



logistics community brabant

SUSTAINABILITY SCAN MANUAL

A tool for a more sustainable future of events

INTRODUCTION

This is the manual for the use of the sustainability scan developed as a graduation project by Danique van Oort. The manual is a step-by-step explanation of how to use the sustainability scan and the goal of the scan. The sustainability scan is, for now, only focused on the CO2 emissions related to passenger traffic to and from events. In the future, the scan could be expanded to include other polluters as well. But for now, the choice has been made to focus on one polluter to create a valuable pilot version.

Please follow the instructions in this manual to receive the right results. The result of the scan is the current CO2 emission of your event. By repeating the scan every year, success or failure can be measured. In order to be successful in decreasing CO2 emissions, relevant tips are given at the end to guide you in the right direction.

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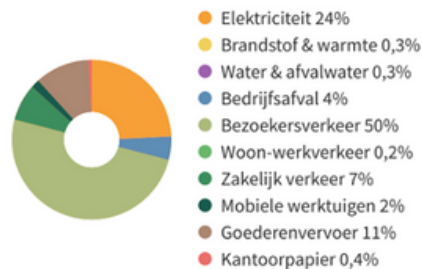
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01 WHY A SUSTAINABILITY SCAN?

The events industry is forced to become more sustainable. The biggest polluter is the movements to and from the event. Think about transporting goods and products, crew and artist traffic, and passenger traffic. These forms of movement all come together in the term mobility. Within mobility, it matters how goods or people are moved or transported.¹

It is proven that almost 50% of the total CO2 emissions come from passenger traffic from and to the event.² The diagram below shows the division of the categories of a one-day event taking place in the city and its share of the total emissions.



The diagram below shows the division of the emissions of multiple-day events. The emissions from passenger traffic from and to the event are relatively lower than in the previous one. But the emissions from electricity and industrial waste are higher. This is because multiple-day events have a camping site. Fewer people travel back and forth and stay camping, hence the lower passenger travel emissions. Higher emissions from electricity and industrial waste are because the event needs the electricity to run the campsite as well. Visitors also eat more, since they are staying multiple days, which leads to an increase in industrial waste.²



As these statistics point out, it has become urgent to start reducing the emissions from passenger traffic to and from events. This causes the highest number of emissions, which can have serious effects on the future of events.

02 WHAT IS THE GOAL OF THE SCAN?

Currently, there are no scans publicly available yet for event organizers to get insights into their CO2 emissions related to passenger traffic. It is impossible to reduce CO2 emissions without knowing what the current situation is. This sustainability scan helps calculate the current CO2 emissions related to passenger traffic from and to events. It is meant for the event organizations to fill in every year in order to measure success. The scan calculates the emissions for the modalities of public transportation (train and bus), airplane, Mobility as a Service (MaaS; touring cars), cars, taxis, and Kiss & Rides.



The goal is to create awareness amongst the event organizations, and indirectly the visitors, about the current impact of their travel choices on the environment. The scan calculates the CO2 emissions per modality and on average per person. When knowing the most polluting modality, measurements can be taken in order to reduce emissions. That is why the scan must be completed every year to measure success.

03 HOW TO USE THE SUSTAINABILITY SCAN?

The sustainability scan is easy to use. Please follow the steps in order to get the right results. The most important variables that you must know are the traveled kilometers per modality and the number of visitors who used that modality. Before starting to fill it in, please make sure you know these numbers. Filling in the scan takes about 15-30 minutes. The scan can be found [here](#).

Step 1

- Fill in the Event information in the left corner of the sheet.
- Fill in the name, date, address, and time of the event.
- Fill in the total number of visitors.
- The Indoor / Outdoor, Day / Weekend, City / Rural, and Day / Night have a drop-down menu. Please fill in which is most suitable for your event.

Please note:

- If the event takes place multiple days, please fill in the start time of day 1 and the end time of the last day.
- If the event takes place multiple days fill in the total number of visitors of all the days together.

Event information	
Name of the event	
Date of the event	
Address of the event	
Time	
# visitors	
Indoor / outdoor	
Day / weekend	
City / rural	
Day / night	

Step 2

- Fill in the category "By foot".
- Fill in the grey square how many people you expect to come on foot.

Please note:

- People who walk from the parking area or train station to your event do not count here. Only fill in those you expect to not have used any other mode of transport but walking.

