CIVITAS DYN@MO CBA Tool

Example Measure 1 – Changing the use of street

Introduction

This note provides the source data for a hypothetical CIVITAS measure typical of those for which you might wish to carry out a CBA. You can test the tool by using the data on pages 1 and 2. Then, after you obtain a result, you can check the right answer on pages 3, 4 and 5 that will hopefully highlight and explain problems that you experienced – if any – in using the spreadsheet.

The example with input data

Reconstructing a "normal" car street to a Public transport and bicycle street. Both bikes and PT used the street before, but it was then open for car traffic as well. The cars will have to use other routes/roads in the city. Public transport used the street before but in mixed traffic. Now they have their own lane. The biking lane will be widened and there will be fewer junctions with other streets.

General Information

Length of the street: 0,8 km

Country: Germany

Size of city: 200 000

Starting year: The benefits from the measure can be seen when the street "opens" after reconstructing it. In this case in 2014.

Cost

The city plans, designs and builds the new street in 2013. It is open for PT and cyclists February 4th 2014.

The cost for the project is 450 000 Euro. Most of the cost occurs during 2013. Today the operating cost is 4 000 euro per year. With the new design best estimate is that the operating cost will be lowered to 3 000 euro. The road is in poor condition and if not redesigned it in any case needs 60 000 euro spent on it this year for structured maintenance. All costs include VAT (The German VAT rate is 19%).

The network

It is important to define the network correctly. In this case the network is the street that will be redesigned.

Modes

Pedestrians

The pedestrians cannot walk faster because of the new street. They are therefore not affected by the measure, and no information has to be entered for this mode.

Cyclists

The cyclists get a far better situation after the street is rebuilt. The average speed on the street is increased from 14 km/h to 18 km/h.

Also cyclist that used to take other parallel routes now choose the high quality bike street. Before there were 2 000 cyclists in each direction every day. After reconstructing it there are 3 000 in each direction.

Cars

AADT on the street is 7 000 before reconstructing it. Because of the rerouting, the average car has to drive a route that is 0,2 km longer than the street i.e. 1,0 km long. The average vehicle (car) occupancy is 1,2. Speed is 40 km/h.

Public Transport

The speed of public transport is increased with 4 km/h, from 19 km/h to 23 km/h. There are 150 vehicles a day in each direction. The average vehicle occupancy is 17 persons.

Accidents

Because of less conflicts between cars and bikes who used to share the same space, accidents are lowered from 4 to 2 per year. Number of casualties are lowered from 6 to 3.

The answer, sheet by sheet

Things to start with, define the network

In this example the network is the street that is being re-designed. You also have to include the street that cars are rerouted to, otherwise the Do Nothing will have 7000 cars while the Do Something has none and it will not describe then reality very well.

Main Calculation

Country: Germany
Size of city: 200 000
Starting year: 2014

Construction Investment

Remember to enter the costs excluding VAT. The VAT in Germany is 19%.

The investment cost for the Do Nothing is 48 600 euros (excluding VAT) and is entered for 2013 when the money becomes unavailable for other projects. The operating cost for the Do Nothing is 3240 euros per year and occurs the starting year, 2014.

The investment cost for the Do Something is 364 500 euros (excluding VAT) and is entered for 2013 when the money becomes unavailable for other projects. The operating cost for the Do Nothing is 2430 euros per year and occurs the starting year, 2014.

Time

An important sheet to understand. It is very important that you have understood the concept of "the network" and that you defined it correctly.

The street length is 0,8 km and the length of the car re-route is 1,0 km. The travel speed for different modes are given in the example. With this information the travel time can be calculated, see table below.

	DO NOTHING	DO SOMETHING
	Travel Time (minutes)	Travel Time (minutes)
Bike	3,43	2,67
Public Transport	2,53	2,09
Car	1,2	1,5

It is a bit tricky to handle the increasing number of cyclists. You have two options to choose from.

1. Do not count the benefit of shorter travelling time for the "new" cyclists and only look at the existing cyclists. Then enter 2 000 cyclists in both DO NOTHING and DO SOMETHING.
2. - Make a qualified assumption on how much faster the new street is for the "new cyclists".
   - Calculate the average travel time for DO NOTHING (average of new cyclists and existing cyclists).

We recommend that you use nr 1 since it is difficult to estimate how many cyclists will reroute to the new road.

Op cost New Public Vehicles

Since the example measure does not introduce new vehicles you should leave this sheet blank.

Op cost No New Vehicles

The total vehicle km on the network per day is entered. Bikes does not have any operating cost, therefore only count the vehicle km by bus and car. There are 150 buses in each direction, 300 in total.

In the Do Nothing both cars and buses use the old road, with a length of 0,8 km.

In the Do Something buses still use the same road, while cars have to take another route that is 1,0 km long.

Multiply the length of the street by the number of vehicles for each mode. The result should be as shown in the table below.

		Length (km)	Number of vehicles	Distance (km) Do Nothing	Distance (km) Do Something
PT	Do Nothing	0,8	300	240	
	Do Something	0,8	300		240
Car	Do Nothing	0,8	7000	5600	
	Do Something	1,0	7000		7000
			Total:	**5840**	**7240**

Pollutants New Vehicles

No new vehicles are introduced, therefore leave this sheet blank.

Pollutants Public Transport

Since the distance for the Public Transport vehicles does not change, you do not have to enter anything in this sheet.

The value of the Do Nothing and the Do Something cancel out each other and the result is the same as when you leave the sheet blank.

Pollutants Private Cars

Enter the car km on the Network per day for the two options. You can get the car km by multiplying the number of cars with the length of each route.

In the Do Nothing option there are 7000 cars per day and the route is 0,8 km. The car km per day is 5600 km.

In the Do Something option there are 7000 cars per day and the route is 1,0 km. The car km per day is 7200 km.

Safety

Remember that it is accidents and not injuries that you want to enter.

In the Do Nothing there are 4 accidents per year in the network.

In the Do Something option there are 2 accidents per year.

Noise, Health and Ticket Income

For the example measure, leave these sheets blank.

These Parameters are always difficult to value in a CBA. We at Lund will advise you how to do this if you think it is significant for your measure.

Monetary Values

Do not edit this sheet.

Results

Total benefit	-183 469
Total cost	306 571
Net Present Value	-490 040
Benefit-Cost Ratio	-0,6