Cargo Bike Band

Let’s swing EPFL campus!

Anne-Michèle Savoy - Loni Mahé - Valentin Prost - Arthur Parmentier
Manuel Zemp - Dominique Zemp - Eva Kieffer

Under Musical (AGEPoly)
1. General informations

<table>
<thead>
<tr>
<th>Project title</th>
<th>Cargo Bike Band</th>
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<tr>
<td>Place of the project</td>
<td>EPFL and UNIL (Lausanne)</td>
</tr>
<tr>
<td>Team leader</td>
<td>Arthur Parmentier</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:arthur.parmentier@epfl.ch">arthur.parmentier@epfl.ch</a></td>
</tr>
<tr>
<td>Faculty</td>
<td>CDH</td>
</tr>
<tr>
<td>Requested funding</td>
<td>13 200.- CHF (First option) or 16 600.- CHF (Second option)</td>
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</table>

Abstract: What do cargo bikes and music have in common? Both are means that can lighten up people’s moods. Imagine what happens when you combine them both. It would be the perfect recipe for making people happier. Exactly this is the main purpose of our project. We want to spread good humour on the campus by playing music on cargo bikes. Furthermore, we want to sensibilise people to move more by bike, thereby spreading the spirit of sustainable mobility. By charging our batteries with solar panels, we would even increase the awareness of sustainability. Last but not least, making the music cargo bikes accessible to other music groups would allow many people on the campus to share our spirit.

a. Participants

<table>
<thead>
<tr>
<th>Name</th>
<th>Faculty/Institution</th>
<th>Role</th>
<th>Email</th>
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<tbody>
<tr>
<td>Arthur Parmentier</td>
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<tr>
<td>Dominique Zemp</td>
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</tr>
<tr>
<td>Name</td>
<td>Position/Institution</td>
<td>Role details</td>
<td>Contact Email</td>
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</tr>
<tr>
<td>Manuel Zemp</td>
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<td>Cargo Bike Band musician</td>
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</tr>
<tr>
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<tr>
<td>Loni Mahe</td>
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<tr>
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</tbody>
</table>
2. Project description

a. Context

How can we animate life at EPFL while keeping it eco-friendly, decreasing the logistic cost of animation and involving students into nice open air concerts? Our slogan “Let’s swing the campus” already partially explains our project. We want to make the campus a better place by playing music on cargo bikes as a extraordinary effect and thereby lightening up the mood of people on campus.

Within the commission of Agepoly “Musical” (musical.epfl.ch), we have seen how people enjoy live music on the campus during events such as “discosoupes” or improvised concerts on Esplanade. It regroups people around a joyful, simple action whose social impact is striking such as it can easily be observed at the regular jam sessions at Satellite or Zelig.

However, the organisation of such musical events can sometimes be painful given the amount of equipment and logistics usually involved, especially when it comes to moving a drum kit or keyboards that are usual in music ensembles.

b. Project history (Cargo Bike Band v0.1 & 0.2)

In February 2018, the Musical organised a workshop of soundpainting, which is a technique for collective, multidisciplinary, live art composition. At the end of the workshop, we thought about performing a set of “happenings” (musical flash mobs) everywhere on the EPFL and Unil campus. For that purpose, we needed to move quickly and easily a lot of music gear, including percussions and a keyboard.

The first “percussion bike” was born: one of the shared cargo bikes around the campus on which Arthur Parmentier attached a lot of small percussion gear using some tape and clamps on its frame as well as the large front space to put bigger equipment.

We used this setup during the whole day, moving around EPFL and Unil to play music at very different places such as in the metro, the hall of the SG building, Esplanade, the Grange Dorigny… The alpha piece of the cargo bike band was born!

The day after, we received an email from Philippe Vollichard, the coordinator of Campus Durable at EPFL. He had seen the “music cargo bike” and wanted to hire a band for the opening of the new Point Vélo at EPFL. The original band (Arthur, Valentin, Loni and Anne-Michèle) was therefore joined by Dominique and Manuel who became part of this very unique formation that we called the “Cargo Bike Band” (CBB).

