PRELIMINARY DRAFT



THE UNIVERSITY OF TEXAS AT AUSTIN CENTER FOR TRANSPORTATION RESEARCH

0-6850-P1

CORRIDOR-BASED PLANNING TOOL FOR TRANSPORTATION OF WIND TURBINE COMPONENTS: MANUAL GUIDE

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TxDOT Project 0-6850: Texas Transportation Planning for Future Renewable Energy Projects

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Contents

The accompanying CD/DVD contains 0-6850-P1, a stand-alone planning tool that can be used to propose a route plan for wind turbine components passing along Texas routes. Following are the instructions.

The CD/DVD contains a TransCAD batch file (Batch1.rsc), four datasets (Bridgeshort.zip, PMIS.rar, SAM_V3 Model.zip, and VertClearance.zip), the compiled TransCAD network (Final Map.rar), and the complete user's guide. The user should copy the folder "WTC_TOOL" and paste it in C:\. The four separate datasets were provided in addition to the already created network in case TxDOT would like to modify the network in the future. Detailed instructions on how to replicate the data creation process are provided in the appendix of this guide. However, the final dataset is the only map the user should open.

Using the tool requires only two steps: open the map in TransCAD (Final Map.cdf) and enter some basic inputs regarding the truck, load, and start/end points. The tool will generate the shortest route based on those inputs. However, the user should compile the batch file first.

Compiling the batch file

In order to compile the batch file, the user should go to the '*Tools*' menu and open the '*GIS Developer's Kit*'. Then the user should click in the first icon, '*Compile to UI*', and select the file Batch1.rsc and the UI database ui1.dbd. A "compilation successful" message should appear after a few seconds.



Once the batch file is compiled, the user needs to include an add-in in the TransCAD tools menu. In order to do that, the user should go to the '*Tools*' menu and open the '*Setup add-ins*' dialog box. The user should '*Add*' a dialog box with description "Batch Macro", name "Batch Run Example" and using the UI database included in the CD/DVD (ui1.dbd).

Setup Add-ins	— ×
Add-ins AUSTIN CAMPO Planning Model (2005 SUMMIT Version) SAM-V3 Batch Macro	OK Cancel Add Remove Move Up Move Down New Folder
Interfaces Settings Type: O Macro O Dialog Box Description Batch Macro Name Batch Run Example UI Database C:\Users\CTR-sa33595\Desktop\Temp\Fir In Folder None	Browse

Running the add-in

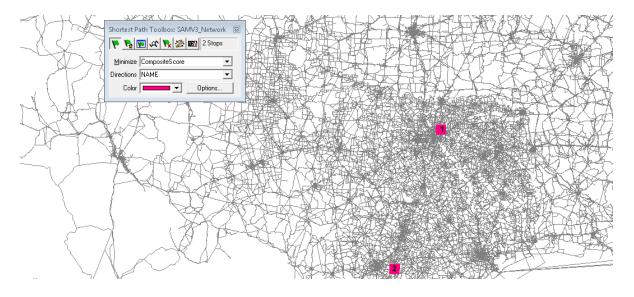
In order to run the add-in, the user should go to the 'Tools' menu and open the 'Batch Macro'. A small dialog box will appear.

Batch Macro
Close

The user should input the Height of their truck (this is a four-digit code, with first two showing feet and next two showing inches, e.g., a clearance of 12 feet and 5 inches will have 1205 as the attribute) and also the weight of the load and truck (in tons). Finally, the user should press the "Batch Macro" button and TransCAD will automatically select only the links of the network in which the truck meets the load and vertical clearance

limitations. The user should see a "Batch routine terminated successfully" message after a few seconds.

Now the user can go to the 'Networks/Paths' menu and run the shortest path toolbox.



At this point, the user inputs origin and destination (or multiple points, as multiple stops are allowed) and the routine will find the shortest path, creating a list of instructions in a .txt file and an accompanying map.

