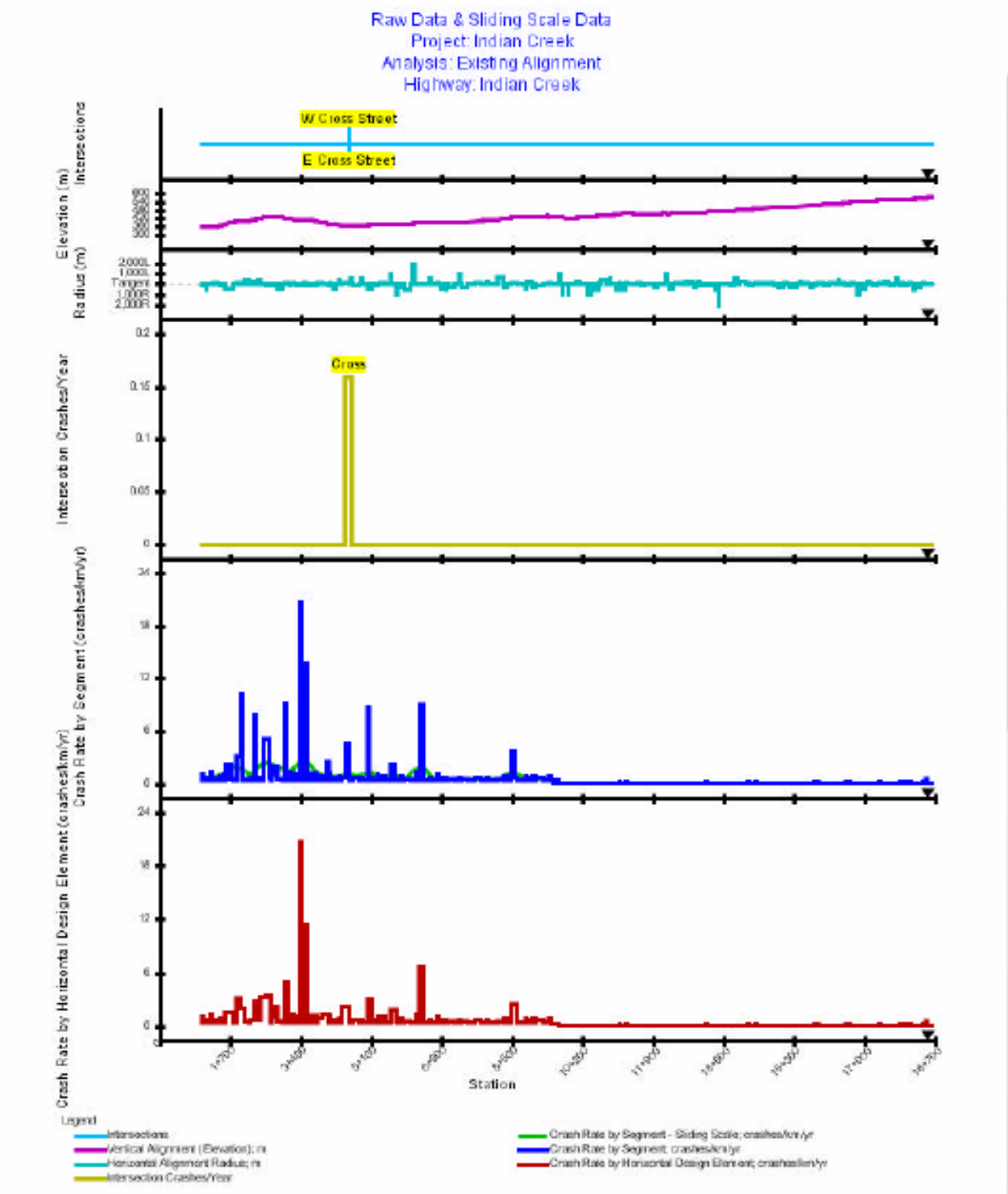
Expected Crash Frequencies and Rates by Horizontal Design Element

