

BUROHAPPOLD
ENGINEERING

BERLIN'S STREETS IN THE AGE OF AUTONOMOUS VEHICLES

BERLIN DESIGN SPRINT - JANUARY 2017



GLOBAL DESIGN SPRINT

Connected and Autonomous Vehicles (CAVs) are on everyone's mind, with the race on among global vehicle manufacturers to create the first fully automated CAV before 2020 mimicking the space race of the mid-20th century. While it is unclear how fast they are likely to become business as usual, it is almost impossible to ignore that they will be part of our environment in the not too distant future.

Our research has shown that there are a range of ideas emerging around how the built environment will be transformed by the introduction of CAVs, there are however few examples of specific urban sites in actual cities and how they may be adapted to suit the various types of CAVs and the people travelling through the sites.

As a result of this, BuroHappold plan to undertake a series of Global Design Sprints in six of our offices across the globe (Bath, London, New York, Berlin, Riyadh and Kuala Lumpur) to address the following question:

‘HOW CAN URBAN STREETS BE RECLAIMED AND REIMAGINED THROUGH THE INTRODUCTION OF CONNECTED AND AUTONOMOUS VEHICLES?’

Global Design Sprints bring a diverse group of people with various skills and expertise together to solve a problem by thinking collaboratively, innovatively, and creatively. The format of a Global Design Sprint is to follow the design process to develop an answer to a specific question within a limited amount of time, but also to have some fun.

Following our Global Design Sprints, we will publish a paper featuring each team's final ideas and images. Selected teams with outstanding outputs will be asked to prepare a 2 minute presentation, which will be published on [BuroHappold's website](#).



BERLIN DESIGN SPRINT

Germany is at the forefront of the transition towards clean energy. This includes the transition from vehicles with internal combustion engines to fully electric vehicles. Thus, as the future of mobility will not only be autonomous and connected, but also green, we were keen to host one of our Sprints in Berlin. The polycentric urban form of the city, the excellent public transport system and the low rates of car ownership, make Berlin an excellent case for considering CAVs as a wider part of the urban mobility and energy landscape.

Fittingly, we hosted the Berlin Design Sprint at the EUREF Campus. The campus is Berlin's urban laboratory for the energy transition ("Energiewende") and innovative mobility schemes such as electric car sharing. The EUREF campus brings together actors from different industries, research and NGOs in order to pilot and showcase innovative energy and mobility solutions and allow the public to experience these innovations. One of its tenants is the Innovation Centre for Mobility and Societal Change (InnoZ) with whom BuroHappold collaborated on the BeMobility project. The fact that InnoZ is currently testing the autonomous shuttle bus "Olli" on the EUREF Campus and offered our Sprint participants a ride, made it the perfect location for exploring our Sprint question. Participants in Berlin represented Berlin's government, the public transport authority, the car and technology industry, academia, advocacy groups,

architects, urban designers, and planners. The Berlin Sprint was introduced by Burkhard Horn, Head of Traffic at Berlin's Senate Department for the Environment, Transport and Climate Protection, who provided an overview of Berlin's transportation strategy and Professor Jochen Rabe, from BuroHappold's Cities team and the Einstein Centre Digital Future (ECDF) in Berlin, who provocatively demanded the sprinters to keep the human point of view in mind.

After having listened to these input speakers, the sprinters eagerly started exploring the question of how to reclaim Berlin's streets in an era of autonomous and connected vehicles. The three sites explored in Berlin were: The Schloßstraße in Steglitz, a main thoroughfare with retail malls on either side of the street; the Friedrichstraße in Mitte, a major road that includes a tram line and is located in one of Berlin's business districts; and the Hufelandstraße, a residential neighbourhood characterised by on-street parking and cobblestones.

The ideas developed for these sites ranged from the introduction of a road pricing mechanism that takes into account the socio-economic status of drivers, to a system where street lanes digitally open and close according to user demand. The discussion at the end focused, not only on the feasibility of the proposed interventions, but also on the question of how realistic and

how desirable an era of autonomous and connected vehicles is. The results made it emphatically clear that Jochen's appeal for a humanistic approach was heeded. This was also reflected by BuroHappold CEO, Roger Nickells, who concluded the workshop by stressing the fact that the potential of autonomous and connected vehicles to improve the quality of a city is only achievable if all stakeholders involved collaborate; the city administration, the designers, and the technology providers will need to work together with the users - the inhabitants of our cities - giving them a participating role in the planning process.

"We love challenges like these as engineers and we love challenges like these as BuroHappold. I'm thankful to all participants for sharing their thinking and ideas."

Roger Nickells
CEO BuroHappold



BERLIN: WHY HAVE WE CHOSEN THESE SITES?



SCHLOSSSTRASSE

The Schloßstraße is the major shopping street of the district “Steglitz-Zehlendorf” and Berlin’s biggest retail location. It is highly frequented and well connected with the rest of the city. The introduction of CAVs could be a great opportunity to create more space for pedestrians and roadside green.



FRIEDRICHSTRASSE

The Friedrichstraße is located in Berlin’s central district “Mitte”, it is one of Berlin’s most popular streets known for its big variety of cultural opportunities and shopping possibilities. The Friedrichstraße runs from the northern part of old “Mitte” down south to the “Hallesches Tor” in the district “Kreuzberg”. Due to its north-southerly direction it forms important junctions with the east-western axes. The road is very narrow in comparison to other roads with a similar traffic volume and business density. The street segment around the train station Friedrichstraße is one of Berlin’s hot spots and is connected to many different kinds of transportation modes, such as the tram, the underground and the regional railway.



HUFELANDSTRASSE/BÖTZOWSTRASSE

The corner Hufelandstraße/Bötzowstraße in Berlin’s district “Prenzlauer Berg” is close to the park “Volkspark Friedrichshain” and is a mixed residential area with many small cafes and shops. It is very densely planted with trees and has a calm and welcoming atmosphere. It is dominated by local residents’ traffic. Through the introduction of CAVs there is a possibility of creating an almost car-free zone and eliminating the current difficulties in finding on street parking.

SCHLOSSSTRASSE 1

Carl-Friedrich Eckhardt (BMW Group), **Sebastian Seelig** (BuroHappold), **Rita Cyganski** (German Aeronautics and Space Research Centre), **Vanessa Miriam Carlow** (COBE, TU Braunschweig), **Nico Grasselt** (eMO Berlin Agency for Electric Mobility), **Norbert Pauluweit** (BSR - Berlin Waste Management Authority)

Write-up by **Sebastian Seelig**

What is your team's idea?

Today, the Schloßstraße suffers from thoroughfare traffic between Berlin's Southwest and the centre city Centre as well as from traffic generated by the large retail units. The team's work focuses on the idea of leveraging CAVs' increased vehicle capacity on roads to more effectively manage the traffic and hence improve the quality of the urban realm, especially for pedestrians and cyclists. Beyond this, the scheme should enhance the quality of life in the entire neighbourhood. Rather than proposing a full transformation of the area, the team proposes a set of careful interventions which will need to be implemented over a longer period of time as the technology evolves.

The first set of interventions focuses on the re-design of the Schloßstraße, with the three lanes being repurposed in the following way:

- one lane should be used by autonomous vehicles, including cars, busses, car sharing and ridesharing;
- one lane should be used for pick-up/drop-off areas, new stops for ridesharing and on-demand bus stops (every 300m); and
- one lane should be used solely by cyclists.