For this event, we started building arranged wood pallets to place more equipment on the cargo bikes with more balance and security, so that we were able to move the cargo bikes by pedalling without struggling. We used two cargo bikes, one on which we placed a simplified drum kit, the other on which we placed a keyboard and...
amplification equipment using a portable power supply. The two cargo bikes of the actual CBB were born, namely the “percu bike” and the “piano bike”.

The performance at the inauguration of the “Point Vélo” was the first in a series on EPFL campus that was greatly applauded for its quality and originality. As of today, the Cargo Bike Band performed more than 10 times on EPFL campus and nearby, mostly for students related events.

c. Bringing the project to a next level (CBB v1.0+)

i. Motivations

1. Strengths of the Cargo Bike Band
Here is again a summary with all the advantages that the Cargo Bike Band could bring to the community of EPFL campus:

1. Motivate people to move by bike and/or use cargo bikes
2. Spread good mood and makes people smile and joke thanks to the music and fancy setup
3. Improve in overall the campus’ well-feeling
4. By its design, could help to promote sustainability and creativeness around the tools provided at EPFL

2. Actual limitations
In the actual state, the use of cargo bikes shows several limitations. There are still some steps to go to reach our aim of being able to mount and dismount efficiently the music gear and move quickly around and to the places of performance:

- First of all, the cargo bikes at EPFL are yet very hard to get for performances, as their reservation system and availability are very limited. The Musical regularly gets demands for music performances and in many cases CBB would fit the specific needs in terms of music quality, style and flexibility. However, due to limited availability of cargo bikes on the campus, the CBB can often not be recruited. A possible solution would be cargo bikes assigned to the Musical association. This could enable flexible and low cost music equipment rental on campus and help CBB to be more easily recruited for all kind of musical events on the campus.
- It takes too much time to prepare the setup. We need to be efficient with setting up in a minimum amount of time in order to save the musician’s energy and time. Additionally, a quick setup would allow last minute concerts and is more efficient and flexible.
- We want to improve the mobility of the cargo bikes when the instruments are in place. For now, it is impossible to ride when the piano is arranged and very inconvenient to move with drums. The setup is too big and heavy to cross a narrow space or a steep slope for example. Therefore the stability and the lightness of the structure is an important part to take into account.
- The cargo bikes cannot play while moving. We would like to think of new designs that would enable the mobility of the setup and playing while slowly moving in a parade style.
- The percu-bike is too loud for indoor performances, playing for events like aperitifs we so often see here at EPFL is today impossible. As we aim to be able to play at most events on the campus and bring an alternative to the usual playlist played on loudspeakers, we must be able to lower the volume of the percu-bike.
- Another concern is about the use of the cargo bike between concerts. Thinking about durability and versatility, we want to expand the possibilities of the setup. For the benefit of many associations on the campus, it could be interesting to offer other features with the bikes (see propositions below) that would fulfill the needs of other associations in terms of light and sound
equipment for low cost rentals and make use of the cargo bike setup to give easy public access to musical equipment at EPFL.

ii. Acquiring the bike fleet and updating the equipment/assemblage

1. Three options for the bike fleet

Here are the multiple options we have thought of, in order to acquire the cargo bike fleet, from our preferred but hardest one to our least preferred but simplest option:

a. Option one: building our own cargo bikes

Building our own cargo bikes would be challenging but has great ecological values and would later better fit our specific needs. There is a large community in Europe that regroups around the idea of building cargo bikes, sharing a lot of online contents: "The history of cargology", A compilation of dozens of cargo bike designs on the platform “Werkstatt Lastenrad”, the biggest online platform about self-built cargo bikes, The wiki of the "Long André" (a type of cargo bike) association in Renens VD...

