

Instructions on Data Collection for the Time/Cost-Distance Methodology

- Basic Template Version -



What is the Time/Cost – Distance Methodology?

- The “Time/Cost – Distance Methodology” is the graphical representation of cost and time data associated with transit transport processes. The purpose of the model is to identify inefficiencies and isolate bottlenecks along a particular transit route by looking at the cost and time characteristics of every section along a transit route.
- The “Time/Cost – Distance Methodology” enables policy makers to:
 - ❑ compare - over a period of time - the changes of cost and/or time required for transportation on a certain route;
 - ❑ compare and evaluate competing modes of transport operating on the same route;
 - ❑ compare alternative transit routes.

Benefits of the Time/Cost – Distance Methodology

- The “Time/Cost – Distance Methodology” includes a detailed break-down of cost and time spent, for example, associated with border crossings. This may be particularly useful to policy makers focusing their policy approaches on the most critical issues. In addition, the inclusion of data on inventory costs for particular commodities, demurrage charges and other indirect costs may be useful to specific export/import industries in evaluating their logistics performance.
- The use of the “Time/Cost – Distance Methodology” allows national stakeholders to track time and cost issues along transport routes. Thereby it helps to identify bottlenecks and barriers in international transport.
- The information on time and cost involved on certain routes informs general transport facilitation policy decisions (e.g. route prioritization, allocation of funds, allocation of socio-economic development efforts).

Objectives of instructions and technical requirements

- Main objectives of the data collection exercise in cooperation with countries are:
 1. Familiarization of national stakeholders in the transport sector with the “Time/Cost – Distance Methodology”, so that they can apply it on their own
 2. Development of a comprehensive database based on the data collection
- The following instructions explain how to use the “Time/Cost – Distance Methodology” step-by-step using an example for a route from Kampala, Uganda to Shanghai, China. They aim to familiarize national stakeholders in the transport sector with the “Time/Cost – Distance Methodology” and to enable them the use of the methodology.
- Please note: The “Time/Cost – Distance Methodology” requires the installation of Microsoft Excel Software on your workstations.

What kind of data is collected?

- The questionnaire for the application of the “Time/Cost – Distance Methodology” captures qualitative and quantitative information. On the following slides the information required for every line of the questionnaire will be explained.
- Preliminary information required:
 1. Decision on a transport route including place of departure, any kind of stops (e.g. for fuel, border crossings) and destination
 2. Decision on the type of goods transported (e.g. specification if only one kind or multi-packaging of goods) as well as on the quantity and/or value.
- One possibility to obtain the required data would be to directly contact transport operators and/or **freight forwarders** involved in cargo transport along the specified route. The **national freight forwarders association** may help to identify relevant transport operators or freight forwarders.

The questionnaire – One MS Excel worksheet, three parts

-UNCTAD Project "Capacity Building in Trade and Transport Facilitation for Landlocked and Transit Developing Countries"

Part I

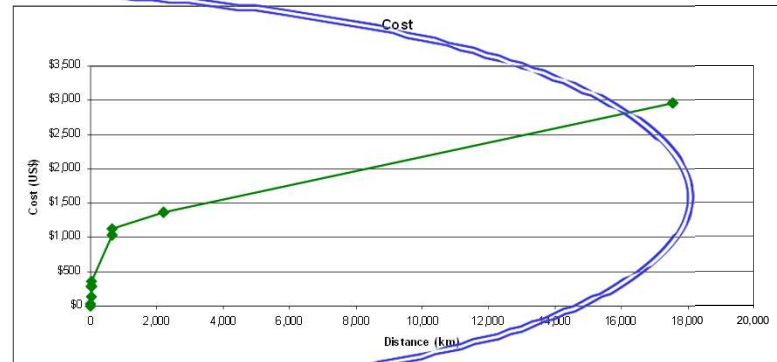
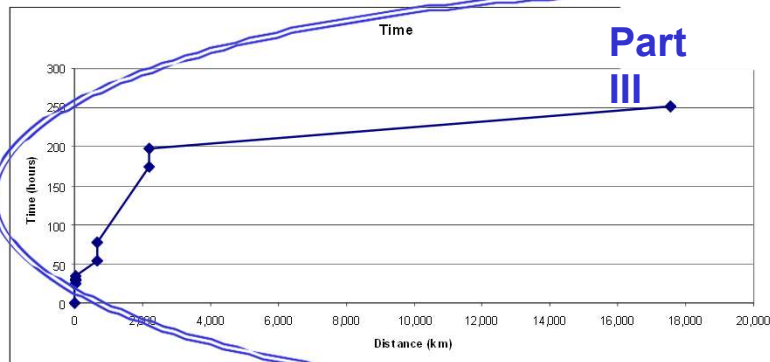
Questionnaire for Application of Time/Cost-Distance Model

