# Hybrid Infrastructures –
# Transit Spaces as Meta Urban Environments

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## Abstract

The paper investigates on the urban dimension in long distance transport hubs reconsidering on-going functional extensions of transport facilities into urban-like spatial environments. Referring to the concept of the "Metapolis" by François Ascher, a conceptual shift in understanding these places, which are still confronted with the stigma of the "Non-Place", is discussed regarding transit spaces as a continuation of the urban realm. It is shown that transit infrastructures, which operate on different levels and scales in the global network, are of a bi-directional structure, thus shaping interfaces between urban context and transit process. This hybrid constitution has become the framing condition for implementing further urban programs but is simultaneously limited by increasing technical criteria. Starting from aspects reflecting on the socio-spatial role of mobility in the contemporary system of "network cities" it is elaborated what notions of urbanity are evolving and possible to create in such "meta-urban" places and if there are potentials or thresholds for enhancing them. Results from a studio workshop at the Institute of Architecture Technology, TU Graz, illustrate design approaches for a bus terminal in Berlin, Germany investigating potentials to expand transit infrastructure into a "meta-urban" typology.

## 1. Introduction

The aspect of environment to be addressed here is about the production of space as part of our culture of mobility and deals with the understanding and designing of urban spatial qualities appearing within transportation hubs focusing on long distance transport.

Traveling as a form of mobility has, nowadays, turned into almost everyday practice in our accelerating network society. Connectivity of distant places has become a profound urban condition changing the perception of places and evolving the urban realm. Complex and refined systems of transport and also communication allow for (almost) ubiquitous access to places and activities and information, services. In regard to mobility there are always points of arrival and departure in these networks, hubs and terminals that organise access, arrival, change and departure. On one side, they are perceived as transitional in the sense of not being actually inhabited by people but passed through following a displayed transport process. On the other hand, they generate gateways to urban places via transport modes accumulating flows and representing spaces of high movement. Stakeholders in facilitating transport, especially in the case of airports and train stations, have made efforts of this potential endorsing transit by implementation of further functions that create benefit, primarily economic, from this flow of movements. This development shows a turn in paradigms of transit being perceived as accumulators of a specific, trespassing public that can be served on their way. During the recent past an increase in adjoining programs can be traced especially in the transit realm, assembling and overlapping diverse activities, fostering economic potentials in transit. Combining programs in one building structure especially in the context of transportation has apparently become a suitable path for development of transport facilities. Maximizing spatial and economic effort bears notions of a process of urbanization in such infrastructures diversifying users, offering opportunities for stay and attracting further

programs where people meet, work, entertain and travel.

So, it is argued that transportation hubs are increasingly hybrid systems melting transit and urban activities as contemporary urban environments that are contextualised as interfaces between the trans-local network of mobility flows and the local urban context where they are implemented physically. In that sense, it can be stated that transit infrastructures, such as airports, train stations and bus terminals, have increasingly become places of urban culture. But are they urban? This is discussed considering criteria of the social role of mobility in the evolution of urban systems, the urban concepts of the Metapolis and hybridity as structural and programmatic constitution. Phenomena in different transport types, with closer look at a case study for a bus terminal document how developments for hybrid use effects these "meta-urban" spaces. Can transport nodes establish urbanity and urban identity in their notion of being transitional and infrastructural? Is it possible to foster urban dimension in transport hubs by additional and multiple functions beyond commerce? How does cross-categorical programming inform relations between transit space and urban context?

## 2. Non place becoming place in the Metapolis

### 2.1. Mobility: An expanding urban culture

"Mobility is the key both socially and organizationally to town planning, for mobility is not only concerned with roads, but with the whole concept of a mobile fragmented community"[1].

The constituting role of mobility in transformation of socio spatial relations as well as urban development, gradually emerging in society, has been acknowledged by urbanist, sociologists and urban planners ever since the advent of transport technologies empowered people to pass longer distances by means of mechanical devices. In the era of 20th century modernism transport infrastructures were conceptualised to form a basis of modern society and urban development, which was regarded to improve urban life by spatial segregation of functions connected by infrastructures like roads, railways and air traffic. Highly specialised urban territories developed like industrial zones and social housing districts melting the border between cities and surrounding landscape and resulting in a de-territorialisation expanding spatial patterns of urban movement, perception and activity. The daily travel has become part of urban life far beyond neighbourhoods to allow for individual constructions of spatial relations. Travelling still holds on to be contemporary urban practice while the modern paradigms of a top down city planning have been overcome. Mobility stayed and is a

crucial influence to urban development that is not fixed in one overall system [2]. Architect Bernard Tschumi recently underscored the existential relevance of mobility saying: …"that society has been doing nothing else but move towards increased mobility for the past 2000 years…." [3] Mobility studies have been investigating widely on the complex relationships between the phenomena of contemporary mobility practices like spatiality, temporality, social networks, inclusion and exclusion in mobile media, tourism, migration, but also rights, financial aspects. In the 1990´s social sciences stated a "turn" under "new mobility paradigms" [4] acknowledging the premises of mobility for society, "examin(e)ing both the large-scale movements of people, goods, capital, information (and also culture) across the world, as well as local processes of daily transportation, movement through public and private spaces, and the travel of material things in everyday life" [5]. Creswell underscored the importance of mobility as a key to identity and privilege in contemporary society and for the modern city planning pointing out analogies by using vocabulary like arteries and veins for roads as example [6].