South on MURPHY RD South on SH0078	(Node IDs: 4475562/3748483)			
	1 1 Miles			
South on SH0078		(1.1 Miles)		
	15.8 Miles	(16.9 Miles)		
West on IH0030	2.2 Miles	(19.1 Miles)		
West on I30	1.2 Miles	(20.3 Miles)		
				2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
	6.9 Miles	(268.1 Miles)		AT A A A A A A A A A A A A A A A A A A
South on BS0123B				
	West on IH 30 South on IH 30 South on 135 E Toll South on 135 E Toll South on 135 E Toll South on 135E South on 140035E South on 135E South on 135E South on 135E South on 140035 South on 14035 South on 1435 South on 14035 South on 14035	West on IH 30 4 Miles South on I35 E Toll 3.3 Miles South on I35 E Toll 3.3 Miles South on IH 4035E 1.6 Miles South on IH0035E 6.7 Miles South on IS5 E 6.7 Miles South on IS5E 6.7 Miles South on US0077 9.8 Miles South on IH0035E 26.3 Miles South on IH0035E 26.3 Miles South on IH0035E 26.3 Miles South on IH0035E 16.2 Miles South on IH0035 12.2 Miles South on IH0035 2.1 Miles South on IH035 2.1 Miles South on IH035 3.4 Miles South on IH035 7.6 Miles South on IH035 3.4 Miles South on IH35 2.6 Miles South on IH35 3.6 Miles South on IH35 4.6 Miles South on IH35(2B) 4.5 Miles South on IH35(2B) 4.5 Miles South on IH35(2B) 6.7 Miles South on IH35(2B) 6.7 Miles West on IH0035 6.7 M	West on IH 30 4 Miles (20.7 Miles) South on I35 E Toll 1.3 Miles (22.2 Miles) South on I35 E Toll 3.3 Miles (25.3 Miles) South on I14 35E HOV 1.6 Miles (22.0 Miles) South on I14 35E HOV 1.6 Miles (27.0 Miles) South on I14035E 6.7 Miles (33.6 Miles) South on I35E 6.7 Miles (33.6 Miles) South on US0077 9.8 Miles (49.8 Miles) South on I10035E 26.3 Miles (77.1 Miles) South on IH0035E 26.3 Miles (77.1 Miles) South on IH0035E 16.2 Miles (10.5 5 Miles) South on IH035 12.2 Miles (10.2 1 Miles) South on IH 35 16.2 Miles (10.2 1 Miles) South on IH 35 21.3 Miles (13.2 1 Miles) South on IH 35 7.6 Miles (11.0 Miles) South on IH35 7.6 Miles (14.1 3 Miles) South on IH35 7.6 Miles (14.1 3 Miles) South on IH35 2.6 Miles (14.4 5 Miles) South on IH35(2B)	West on IH 30 4 Miles (20.7 Miles) South on I35 E Toll 1.3 Miles (22.3 Miles) South on I35 E Toll 3.3 Miles (22.5 Miles) South on I35 E Toll 3.3 Miles (22.5 Miles) South on IH0035E 6.7 Miles (3.6 Miles) South on IS5E 6.4 Miles (40.0 Miles) South on US0077 9.8 Miles (49.8 Miles) South on I35E 2.6 Miles (40.0 Miles) South on I35E 2.8 Miles (50.7 Miles) South on I35E 2.8 Miles (49.8 Miles) South on IH0035E 2.2 Miles (50.7 Miles) South on IH0035E 2.2 Miles (50.7 Miles) South on IH035 1.2 Miles (10.5 Miles) South on IH035 2.1 Miles (10.5 Miles) South on IH035 2.1 Miles (10.8 Miles) South on IH035 2.1 Miles (10.8 Miles) South on IH35 7.6 Miles (11.0 Miles) South on IH035 7.6 Miles (14.1 Miles) South on IH035 1.2 Miles (14.4 M

Appendix A: Data creation process

The operations we perform to create the dataset are as follows:

1) Read the Texas road network from the SAM Dataset and add the other three layers (bridges, vertical clearance and pavement condition).