a. Date of questionnaire completion: b 16/02/2007
 Route description: Transit Transport from Vientiane (Lao PDR) to Rotterdam (Netherlands) via Bangkok Port (Vietnam)
 c. Goods: 1 TEU
 d. Quantity: not available [Only applicable when road] not available [Only applicable when road] not available
 e. Nationality of driver: not available
 f. Country of vehicle registration: g
 Effective date of transport start: h Effective delivery date of goods:
 i. Was the transport performed under an international transit system (e.g. TIR, NCTS)? not available

Data table (Please fill in the highlighted cells and scroll down to see how the data translates into the graphs of "Time to Distance" and

Part II

Line no.	Place of departure (place and country)	Mode of transport	Distance to next stop (km)	Duration of travel		Costs while en route (in USD)	Place of next stop (place and country)	Reason for stop	Duration of stop		Costs at stop (in USD)	Description of actions taken (e.g. procedures, formalities applicable to the section of the route). Please also provide a break-down of costs as well as a break-down of time used for individual procedures (e.g. customs, fueling).	Cumulative distance (km)	Cumulative time (in hours)	Cumulative costs (in USD)
				hrs	min				hrs	min					
1	Vientiane (Lao PDR)	-	0	0	0	\$0.00	Vientiane (Lao PDR)	Place of Departure (Pre-shipment formalities and loading)	24	0	\$28.17	Break-down of cost: \$18 for customs papers, \$10.17 for uploading. Break-down of time: 17 hours for uploading, 3 hours waiting, 4 hours customs procedures	0	24.00	\$28.17
2	Vientiane (Lao PDR)	road	25	1	30	\$112.68	Thanaleng (Lao PDR)	Intermediate Stop	4	0	\$140.00	At stop: clearance (1hr, no cost), storage and loading (3 hrs, \$140) during travel: \$112.68 for operational costs	25	25.50	\$140.85
3	Thanaleng (Lao PDR)	road	0	0	0	\$0.00	Friendship Bridge (Lao PDR)	Exit Border Crossing	0	0	\$0.00	customs and other formalities	25	29.50	\$280.85
4	Friendship Bridge (Lao PDR)	road	3	0	30	\$0.00	Nongkai (Thailand)	Entry Border Crossing	5	0	\$85.00	gate fee (\$ 20, 2 hrs wait period), weight fee (\$20, 1hr), unloading plus transit entry document (\$45, 2 hrs)	25	29.50	\$280.85
5	Nongkai (Thailand)	road	630	19	0	\$676.00	Bangkok Port (Thailand)	Intermediate Stop	24	0	\$92.00	Unloading, loading, storage, seal inspections, clearances	25	29.50	\$280.85
6	Bangkok Port (Thailand)	ship	1,540	96	0	\$230.00	Port of Singapore (Singapore)	Intermediate Stop	24	0	\$0.00	waiting for transshipment, feeder connection (24 hrs)	658	54.00	\$1,041.85
7	Port of Singapore (Singapore)	ship	15,350	3	0	\$1,602.00	Rotterdam Port (Netherlands)	Final Destination	0	0	\$0.00		28	35.00	\$365.85
												658	78.00	\$1,133.85	
												2,198	174.00	\$1,363.85	
												2,198	198.00	\$1,363.85	
												17,557	252.00	\$2,965.85	
												17,557	252.00	\$2,965.85	



How to fill out Part I of the questionnaire?

