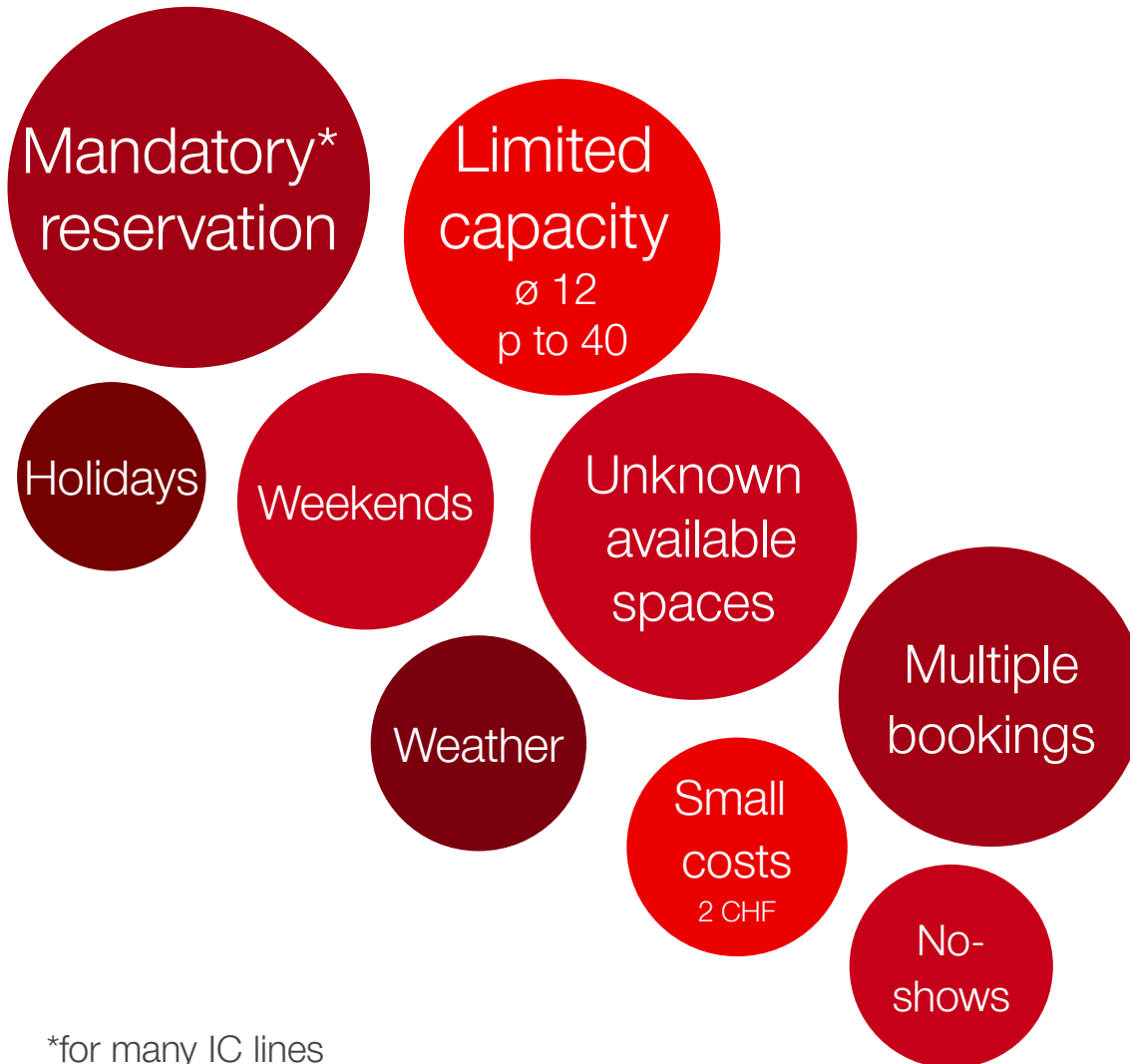# SBB Challenge
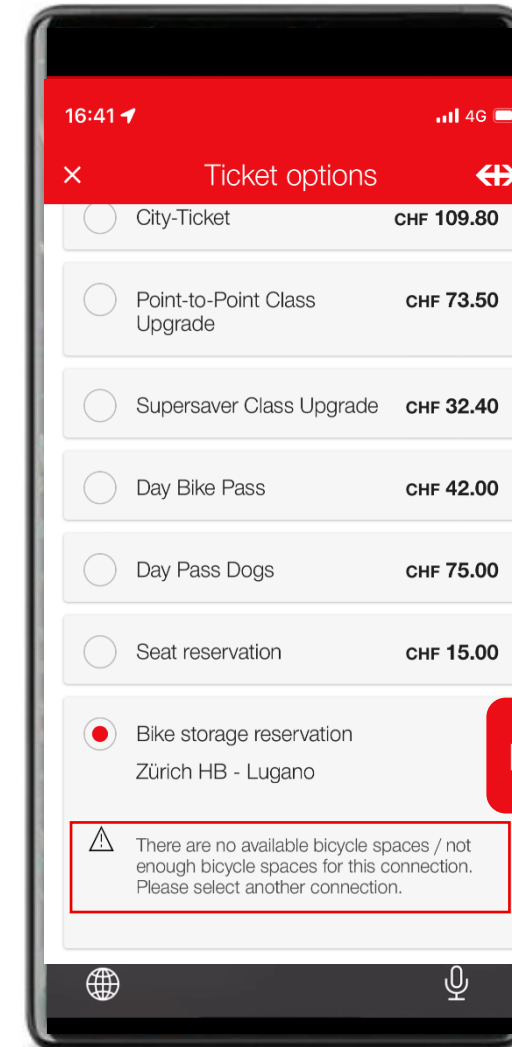## Forecast the latest chance to get your bike reservation.