Transportation can be regarded as the technical premise for changing socio-spatial relations with diversified and expanded possibilities of urban activities beyond locality onto gradual scales between local and global levels. The constant technological evolution of individual and mass transport has provided advancing spatial connectivity and interaction reducing the time constraints from pre-industrial eras to effectively overcome space distances. By a spatial compression in time transport dissolved the socio-spatial condition of proximity and density as main features of the traditional urban realm [7]. Through transport, especially by means of the car, people deliberated from place and started to act in ever-larger spatial radii, spreading their activities of work, live, leisure in wider contexts, which not necessarily relate in space. Today, people spent an increasing time travelling in their daily work life as well as for vacation. Further, evolutions in communication technologies have overall diminished time constraints in overcoming space completely and shifted the relationship between physical, geographical and social space. So, social urban activities were allowed to exceed local ties beyond physical matter and overcome constraints of spatial encounter for social interaction. Both processes have been creating "network societies" [8].

In these "network societies", according to Castells, complex "spaces of flow", operated by information, communication and transportation infrastructure, appear to generate permanent mobility transcending social, economic and political relationships over geographical and even geopolitical boundaries on different scales [9]. This can be recognised in all areas of life: production processes and business organizations

globalise installing their facilities and branch-offices strategically on a global scale benefitting from local financial or increasingly environmental advantages forcing their representatives to constant travel that becomes work activity. The logistic sector forms a spatial syntax under criteria of distribution distances and proximity to traffic infrastructure. Migration processes establish invisible networks of trespassing national borders; multilocality and multimodality are emerging attributes of mobile urban lifestyles demanding aspects of sustainability, flexibility and budget while contributing to high labour fluctuation, loose family structures and independency from a prior mobility behaviour like a private car.

This shows again that mobility is not only a technical parameter in connecting places but is essential part of urban cultural practice. Transport and communication are the means of a mobile society affecting social and economic activities in all areas of life by deliberating urban culture from spatial-temporal constraints and territorial limitation expanding into networks and flows up until a global scale.

## 2.2. The Metapolis as urban realm of the transitory

By the efforts of mobility delocalisation on one side contributed to a spatial independency of socio spatial activities. On the other side it caused a certain casualization of urban culture transforming the spatial structure of the urban realm. So, metropolitan cities have gradually been superimposed by "urban phenomena that free themselves from any territorial medium to base themselves on interconnection networks composed of visible means of transport and invisible means of communication" [10].

French urbanist François Ascher described these phenomena under the concept of "Metapolis", emphasising that the urban realm of the cities expand beyond the metropolitan scale and that spaces and activities appearing in this expanding realm acquire urban attributes in contributing to the functioning of an expanding urban system.

This expansion of the urban realm described by the Metapolis is not to confound with the traditional growth of the metropolitan city, even though it contributes to that, too, but refers to the network idea of society connected by flows, that shape a globalising web of information, goods, knowledge, finances and of course people. Acknowledging the premises of transportation and communication, spatial configurations and patterns result from spontaneous wandering around world relation. Bourdin, Eckhard and Wood described it as a kind of global colonisation and give the example of

Angelina Joly and Brad Pitt owning a house in a self-branded bio-village in France [11].

So, a main attribute of the Metapolis is its structure of superimposed relational webs reaching from local, regional to transnational levels like a neuronal grid. The city as a compact, dense territorial artefact with an identifiable core area dissolves in that concept into accumulative nodes of urban activities, so the spatial continuity of the metropolitan city is dispersing into urban fragments following the logic of connectivity and accessibility in these webs. Cedric Price established another physiognomic analogy to the urban structure of the Metapolis: the city as a scrambled ham and egg acknowledging the spatial indifferent dispersing of urban fragments [12].