Narrowing down the lanes to 2.5m will free up additional space for extended and improved pedestrian space.

The lesser number of cars will also result in a more efficient use of parking infrastructure that in turn may be used for re-densification or to provide required recreational areas or social infrastructure. Another intervention centres around the upgrade of public infrastructure which might be under stronger competition in the future due to an increased use of ridesharing and car sharing.

Why is this a good idea for your city?

The design is a good idea because it provides multiple benefits for the most frequent users of the street and its adjacent residents. Firstly, the design significantly improves the quality of the urban realm, especially for pedestrians and cyclists. Pedestrians shopping in the Schloßstraße will

benefit from broader sidewalks for a safer and more enjoyable pedestrian experience. A greener environment with more trees will lead to an enhanced microclimate, crucial in times of more frequent and longer heat waves. Redesigning the entire street space will also allow for an upgrade of the old 20th century infrastructure, introducing natural rainwater management through green infrastructure.

Cyclists using the Schloßstraße as a main transport spine to the south west of Berlin will enjoy a separate cycle lane with 2.50m width. The residents of the adjacent residential areas will benefit from reduced peak traffic, as service and waste vehicles will provide their services during evening hours and night time, with dedicated service areas for drop-off and pick-up. Residents of the adjacent neighbourhoods will also benefit from new social infrastructure on top of multi-storey car-parks that are no longer needed due to the higher utilisation of parking facilities. Public transport users will profit from the introduction of pick-up and drop-off zones for shared services and from an improved station design of the Walther Schreiber Platz Station, offering additional services such as a post office in the station and bicycle infrastructure.

What would need to happen to implement your team's idea?

The redesign of streets, public transport stations, and existing infrastructure (such as multi-storey car parks) will require substantial funds for implementation. The team's proposal is to introduce a pricing mechanism that will help generate sizeable funds while aiming to reduce the overall traffic on Berlin's streets. Hence, the team introduces the idea of dynamic road pricing, which should be rolled out for the entire city of Berlin, both implemented and operated by the City of Berlin. The price that the individual user pays depends on the size of the car, the distance travelled, the number of passengers on board, the emissions caused and the social status of the user. The more efficient the vehicle and the lower the distance travelled, the lower the price. Furthermore, by adding socio-economic criteria into the pricing model one can allow for the implementation of an inclusive approach. Monitoring data and payments will be done with mobile devices.

“Technically AVs could have conquered the streets of Berlin in 2025 to 2030. However, it is very much dependent on which framework conditions are in place in the city.”

Carl Friedrich Eckhardt

BMW Group, Leader of the Centre for Urban Mobility





SCHLOSSSTRASSE 1

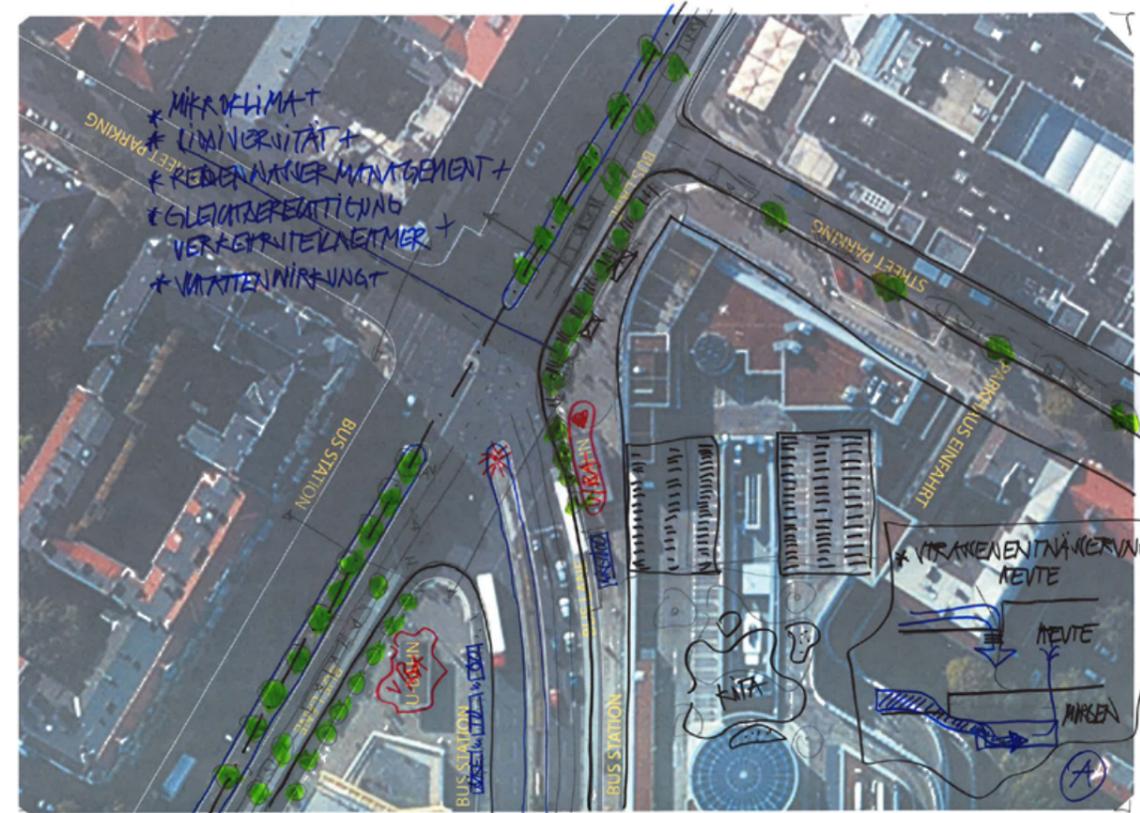
THESE:

2050 = 100% -ELECTRIC

- SHARED + INDIVIDUEL
- KEINE VERKEHRZEICHEN
- FULLY GANZFLEISSIG
- PLATZSPAREND
→ MEHR PLATZ FÜR RAD + FUß!
- 30 km/h
- MEHR QUALITÄT
→ VERFÜGBARKEIT + QOL
- ENTZERRUNG (LIEFERVER + PRIVAT)

TOOL:

- DYNAMISCHES "ROAD PRICING"
- NACH PLATZ / BREIT / EMISSIONEN / SOZ. INDIKATOR. GRÖSSE ^{BEDÜRFTIGK.}



VORZÜGE:

- BESSERE STADTRAUM - UMVERTEILUNG
- MIKROKLIMA / EMISS. - DURCH MEHR GRÜN ^{HEIMISCHES ZUKUNFTSPOTENTIAL}
- ENTZERRUNG VERKEHR - FLÜSSIGER
- MEHR RAUM FÜR RAD (WEGE + INTRA) PARKEN/REP./LADEN/CAFES)
- BESSERE ÖPNV (MEHR SERVICE, BESSERE NUTZERKOM.)
- NACHVERDICHTUNG AUF PARKHÄUSERN - NEUE ORTE FÜR SOZ. INFRA.
- UPDATING VON INFRASTRUKTUR (z.B. BELEUCHTUNG)
- EFFIZIENTERE LOGISTIK & MÜLL-ENTSORGUNG DURCH "SERVICE AREAS"
- NEUE BUSINESS-MODELLE FÜR ANRAIMER/ANWARTNER

SCHLOSSSTRASSE 2

Alan Harbinson (BuroHappold), **Dalia Levens** (BuroHappold),
Ludwig Engel (UdK Berlin), **Roger Nickells** (BuroHappold),
Thomas Willemeit (Graft Architects)

Write-up by **Dalia Levens**

What is your team's idea?

