



LU & Traffic Analysis | JRS Map | TAZ Map | User Guide

Land Use Data Sample/Template

Browse... Upload [Land Use Data]

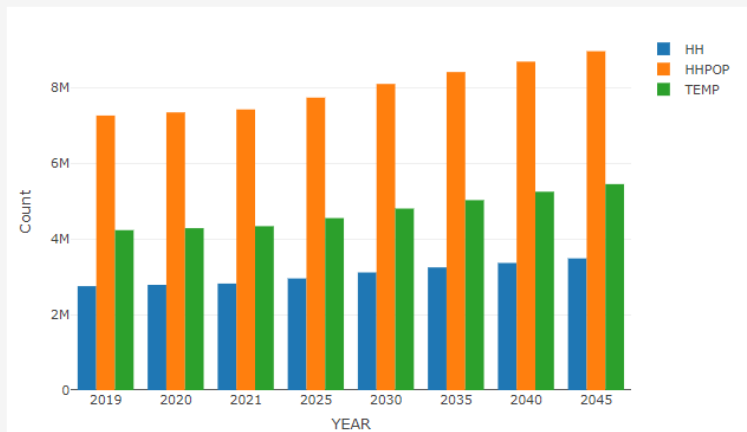
Please download the template on the left and upload it with your input

Jurisdiction: All | City: All | JRS: All | TAZ: All | Growth Method: Simple | Alpha (1.0 to 1.5): 1.5

Production and Attraction

YEAR	HH	HHPOP	TOTEMP
2019	2,753,163	7,268,266	4,235,221
2020	2,787,518	7,351,946	4,287,262
2021	2,821,362	7,430,111	4,340,554
2025	2,956,878	7,742,742	4,554,059
2030	3,115,506	8,104,589	4,806,757
2035	3,249,283	8,419,428	5,029,637
2040	3,366,633	8,694,838	5,252,144
2045	3,487,592	8,970,465	5,454,003

Distribution of Production and Attraction



# LAND USE COMPLETE INTERACTIVE (LUCI)

Developed for Virginia Department of Transportation (VDOT) by Connetics Transportation Group (CTG)

August 2020

# OVERVIEW

Land Use Complete Interactive (LUCI) is a program, designed to forecast productions (population) and attractions (employment) of future traffic based on current year's datasets. It applied two growth computation methods - compound and simple growth methods.

LUCI's analysis area of LUCI is Washington D.C. Metropolitan Area, consisting of Washington D.C., a portion of Maryland (MD), Northern Virginia (NOVA), and partial West Virginia (WV).

This web-application was developed based on a standalone Excel LUCI, which was developed by Ed Azimi at Virginia Department of Transportation (VDOT). Connetics Transportation Group (CTG) is contracted to transform the Excel version into a web-app, bringing more flexibility and accuracy.

# DISCLAIMER

This program is to provide valuable resources to assist engineers, transportation professionals, and policymakers in achieving a technically based decision. The author is not responsible for the miss-use of the program's outputs and the accuracy of the outputs in conjunction with input information provided by users.

# LOG-IN PAGE

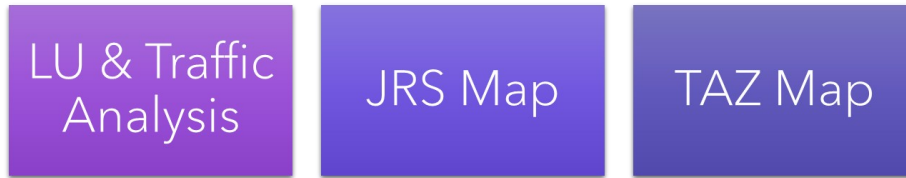
The LUCI web-app require a login credential to access it. Any user without the correct credential cannot access the web-app.