That means the Metapolis is a concept that considers the appearance of those urban elements that authors like Marc Augé and earlier Edward Relph critical identified as places without identity and cultural relation, serving logistics in opposing anthropological aspects of space [13]. Motorways, airports, railways, subways, shopping centers, motels, create an immanent realm of today's urban society with no or very less contextual relation. In the concept of the Metapolis these places are allocated to a globalising sphere of urbanization by transfer and logistics. Place in the Metapolis encompasses all transitory elements as a socio spatial system beyond a place of places [14]. That means the urban logic of this metapolitan system is characterised by ephemeral attributes of the mobile and the virtual. The form of urbanity appearing from these notions is transitory and rather nomadic. Physical and spatial permanence as traditional categories of urban life are transferred into permanent "space of flows…link(s)ing up distant locales around shared functions and meanings on the basis of electronic circuits and fast transportation corridors, while isolating and subduing the logic of experience embodied in the space of places" [15].

Thus, it can be argued that exactly elements of logistics, transport, touristic spots or places of consumption generate contemporary urban spheres because the perception or "imagination" [16], as Alain Bourdin called it, of urban life and places changed tremendously on behalf of mobility and in a subversive matter, so that still there is a kind of discomfort about these places which often is replaced by a petrified, installed pseudo urban scenery as can be found in shopping centers creating an indoor street scenery or total lack of any spatial quality while obeying to technical, security criteria like at service stations on the road, airports. All these spaces show a dis-connective relation to their context. The experience in these spaces is isolated from contextual aspects: inhabitants, local culture and local landscape. These places are out of place in a physical sense. The

relations to surroundings are externalised by means of virtual communication or consumption methods that create a clean and filtered perception as a substitute for physical experience of the local and orientation is supported by global codes including generic semantics so that a spatial aesthetic evolved where identification with a place is replaced with identical attributes.

### 2.3. Transit as "meta-urban" space and urbanity

The Metapolis concept acknowledges that processes and spatial attributes evolving in the context of globalised mobility in general can hardly be described within frames of traditional urban models. Mobility practices have been generating different urban environments but also different demands of users. So, conditions of movement and service have become more important than build mass and territory in defining zones of urban activity in the realm of mobility infrastructures. One aspect that is symptomatic for this shift is the privatization of public transport services in order to run mobility infrastructure. The management of transit spaces through private or semiprivate enterprises has resulted in assemblages of commerce-driven public service areas that transformed users into consumers and supporting infrastructure into "self-contained satellites" [17] of urban practice independent from urban context and neglecting citizen-like urban perception while rather accounting for distance, speed, frequency and intersection as spatial criteria.

The discussion about commercial transformation process still is crucial in the field of transportation facilities. Recently, Meinhard van Gerkan of gmp Architects, Germany released a publication about the new airport Berlin discussing the ambiguity in designing an airport. He argues that the transitional character of transit spaces, in this case: airports, as main function has to be the main experience in space for travellers and must support a reflection on the state of flying itself rather than render as a "mallificated" [18] commercial tunnel of transfer.

So, a main question that arises concerning transit spaces is the quality of the urban experience and with it the question of spatial identity in the transitional sphere. The concept of Metapolis, in focusing on the broadening of the urban realm generated by flows and networks of transit and information processes, addresses the spatial phenomena primarily as a virtual accumulation and perception of places [19] and not their physical conditions and qualities. Nevertheless, if contemporary urban culture is a mobile one, the places of its practice, as can be detected in transportation facilities constituting the network of the Metapolis, are consequently metapolitan that means an urban realm

and it that sense also anthropological physical constructions. So, transit spaces are, beyond pure modernistic functionalism, not only matter of engineered transport infrastructure but urban condensers of a specific public activity, too. One only has to look at the growth of flight movements in Europe [20] and the financial reports of airports, like Frankfurt/Main, Germany, to capture this phenomenon. Fostering this evolution doesn't have to mean to surrender to commercial or pure technical consideration but to consider spatial qualities where people move, connect to transports, socially interact [21], as well as a programmatic opening not only in terms of services but also other economic and cultural programs. So, the production of space as a linking of transport and urban space becomes crucial in its relation to the activities possible through it. The question arises if these implications can generate notions of urbanity as quality that allow for a spatial identity in the meta-urban sphere of transit as a modern, meaningful urban place. It is tried to examine some key attributes associated to urbanity in relation to aspects of transit processes. Minding the fact that there is an own discourse on contemporary urbanity, which shall not be represented itself, 3 common parameters of urbanity are focused closer and discussed concerning their relevance in the realm of transit spaces: presence, diversity and accessibility:

Presence of people can be considered a premise to any kind of urban activity because it is a condition for encounter and communication between people. A space without people who stay can be an urban space but it needs a critical mass of people engaging in space to accommodate the space to be urban [22]. Important here is a differentiation between gathering and co-existence, often elaborated in terms of puplicness. While philosophers like Jürgen Habermas advocated for places of meeting and discussion as a gathering public others like Richard Sennett argued for a co-existence of "the other" as public condition. The idea of gathering leads Habermas to a rather programmatic understanding of public space. Sennett´s approach is a rather broader, informal urban character accounting for certain anonymity as "a space where strangers meet" [23]. Both gathering and meeting demand corporal movement in space in order to perceive and experience the others and the spatial context.