START Hack, 23-25 March 2022, St. Gallen,
Marc Guggenheimer and Christian Trachsel

SBB CFF FFS

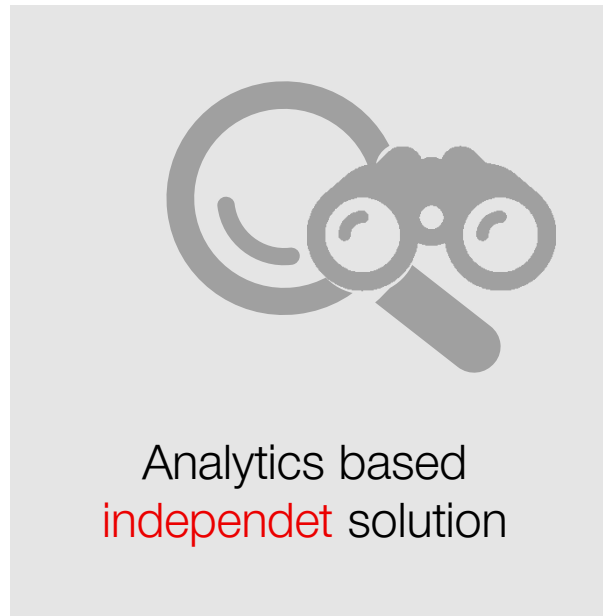# Summary April–October 2021.

**+70%**
reservations on IC5/51 and IC2/21.

**+24%**
sold Day Passes Bike compared to 2019

**66%**
book on day of departure

**188'000**
total amount of bike reservations on domestic IC trains

**87%**
reserve their bicycle space with SBB's mobile application

**626**
customer complaints about self-service loading of bicycles in 2021

**2'537**
reservations on Sunday, 18 July (day with highest demand)

**2'101**
total amount of reservations on train with highest demand

**+7%**
Annual Bike Passes (compared to 2020)

**408'000**
sold Day Passes Bike compared to 2020 (+7%)

# Current situation.

**Mandatory\* reservation**

**Limited capacity**
ø 12
p to 40

Holidays

Weekends

**Unknown available spaces**

Weather

Small costs
2 CHF

**Multiple bookings**

No-shows

\*for many IC lines



16:41

⬤⬤⬤ 4G 🔋

✕　Ticket options

| | City-Ticket | CHF 109.80 |
| ○ | Point-to-Point Class Upgrade | CHF 73.50 |
| ○ | Supersaver Class Upgrade | CHF 32.40 |
| ○ | Day Bike Pass | CHF 42.00 |
| ○ | Day Pass Dogs | CHF 75.00 |
| ○ | Seat reservation | CHF 15.00 |
| ⦿ | Bike storage reservation Zürich HB - Lugano | |

⚠ There are no available bicycle spaces / not enough bicycle spaces for this connection. Please select another connection.