Mobility	
By foot	
How many people do you expect to arrive by foot?	

Step 3

- Fill in the category "Bicycles".
- Fill in the grey square how many people you expect to come by bike.

Please note:

- This category only includes the use of bicycles and "OV-bicycles"; scooters are left out of this category.

Please note:

- People who come by "OV-bike" can be counted in this category. Do not forget to also add them in the category of Public transportation.

Bicycle	
How many bicycles do you expect (incl. OV-bicycles)?	

Step 4

- Fill in the category "Public transportation".
- Square 1: CO2 emissions in kg per person met km traveled.
- Square 2: Fill in how many people you expect to arrive by train or bus.
- Square 3: Automatically calculated CO2 emissions in kg per km for everyone.
- Square 4: Fill in the total traveled distance in km of all people who arrived by bus or train.
- Square 5: Automatically calculated CO2 emissions by everyone in this category.
- Square 6: Automatically calculated average CO2 emissions per person.

Please note:

- The bus in this category is a public transportation bus, this is not the shuttle service or a touring car.
- The total traveled distance in kilometers is for both ways, to and from the event.

Public transportation (bus + train)	2	# visitors	CO2 in kg per km	kg CO2 pp per km	1
How many people do you expect to come by public transportation?		0	3	0	0.0019
What is the total distance in km traveled by public transportation?	4			0	Total kg CO2 per person
		Total CO2	5	0.00	#DIV/0!
				6	

Step 5

- Fill in the category "Airplane".
- Square 1: CO2 emissions in kg per person met km traveled.
- Square 2: Fill in how many people you expect to arrive by airplane.
- Square 3: Automatically calculated CO2 emissions in kg per km for everyone.
- Square 4: Fill in the total traveled distance in km of all people who arrived by airplane.
- Square 5: Automatically calculated CO2 emissions by everyone in this category.
- Square 6: Automatically calculated average CO2 emissions per person.

Please note:

- People who have arrived by airplane must take another mode of transportation before they arrive at the festival. Do not forget to add this to the right category as well.
- The total traveled distance in kilometers is for both ways, to and from the event.

Airplane	2	# visitors	CO2 in kg per km	kg CO2 pp per km	1
How many people do you expect to arrive by airplane?		0	3	0	0.0852
What is the total traveled distance in km (both ways) by airplane?	4			0	Total kg CO2 per person
		Total CO2	5	0.00	#DIV/0!
				6	

Step 6

- Fill in the category "Mobility as a Service".
- Square 1: CO2 emissions in kg per person met km traveled.
- Square 2: Fill in how many people you expect to arrive by touring car.
- Square 3: Automatically calculated number of visitors by touring car.
- Square 4: Automatically calculated CO2 emissions in kg per km for everyone.
- Square 5: Fill in the total traveled distance in km of all people who arrived by touring car.

- Square 6: Automatically calculated CO2 emissions by everyone in this category.
- Square 7: Automatically calculated average CO2 emissions per person.

Please note:

- Make the distinction between benzine and electric touring cars.
- Touring cars are not the same as the shuttle service. Touring cars are designated busses that pick up and drop off people at a certain city or village.
- The total number of visitors arriving by touring car is based on a fully occupied touring car of 50 people. See the justification report for the full explanation of this number.
- The total traveled distance in kilometers is for both ways, to and from the event.

Mobility as a Service	# visitors	CO2 in kg per km	kg CO2 pp per km
How many touring cars do you expect?	0	0.0000	0.0135
How many electrical touring cars do you expect?	0	0	0
What is the total traveled distance in km (both ways) of the touring cars?		0	
Total CO2		0.00	Total kg CO2 per person
			#DIV/0!

Step 7

- Fill in the category "Car".
- Square 1: CO2 emissions in kg per person met km traveled.
- Square 2: Fill in how many people you expect to arrive by car.
- Square 3: Automatically calculated number of visitors by car.
- Square 4: Automatically calculated CO2 emissions in kg per km for everyone.
- Square 5: Fill in the total traveled distance in km of all people who arrived by car.
- Square 6: Automatically calculated CO2 emissions by everyone in this category.
- Square 7: Automatically calculated average CO2 emissions per person.