Design Element (Horizontal Curve Number or Tangent	Stations		Length (km)	Expected no. of Crashes for analysis period	Expected Crash Rate	
	From	To			/km/yr	/million-veh-km
Tangent	1+000.000	1+025.028	0.0250	0.0523	0.5221	0.6739
Curve 1	1+025.028	1+047.356	0.0223	0.2407	2.6949	3.4783
Tangent	1+047.356	1+124.949	0.0776	0.1603	0.5164	0.6665
Curve 2	1+124.949	1+132.214	0.0073	0.0400	1.3764	1.7765
Tangent	1+132.214	1+209.123	0.0769	0.1578	0.5128	0.6619
Curve 3	1+209.123	1+263.345	0.0542	1.0659	4.9146	6.3433
Tangent	1+263.345	1+284.606	0.0213	0.0462	0.5429	0.7007
Curve 4	1+284.606	1+400.306	0.1157	0.4779	1.0327	1.3328
Tangent	1+400.306	1+453.724	0.0534	0.0975	0.4563	0.5890
Curve 5	1+453.724	1+533.639	0.0799	0.5248	1.6416	2.1188
Tangent	1+533.639	1+580.228	0.0466	0.1074	0.5761	0.7436
Curve 6	1+580.228	1+781.660	0.2014	0.6002	0.7450	0.9615
Tangent	1+781.660	1+831.131	0.0495	0.1052	0.5314	0.6859
Curve 7	1+831.131	1+949.954	0.1188	0.5751	1.2099	1.5616
Tangent	1+949.954	2+043.574	0.0936	0.2002	0.5345	0.6899
Curve 8	2+043.574	2+135.747	0.0922	0.3145	0.8530	1.1010
Tangent	2+135.747	2+185.838	0.0501	0.1152	0.5751	0.7423
Curve 9	2+185.838	2+296.655	0.1108	0.4728	1.0666	1.3767
Tangent	2+296.655	2+364.670	0.0680	0.1533	0.5636	0.7274

This table gives the expected crash frequencies and rates for each tangent and curve.

Crash Rate Plots

Below is a graphical presentation of the above tables. The user can view this graph and quickly go to the corresponding location in the tables to see what is happening.


Raw Data & Sliding Scale Data
Project: Indian Creek
Analysis: Existing Alignment
Highway: Indian Creek
W Cross Street
E Cross Street
Elevation (m)
Intersections
Radius (m)
Tangent
Intersection Crashes/Year
Cross
Crash Rate by Segment (crashes/km/yr)
Crash Rate by Horizontal Design Element (crashes/km/yr)
Station
Legend
Intersections
Vertical Alignment (Elevation); m
Horizontal Alignment Radius; m
Intersection Crashes/Year
Crash Rate by Segment - Sliding Scale; crashes/km/yr
Crash Rate by Segment; crashes/km/yr
Crash Rate by Horizontal Design Element; crashes/km/yr