Our idea focused on the goal of maintaining and increasing the value of the urban environment through the use of AVs. We wanted to maintain and improve upon our location as a destination for shopping and a dense residential neighbourhood, while maintaining traffic access to Schloßstraße as a main thoroughfare. We have therefore envisioned a space in which technology is used to optimise operations of the roadways. With resident and customer parking abolished in the area, street parking space could be reclaimed for public or commercial uses. In addition, operational optimisation would allow us to shrink roadway profiles by narrowing lanes, narrowing turning radii, and potentially removing traffic lanes. A technological solution would allow optimal use of the remaining solutions, by digitally opening and closing lanes during periods of changed demand. Directions could also be changed to meet directional peaks as needed. Routing algorithms could also be used to change AV routing through the city at different times of day. In this way back streets could be used more when the neighbourhoods are more likely to be empty (i.e. during the midday), but vehicles would be routed along designated major streets to avoid interferences with neighbourhood activities. This could all be done in real-time to match current demand.

Why is this a good idea for your city?

This is a good idea for the site because it provides increased opportunity for economic growth, while simultaneously increasing the efficiency of the transportation network. It is our proposal for an area that is well served by public transit (including many U-Bahn (subway) stations and bus routes) to use some level of traffic congestion to encourage pedestrian activity and the use of transit in the neighbourhood, while improving access. Thoroughfare traffic can still be accommodated, but it is not the priority for this street. This technological solution would be highly adaptable, and would let the whole city – not only this neighbourhood – adapt to changing conditions in the most efficient way possible. This is also an evolutionary solution, that accommodates as much or as little change as might be needed, as people slowly start to change their behaviour.

What would need to happen to implement your team's idea?

Our basic assumptions included a fleet of 100% emission and noise free vehicles. That would reduce the impact that vehicles had on humans. We

would require that within some predefined area, only pick-up and drop-off was allowed, so that no non-autonomous vehicles that need to be parked would be allowed in the area. This would not necessarily extend to the existing parking garages – if not redeveloped, perhaps these existing garages would serve as good locations for long-term storage of self-driving vehicles. The major requirement to implement this solution is a city-wide (or perhaps area-wide) real time traffic management system. This system would need to be able to monitor traffic conditions in real time, and be connected to the routing software of all AVs in the city, so that routing could be changed as needed.

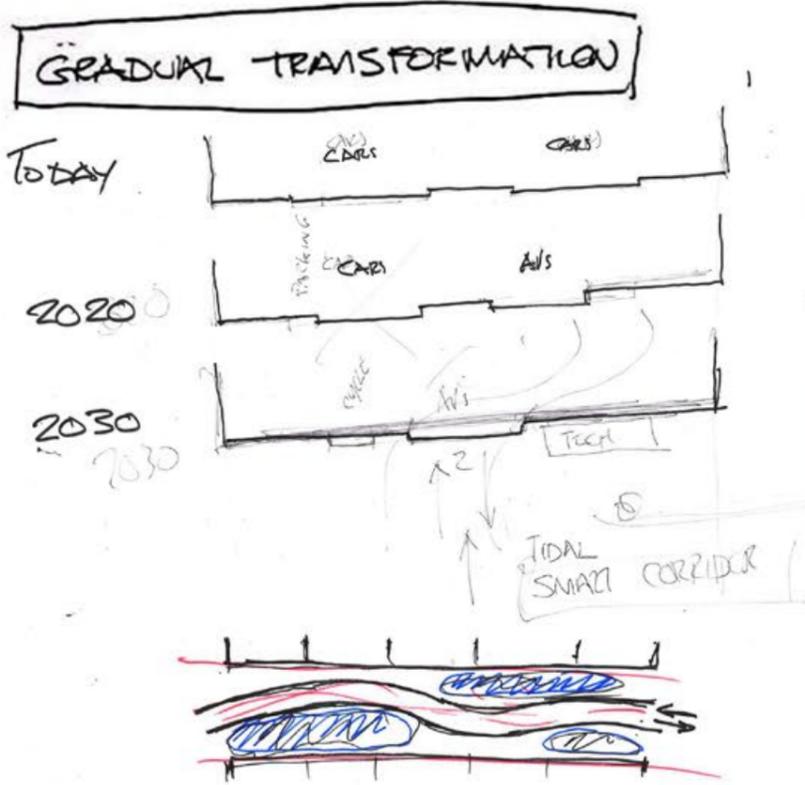
“The really interesting departure from the norm is bringing together individuals from different professional backgrounds.”

Alan Harbinson
Managing Director Cities BuroHappold





SCHLOSSSTRASSE 2



Behavior:

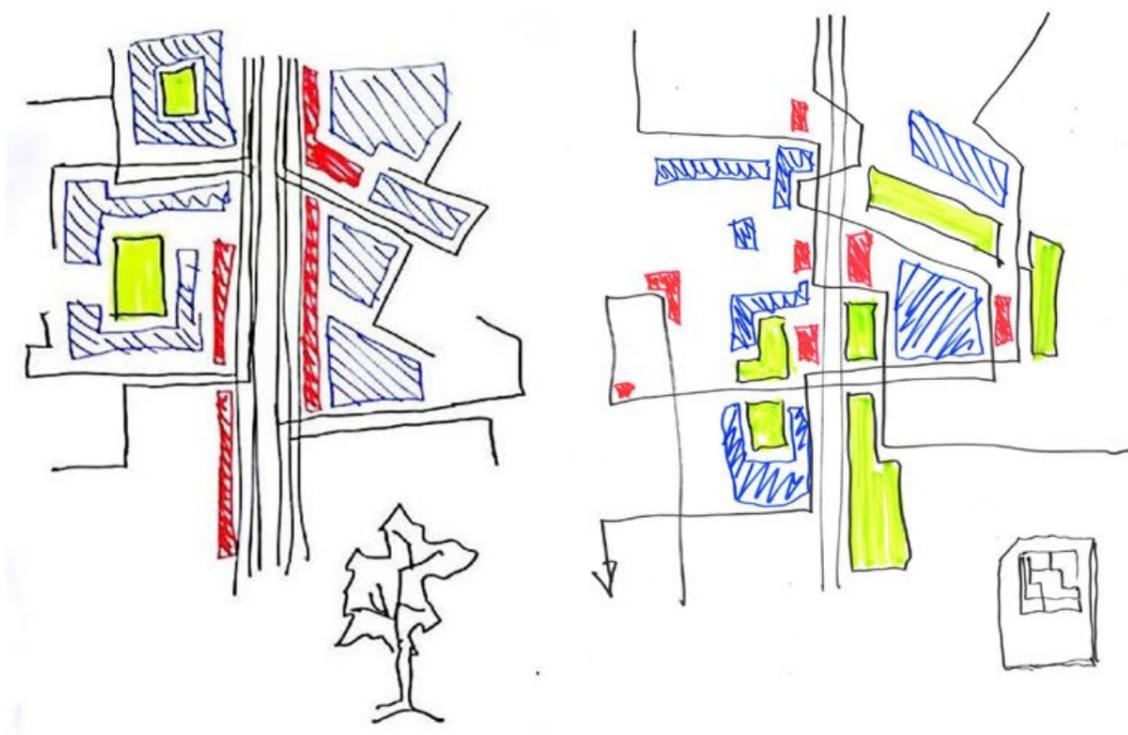
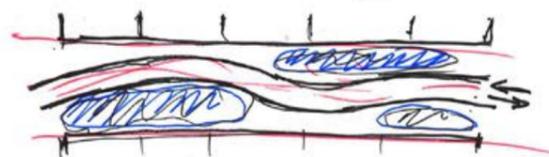
- People will want to drive more
- Capacity capping will help curb demand

Assumptions:

- No noise
- No emissions
- 100% AV in area (drop off/pick-up only)

Our Goal:

Increase value of urban environment operations of the roadway facilities.