	B	C	D	E	F	G
3	Questionnaire for Application of UNESCAP Time/Cost-Distance Model					
5	a	Date of questionnaire completion:			16-Feb-07	
6	b	Route description:			Transit Transport from Vientiane (Lao PDR) to Rotterdam (Netherlands) via Bangkok Port	
7	c	Goods:			Garment	
8	d	Quantity:			1 TEU	
9	e	Nationality of driver:			not available [Only applicable when road]	
10	f	Country of vehicle registration:			not available [Only applicable when road]	
11	g	Effective date of transport start:			05-Mar-00	
12	h	Effective delivery date of goods:			not available	
13	i	Was the transport performed under an international transit system (e.g. TIR, NCTS)?			not available	

- Please fill out rows a to i with the information required:

Row a: Please insert the date of questionnaire completion.

Row b: Please provide a description of the route (e.g. place of departure and destination).

Row c: Please choose the type of goods and indicate, whether it is only one type or different types of goods.

Row d: Please indicate the quantity and/or value of the goods transported.

Row e: [for road only] Please enter the nationality of the driver is important for road transport.

Row f: [for road only] Please enter country of vehicle registration.

Row g: Please provide the date when the goods are supposed to leave the place of departure.

Row h: Please provide the date when the goods are supposed to arrive at their final destination.

Row i: Please indicate any international transit system which has been used for the chosen transport, if the transport is not an international system then please say so in your response.

How to fill out Part II of the questionnaire? – I/IV

Microsoft Excel - 160207_TC Model Example master file.xls

File Edit View Insert Format Tools Data Window Help

Type a question for help

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J23 Exit Border Crossing

Line no.	Place of departure (place and country)	Mode of transport	Distance to next stop (km)	Duration of travel		Costs while en route (in USD)	Place of next stop (place and country)	Reason for stop	Duration of stop		Costs at stop (in USD)	Description of actions taken (e.g. procedures, formalities applicable to the section of the route). Please also provide a break-down of costs as well as a break-down of time used for individual procedures (e.g. customs, fueling).
				hrs	min				hrs	min		
1	Vientiane (Lao PDR)	-	0	0	0	\$0.00	Vientiane (Lao PDR)	Place of Departure (Pre-shipment formalities and loading)	24	0	\$28.17	Break-down of costs: \$18 for customs papers, \$10.17 for uploading Break-down of time: 17 hours for uploading, 3 hours waiting, 4 hours customs procedures
2	Vientiane (Lao PDR)	road	25	1	30	\$112.68	Thanaleng (Lao PDR)	Intermediate Stop	4	0	\$140.00	At stop: clearance (1hr, no cost), storage and loading (3 hrs, \$140) during travel: \$112.68 for operational costs
3	Thanaleng (Lao PDR)	road	0	0	0	\$0.00	Friendship Bridge (Lao PDR)	Exit Border Crossing	0	0	\$0.00	customs and other formalities
6	Friendship Bridge (Lao PDR)	road	3	0	30	\$0.00	Nongkai (Thailand)	Entry Border Crossing	0	0	\$85.00	gate fee (\$ 20, 2 hrs wait period), weight fee (\$20, 1hr), unloading plus transit entry document (\$45, 2 hrs)
8	Nongkai (Thailand)	road	630	19	0	\$676.00	Bangkok Port (Thailand)	Intermediate Stop	4	0	\$92.00	Unloading/loading, storage, seal inspections, clearances
9	Bangkok Port (Thailand)	ship	1,540	96	0	\$230.00	Port of Singapore (Singapore)	Intermediate Stop	24	0	\$0.00	waiting for transshipment, feeder connection (24 hrs)
10	Port of Singapore (Singapore)	ship	15,353	54	0	\$1,602.00	Rotterdam Port (Netherlands)	Final Destination	0	0	\$0.00	

- Please fill out all of the highlighted cells in Part II of the questionnaire.
- Please read each line from left to right. Each line captures one section of the journey (i.e. from one stop to another).
- Please note that the cells circled contain drop-down menus, which you see when clicking on the cell. Please choose your answers from the drop-down menu.