In case our funds do not allow us for simpler options, we have started to gather contacts in Lausanne in the field of self-made cargo bikes:

- “Long andré”, earlier based in Renens and now opening a new workshop in Lausanne. “Long andré” is both the name of the collective and the name of a very well known and tested design of cargo bike that we would be able, thanks to their help, to build from a used, normal bike. This would be our main partner for building the cargo bikes.
- The “Maison du vélo” in Lausanne is an association regrouping several projects and initiatives around bikes.
- Hervé Burgener from the project Remorque Solaire pour Vélo, funded by the association ADER in Lausanne, with whom with have taken contact.
- The association ADER would also be able to give us help for gathering contacts and possibly a technical and financial help (not discussed yet).
- EPFL SKIL
- The point vélo EPFL and the “atelier vélo” at Unil
- We will also soon contact the lausanne hub of Solar sound system who achieved to power their sound system thanks to solar panels as we would also like to do in our design.
- Hervé Lissek (EPFL acoustic group director) and Eric Willimann for building custom audio speakers

b. Option two: buying second-hand cargo bikes

Another possibility would be to buy second-hand cargo bikes using websites such as Ricardo, Anibis etc. The main difficulty would be to find the correct model regarding our specific needs. Weeks or months could be necessary as this kind of products are quite rare on the market. Economically and ecologically speaking, this would be the best solution, but maybe also the most unsecure to achieve.

c. Option three: buying new cargo bikes

The easiest but also most expensive solution would be to buy brand new cargo bikes, the only model that would fit our project would be the “Riese Muller Packster 80”, which you can currently see on the campus. We would only need the structure without the wooden box that is often sold with it.
2. Design
   a. General structure
   On both cargo bikes, a solid wooden structure holding everything added to the basic cargo bike frame (hardware, speakers, audio and musical equipment) will be attached so that it can be removed if necessary. As the pianist and drummer need someplace to put their feet on, two shelves will unfold just under the saddle. You will still find a wooden box in between the handlebar and the front wheel. Inside that box, just before the foot of the handlebar, will be a rack mount chassis in which we will fix the different audio units, the audio system’s battery and eventually a drawer. In addition, the box will open allowing solar panels installed in the inside to capture the sunlight, just like a sunflower would.

   b. Audio installation
   At the very front of both cargo bikes, you will find a custom speaker(PA) system built-in a wooden structure consisting of a subwoofer (oriented towards front), a monitor (oriented rearward) and a satellite speaker (standing on top of a retractable pole and oriented freely). This system will be powered by a rackable amplifier. We will use a rackable compact yet complete mix console on each cargo bike enabling microphone, guitar, piano, electronic drums or any other instrument inputs.

   To support the instruments, we make use of articulated arms attached below the handlebar on the main frame of the bike, as we attached the percussions thanks to standard rack clamps. The articulated arms will be used in the actual state of the band to place midi keyboards on the piano bike and electronic drums pads on the percu bike, allowing for a light, customizable and flexible, foldable setup. The idea is that this scheme would fit the needs of any of instrumentist that would later join the project.

   c. Sketch of the future piano cargo bike
   Sketch is detailed in appendix 5.d.

iii. Project outline

   1. An official status for long term commitment
   The idea would be to make the CBB a sub-commission of the Musical (AGEPoly), whose status would require that every member of the band finds a new musician to replace himself (or in case that groups quit the project, select the replacing band). The replacement and selection process can be reviewed and managed by the CBB committee, who would be formed of musicians from the Cargo Bike Band(s), as well as the access and use of the setup by external artists.

   2. Live music on the campus...
   The amount of events involving music on the campus is large and could possibly increase in the future. The demand for music and musicians is increasing whereas the music associations, bands and collective cannot extensively answer all these demands.

   The Cargo Bike Band (and possibly later, Cargo Bike Bands) would be the most prepared and equipped to animate the campus when needed. The band would make use of the Musical website and social medias to promote its music and probably also replies to most of the requests that are currently being sent by mail to the Musical committee.
3. ... and low cost sound equipment rental

When accessing the website of the Musical under the “Rental” tab (https://musical.epfl.ch/rent/), students, collaborators and associations of EPFL will be able to rent our gear at a very low cost with almost no logistics.

4. Long-term financing of the project

The project, once the cargo bikes and the setup acquired, would be self-financed by charging the events organiser some fee (from 100 CHF to 1000 CHF depending on the type of event) to finance the music equipment and defray the artists. The band would also, of course, play for free to support students/association projects (e.g. disco-soupes) or for partnerships.