HUFELANDSTRASSE 1



Frank Christian Hinrichs (inno2grid), **Melanie Garcia** (BuroHappold), **Nicolas Pomränke** (gmp Architects), **Jörg Kirst** (ADAC - German Automobile Association), **Paul Rogers** (BuroHappold), **Ricarda Pätzold** (German Institute for Urbanism)

Write-up by **Melanie Garcia**

What is your team's idea?

Since the Hufelandstraße is located in a residential area, a significant part of the street is currently being occupied by parking lots. Our team assumed that the future of autonomous vehicles will include car-sharing fleets, ridesharing as well as privately owned AVs. We conceived a city full of autonomous vehicles as unrealistic.

In view of a future where autonomous driving does however become a reality, our team assumes that the use of CAVs will ease the neighbourhood's on-street parking demand and therefore proposes to make use of the no longer needed parking space for other neighbourhood functions. The concept for the reuse includes community gardens, playgrounds, temporary use spaces and drop-off areas for the autonomous cars that attend service purposes.

As retail outlets such as supermarkets might no longer exist in the future, the street would also need to be able to accommodate the increasing number of deliveries by autonomous vehicles. This not only poses a technological challenge, but also requires a range of policy changes.

The team's main assumptions regarding the street design are as follows:

- One lane will remain reserved for on-street parking, especially for individually-owned cars. The dimension of the lane will remain the same (about 2 meters) as we anticipate this lane to be used by both CAVs and traditional cars.
- One lane will have 2 drop-off areas at either side of the street for CAVs attending service purposes (groceries and other deliveries) as well as parking space for car-sharing. In this lane different urban functions can take place such as community gardens, playgrounds, shared spaces and temporary use spaces that adjust to the neighbourhood's needs and preferences.
- The car circulation space of the street will be gradually reduced until normal cars slowly leave the grid, releasing space for pedestrians, cyclists and the above-mentioned urban functions.

Our concept can best be explained with a series of transitions that would be phased as people get used to autonomous and connected vehicles. Hufelandstraße is a street with on-street parking on either side. The team

therefore proposes to leave one street side open for on-street parking while developing the other side during a first phase. In a second phase, the on-street parking would be closed on both sides, allowing for the appropriation of space by the community.

Why is this a good idea for your city?

Freeing up space in a residential area would allow citizens to reclaim the street as their public space. This translates into an increased quality of the urban space and in turn into a better quality of life for the residents. Through community participation residents will play a main role in the development of these public spaces, since they will be able to decide what kind of activities they would like to see taking place at the sites. Our team foresees these spaces as "flexible spaces" that will change over time as autonomous driving evolves. This, along with a phased approach, will ease the process for both residents as well as the urban fabric. At the same time, the residents' mobility will be increased, since the idea conceives an integrated transport system in which CAVs will be key, especially for people with reduced mobility.

What would need to happen to implement your team's idea?

As the planned space belongs to the government, the re-development of the street would have high costs for both the citizens and the government. To implement our idea, the autonomous vehicle companies should contribute to the financing of the transportation hubs within the city. The team also foresees the implementation of regulative policies that allow the cooperation between public transport authorities and CAV companies. This will be key for the success of an integrated transport system.

Through the phased approach (led by regulative policies), the demand of traditional cars will slowly be reduced, since it will be more difficult to park a traditional car within the city. In this way, the transition process may be accelerated.

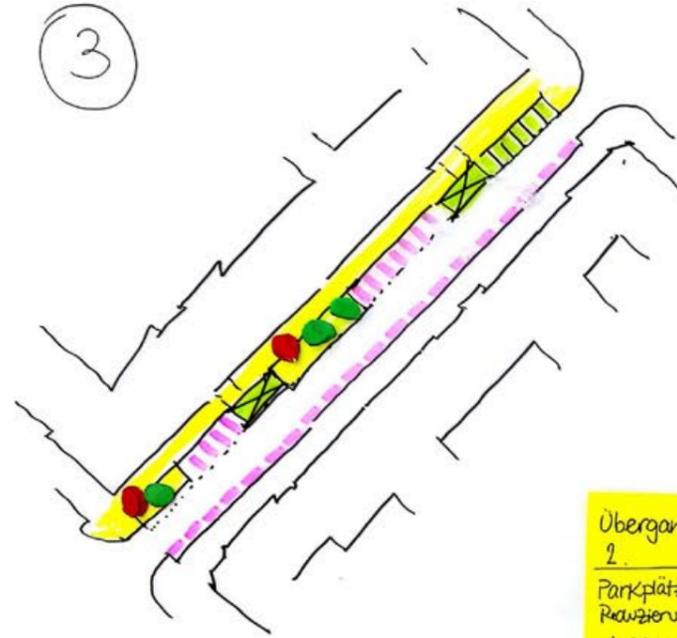
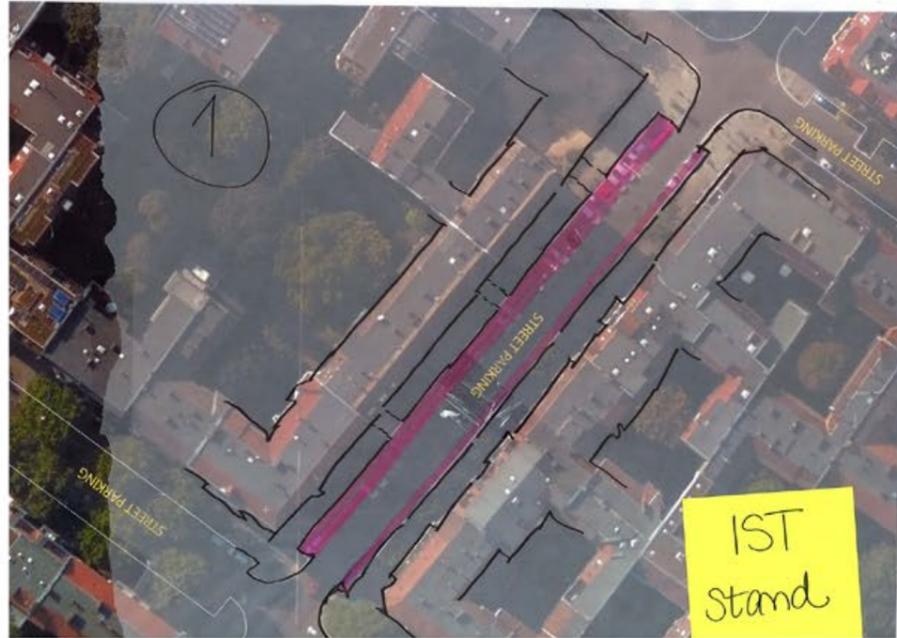
"It was really a sprint getting straight into the heart of the challenge."