**Process stops**

# The best solution is going to be published on a seperate website, where customers can see the last possible moment to make a reservation.
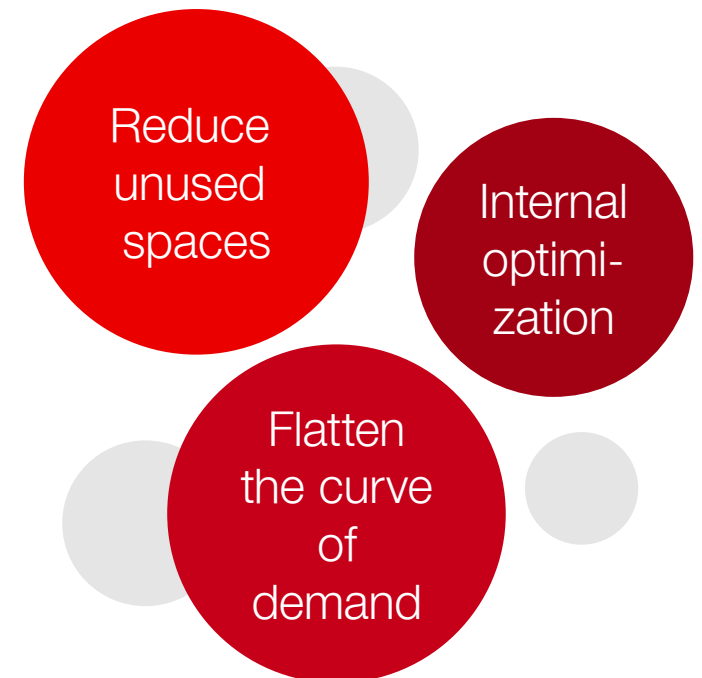
## Solution



Analytics based **independet** solution

*SBB reservation backend system is going to be replaced

## Publishing channel



Carriage of bikes on the train.

Take your bike on your travels: with a Point-to-Point Ticket, a Day Pass Bike, or an annual bike pass, you can load your own bicycles on many public transport routes in Switzerland.

Compulsory bicycle space reservation.

| Day Pass Bike. | |
| Price | CHF 14 |
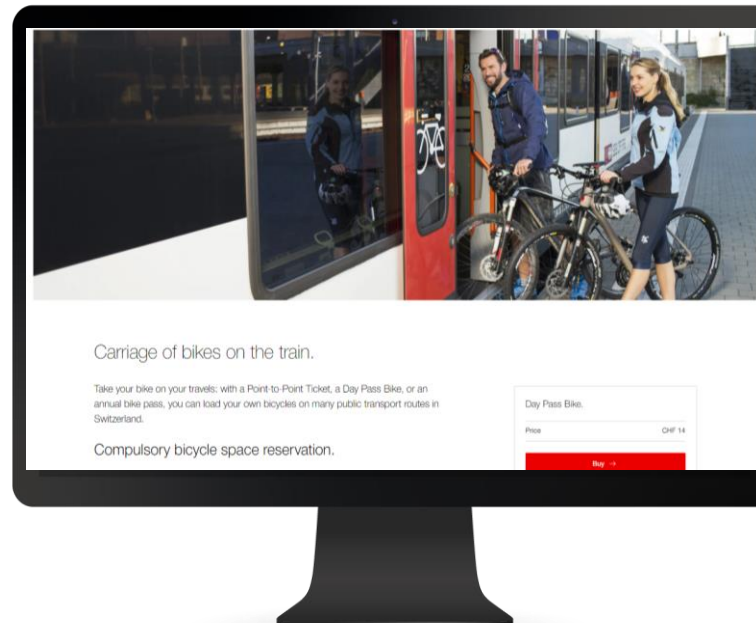
www.sbb.ch/en/biketransport

## Value

Reduce unused spaces

Internal optimi-zation

Flatten the curve of demand

To build your forecast we offer several data sources.

SBB CFF FFS

Finde Daten....

Open Data - gemeinsam für einen attraktiven öV Schweiz.