Design Consistency

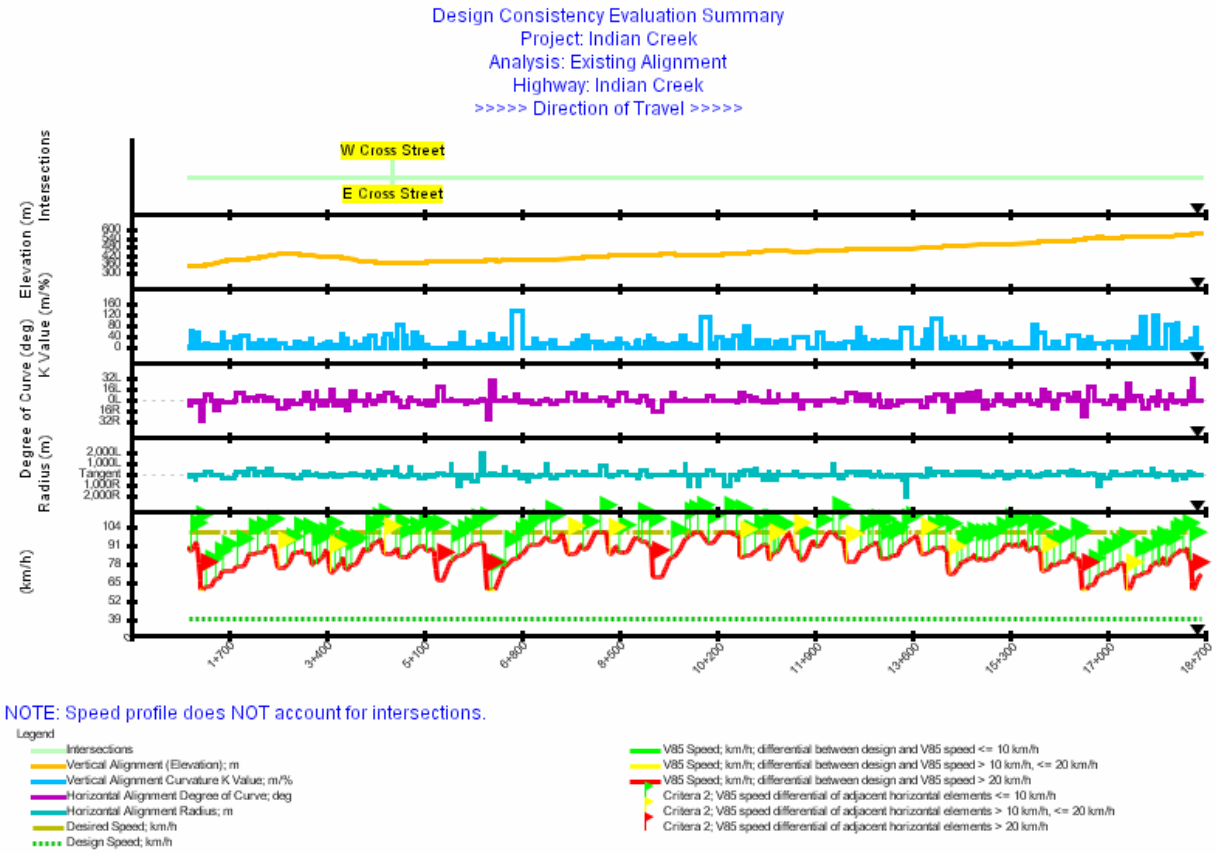
This model will provide a total of two graphs and six reports, one graph and three reports for each direction of travel. This chapter will only give example reports for one direction of travel.

Design Consistency Results Graph

Design Consistency Module Version: 2.01d (DCM Nov 15, 2002)
DCM Analysis Vehicle: Passenger Car - Type 5
Vehicle Start Speed: 100
Vehicle End Speed: 100

[DCM Graphical Output in the Design Consistency Module (DCM) Engineer's Manual]

Graph: Design Consistency Results (in the direction of increasing stations)



This graph is a good way for the user to see where the spikes in the K Value and Radius of curve seem out of place. An estimated 85th percentile operating speed (V85) profile is plotted, with color-coding and flagging related to the two design consistency criteria, i.e., the design speed versus operating speed assumption check and the speed differential of adjacent horizontal design elements check, respectively. See the CDM Engineer's Manual section 4 for more details.

V85 Speed Profile Coordinates

V85 Speed Profile Coordinates (in the direction of increasing stations)

Station	Speed (km/h)
1+000.000	90.7
1+025.028	87.4
1+027.778	87.4
1+047.356	87.4
1+124.949	93.4
1+132.214*	93.4
1+209.123	60.0
1+263.345	60.0
1+277.778	61.7

This table contains the (Station, Estimated V85) coordinates that are plotted in the graph shown on p. 13-12. Locations where he predicted deceleration rate is greater than the approximated comfortable deceleration rate are noted by and asterisk.