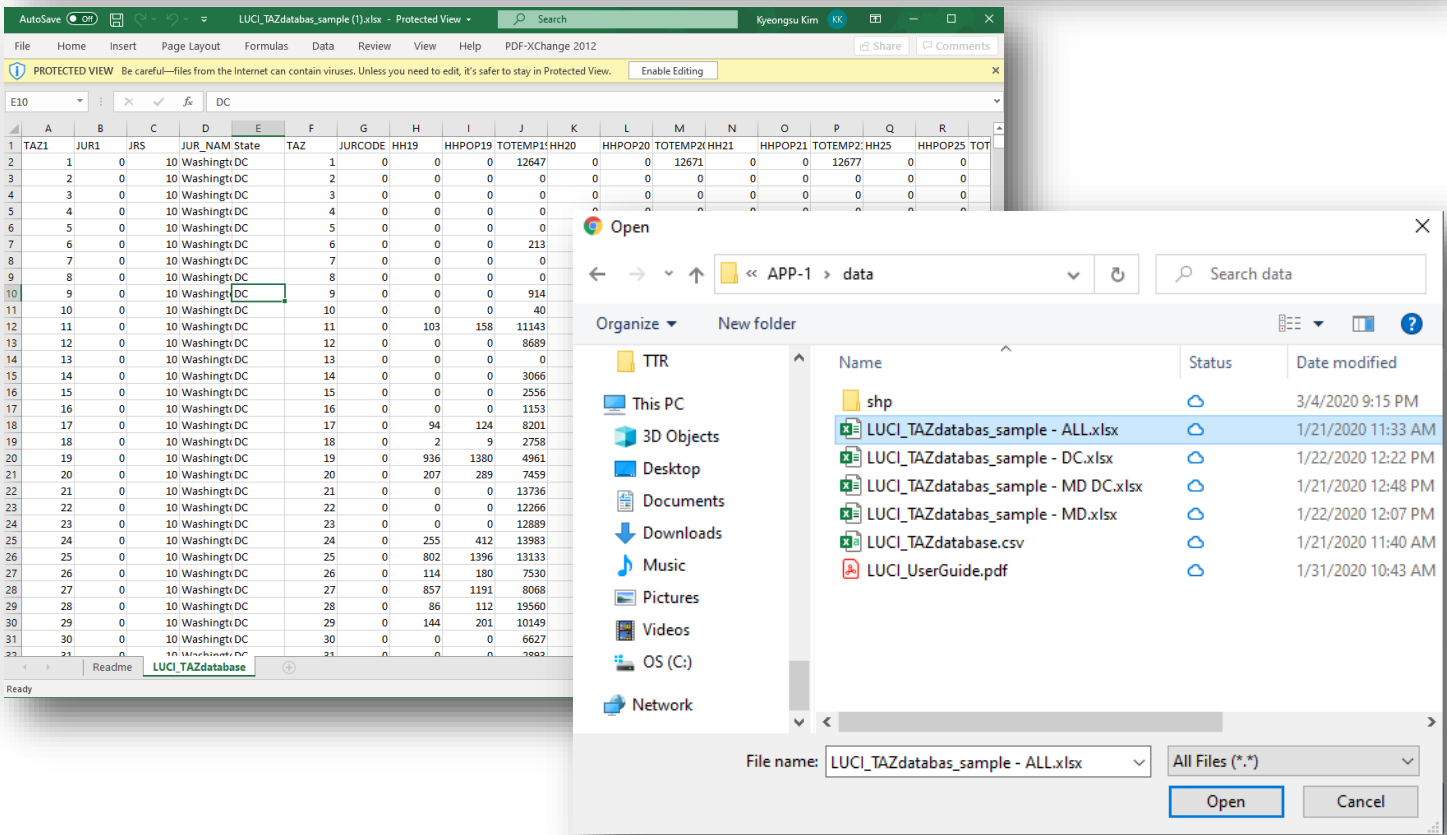
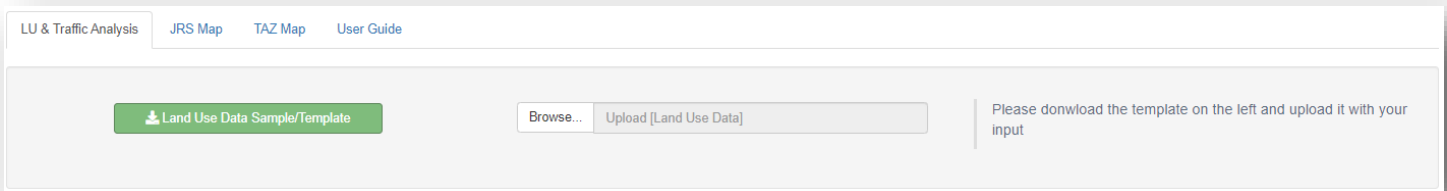
The screenshot shows the login interface for the LUCI web-app. At the top center is the VDOT logo, which consists of the letters 'VDOT' in blue with an orange swoosh, followed by the text 'Virginia Department of Transportation' in orange. Below the logo is the text 'LUCI | Land Use Complete Interactive'. A horizontal line separates the header from the login form. The form contains two input fields: 'Username' with the text 'luci' and 'Password' with five dots. Below the password field is a 'Log in' button. At the bottom of the page, there is a footer text: 'This tool has been developed & maintained by Ed Azimi, NOVA-TP, 1995-2020'.