Infrastruktur   Karte   Bilder   Bahnhof   Verkehr

Rollmaterial   Immobilien   Blaulicht   Dienstleistungen   Barrierefrei
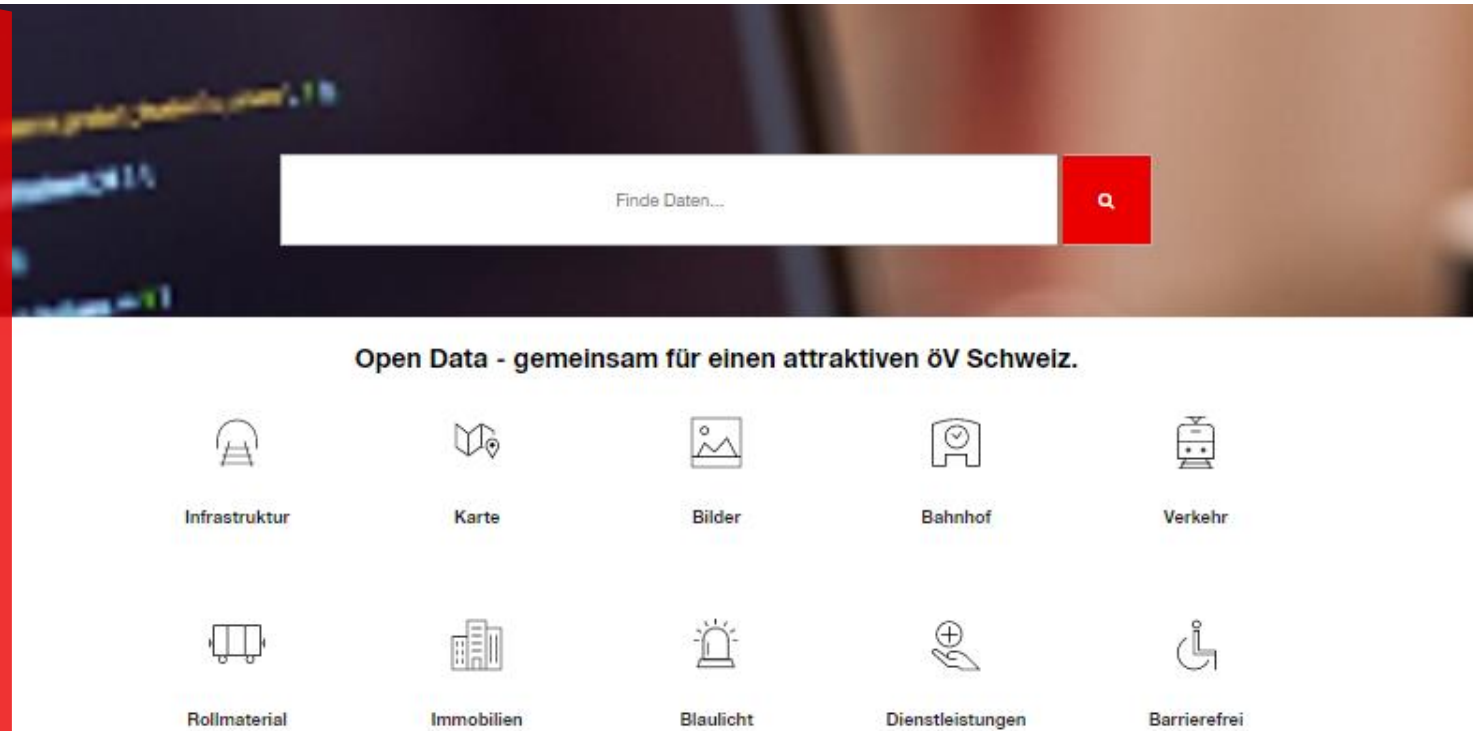
# Some facts and figures.