How to fill out Part II of the questionnaire? – II/IV

Line no.	Place of departure (place and country)	Mode of transport	Distance to next stop (km)	Duration of travel		Costs while en route (in USD)	Place of next stop (place and country)	Reason for stop	Duration of stop		Costs at stop (in USD)	Description of actions taken (e.g. procedures, formalities applicable to the section of the route). Please also provide a break-down of costs as well as a break-down of time used for individual procedures (e.g. customs, fueling).
				hrs	min				hrs	min		
1	Vientiane (Lao PDR)		0	0	0	\$0.00	Vientiane (Lao PDR)	Place of Departure (Pre-shipment formalities and loading)	24	0	\$28.17	Break-down of costs: \$18 for customs papers, \$10.17 for uplo... Break-down of time: 17 hours for uploading, 3 hours waiting, 4 hours customs procedures
2	Vientiane (Lao PDR)	road	25	1	30	\$112.68	Thanaleng (Lao PDR)	Intermediate Stop				At stop: clearance (1hr, no cost), storage and loading (3 hrs, \$140) during travel: \$112.68 for operational costs
3	Thanaleng (Lao PDR)	road	0	0	0	\$0.00	Friendship Bridge (Lao PDR)	Exit Border Crossing	0	0	\$0.00	customs and other formalities

- Please fill out row 1 (highlighted cells only):
 - **Step 1:** Enter the name and the country that indicate the place of departure. For example: Vientiane (Lao PDR), as above, or Kampala, Uganda
 - **Step 2:** Enter the total amount of time spent at the place of departure by providing the hours and the minutes. Please enter the total amount of time (For example: 20 minutes for fueling, 15 minutes for customs and 5 minutes at the restroom, then please enter 40 minutes).
 - **Step 3:** Fill in the amount of costs incurred at the place of departure. If you have several payments, please insert the total amount only (For example: "\$28.17" or if you paid 50 USD for fuel and 10 USD at customs, then please enter "\$60").
 - **Step 4:** Describe any actions (e.g. fueling, rest period) undertaken at the stop and provide details, if applicable, regarding the break-down of the time spent (see step 2) and of the different costs (see step 3).

How to fill out Part II of the questionnaire? – III/IV

Line no.	Place of departure (place and country)	Mode of transport	Distance to next stop (km)	Duration of travel (hrs : min)	Costs while en route (in USD)	Place of next stop (place and country)	Reason for stop	Duration of stop (hrs : min)	Costs at stop (in USD)	Description of actions taken (e.g. procedures, formalities applicable to the section of the route). Please also provide a break-down of costs as well as a break-down of time used for individual procedures (e.g. customs, fuelling).
1	Vientiane (Lao PDR)		6	0 : 0	\$0.00	Vientiane (Lao PDR)	Place of Departure (Pre-shipment formalities and loading)	24 : 0	\$28.17	Break-down of costs: \$18 for customs papers, \$10.17 for uploading Break-down of time: 17 hours for uploading, 3 hours waiting, 4 hours customs procedures
2	Vientiane (Lao PDR)	road	25	1 : 30	\$112.68	Thanaleng (Lao PDR)	Intermediate Stop	4 : 0	\$140.00	At stop: clearance (1hr, no cost), storage and loading (3 hrs, \$140) during travel: \$112.68 for operational costs
3	Thanaleng (Lao PDR)		5			Friedberg	Intermediate Stop			customs and other formalities

- o **Step 5:** Choose from the drop-down menu the mode of transport used to get from departure to next stop.
- o **Step 6:** Enter the distance in kilometer from departure to next stop.
- o **Step 7:** Enter the duration of the journey from departure to next stop by providing the hours and the minutes.
- o **Step 8:** Enter the costs of the journey from departure to next stop in USD. Enter name of
- o **Step 9:** place and country of next stop.
- o **Step 10:** Choose from the drop-down menu the best description of the nature of the stop.
- o **Step 11:** Enter the total amount of time spent at the stop (in hours and minutes).
- o **Step 12:** Fill in the total amount of costs incurred at the stop.
- o **Step 13:** Describe any actions (e.g. fuelling, rest period) undertaken at the stop and provide details, if applicable, regarding a break-down of the time spent (see step 7 and 11) and of the different costs (see step 8 and 12).