# INPUT/ OUTPUT

LUCI consists of three Core tabs



The program requires socio-demographic forecasting data. A sample data template (.xlsx file) that contains input data structure is downloadable in a web-app (see below figure). Once users update the socio-demographic forecasting data (when new data is available or required to use), LUCI will be ready to provide the latest information based on the newly uploaded input file.



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LUCI

Land Use Complete Interactive

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Please download the template on the left and upload it with your input

Jurisdiction	City	JRS	TAZ	Growth Method	Alpha (1.0 to 1.5)
All	All	All	All	Simple	1.5
DC	Anne Arundel County	10	1	Simple	
MD	Arlington County	100	2	Simple	
NOVA	Calvert County	200	3	Compound	
VA-X	Carroll County	312	4		
WV	Charles County	321	5		
	City of Alexandria	322	6		
	City of Fairfax	325	7		
	City of Falls Church	332	8		
	TOTEM				
2019	2,750,000	4,235,200			
2020	2,780,000	4,287,200			
2021	2,821,362	7,430,111			
2025	2,956,878	7,742,742			
2030	3,115,506	8,104,589			
2035	3,249,283	8,419,428			
2040	3,366,633	8,694,838			
2045	3,487,592	8,970,465			

Parameters in LUCI include specifications of geographies (State, County (City), JRS ID, and TAZ), growth methods, and the value of alpha in the calculation methods. The selections of State, County, JRS ID, and TAZ are extracted from the data file uploaded by users. The alpha value is set as 1.5 by default. However, users can always specify it within the range of 1.2 to 1.5. The Growth Method is predefined as "Simple" and "Compound." The calculation details are shown below equation.

$$R_{simple} = \left\{ \frac{HH_{y2}/HH_{y1} + \alpha \cdot TE_{y2}/TE_{y1}}{1 + \alpha} \right\} / (y2 - y1) - 1$$

Equation - Simple Method

$$R_{compound} = \left\{ \frac{HH_{y2}/HH_{y1} + \alpha \cdot TE_{y2}/TE_{y1}}{(1 + \alpha)} \right\}^{(y2 - y1) - 1} - 1$$

Equation - Compound Method

where,  $R$  is the traffic growth rate;  $HH$  is the number of households;  $TE$  indicates the total number of employments.  $\alpha$  is the weighted average variable;  $y2$  and  $y1$  represent a later year and a previous year, respectively.

Based on the data file uploaded and parameters set, a corresponding data subset is filtered out for analysis purposes. LHD program generates four tables, as shown below: Population & Attraction, Distribution of Production and Attraction, Annual Land Use (LU) Growth from Previous Periods (%), and Annual LU & Traffic Growth Rate since current year (%).

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**LUCI**  
Land Use Complete Interactive

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Please download the template on the left and upload it with your input

**Jurisdiction**

**City**

**JRS**

**TAZ**

**Growth Method**

**Alpha (1.0 to 1.5)**

**Production and Attraction**

YEAR	HH	HHPOP	TOTEMP
2019	2,753,163	7,268,266	4,235,221
2020	2,787,518	7,351,946	4,287,262
2021	2,821,362	7,430,111	4,340,554
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**Distribution of Production and Attraction**

**Annual LU Growth from Previous Period (%)**

YEAR	HH	HHPOP	TOTEMP	TRAFFIC
2020	1.25	1.15	1.23	1.24
2021	1.21	1.06	1.24	1.23
2025	1.20	1.05	1.23	1.22
2030	1.07	0.93	1.11	1.10
2035	0.86	0.78	0.93	0.90
2040	0.72	0.65	0.88	0.82
2045	0.72	0.63	0.77	0.75

Legend: <0.5, (0.5, 0.75], (0.75, 1), >1

SimpleMethod : Wt. Avg. TrafficGrowth =  $\left[ \frac{HH_2/HH_1 + TE_2/TE_1 * \alpha}{1 + \alpha} \right] / (y_2 - y_1) - 1$