Finally, renting the setup for music diffusion would also be charged a little fee which would allow us to improve the equipment over time.

iv. Further ideas for future projects

See appendix, section 4. a.

v. Communication and promotion

Communication and promotion of the project will simply be visible:

- On social medias (https://www.facebook.com/cargobikeband/)
- On the Musical’s website - linked with the Cargo Bike Band sub-commission
- During events at EPFL (Vivapoly, AGEPoly’s events, Discosoupes...)
- During festivals around durability and sustainability, street music or students festivals
- Many other opportunities imaginable... in Lausanne and everywhere we can bike to!
# 3. Summary of project impact

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Key aspects</th>
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| Innovation          | ● Modular and original setup with multiple uses  
● Possibly self, custom-made cargo bikes  
● Reproducible setup and extendable project size  
● Multidisciplinary project, mixing music with eco-friendly cargo bike design/customization technical skills  
● An original proposition to the musical world where environmental durability is often not taken into account  |
| Potential           | ● Could be joined by a large community of musicians at EPFL  
● Increasing demand of live music and equipment for events around EPFL  
● Possibilities of further extensions of the project  
● Great impact for sensitisation of the public to mobility/durability challenges and solutions during events  |
| Interest            | ● Promoting live music on the campus  
● Cheering EPFL atmosphere  
● Promoting soft mobility and the multiple uses of cargo bikes  
● More flexible and simpler music equipment rental at EPFL  
● Animating events related to other associations of the campus that share the same values  |
| Environmental impact| ● Use and promotion of solar energy + further extension with participative dynamo energy feed like the “solar sound system” project  
● Reused and recycled materials  
● Over time, limits the impact of car transportation of the music equipment  
● Second-hand audio setup  |
| Social impact       | ● Involvement of EPFL students and employees into the band and the cargo bike conception  
● Appreciation of music practice, collaborative work and creativity  
● Participation into events with very large and broad public with performances on and around the campus  
● Plenty of opportunities to animate the events of other associations or festivals around the campus  |
| Economic impact     | ● Self-sufficient project once built  
● Cheaper than other logistic means for music equipment transportation: overall benefit for EPFL community  |
| Bonus               | ● Originality of the project  
● A great music band sharing many joyful moments and a lot of |
Multiple artistic possibilities: street music, soundpainting, fanfare, happenings, stage concerts, subway performances...
4. Budget and funding

a. Requested funding

Depending on the cargo bikes that we will be able to acquire or build, the cost of the project will change by an order of 3500 CHF. We present here two options: a low cost option for building one cargo bike and acquiring one used and a more expensive option for acquiring two cargo bikes new that would fit our needs (expensive cargo bikes).

Overall, we would like to request 13 200.- CHF to fund option 1 or 16 600.- CHF to fund option 2. The timeline for expenses and details of estimated costs is shown in section 3. b.

b. Calendar of estimated costs

i. Option 1 (low cost)

<table>
<thead>
<tr>
<th>Timeline</th>
<th>Product</th>
<th>Number of units</th>
<th>Estimated cost per unit</th>
<th>Estimated total cost</th>
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<tr>
<td>Before december 2019</td>
<td>Self-made Cargo</td>
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<tr>
<td></td>
<td>Bike</td>
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<td></td>
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<td></td>
<td>Used Cargo Bike</td>
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ii. Option 2 (expensive)

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<th>Estimated cost per unit</th>
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<tr>
<td>Before september 2019</td>
<td>Riese &amp; Muller Packster 80</td>
<td>2</td>
<td>5 679</td>
<td>11 358</td>
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</table>

iii. Both options

The timeline here is shown for option 1, but we will advance faster if we only buy the cargo bikes (new or used).