Layers				8
Layers in Order of Display	Sample	Status		
SAMV3_Endpoints	•	Hidden	~	Close
SAMV3_Network				
PMIS Layer	•			Hide Layer
ShortBridgeData Laye	·		_	Add Layer
verticalclearance	•			Drop Layer
			Ŧ	Move Up Move Down
Style Labels	Autosca	e Renam	ie	Metadata
Geographic File C:\Data\ve	erticalclearan	ce.shp		

2) Select only road links from the network (exclude rail and air).

Select by Condition (Dataview: S	SAMV3_Network)	8
Enter a Condition RouteID=nul 		OK Cancel
Condition Builder	Set Name Selection	Verify Clear Save
Function List Values	Create Set Previous Conditions	Load
	🔲 Select from visible features only	

3) Overlay the vertical clearance shapefile on the data with a band size of 0.5 miles.

Overlay (Layer: SAMV3_Network)	23
Overlay All Features Band size 0.5 Miles	OK Cancel
With Layer verticalclearance	Attributes
Include All Features	

4) Export this overlay map and save it.

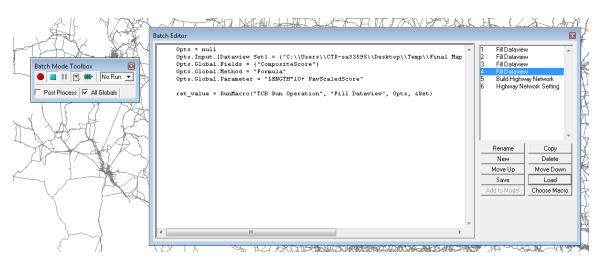
Export SAMV3_Network Geography
Export All Features
To Compact Geographic File 💌
Data Field DATA
Node Data Field DATA
Output Names
Layer Name SAMV3_Network
Node Name SAMV3_Endpoints
Options
,
Options
Options Include Built-in Data
Options Include Built-in Data Add layer to map

- 5) On this overlaid map, overlay the bridge data with a band size of 0.05 miles (this data is fairly accurate, geographically).
- 6) Export and save this overlay map.
- 7) Open this saved map and overlay the pavement data with a band size of 0.05 miles.
- 8) Export and save this final map.
- 9) Open the dataview of the map, and delete the columns we are not using.
- 10) Use the vertical clearance data fields along with the bridge over/under data fields to add an attribute of maximum vertical clearance to all the links. (This is a four-digit code, with first two showing feet and next two showing inches, e.g., a clearance of 12 feet and 5 inches will have 1205 as the attribute).
- 11) Use the bridge data to fill in the maximum load capacity of certain links (in tons).
- 12) From the pavement data, assign a condition score to each road.
- 13) Export this dataset. This is our final dataset.

Appendix B: Modifying the optimization criteria

The user can modify the parameters of the optimization criteria using the Batch Mode Toolbox.

Item number 4 contains the formula with the weights of the travel distance and the pavement score.



Item number 6 contains the left turn and right turn penalties.



Appendix C: Labeling the Main Highways

The user can add labels for the main highway names by pressing the automatic labels button:

abels Overlaps Frames	1	
General		
Field NAME		Save
Position Centered abov	e	▼ Load
Allow Dupli	ment C Stretch cates Spacing 0 to Character	Inches
Font Andalus Angsana New Angsana UPC Aparajita Arabic Transparent	Color	old 🗆 Italic

Then, in the "Overlaps Menu", the user should make sure the 'prevent overlapping labels' option is selected.

abels Overlaps	Frames		
Overlaps			
Prev	vent overlapping labe	ls	
Alt. Field		•	
Layer Priority	7 (Low)	•	
Within th	ne layer based on Hi	gher 💌	
values of	LENGTH	<u> </u>	
and an			
Autoscale			
Autoscale Current Scale	1:17,578,053	Clear	
	1:17,578,053	Clear	
Current Scale	1:17,578,053	Clear	
Current Scale Largest	1:17,578,053	Clear	
Current Scale Largest	1:17,578,053	Clear	