Design Speed Assumption Check

Design Speed Assumption Check (in the direction of increasing stations)

Station		V85 - Vdesign Speed (km/h)		Condition
From	To	Min	Max	
1+000.000	1+209.123	20.0	53.4	3
1+209.123	1+263.345	20.0	20.0	2
1+263.345	6+181.539	20.0	55.9	3
6+181.539	6+234.884	20.0	20.0	2
6+234.884	6+252.922	20.0	21.5	3
6+252.922	6+336.662	20.0	20.0	2

This table compares the estimated V85 speed to the design speed, using the following conditions:

Design Speed Assumption Check Conditions Key
Condition 1: 0 km/h <= (V85 - Vdesign) <= 10 km/h
Condition 2: 10 km/h < (V85 - Vdesign) <= 20 km/h
Condition 3: 20 km/h < (V85 - Vdesign)
Condition 4: (V85 - Vdesign) < 0 km/h
where:

V85 = estimated 85th percentile operating speed (km/h)
Vdesign = design speed (km/h)

Speed Differential of Adjacent Design Elements Check

Speed Differential of Adjacent Design Elements Check (in the direction of increasing stations)

Station of max speed on preceding element	Max speed on preceding element (km/h)	Start Station of curve	Speed on curve (km/h)	Speed Differential (km/h)	Condition
1+000.000	90.7	1+025.028	87.4	3.2	1
1+124.949	93.4	1+124.949	93.4	0.0	1
1+132.214	93.4	1+209.123	60.0	33.4	3
1+284.606	62.4	1+284.606	62.4	0.0	1
1+453.724	68.2	1+453.724	68.2	0.0	1
1+580.228	72.8	1+580.228	72.8	0.0	1
1+831.131	76.5	1+831.131	76.5	0.0	1
2+043.574	84.6	2+043.574	84.6	0.0	1
2+184.243	86.2	2+185.838	86.0	0.1	1
2+364.670	90.3	2+364.670	90.3	0.0	1
2+473.111	91.3	2+554.799	75.4	15.9	2

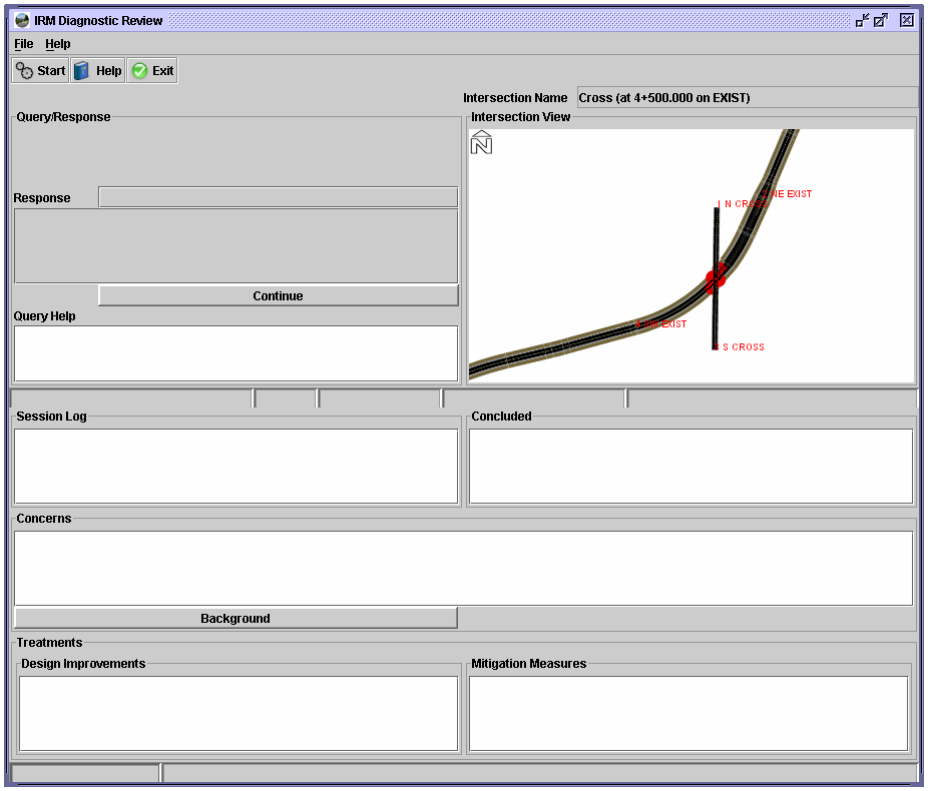
This table shows speed differentials between adjacent design elements (e.g., speed reduction from a tangent to a curve) meets the following Condition criteria:

Speed Differential of Adjacent Design Elements Check Conditions Key
Condition 1: (V85Tangent - V85Curve) <= 10 km/h
Condition 2: 10 km/h < (V85Tangent - V85Curve) <= 20 km/h
Condition 3: 20 km/h < (V85Tangent - V85Curve)

where:
V85Tangent = estimated 85th percentile operating speed on tangent (km/h)
V85Curve = estimated 85th percentile operating speed at the beginning of the curve (km/h)

Intersection Review

This report is more interactive. The following dialog box will come up and ask the user a series of questions. Answer the questions by clicking on Yes or No and picking Continue. After the questions are answered, IHSDM will provide the reports.



The Analysis Report gives the intersection information, a schematic of the intersection, the answers the user provided, and a table of the results. An example of each element is shown below:

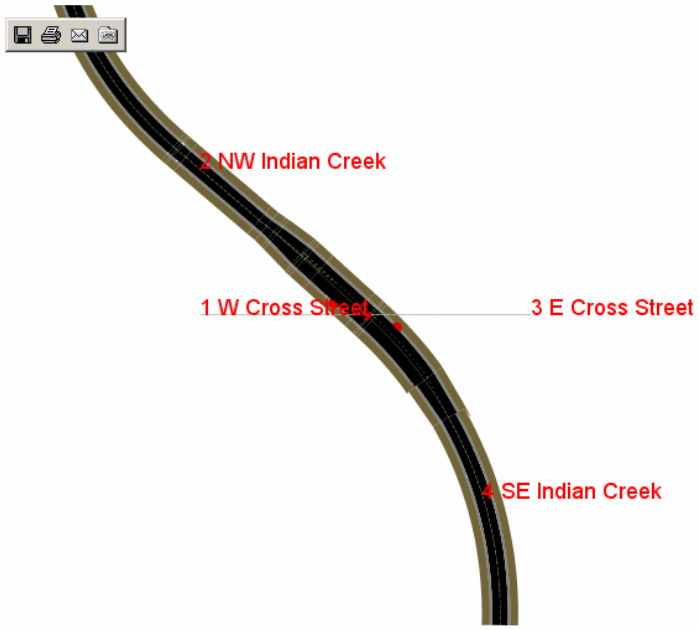
3.1 Diagnostic Review for Cross (at 4+560.000 on Indian Creek)

Intersection: Cross (at 4+560.000 on Indian Creek)
Analysis vehicle: P - Passenger Car
Design vehicle: A-BUS - Articulated Bus
Checking 23 potential concerns