Ricarda Pätzold

Researcher at the German Institute for Urbanism, Department Urban Technology, Law, Social Affairs



HUFELANDSTRASSE 1



Übergangsphase 2.
Parkplätze Reduzierung
↳ Platzgewinn

Konzept

- Neue Funktionen etablieren, sowohl in der Straße als auch im Quartier
- Parkplatzreduzierung → Mehr Platz im öffentlichen Raum
- Aufenthaltsqualität im öffentlichen Raum
- Ansprüche der Nutzer im Quartier erfüllen

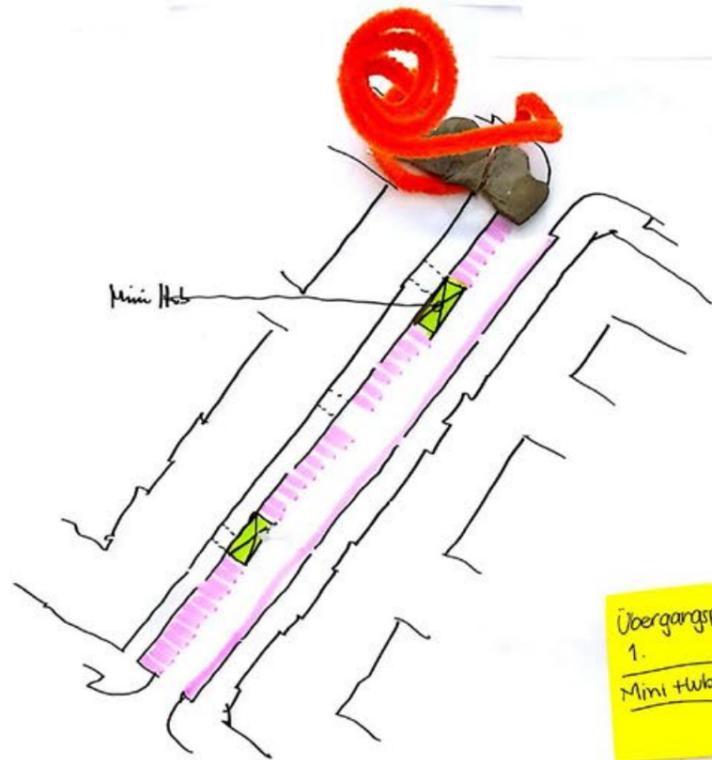
Konzept

- Neue Funktionen etablieren sowohl in der Straße als auch im Quartier
 - ↳ Vorgärten
 - ↳ Community Gardens
 - ↳ Spielplätze
 - ↳ Drop-off areas
 - ↳ Fahrradwege
 - ↳ Fußgängerwege

Challenges / Potential risks

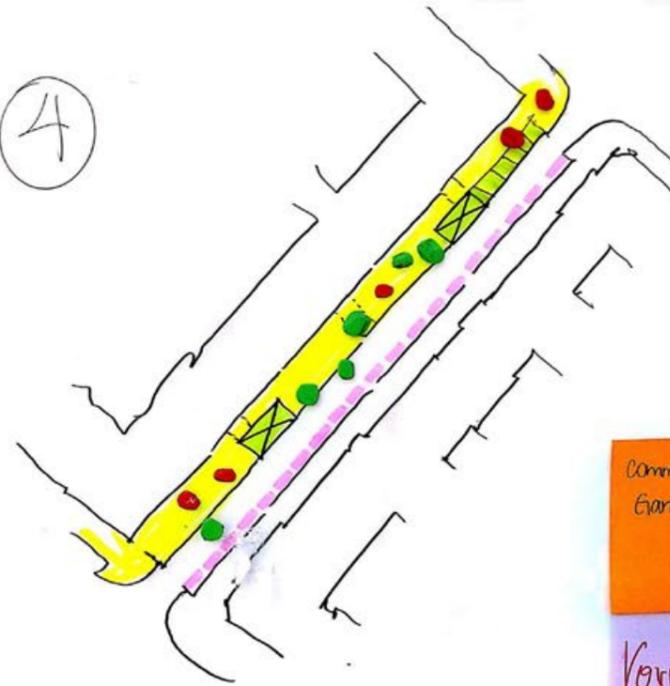
- Betrieb von den Flächen
- Wem gehören diese Räume?
- Wer finanziert das?
- Arbeitsplätze werden schreken.
- Gesundheit wird beeinflusst → Vltt werden viele zu faul, werden sich nicht so viel bewegen.

2



Übergangsphase 1.
Mini Hubs

4

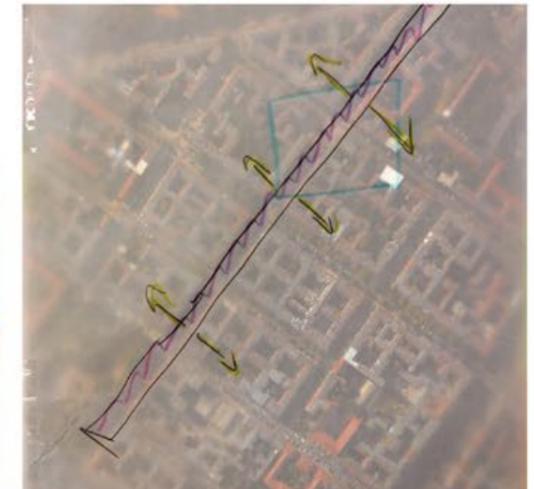


Community Gardens
Vorgärten
Spielplätze
Fahrrad-Wege
Drop-off Areas

- Platz schaffen
- Ansprüche der Nutzer erfüllen
- Aufenthaltsqualität der Nutzer im öffentlichen Raum
- Dienstleistungsanbieter

Konzept

- Straßen müssen nicht komplett neu gemacht werden. Man muss schon die vorhandene Infrastruktur für die Umnutzung verwenden.
- Sondernutzung



HUFELANDSTRASSE 2

Burkhard Horn (Berlin Senate Department for the Environment, Transport and Climate Protection), **Christian Roth** (zanderrotharchitekten), **Doris Lohrmann** (Local Motors), **Ellen Kallert** (bbz landschaftsarchitekten), **Richard Kemmerzehl** (inno2grid), **Jochen Rabe** (BuroHappold, Einstein Center Digital Future)

Write-up by **Jochen Rabe**

What is your team's idea?

Our starting point was the statement that Hufelandstraße, as a mostly residential inner city location, is already well connected to various modes of public transport. Hence, the focus of the discussion was how to position autonomous driving as an added value, whilst avoiding cannibalism of the other forms of public transport which should have priority over autonomous driving offers. We suggest that complementary CAV services will be operated by public transport companies to ensure that the CAV technologies add new qualities to the overall multimodal transport, without replacing more sustainable forms of mobility (e.g. metro, trams and buses). The team was adamant that future modal mixes utilising CAVs must not generate more trips congesting our streets, but less (provided the population number remains unchanged).

The idea is to use the opportunities provided by autonomous driving to further unlock the qualities of the neighbourhood as a home to hundreds of Berliners. Key to the design is the desire to declutter the streets of the neighbourhood, assuming that sharing and autonomous driving services for both people and goods will significantly lower the ratio of car ownership and the number of cars parked on the streets. The team therefore suggests to gradually introduce parking restrictions and eventually free the streets of resident owned cars by 2030. The unlocked public space will be used to increase the share of green space, improving both the climate and the spatial qualities of the neighbourhood.