## RESERVATIONS ACCORDING TO LINES



Div; 263
IC 6; 6'194
IC 51; 7'840
IC 61; 14'706
IC 5; 60'667
IC 3; 20'030
IC 1; 22'416
IC 8; 28'687
IC 2/21; 27'242
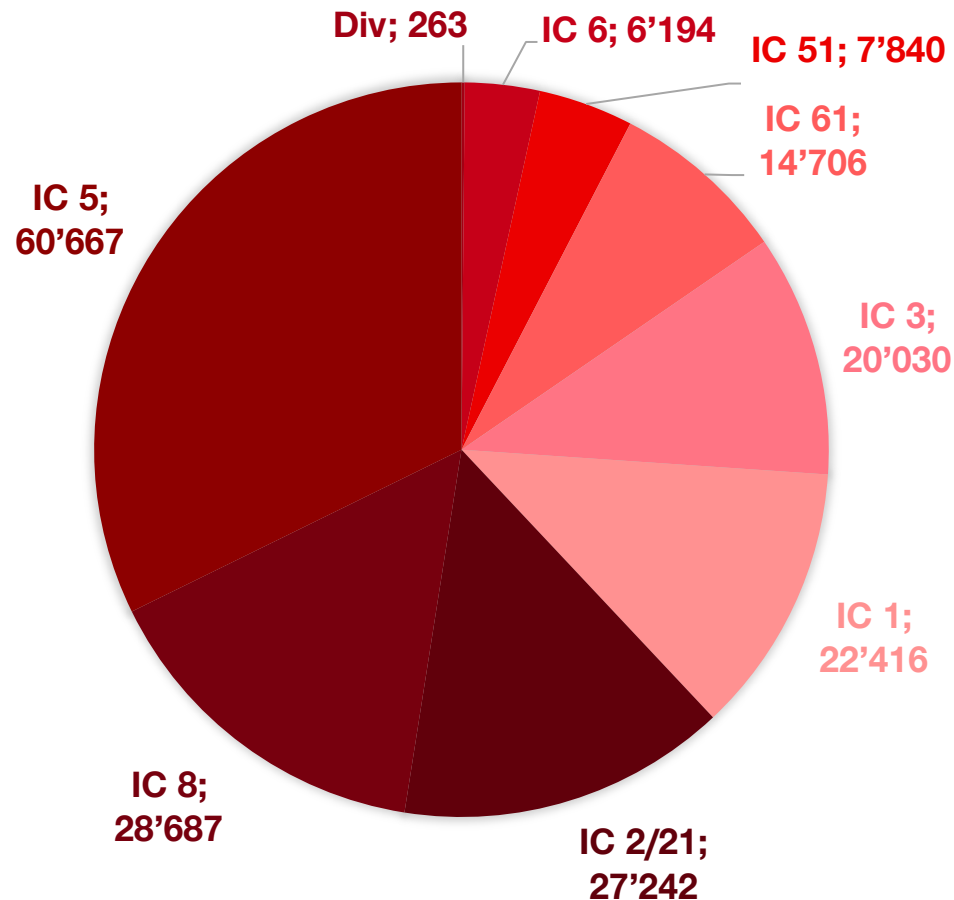
## TOP 10 RESERVATIONS (TRAINS)

| Train No. | Departure place/time | Volume |
| --- | --- | --- |
| IC21 684 | Lugano ab 16.02 | 2'101 |
| IC2 886 | Lugano ab 17.02 | 2'014 |
| IC5 514 | Zürich HB ab 9.04 | 1'892 |
| IC5 529 | Biel/Bienne ab 16.46 | 1'877 |
| IC2 865 | Zürich HB ab 9.05 | 1'766 |
| IC8 829 | Brig ab 16.48 | 1'691 |
| IC8 806 | Bern ab 08.07 | 1'677 |
| IC21 663 | Basel SBB ab 7.03 | 1'535 |
| IC2 882 | Lugano ab 15.02 | 1'533 |
| IC8 808 | Bern ab 09.07 | 1'488 |

Trains IC2/21 and IC5 require a bike reservation every day from 21 March until 31 October. Trains IC8 only from Friday to Sunday.