3.1.1 Summary: Cross

Intersection Name: Cross; **Base Highway:** Indian Creek at 4+560.000
Traffic Control: stop; **Construction Type:** existing
Leg #1: W Cross Street; **PI:** Cross Street at 75.000
Relative Heading: -42.12 deg.; **Classification:** minor
Control: stop; **Control position:** side at 66.349
Corner: simple curve; radius=5.00 (m); turn angle=137.9 (deg); turn speed=20 (km/h)
Leg #2: NW Indian Creek; **PI:** Indian Creek at 4+560.000
Relative Heading: 0.0 deg.; **Classification:** major
Control: none; **Control position:** side at 4+566.000
Corner: simple curve; radius=5.00 (m); turn angle=42.1 (deg); turn speed=20 (km/h)
Leg #3: E Cross Street; **PI:** Cross Street at 75.000
Relative Heading: 137.88 deg.; **Classification:** minor
Control: stop; **Control position:** side at 83.651
Corner: simple curve; radius=5.00 (m); turn angle=137.9 (deg); turn speed=20 (km/h)
Leg #4: SE Indian Creek; **PI:** Indian Creek at 4+560.000
Relative Heading: 180.0 deg.; **Classification:** major
Control: none; **Control position:** side at 4+554.000
Corner: simple curve; radius=5.00 (m); turn angle=42.1 (deg); turn speed=20 (km/h)

Graph: Intersection Diagram for Cross



3.1.2 Queried Values

W Cross Street/SE Indian Creek - Clear of sight obstructions, right of intersection Case B1(level 2) [yes]
E Cross Street/NW Indian Creek - Clear of sight obstructions, right of intersection Case B1(level 2) [yes]
W Cross Street/NW Indian Creek - Clear of sight obstructions, left of intersection Case B2(level 2) [yes]
E Cross Street/SE Indian Creek - Clear of sight obstructions, left of intersection Case B2(level 2) [yes]