A mobility hub placed at the edge of the neighbourhood at the Arnswalder Platz, yet within 10min walking time will provide two main functions. Firstly, it will connect the neighbourhood to the full mobility mix of the borough and wider Berlin. Secondly, the hub as one key arrival point to the area will function as an access point to neighbourhood services such as the Neighbourhood Autonomous Shuttle Bus, last mile delivery services for shopping and other goods etc. By concentrating these services at one location at the edge of the neighbourhood. The team would like to avoid merely replacing space previously occupied by car parking, with space allocated to CAV services ("Driving cars, classic or CAVs shouldn't be too comfortable!"). The team acknowledges that the careful distribution of drop off points and parcel stations connected by CAV services and designed into the neighbourhood's public realm will increase the comfort for residents.

The "Olli Neighbourhood Shuttle" is seen as the main CAV service provided within the area, however additional autonomous driving services from outside of the neighbourhood need to be considered, given that they follow the general principles for CAV services set out above. These external services should focus on connecting to the neighbourhood mobility hub and hence increasing its efficiency.

Why is this a good idea for your city?

The implementation of the ideas introduced above would allow the provision of significantly more public and green space whilst maintaining and improving the currently good levels of accessibility and mobility to the citizens. In particular the provision of additional green space in the streets is seen as important, because it currently is below its desirable standards, despite the otherwise reasonably high architectural quality of the neighbourhood. The team's strategy would include two major benefits to the neighbourhood: The activation of the streets would introduce numerous public activities in the streets critical for the wellbeing of residents and to the local identity building and community participation. The additional green space would mitigate local and global environmental challenges such as nitrogen dioxide and particulate matter emissions, as well as climate change impacts such as heat waves.

The team discussed further, considering more radical approaches on how to capitalise on the increased and higher quality provision of space and services in the streets. The team thinks that this would principally allow to further increase the density of neighbourhoods through the provision of additional dwellings on top of existing buildings or gaps in the urban fabric. However, due to the architectural quality of the neighbourhood the team was hesitant to deploy this strategy in this neighbourhood.

What would need to happen to implement your team's idea?

The team acknowledges that regulation is key to introduce a sustainable mobility mix including the harnessing of CAV services. Phasing out resident parking would need regulation, allowing the residents to adapt over time. This would include measures such as the provision of less parking space, increasing the costs of resident parking (the Berlin prices were considered to be far too low compared to already existing pricing systems in other cities such as, for example, Amsterdam) and eventually the ban on any form of parking for privately owned cars. The team suggests to immediately drop the speed limits in the neighbourhood to 10kph and to try to restrict trips generated by delivery traffic possibly through the tendering of exclusive neighbourhood delivery services.



"If Berlin voluntarily submits itself to AVs, it would have to be in a regulated way. The goal is not only to have less parked cars, but also a reduction of individual traffic whilst strengthening public transport."

Burkhard Horn

Head of Traffic, Berlin Senate Department for the Environment, Transport and Climate Protection



HUFELANDSTRASSE 2



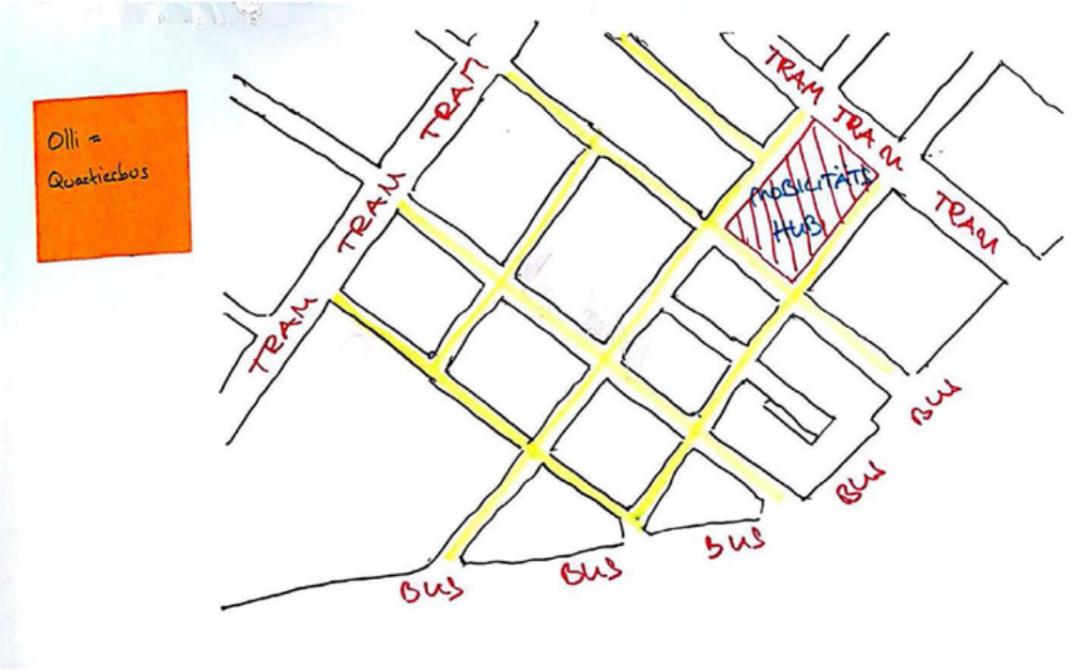
↑ zentraler
Lesistik-Hub
autonomes Bus macht
Kleinverteilung
• losweise Ausschreibung

Szenario
2030
• kein privates Auto im
alltäglichen Raum

• kein
Bewohnerparken

• after Carsharing
+ Quartierbusse
sind Teil des
ÖPNV

— MEHR GRÜNFÄCHEN
IM QUARTIER
FÜR BEWÖHNER



— LIEFERVERKEHR
BÜNDELN
— PARKSTATION
— FARRADPARKEN

— AUTOFAHREN DARF
NICHT ZU BEQUEM SEIN
— CAR DARF NICHT MEHR
AUTOVERKEHR PRODUZIEREN

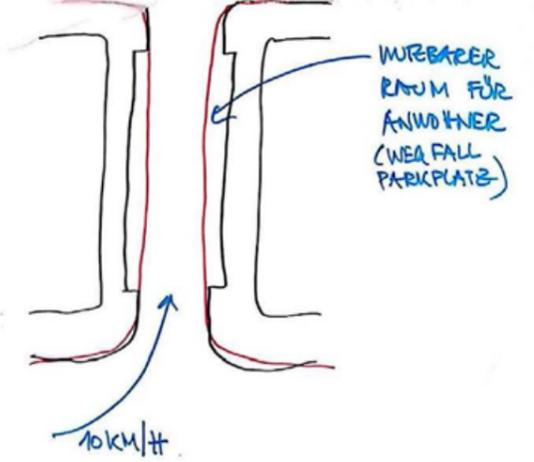
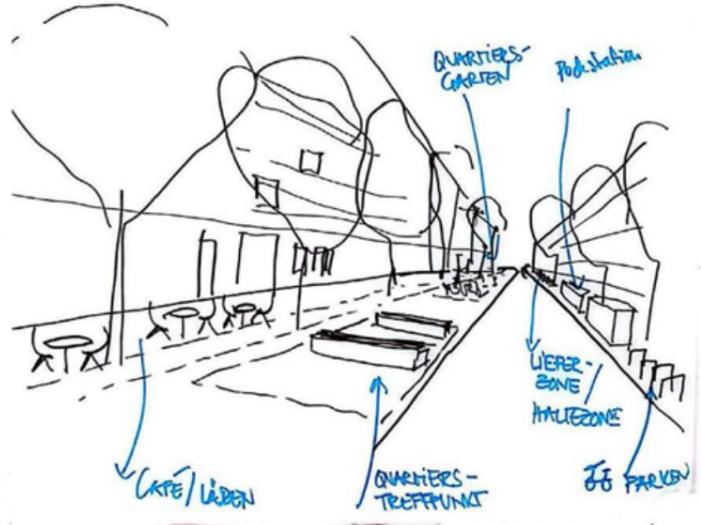
Regulierung:

Regulierung:

- (Bewohner)Parken verbieten
bzw. ganz abschaffen
- Lieferverkehr durch
quartiersweise Ausschreibung
bündeln
- 10 km/h-Zone

Natwendigkeit:

Quartierbus + Carsharing
in ÖPNV integriert



— LIEFERZONE (BÜNDELUNG DER STRÖME)
— PARKSTATIONEN
— ERWEITERUNG EG-NUTZUNGEN
— FREIRÄUME FÜR ANWOHNER
— QUARTIERBUS

FRIEDRICHSTRASSE 1

Anne-Caroline Erbstößer (Foundation Technologiestiftung Berlin),
Hendrik Wüst (BVG - Berlin Public Transport Corporation),
Öykü Ülgüner (BuroHappold), **Thomas Stellmach** (TSPA Planning and
Architecture), **Ute Klotzbücher** (BVG - Berlin Public Transport Corporation),
Xavier Vagedes (Bosch)

Write-up by **Öykü Ülgüner**

What is your team's idea?

Friedrichstraße is one of the most crowded central streets of the city. Our team's main goal was to maintain and improve the quality of the streetscape for pedestrians (mainly tourists and people who work in the area); and to reclaim the street for those who spend time "on the street".

In order to follow this target, we assumed that autonomous cars will reduce the intensity of traffic on the street. Therefore, we propose to reduce the space for cars and thereby increase the space for people to sit in cafes and restaurants on either side of the street. We also propose to use some of the reclaimed street for open and green spaces. While we considered options around different levels for traffic (cars on the top, public transport on the ground), we propose a one-level solution that organises the traffic into a single lane: An LED-ground lighting system will guide the traffic – a solution that also increases the visual quality of the street.

Why is this a good idea for your city?

The idea will improve the quality of place and increase the accessibility of the shops, offices, and recreation spaces for people. It also considers and appreciates the continuing role of public transport. The Friedrichstraße station, already a hub for different transport options will be maintained and improved. This concept is a good idea as it acknowledges the important features of the street and highlights the features of autonomous driving that are contributing to the sustainability of the area and its "human scale".

"The car has defined the urban shape and our cities as we know them today. This means that the cities change with the modes of transport."

Thomas Stellmach
TSPA Planning and Architecture

What would need to happen to implement your team's idea?

The team was relatively realistic about the implementation when coming up with ideas but identified a point in the future where many of the foreseen innovative technological solutions that are discussed today are assumed to be in use. For example, new product delivery services including drones and smart systems are considered to be a main part of logistics in the future, which will cause a decrease in the volume of traffic on the street.

Another aspect is the policy regulations in terms of the cooperation with the public transport authorities and the autonomous car-companies in terms of creating hubs for transportation. It is not strictly defined by the team whether the autonomous cars will be privately owned cars or always under the control of large companies or bodies - the idea considered both options.



FRIEDRICHSTRASSE 2

Benjamin Scheerbarth (Eckwerk Entwicklungs GmbH), **Peter Specht** (ADAC - German Automobile Association), **Boris Dehler** (Die Grünen), **Nadine Kuhla von Bergmann** (TU Berlin, Smart Sustainable District Moabit), **Thomas Kraubitz** (BuroHappold, DGNB)

Write-up by **Thomas Kraubitz**

What is your team's idea?

Using the right space for the right function made us consider blocking off parts of the Friedrichstraße for all vehicular traffic – as is currently proposed by Berlin's Green Party. By doing so, drop-off areas become more important and might come to be the true “intermodal exchange and orientation” points within the city.

We looked closely at the intersection between the Friedrichstraße and Unter den Linden where vehicle traffic will be rerouted. At this location, we imagine that people will change from a motorised vehicle to bicycle or continue on foot. At the same time, there may be drones, postal drop-offs, etc. enhancing these areas as an exchange on various levels. Free WLAN and other forms of connecting – including meeting people – are included.

Removing vehicles from parts of the street frees the space between buildings and across streets, this space can be used for outdoor activities and will strengthen the spatial relationship across the street – exchange becomes possible.

On the strip between the Friedrichstraße Station and Unter den Linden, we suggest utilising the non-traffic intervals of the trams for autonomous vehicles, allowing them to cut in and to thus exploit the space between trams – where speed limits might even be lifted.

Further South – between Friedrichstraße and Leipziger Straße we suggest a so-called ‘Lens’, defining a drop-off space where cars unloading passengers will not block passing traffic and ultimately leading to a reduction in traffic.

Why is this a good idea for your city?

We see three specific benefits of the concept:

By combining the lane for the tram with a lane for autonomous and connected vehicles, the currently not fully utilised corridor will be used more efficiently.

Pedestrianising the Friedrichstraße allows for more pedestrian and exchange space where people and deliveries get dropped off and picked up. There will be no intermodal station, but a series of decentralized intermodal nodes.

What would need to happen to implement your team's idea?

In a first step, we suggest following the proposal of the Green Party to make parts of the Friedrichstraße a pedestrian street. In order to use the tram tracks for autonomous vehicles, the times need to be coordinated with the public transportation authority. Finally, the intermodal exchange spots need to be defined.

“Autonomous vehicles are not just a revolution in mobility but also a revolution for urban space.”