<table>
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<tr>
<th>Timeline</th>
<th>Product</th>
<th>Number of units</th>
<th>Estimated cost per unit</th>
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<td>200.-</td>
<td>400.-</td>
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<tr>
<td></td>
<td>Subwoofers*</td>
<td>2</td>
<td>200.-</td>
<td>400.-</td>
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<tr>
<td></td>
<td>Monitors</td>
<td>2</td>
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<td>300.-</td>
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### Total cost of option 1

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<tbody>
<tr>
<td><strong>Subtotal</strong></td>
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<td></td>
<td><strong>5200.-</strong></td>
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*Custom speakers made by ourselves to fit the design of the cargo bike, typically with recycled components.

All the prices are estimated on the hypothesis that we buy the PA equipment used and the electric system new, as it will probably be the case.

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Unit Cost</th>
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<td><strong>13 200.-</strong></td>
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<tr>
<td><strong>Total cost of option 2</strong></td>
<td></td>
<td></td>
<td><strong>16 600.-</strong></td>
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## 5. Appendix

### a. Further ideas for future projects

The Cargo Bike Band does not stop at the campus borders! During the following years, there are several projects that would get possible by using this setup. Let’s go through some of them:
Moreover, finding bike and sub-committee. to bare; project, what about multiple Cargo Bike Bands? Indeed, could become a Cargo Bike Band and that every motivated musician could join this project! By now, are usually facing: bands and rideable while playing and look forward to trying it out once the design is fixed. As of today, the CBB can move with the instruments but cannot move while playing, especially for the percussion bike. We have thought about how to make the percussion bike and piano bike rideable while playing and look forward to trying it out once the design is fixed.

### iii. Playing.. while moving!

As of today, the CBB can move with the instruments but cannot move while playing, especially for the percussion bike. We have thought about how to make the percussion bike and piano bike rideable while playing and look forward to trying it out once the design is fixed.

### iv. Cargo Bike Bands and bringing musicians together

The Cargo Bike Band’s major dedication is to be a band. That is, a structure that allows musicians to play together. This is promoted by easy-to-use equipment that allows for a diversity of musical styles and a lot of flexibility. This project is creating a great opportunity for musicians to join and form bands with different styles. The cargo bike setup answers several challenges that the bands on the campus are usually facing:

- accessibility of music equipment on campus
- ability to move and perform outside the rehearsal rooms
- representability, communication and promotion on the campus

By providing a structure that solves these challenges, we hope to be emulated by musicians and make it easier for musicians to play, while animating the campus. We wish that any motivated band could become a Cargo Bike Band and that every motivated musician could join this project!

**Indeed, as of today, the CBB is already formed and composed of 7 players. But in the future of the project, what about multiple Cargo Bike Bands?**

**Historically, the project has built on a single band, namely the Cargo Bike Band, formed by musicians from the Musical, but there are little limitations on extending the idea to several bands. For the future of the project, we can assume that the setup would not be only used by a single band; instead, it would be proposed to all the musicians and bands of the campus who would like to make use of it, based on a selection process that is determined by the committee of the cargo bike and sub-committee.**

Finding musicians on campus is not hard: the Musical already connects more than 120 musicians in its rehearsal room, as well as 30 additional members from the Big Band and the Soundpainting group. Moreover, the possibilities of the setup as well as the financial considerations motivates a lot of
musicians, among which some of them already play a lot for events on campus and would benefit from the setup.

The band(s) will change over time, as the project evolves, some students leave EPFL and others replace the previous ones.

b. Current setup description

The setup so far consists of two cargo bikes, one for the keyboards and one for the drums. On both of them, wooden pallets were mounted onto which the respective instruments could be fixed.

For the drums, the instrument was secured in front of the handle bar, so the drummer can sit on the bike saddle and easily reach the instrument to play.

The keyboards were installed in front of the handlebar and the pianist sits on a chair installed on the wooden pallet, looking forward, away from the handlebar and the bike saddle. It is therefore not possible for him to reach the pedals of the bike. The amplifier is also placed on the wooden pallet.

The other musicians are standing in the middle or around the two cargo bikes, having their music stands in front of them.
c. Photos

i. Percu Bike v0.1
ii. **Point Vélo inauguration**
iii. Vivapoly 2018
d. Sketch piano bike