**Annual LU & Traffic Growth Rate since 2019 (%)**

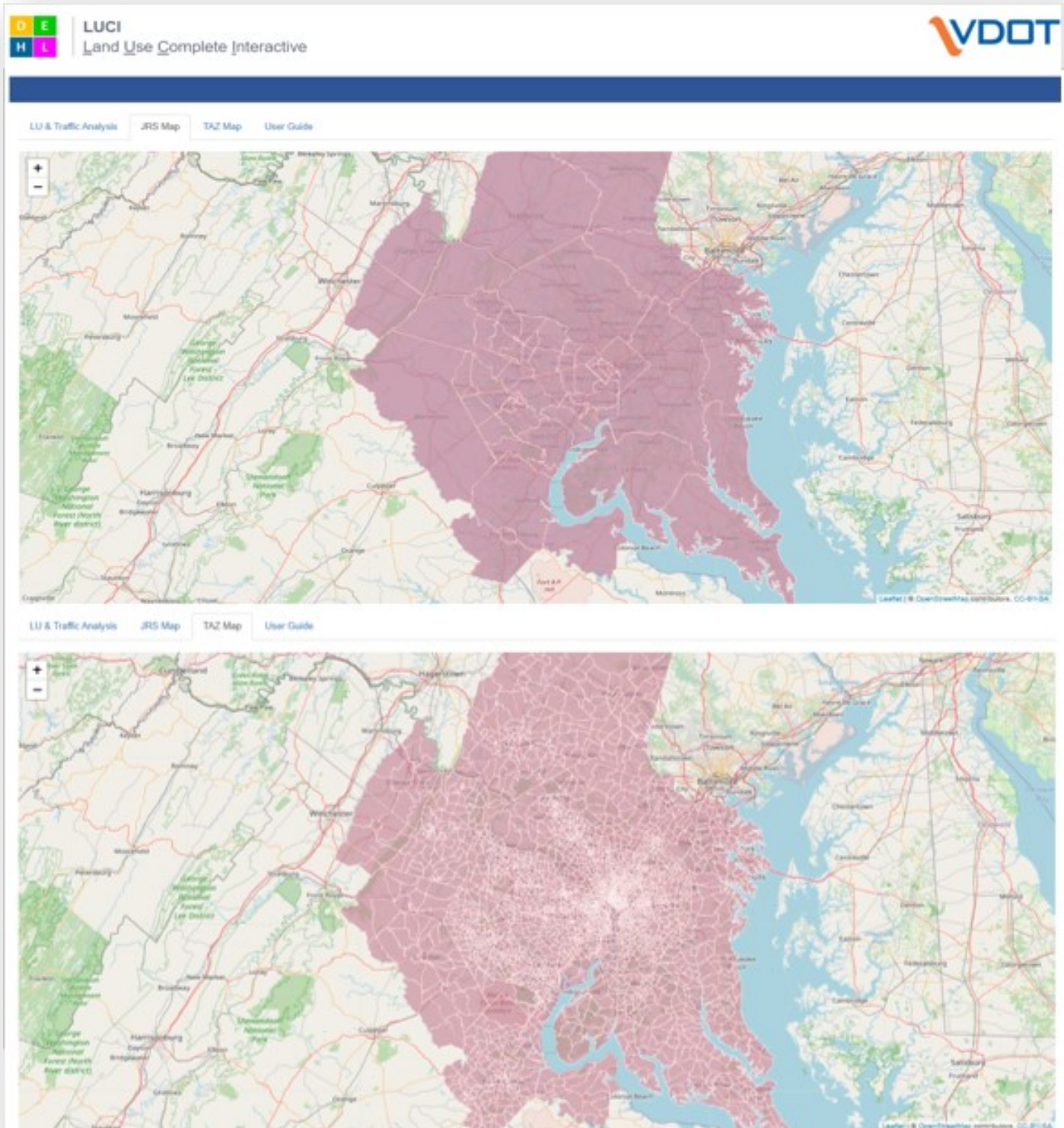
YEAR	HH	HHPOP	TOTEMP	TRAFFIC
2020	1.25	1.15	1.23	1.24
2021	1.24	1.11	1.24	1.24
2025	1.23	1.09	1.25	1.25
2030	1.20	1.05	1.23	1.21
2035	1.13	0.99	1.17	1.15
2040	1.06	0.93	1.14	1.11
2045	1.03	0.90	1.11	1.07

Legend: <0.5, (0.5, 0.75], (0.75, 1), >1

CompoundMethod : Wt. Avg. TrafficGrowth =  $\left[ \frac{HH_2/HH_1 + TE_2/TE_1 * \alpha}{1 + \alpha} \right]^{1/(y_2 - y_1)} - 1$

\*JRS; short for "Jurisdiction Ring Sector" is a polygon of TAZs based on Corridor.