How to fill out Part II of the questionnaire? – IV/IV

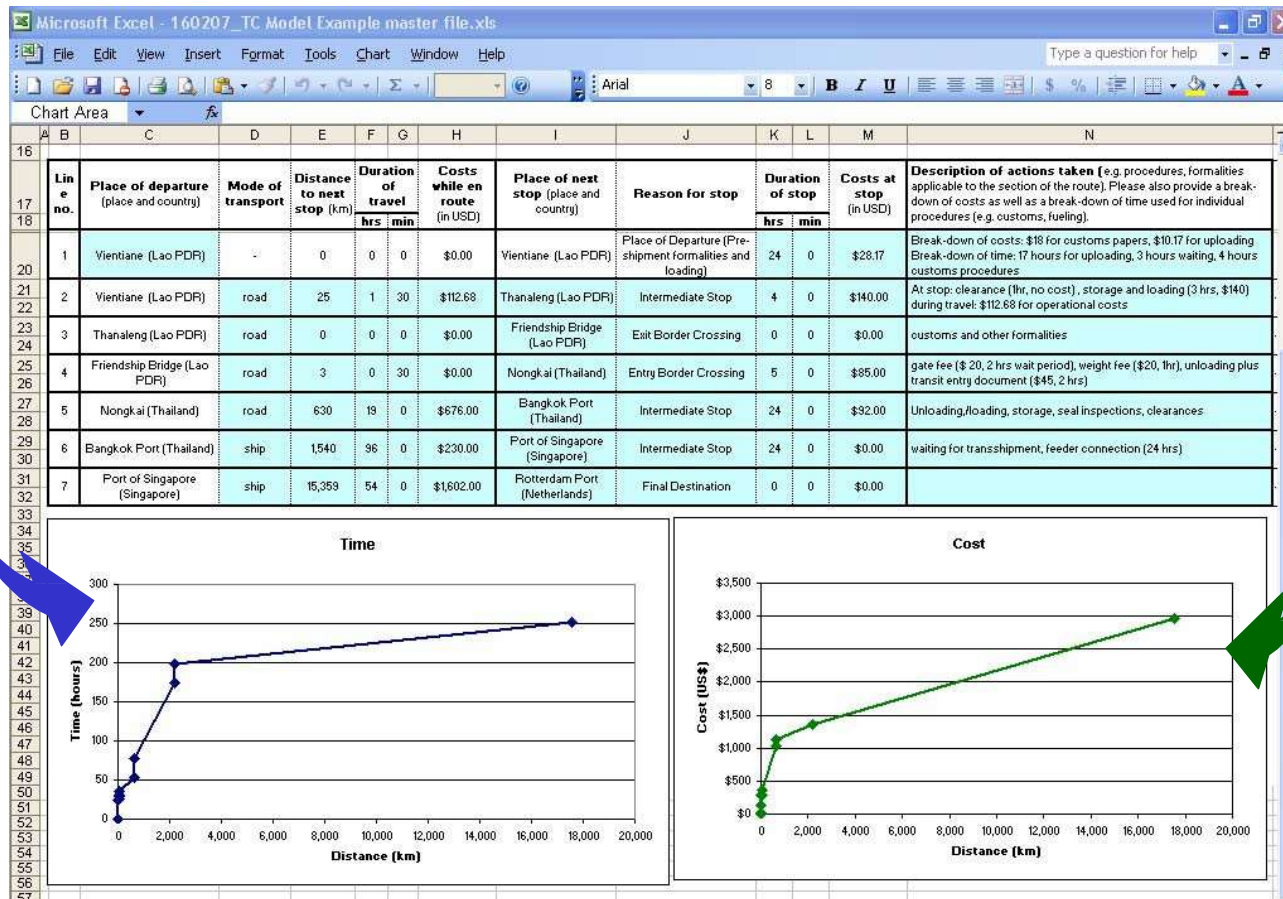
Line no.	Place of departure (place and country)	Mode of transport	Distance to next stop (km)	Duration of travel (hrs min)	Costs while en route (in USD)	Place of next stop (place and country)	Reason for stop	Duration of stop (hrs min)	Costs at stop (in USD)	Description of actions taken (e.g. procedures, formalities applicable to the section of the route). Please also provide a break-down of costs as well as a break-down of time used for individual procedures (e.g. customs, fueling).
6	Bangkok Port (Thailand)	14	15	16	17	18	Intermediate Stop	19	20	21
7	Port of Singapore (Singapore)	ship	15,359	54 0	\$1,602.00	Rotterdam Port (Netherlands)	Final Destination	0	\$0.00	22

Please repeat the steps of row 2 for as many rows as you have stops before reaching the final destination. (In the example there are rows 3 to 6, see slide XII.)

