



Euskal Herriko Unibertsitatea



November 17th 2021, ONLINE

Reducing the Environmental footprint due to mobility in the University of the Basque Country

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2. LIVING LAB. EHUAZTARNA.

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CONTEXT





EHUagenda 2030 for sustainable development (2019-2025) describes UPV/EHU's contribution to 12 of 2030 Agenda's 17 SDGs, with the addition of its own commitment to linguistic and cultural diversity in SDG 17+1; and the sectoral plans this comprises (Campus Equality, Campus Inclusion and Campus Planet) and the refocus of its education model IKD i3 (ikaskuntza x ikerketa x *iraunkortasuna* [learning x research x sustainability]). https://www.ehu.eus/en/web/iraun kortasuna/ehuagenda-2030









The <u>Campus Planeta Plan</u> (2019-2025) seeks to be the benchmark for the UPV/EHU's healthy and sustainable environmental management policy.

It is structured around the pragmatic lines of action of environmental management: energy, water, waste, urban development and infrastructures, health and wellbeing, <u>transport and</u> <u>mobility</u>, responsible purchasing and consumption, and climate change.

https://www.ehu.eus/en/web/iraun kortasuna/kudeaketa-iraunkorraunibertsitatean







GOAL 6

6. Facilitating access to university facilities in safe and sustainable modes of transport.

6.1. Promoting the use of non-motorised systems as main mode of transport.

6.2. Backing the construction and maintenance of pedestrian routes and bicycle lanes connecting the campuses to the cities.

6.3. Encouraging and boosting the use of public transport.

6.4. Working with the competent authorities to provide en masse transit (tram, metro and train) to university areas.

6.5. Tabling formulas to companies, organisations and public bodies with competences in mass transit management to increase the frequency of public transport to university areas, minimise ride times and offer better prices to the university community.

6.6. Maintaining and encouraging car-share programmes and giving parking priority to clean vehicles (ecology-friendly or zero emissions) and High-Occupancy Vehicles (HOVs).















The Campus Bizia Lab Programme is an initiative arising from the Erasmus University Educators for Sustainable Development Project, in which the UPV/EHU was involved between 2013-2016.

It seeks to trigger a collaborative process between academic staff, service and administrative staff and students (multidisciplinary approach) in order to respond to sustainability challenges within the university.

https://www.ehu.eus/en/web/iraun kortasuna/campus-bizia-lab

One of the 8 challenges is mobility and urban planning





EHU-Aztarna



Multidisciplinary team: > 20 participants of 4 Faculties of the UPV/EHU):

- Professors and research staff (PDI)
- Administration and services staff (PAS)
- Students

- ✓ **Objective:** to calculate the Organizational Environmental Footprint (OEF) of the academic activity of the University of the Basque Country (UPV/EHU)
- ✓ **Specific objective:** Estimate environmental, social and economic impacts of the **Transport** in the UPV/EHU.





- Universities are important poles of attraction for frequent travellers and thousands of daily trips are made towards and from European universities [1].
- One of the O-LCA practical cases for academia sector published by the UN Environment report indicated that **the greatest impact is due to transport** and it is generated out of its organizational boundaries
- \checkmark Our hypothesis is that transport is one of the main activities of negative impact on the environment in our university.







UPV/EHU



> 40-year-old
institution
> 45,000 students
> 5,000 academic
staff
> 2,000
administration & service staff













- ✓ **Reference:** OEF Guide promoted by the European Commission [3]
- ✓ Modelling:









4.1. SURVEY RESULTS

- ✓ **Two users groups:** Staff and Students
- Means of transport: airplane, train, intercity and urban bus, tram, metro, car, motorcycle, bicycle and by foot
- ✓ Types of transport: daily commuting, change of residence displacement and work displacements
- ✓ Unit of transport measurement: person * kilometer for one academic year (pkm)

Groups of Users	Responses	Population from 2016/17	Margin of error
Students	2.966	39.018	1.7%
Staff	603	8.178	3.8%

Table 1. Answers gathered in the survey by groups, population and margin of error.





Table 2. Distribution of total transport according to type of transport (% of pkm)

	Daily	Change of	Work
	Commuting	residence	transport
Students	60%	10%	0%
Staff	20%	1%	9%



Figure 1. Distribution of total transport according to passenger kilometers (pkm)











Figure 2. Transport distribution for students by transport modes and by campuses, as a percentage of total daily commuting









Figure 3. Transport distribution for staff by transport modes and by campuses, as a percentage of total daily commuting

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RESULTS



4.2. ENVIRONMENTAL IMPACTS

CLIMATE CHANGE-GLOBAL WARMING

Groups of Users	Impact per person	
Students	599 kg CO ₂ -eq/person	STUDENTS x3 ≈ STAFF
Staff	2043 kg CO ₂ -eq/person	



Figure 4. Distribution of climate change impacts according to means of transport and user groups

HUMAN TOXICITY

Groups of Users	Impact per person	
Students	359 kg 1,4-dichlorobenzene eq.	\subset STUDENTS x5 \approx STAFF \supset
Staff	1709 kg 1,4-dichlorobenzene eq.	

Figure 5. Distribution of human toxicity impacts according to means of transport and user groups

RESULTS

Figure 6. Distribution of selected environmental impacts by transport modes in the UPV/EHU. Transport (in pkm) and economic cost estimation are also shown for comparison.

4.3. PROPOSAL OF SCENARIOS

. What if PRIVATE transport would go to PUBLIC transport?

Climate Change

Groups of Users	Impact per person Today scenario	Impact per person PUBLIC TRANSPORT scenario	% Reduction
Students	599 kg CO ₂ -eq/person	465 kg CO2-eq/person	22%
Staff	2043 kg CO ₂ -eq/person	1424 kg CO ₂ -eq/person	30%
Total	2642 kg CO ₂ -eq/person	1889 kg CO ₂ -eq/person	29%

Human Toxicity

Groups of Users	Impact per person Today scenario	Impact per person PUBLIC TRANSPORT scenario	% Reduction
Students	359 kg 1,4-dichlorobenzene eq.	172 kg 1,4-dichlorobenzene eq.	52%
Staff	1709 kg 1,4-dichlorobenzene eq.	865 kg 1,4-dichlorobenzene eq.	49%
Total	2068 kg 1,4-dichlorobenzene eq.	1037 kg 1,4-dichlorobenzene eq.	50%

What if number of passengers in PRIVATE VEHICLES would be doubled?

What if the presence in campus would be reduced to 4 DAYS/WEEK?

What if staff / students would CHANGE THEIR RESIDENCE (closer to campus)?

Students use more sustainable means of transport

- In general bus is the most used means of transport, followed by the car
- Students' individual environmental impact is remarkably lower.
- ✓ **Staff** has the **40% of the total climate change impact**.
- Different environmental impacts analysis results in different impact distributions (e.g. Human Toxicity).
- Using alternative means of transport for daily commuting (car -> public transport) we can potentially reduce environmental impacts
- ✓ OEF is useful tool to propose different improving transport scenarios and to determine effective mobility strategies and plans.

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