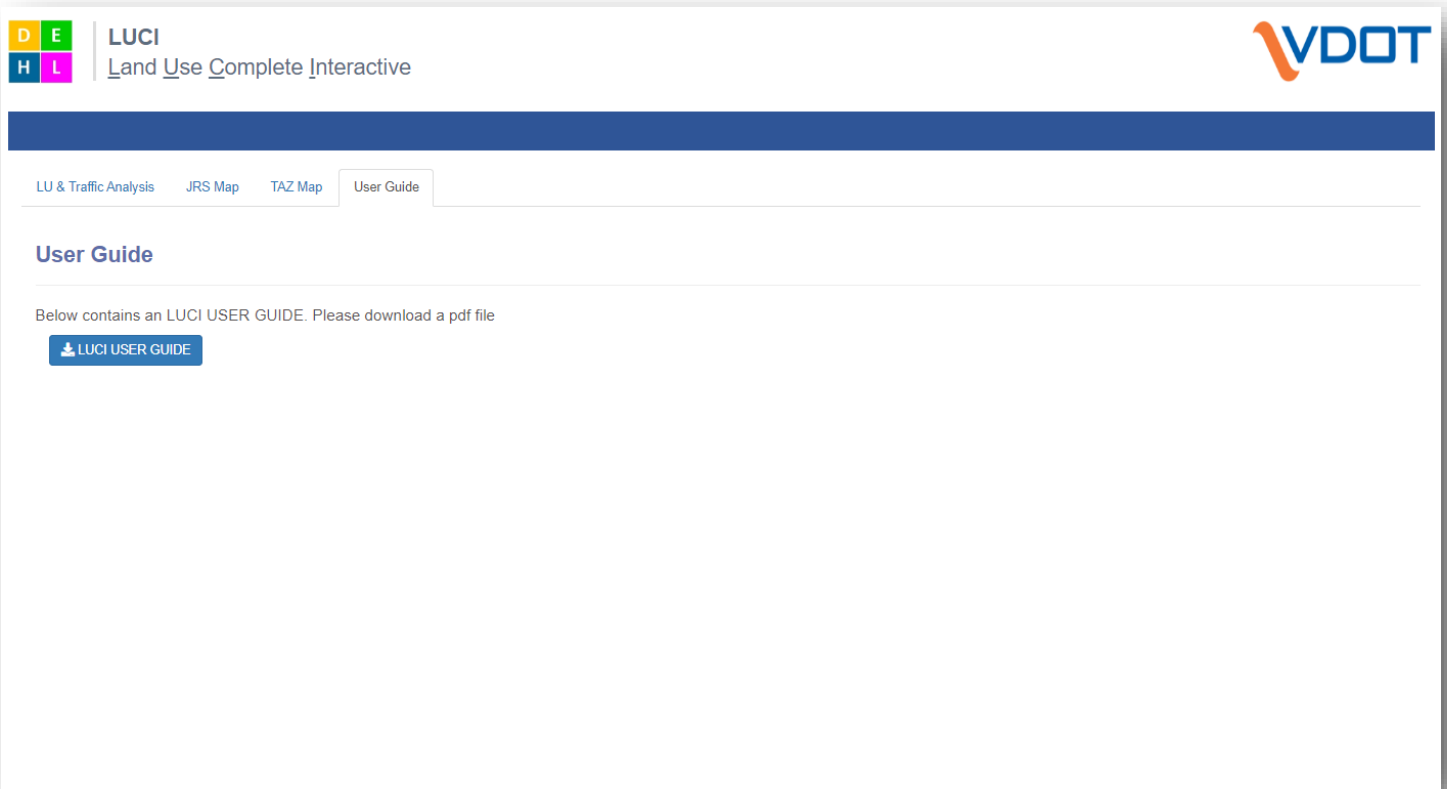
The map module consists of two parts, the **JRS map**, and the **TAZ map**. The JRS map is rendered in the level of county level. With mouse hovering on the county polygons, detailed information will be displayed on top. The TAZ map is rendered at the TAZ level, which is more detailed and precise for references. Similarly, detailed information regarding a TAZ will be popped up when mouse hovering over. Some other basic map manipulation tools are also available, such as zoom in & out, panning over, etc.





# USER GUIDE

It includes a download link of a PDF version user guide.



The screenshot shows the LUCI web application interface. At the top left, there is a logo with the letters 'D', 'E', 'H', and 'L' in colored squares. To its right, the text 'LUCI Land Use Complete Interactive' is displayed. The VDOT logo is in the top right corner. Below the header is a dark blue horizontal bar. Underneath this bar is a navigation menu with four items: 'LU & Traffic Analysis', 'JRS Map', 'TAZ Map', and 'User Guide'. The 'User Guide' item is highlighted with a white background. Below the navigation menu, the heading 'User Guide' is shown. A line of text reads: 'Below contains an LUCI USER GUIDE. Please download a pdf file'. Below this text is a blue button with a white download icon and the text 'LUCI USER GUIDE'.

This User Guide was developed for Virginia Department of Transportation (VDOT) by Connetics Transportation Group (CTG), <https://ctgconsult.com>