When reaching the final destination, please fill out the last row (highlighted cells only):

- o **Step 14:** Please choose from the drop-down menu the mode of transport used to get from departure to next stop (same as step 5).
- o **Step 15:** Please enter the distance in kilometer from departure to next stop, which will be the final destination (similar to step 6).
- o **Steps 16 and 17:** Please enter the duration and the costs of the journey from departure to next stop in hours.
- o **Steps 18 and 19:** Please enter name and country of the final destination. Choose from the drop-down menu “Final destination”.
- o **Steps 20, 21 and 22:** Please enter the total amount of time and costs spent at the final destination for individual activities. Add a detailed description of activities.

Part III: How to plot the graphs?



- The individual charts “Time over Distance” (left) and “Cost over Distance” (right) are plotted automatically as a function of the information you entered into the highlighted cells.

How to interpret the data and the graphs?

- The y-axis represents either the time or the cost incurred, while the x-axis represents the distance from origin to destination. It is also possible to have two y-axes, one for time and one for cost (Please see back-up slide).
- The unit costs and the time allocation of transport may vary between modes as well as over time, and the steepness of the cost/time curves reflect the actual costs (price) and/or time.
 - The steeper the curve, the more time consuming or costly is the transport along the analyzed route.
 - Vertical steps in each curve indicate a sharp increase of time/cost without an increase in distance (i.e. without movement of the transport).
 - Vertical steps typically occur at stops (e.g. border crossings) and they indicate inefficiencies or bottlenecks on a transport route, since the larger the vertical step, the more time/cost are used for activities undergone at a stop.

Back-Up: How are the graphs plotted?

Microsoft Excel - 160207_TC Model Example master file.xls

File Edit View Insert Format Tools Data Window Help

Type a question for help

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H I J K L M N O P Q R S

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15 the data translates into the graphs of "Time to Distance" and "Cost to Distance.")

16

	Costs while en route (in USD)	Place of next stop (place and country)	Reason for stop	Duration of stop		Costs at stop (in USD)	Description of actions taken (e.g. procedures, formalities applicable to the section of the route). Please also provide a break-down of costs as well as a break-down of time used for individual procedures (e.g. customs, fueling).	Cumulative distance (km)	Cumulative time (in hours)	Cumulative costs (in USD)
				hrs	min					
17	\$0.00	Vientiane (Lao PDR)	Place of Departure (Pre-shipment formalities and loading)	24	0	\$28.17	Break-down of costs: \$18 for customs papers, \$10.17 for uploading	0	24.00	\$28.17
18							Break-down of time: 17 hours for uploading, 3 hours waiting, 4 hours customs procedures			
20	\$112.68	Thanaleng (Lao PDR)	Intermediate Stop	4	0	\$140.00	At stop: clearance (1hr, no cost), storage and loading (3 hrs, \$140)	25	25.50	\$140.85
21							during travel: \$112.68 for operational costs	25	29.50	\$280.85
22	\$0.00	Friendship Bridge (Lao PDR)	Exit Border Crossing	0	0	\$0.00	customs and other formalities	25	29.50	\$280.85
23								25	29.50	\$280.85
24	\$0.00	Nongkai (Thailand)	Entry Border Crossing	5	0	\$85.00	gate fee (\$20, 2 hrs wait period), weight fee (\$20, 1hr), unloading plus	28	30.00	\$280.85
25							transit entry document (\$45, 2 hrs)	28	35.00	\$365.85
26	\$676.00	Bangkok Port (Thailand)	Intermediate Stop	24	0	\$92.00	Unloading/loading, storage, seal inspections, clearances	658	54.00	\$1,041.85
27								658	78.00	\$1,133.85
28	\$230.00	Port of Singapore (Singapore)	Intermediate Stop	24	0	\$0.00	waiting for transshipment, feeder connection (24 hrs)	2,198	174.00	\$1,363.85
29								2,198	198.00	\$1,363.85
30	\$1,602.00	Rotterdam Port (Netherlands)	Final Destination	0	0	\$0.00		17,557	252.00	\$2,965.85
31								17,557	252.00	\$2,965.85
32										

- Every questionnaire contains three additional columns based on which the graphs are plotted. These calculate cumulative distance, cumulative time and cumulative costs:
 - "Time over Distance" graph refers to cumulative distance (x-axis) and cumulative time (y-axis)
 - "Cost over Distance" graph refers to cumulative distance (x-axis) and cumulative cost (y-axis)
- Please note that the cells are automatically calculated and need no additional information from you.