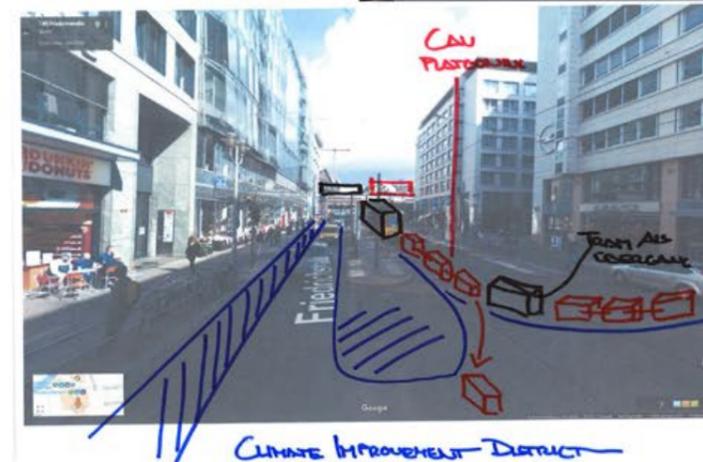
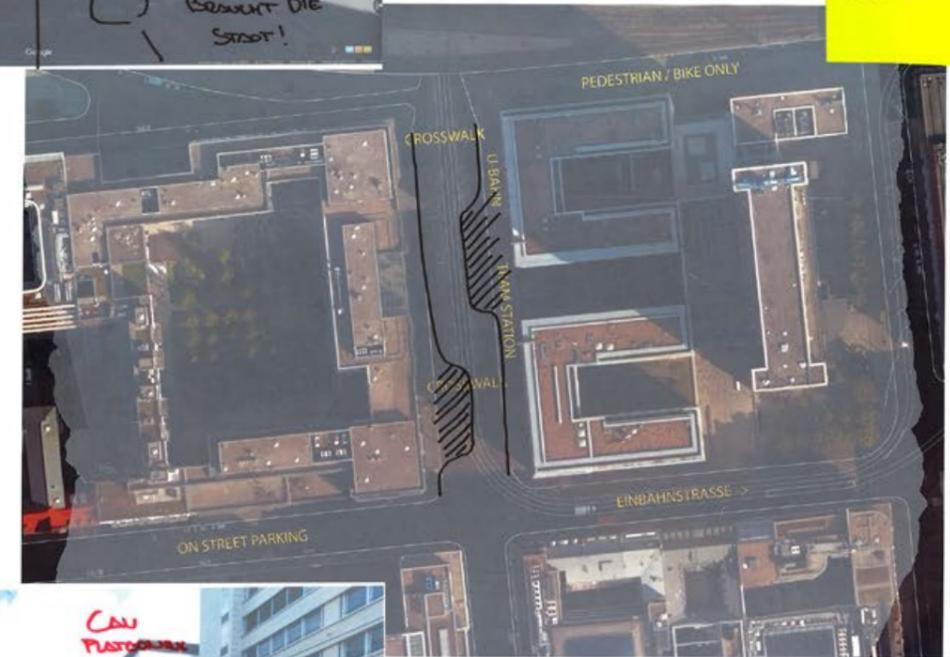
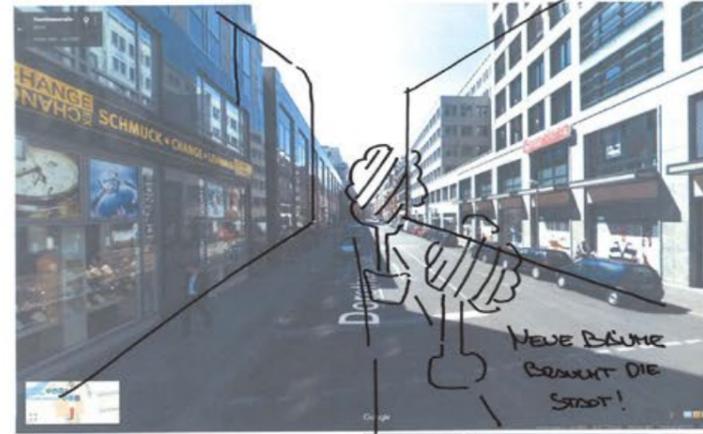
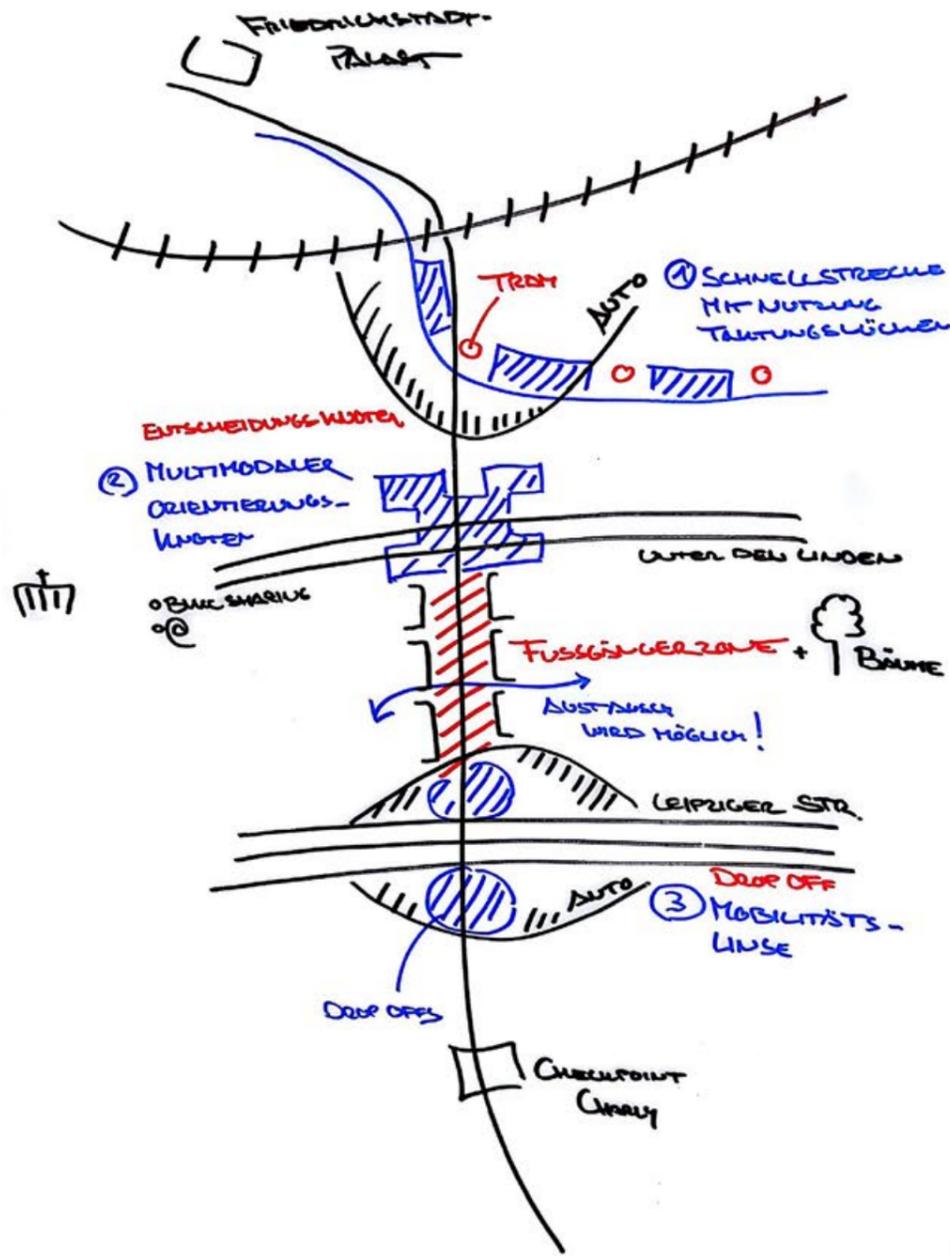
Thomas Kraubitz

Associate BuroHappold and DGNB Auditor





FRIEDRICHSTRASSE 2



CHALLENGES

- KALIBRATION DES ÖFFENTLICHEN VERKEHRS
- ÖKONOMISCHE MONOPOLISIERUNG
- PROZESS FÜR GESTALTUNG DES STRASSENRAUMS
- WETTBEWERBS-SITUATION
- VERSORGEN DER TECHNIK

VORTEILE

- ### VORTEILE SOZIAL
- WAHL DER MODALITÄT
 - BEFREIUNG DES FUßGÄNGERS

- ### VORTEILE WIRTSCHAFT
- UMSATZ ANLIEGENDER GESCHÄFTE
 - POTENZIELLE BETRIEBER MODALER KNOTENPUNKTE

- ### VORTEILE ÖKOLOGISCH
- REDUKTION DER ÜBERHITZUNG DES ÖFFENTLICHEN RAUMS
 - STADTBEGRIÜNUNG

BUROHAPPOLD
ENGINEERING

CONTACT US

Email: globaldesignsprints@burohappold.com
Cities Berlin: sebastian.seelig@burohappold.com
Tel: +49 (0)30 860 906 0

Images and Film

<http://www.burohappold.com/the-lab/berlin-sprinting-future/>

#bhdesignsprint

www.burohappold.com