Please note:

- Make the distinction between benzine and electric cars.
- The total number of visitors is calculated by using the average occupancy rate of 2.7 people per car. See the justification report for the full explanation of this number.

- The total traveled distance in kilometers is for both ways, to and from the event.

Car		# visitors	CO2 in kg per km	kg CO2 pp per km
How many gasoline cars do you expect?	2	0	0	0.0509
How many electrical cars do you expect?		0	0	0
What is the occupancy rate per car?	2.7			
What is the total distance in km by gasoline car?			0	
What is the total distance in km by electrical car?			0	
	5			Total kg CO2 per person
		Total CO2	0.00	#DIV/0!

Step 8

- Fill in the category "Shuttle service".
- Square 1: CO2 emissions in kg per person met km traveled.
- Square 2: CO2 emissions in kg per empty bus.
- Square 3: Fill in "yes" or "no" if there is a shuttle service available. If "no", skip this category, if "yes", continue.
- Square 4: Fill in how shuttle buses you expect.
- Square 5: Automatically calculated number of visitors by shuttle service.

- Square 6: Fill in the total traveled distance in km of all buses together between event and station.
- Square 7: Fill in the total traveled distance in km of all buses from their origin (garage) to the event.
- Square 8: Automatically calculated CO2 emissions in kg per km for everyone.
- Square 9: Automatically calculated CO2 emissions by everyone in this category.
- Square 10: Automatically calculated average CO2 emissions per person.

Please note:

- The total number of buses needed is the total number the buses need to drive back and forth to pick up and drop off all visitors. F.e. one bus can drive back and forth 4 times an hour and does this for 3 hours long. This bus counts as 12 buses since it drives back and forth 12 times.

Taxi		# visitors	CO2 in kg per km	kg CO2 pp per km
How many taxis do you expect?	2	0	0.000	0.0598
What is the occupancy rate per car?	2.3			
What is the total traveled distance in km of the taxis?	5		0	
		Total CO2	0.00	#DIV/0!

Step 10

- Fill in the category "Kiss & Ride".
- Square 1: CO2 emissions in kg per person met km traveled.
- Square 2: Fill in how many people you expect to arrive by Kiss & Ride.
- Square 3: Automatically calculated number of visitors by Kiss & Ride.
- Square 4: Automatically calculated CO2 emissions in kg per km for everyone.
- Square 5: Fill in the total traveled distance in km of all people who arrived by Kiss & Ride.
- Square 6: Automatically calculated CO2 emissions by everyone in this category.
- Square 7: Automatically calculated average CO2 emissions per person.

Please note:

- The total number of visitors is calculated by using the average occupancy rate of 2.2 people per car. See the justification report for the full explanation of this number.
- The total traveled distance in kilometers is for both ways, to and from the event.

Kiss & Ride		# visitors	CO2 in kg per km	kg CO2 pp per km
How many K&R drop offs do you expect?	2	0	0	0.0625
What is the occupancy rate per car?	2.2			
What is the total traveled distance in km (both ways) of the K&R?	5		0	
		Total CO2	0.00	#DIV/0!



04 THE RESULT

The result of the scan can be found on top of the sheet. On the left side, it shows the total CO2 emissions in tons, which is calculated by adding up all total CO2 emissions of every category. On the right, it shows the average CO2 emissions per person in kilograms. This is the total CO2 emissions in tons divided by the total number of visitors, which has been added to the category **Event Information**. Besides that, you can also see the total CO2 emissions per category and per category per person.

Total CO2 emissions in ton	0.00	Average CO2 emissions per person in kg	#DIV/0!
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When this scan is repeated every year, you can see an increase or decrease in the total CO2 emissions. You can also see which categories went up or down. The scan provides a clear picture of the total CO2 emissions and which categories are the most polluting. The result of the first year will be the benchmark for the upcoming years to be compared.

05 TIPS TO INFLUENCE THE BEHAVIOR

There are many things an event organizer can do to try and influence the behavior of the festival visitor. But it is never a given that the visitors will behave the way the organization wants. Below are a few tips and tricks to stimulate sustainable modes of transport with examples of events that have managed to implement them successfully.