# Bike reservations per calendar week in 2021.

Only contains domestic IC trains.
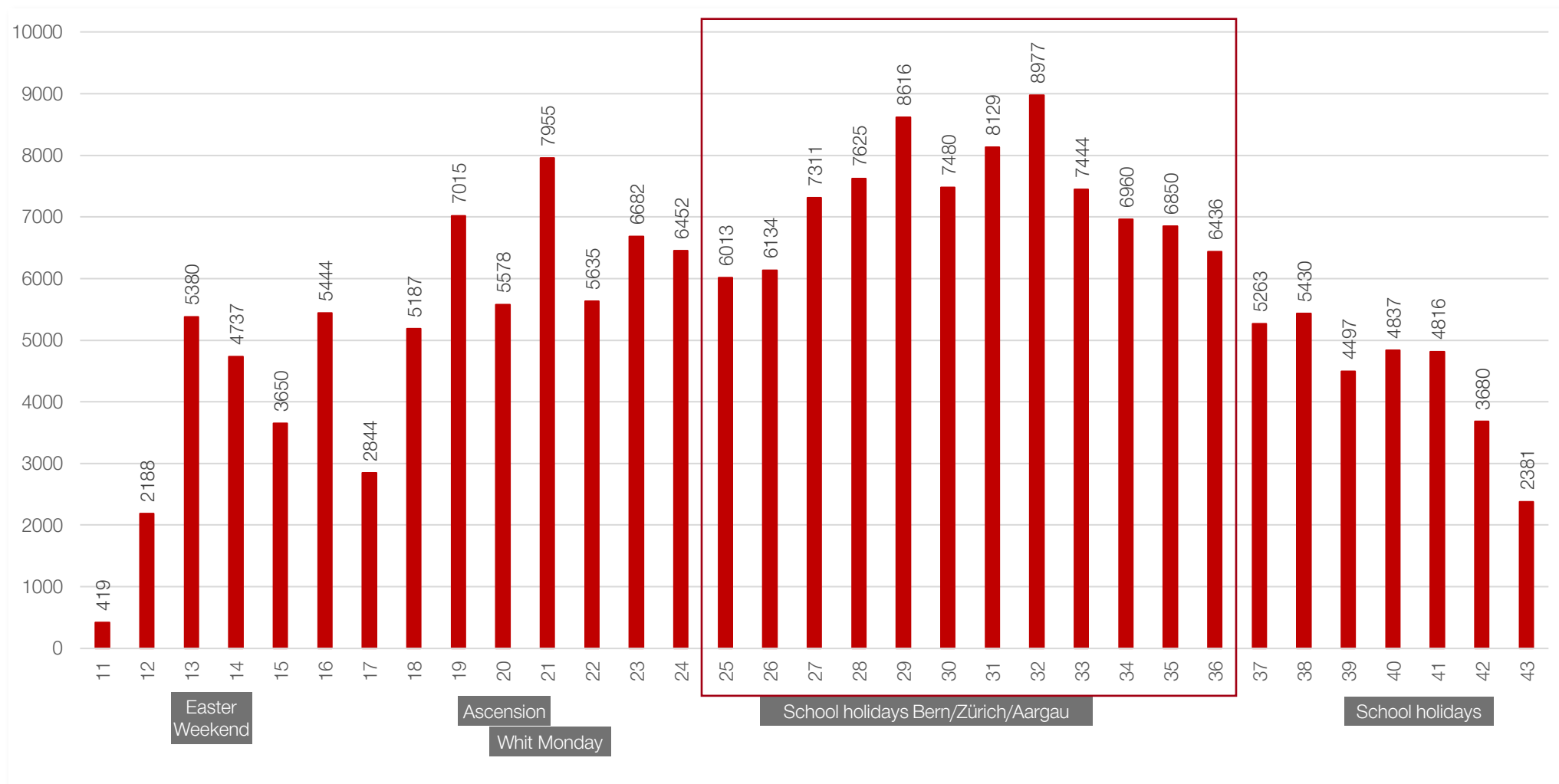
# Historical bicycle reservation data.





## Historical reservations.

- CSV-files includes booking time, routes, number of spaces etc.
- Beginning of periode all data: 2020
- Data from 2019* is only available for IC2/21 (Gotthard) and IC5/51 (Jurasüdfuss)

## Capacity

- Contains additionally actual capacity data («Ist-Kapazität»)
- Attention: Data is pervated by errors (probably periodical transmissons errors)

# Annual Formation.

In the annual formation Information you can find the amount of bikehooks.