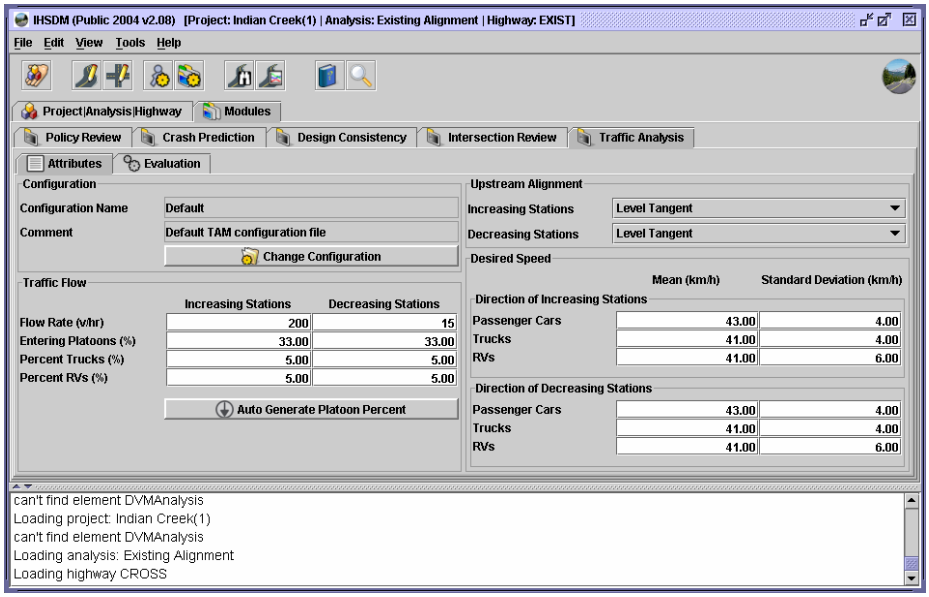
Diagnostic Review Summary - Cross

Scope	Status	Concern	Feature			Comment	Treatment	
			Category	Road	Threshold		Design Improvement	Mitigation Measures
Intersection concern	Level 2	Large intersection pavement area	Skewed angle	42.12368 degrees	60.00000 degrees	Skewed intersection, large vehicle turn path	1. Realign one or more legs. 2. Add channelizing islands. 3. Relocate one or more legs. 4. Close one or more legs. 5. Consider smaller design vehicle. 6. Improve drainage. 7. Realign approach. 8. Increase throat width.	1. Move stop bar.
Leg #1 - W Cross Street	Level 2	Insufficient ISD to right (Case B1)	ISD (vertical)	78.00 meters	89.66 meters	The required time for the maneuver used in the ISD calculations are for passenger cars only ; crest vertical curve, skewed intersection	1. Remove roadside obstacles within sight triangle. 2. Close approach. 3. Relocate approach. 4. Make leg one-way away from intersection. 5. Lengthen vertical curve. 6. Realign one or more legs. 7. Relocate one or more legs. 8. Close one or more legs.	1. Remove roadside obstacles within sight triangle. 2. Signalize intersection. 3. Convert to all-way STOP. 4. Post advisory speed on major road. 5. Review speed limit on major road. 6. Install warning sign on major road. 7. Install flashing beacons. 8. Prohibit left turns. 9. Provide intersection lighting.
	Not a concern	Insufficient ISD to left (Case B2)				The required time for the maneuver used in the ISD calculations are for passenger cars only		

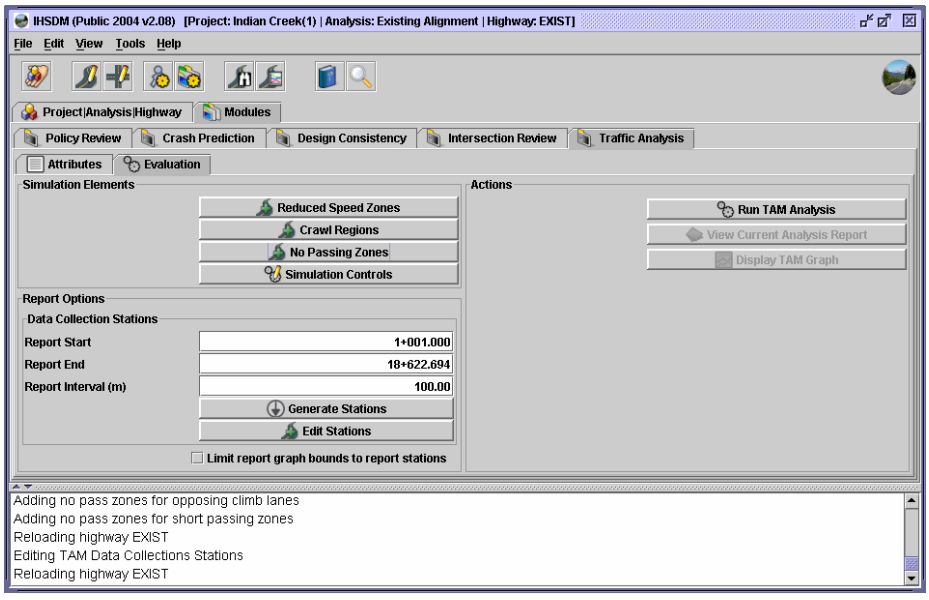
This table will point out areas of concern, describe why they are a concern and offer potential treatments to address each concern.

Traffic Analysis Module

The traffic analysis is the most calculation intensive module. The below figure is an example of the evaluation dialog box. Check that each item has the information necessary to get a detailed analysis.



Once the user is satisfied with the Attributes, pick the Evaluation Tab to get the following dialog box:



Set the desired Report Start station, the Report End station, and the Report Interval and pick Run Analysis. After the calculations are completed, the following reports are provided:

The first three reports describe the data used for the calculations.

Simulation Data

Traffic Analysis Module Version: 1.00f (TAM Jan 09, 2004)
Highway Information: Indian Creek, chain: none (unspecified, file: Indian_Creek)
Processing Limits: 1+000.000 to 18+623.694

Simulation Data

Simulation Time (min)	60		**Test Road Length (km)**	17,623.6936
Warm-up Time (min)	10			
Total Time (min)	70			
Computer Time (sec)	4.7			

Random Number Seeds

Random Number Seeds

Entering Traffic in Platoons / Direction of Increasing Stations	81,250,132		**Desired Speed / Direction of Increasing Stations**	70,867,724
Entering Traffic in Platoons / Direction of Decreasing Stations	33,333,334		**Desired Speed / Direction of Decreasing Stations**	16,532,240
Passing Decisions	52,338,126			