CREATE AWARENESS

By creating awareness amongst the festival visitors about the impact of their journey, it is most likely that visitors will choose a more sustainable mode of transport. There are some event organizations that already use this technique, such as DGTL, which is one of the most carbon-neutral festivals currently.³

OFFER FREE BIKES AND FREE LUGGAGE SERVICE

SNNTG Festival in Hanover has managed to reduce the CO2 emissions for its weekend festival by providing a free bike service from the closest transport hub to the event.⁴ The struggle with weekend festivals is that visitors do not want to bring all their belongings with them by bike since this is very inconvenient. By providing a free luggage service and bikes from the hub to the event instead of a shuttle service, it is possible to reduce CO2 emissions.

OFFER PRE-SETUP TENTS

Visitors tend to travel by car since they need to bring all their belongings. To stimulate visitors to come by public transportation, pre-setup tents are a solution. Festival visitors tend to forget about public transportation since it is a huge struggle to carry all festival materials with you on the train. Offering the most important facilities at the campsite, the use of public transportation will increase.⁵

OFFER COMBINATION PACKAGES

Price is an important variable when making a choice about how to travel to the event, according to the results of the survey. Since public transport tickets are quite expensive, offering a combination ticket including the entrance to the event and the train/shuttle service will stimulate the use of public transport. OpenAir St. Gallen has used this technique since the beginning and has always included the shuttle service in the ticket price.⁴ Another idea can be to offer a price reduction when train and festival tickets are bought together. Study shows that 42,7% would travel via public transportation if there is a discount on the tickets.⁶

FIRST AND LAST MILE IMPROVEMENTS

One of the main reasons visitors prefer to travel by their own car is because it is the most convenient way of travel and it brings you exactly to where you need to be.

“How am I getting from the station to the event?” is one of the thoughts when traveling by public transport.⁷ Offering shared modalities, such as Felyx and GO Sharing scooters, could be a solution to the last-mile struggles. It could also be seen the other way around; make the last mile for car users more difficult than the last mile from the train station to the event

OFFER PRE-SETUP TENTS

Touring cars are a great way to transport visitors who are located in hard-to-reach cities. Touring cars start in one city, could potentially make a few stops in other places, and bring you to the entrance of the event. In the end, it will drive back the same route to drop everyone off in their hometown. This mode of transport makes it easy for visitors to reach the event and solves the hassle of using the car or public transportation. A touring car has on average a lower CO2 emission per person⁸ and is a great solution to prevent people from coming by car.

According to the results of the survey, more than 85% of the visitors are willing to travel via touring car as well.

INCENTIVES FOR FULLY OCCUPIED CARS OR ELECTRIC CARS

Another solution could be to offer incentives for fully occupied cars to stimulate visitors to carpool.⁵ It is also possible to offer incentives for electric cars, to stimulate their use of it. Make sure to also offer (free) charging stations for electric cars. These incentives do reduce CO2 emissions. However, it still rewards the use of cars. Implementing incentives like these must be well thought out.



06 LINKS

- 1 Green Events. (2021, May 4). Mobiliteit. <https://greenevents.nl/areas-of-impact/mobiliteit/>
- 2 Milieubarometer. (n.d.). Recreatie - Festivals - Milieubarometer - Stimular. <https://www.milieubarometer.nl/voorbeelden/festivals-en-evenementen/>
- 3 DGTL. (2022, December 6). SUSTAINABILITY. <https://dgtl.nl/sustainability/>
- 4 GO Group & Delta1. (2022). FUTURE FESTIVAL TOOLS - GREEN COMPETENCY FOR EVENT PROFESSIONALS. <https://www.futurefestivaltools.eu/>
- 5 ecolibrium. (2020). Sustainable Travel & Transport Guide for Festivals and Outdoor Events (2020). In ecolibrium.earth. <https://ecolibrium.earth/wp-content/uploads/2020/05/ecolibrium-Travel-Guide-for-Events-2020.pdf>
- 6 Powerful Thinking. (2020). The Show Must Go On: Event Industry Environmental Impact Report. In Vision2025. <https://www.vision2025.org.uk/the-show-must-go-on/>
- 7 Intertraffic. (2020, January 14). Last-mile solutions: the final steps for easier and sustainable transport. <https://www.intertraffic.com/news/the-last-steps-in-easier-transport>
- 8 CO2emissiefactoren. (2023, February 2). Lijst emissiefactoren. CO2 Emissiefactoren. <https://www.co2emissiefactoren.nl/lijst-emissiefactoren/>



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