The key of the table is «zug». The Formation is "block_bezeichnung". In the field "bitmap" you can find for each day of the period a "x" where the formation is valid. Beginning of the period: 12.12.2021

**DCAT-AP for Switzerland**

| | |
|---|---|
| **Domain** | schweizerische-bundesbahnen-sbb |
| **Rights** | NonCommercialAllowed-CommercialAllowed-ReferenceRequired |

**Dataset schema**
*Click to collapse*

**Train**

| Train number | Name (identifier) | zug |
|---|---|---|
| | Type | decimal |
| | Sample | 18780 |

# Weather Data.
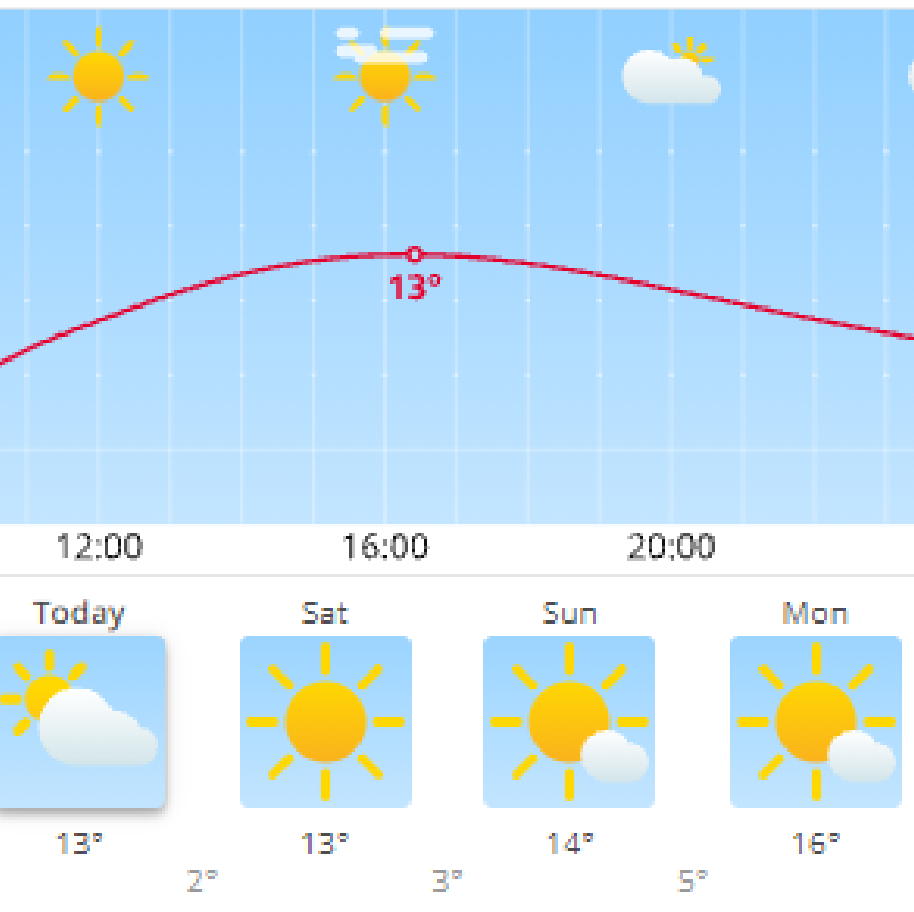


We provide historical weather data for a few points in switzerland

- IC 8 Romanshorn – Zürich – Bern – Brig: Brig/Visp, Saas-Fee, Oberwald, Torrent
- IC 3 Basel – Zürich – Chur: Davos, Samedan, Marguns, Laax
- IC 5 Rorschach – Zürich – Biel – Neuchatel – Lausanne/Genève: Biel, Neuchâtel, Yverdon
- IC 2/21 Basel/Zürich – Bellinzona – Lugano: Bellinzona und Lugano

leisure_biking:idx  ➜ index 0 to 1 to indicate how well you can bike
snow_depth:cm ➜ deepth of snow at this point
t_2m:C, ➜actual temperature
precip_24h:mm ➜ amount of rain during the last 24 hours
weather_symbol_1h:idx ➜ summary of the weather in the last hour link
effective_cloud_cover:octas ➜ index of cloud coverage

Details on Available Parameters | Meteomatics

# Holidays in Switzerland.



Each canton has different holidays.
We collected all of them  in one list.



| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| | Kanton | Sportferien | | Frühlingsferien | | Sommerferien | | Herbstfer |
| 1 | | | | | | | | |
| 2 | Aargau | | | 12.04.2022 | 23.04.2022 | 19.07.2022 | 19.07.2022 | 04.10.2022 |
| 3 | Ausserrhoden | | | 12.04.2022 | 23.04.2022 | 12.07.2022 | 13.08.2022 | 11.10.2022 |
| 4 | Basel-Land | 13.02.2022 | 28.02.2022 | 27.03.2022 | 11.04.2022 | 03.07.2022 | 15.08.2022 | 02.10.2022 |
| 5 | Graubünden | 01.03.2022 | 05.03.2022 | 19.04.2022 | 30.04.2022 | 01.07.2022 | 15.08.2022 | 11.10.2022 |
| 6 | Uri | 27.02.2022 | 07.03.2022 | 01.05.2022 | 16.05.2022 | 03.07.2022 | 15.08.2022 | 02.10.2022 |
| 7 | Innerrhoden | 12.02.2022 | 21.02.2022 | 10.04.2022 | 25.04.2022 | 03.07.2022 | 15.08.2022 | 09.10.2022 |
| 8 | Basel-Land | 13.02.2022 | 28.02.2022 | 27.03.2022 | 11.04.2022 | 10.07.2022 | 15.08.2022 | 02.10.2022 |
| 9 | Basel-Stadt | 13.02.2022 | 27.02.2022 | 27.03.2022 | 10.04.2022 | 03.07.2022 | 14.08.2022 | 02.10.2022 |
| 10 | Bern | | | 10.04.2022 | 25.04.2022 | 03.07.2022 Bern | 15.08.2022 | 25.09.2022 |

# Timetable information and annual formation gives you

## Open Journey Planer– Service - timetable search.

- OJP allows you to look for trips
- After you find a trip, you can look for the specific formation (cars which are in the train). In this formation information
- Description of the service: OJP – Open Journey Planer | Open-Data-Plattform Mobilität Schweiz (opentransportdata.swiss)
- Endpoints to use: - Trip Request
- Credentials: find on the website

## Opendata Transport Service - timetable search

- Opendata.& search.ch provide easy timetable search
- Limited usage  (1000 times a day.)
- Description of the service: Transport API (opendata.ch)
- Endpoints to use: /connections
- No Credentials needed



Open-Data-Plattform Mobilität Schweiz

| MahaliaStephan Update README.md | | 1a6ee89 18 hours ago | 🕐 7 commits |
|---|---|---|---|
| 220207_Angebot_Veloplätze_Züge_2... | Add files via upload | | 15 days ago |
| README.md | Update README.md | | 18 hours ago |
| Reservationen_alle_inkl._int_Mrz_Okt_... | Add files via upload | | 15 days ago |
| Schulferien.xlsx | Add files via upload | | 6 days ago |
| weather.xlsx | Add files via upload | | 15 days ago |

## About

*No description, website, or topics provided.*

📖 Readme
☆ 0 stars
👁 2 watching
⑂ 0 forks

## Releases

No releases published
Create a new release

## Packages

No packages published
Publish your first package

## Contributors 3

- timetable2014 Christian Trachsel
- YvGra Yves
- MahaliaStephan

≡ README.md ✏

# START Hack 2022 - SBB Case

## Case Introduction

- Travelers more and more want to take their bicycle on the train to discover Switzerland. For self-service loading of bicycles SBB offers space on the train, which customer need to reserve upfront. On top of that at the weekend there is extra space available staffs helping travelers to load their bicycles in a separate wagon. But also with that extra capacity space can going to be scarce at days weather is supposed to become nice. Unfortunately customers can't see how many spaces are available. However, if the weather is rainy or cold there are not so many staffs needed and the reservation does not has take place so early.

Expected Final Product A prediction for the upcoming weekend at w time bicycle slots on the train are already fully booked. So customers can get the information of the latest timeslot they probably should book their reservation to get a free bicycle space depending on the train or trainline. Furthermore, internal staffing can be adjusted upfront depending on the predicted demand for bicycle transportation.

Who will help us to enable our customers to have a joyful ride at the weekend?

# Thank you.

Merci. Grazie & Dankeschön.