Traffic Input Data

Traffic Input Data

Traffic Input Data	Direction of Travel	
	Increasing Station	Decreasing Station
Flow Rate (v/hr)	200	15
Distribution (%) CARS	90.0	90.0
Distribution (%) TRUCKS	5.00	5.00
Distribution (%) RVs	5.00	5.00
Mean Desired Speed (km/h) CARS	43	43
Mean Desired Speed (km/h) TRUCKS	41	41
Mean Desired Speed (km/h) RVs	41	41
Desired Speed Standard Speed Deviation (km/h) CARS	4	4
Desired Speed Standard Speed Deviation (km/h) TRUCKS	4	4
Desired Speed Standard Speed Deviation (km/h) RVs	6	6
Entering Traffic in Platoons (%)	33.00	33.00
No Passing Zone (%)	0.00	0.00

Section Summary

1.1 Section Summary

Traffic Output Data / Main Section (1+005.000 to 18+605.000 increasing; 18+605.000 to 1+005.000 decreasing)

Traffic Output Data	Direction of Travel		
	Increasing Station	Decreasing Station	Combined
Flow Rate from Simulation (v/hr)	197	11	208
Percent Time Spent Following (%)	42.4	17.4	41.1
Average Travel Speed (km/h)	39.6	41.0	39.7
Trip Time (min/veh)	26.6	25.7	26.5
Traffic Delay (min/veh)	1.64	0.82	1.60
Geometric Delay (min/veh)	0.02	0.00	0.02
Total Delay (minutes/vehicle)	1.66	0.82	1.61
Number of Passes	340	4	344
Vehicle km Traveled	3,449	199	3,648
Total Travel Time (veh-hrs)	87.2	4.9	92.1

This table summarizes the traffic analysis.

Station Summary

1.2 Station Summary

Station Summary (direction of increasing stations)

Station Number	Station	Number of Lanes	Traffic Volume (v/hr)	Simulation Speed Characteristic Mean (km/h)				Percent Following (%)	Platoon Size	Number of Passes
				CARS	TRUCKS	RVs	ALL			
1	1+005.000	1	200	43	42	42	43	33.00	2.8	0
2	1+105.000	1	201	42	39	39	42	33.30	2.8	0
3	1+205.000	1	201	41	39	39	41	33.80	2.8	0
4	1+305.000	1	200	42	38	39	41	35.00	2.8	0
5	1+405.000	2	203	42	35	38	42	32.50	2.7	0
6	1+505.000	1	203	41	34	39	41	36.50	2.8	0
7	1+605.000	1	203	41	36	39	41	36.90	2.8	0
8	1+705.000	1	203	41	37	38	41	37.90	2.8	0
9	1+805.000	1	204	41	39	38	41	38.70	2.8	0
10	1+905.000	1	204	41	39	38	41	40.20	2.7	0
11	2+005.000	1	202	41	38	38	41	40.60	2.8	0
12	2+105.000	1	205	41	38	37	40	42.90	2.8	0
13	2+205.000	1	207	40	37	37	40	44.40	2.7	0
14	2+305.000	1	207	41	38	38	40	44.90	2.8	0
15	2+405.000	1	207	41	38	38	41	45.40	2.8	1.0
16	2+505.000	1	209	41	38	37	40	46.40	2.8	4.0

These two tables break the report into the interval set on the Evaluation dialog box. There is one table for increasing stations and one for decreasing stations.

Graphs

There are two graphs, one for the increasing station direction and one for the decreasing station direction. Plots of percentage of vehicles following in platoons, flow (veh/hr) and mean speeds by vehicle type (km/hr [mi/hr]) are provided. They summarize the above tables.

1.3 Graphs

Graph: Traffic Analysis - Increasing Stations