The basic structure of transportation facilities is constituted by the transfer of passengers from the state of moving to being moved. This transition is processed by functional layers as a linear sequence of spaces in order to guide the traveller through information, check-in, ticketing, waiting, boarding. The condition of the linear spatial sequence in a programmatic understanding generates a setting for the presence of people as passengers, which is characterised by a continuous flow, and also those who manage this

flowing movement of people in transit. The personal relation is rather characterised by a functional and anonymous "moving through space" than to gather in the sense of Habermas and compares to a channelled funnel where people rather co-exist having a same purpose: travelling, but only temporarily and in a predefined direction. Staying and possible encounter with "the other" are predetermined and limited by the process of transit such as arrival times and boarding times. These spaces are therefor not a destination itself but rather an urban passage stretching the real and imagined experience of the individual journey generating an anonymous community by a continuous presence of different people that come and go, which work through similarity to places, that are referenced in a general understanding of urbanity [24]. In transit space this passage like movement generates the well-known economic potential for commerce activities. Travelling has become a shopping tour as van Gerkan stated but at the same time transit is enhanced by serving programs that produce engagement in the transit.

A second parameter to regard when discussing urbanity is diversity. Christopher Alexander identified the most urban spaces at places of overlapping areas with different social structures [25]. Alexander established the metaphor of a tree as opposed to the structure of an urban city, where people, interests, activities and areas overlap. In a similar way as Jane Jacobs he regards incremental growth much more natural than the top-down implementation of segregated large-scale structures with specific programs as common in modernistic city planning. That implies that difference in interests, social groups and programs and spatial openness for gradual transformation, in the sense of a degree of spatial indeterminacy, like Sennett´s demand for an open narrative in the urban system, are activating and diversifying urban space.

Transit facilities represent defined entities that accumulate a range of diverse people with an important common ground: the objective of passing through. Transit space is basically determined by a more or less constant flow of trespassing people as passengers. So spatial activities are depending on the frequency of the transportation medium. The main objective of travel and the security aspects of the dispatching process limit interests and reduce diversity to safety, comfort and efficient service. The fact, that transit as a public service is managed by an increasingly privatized operating sector, exclude possibilities of adaption by other stakeholders or even certain groups of people. That means interests are mainly orientated towards economic profit. Precarious social groups, for example the "Bahnhofsmilieu", are more and more gentrified and diversity tends to decrease. The integration of commercial offers and other services proofed to be a relevant strategy for raising benefits and establishing a

new market, which have become successful with increasing traffic connections producing temporal slots of non-activity especially in the case of interchanges. Activities like retail, gastronomy and entertainment are creating a stimulus for consumption as a form of time compensation. This is directed in line with the transit and reduces activities mainly to commercial benefits. Activities in urban context, however, can be but are not established to fill time frames and are much more diverse and allow for social encounter of different groups as well as political agenda, even though it can be stated that especially European cities upgrade their central areas by enhancing the commercial sector while gentrifying other, cultural or political, activities. "Mallification", as van Gerkan condemns in transport hubs, is therefor a general trend to establish a scenic impression of urbanity while satisfying individualistic needs. That goes together with an "internalization of the urban realm", as Alain Bourdin called it, which can be traced back not only in peripheral shopping centers but also in airports, rail station and service station that transformed into suppliers not only for travellers but also including other economics on different urban scales.

A third parameter in relation to urbanity is defined by accessibility. According to Richard Sennett an urban public space needs a certain degree of open boundaries to allow people to move through it and engage in space [26]. The location of transportation within the urban context is crucial for such an understanding. Centred or peripheral: the location determines accessibility to place that means in transit to travellers and others not directly engaged in travel. That aspect accounts also for Alexander´s premise of urban space to be overlapped in activity patterns [27]. In the context of transnational transport this aspect is almost impossible to implement. Airports, situated in a peripheral situation when looking from a metropolitan view, generate rather autarkic urban structures referring to the global connections. Thus, airports show high boundaries of access and low connection to the residential realm of the urban context. This is underlined by a high standard in access control. So even if airports present a big range of activities in other economics than travel the spaces are restricted in accessibility to an urban public and hardly interfere so that the presence of people and a possible interaction is limited, too. Train stations, on the other hand, are located more central due to track disposition originating back to industrialisation. Since then the area of the station and the station itself offered low boundaries and easy access for diverse social groups in connection also to residential urban realms which allow them to integrate in everyday urban activities. The transition from urban context is primarily defined by the platforms that are setoff from the ground so that this step in height marks the interface to the transit realm.

Accessibility as a criterion for urban spaces becomes a crucial factor for transit infrastructures in regard to their urban qualities. The means of physical boundaries and security controls as well as location are defining access and zones of predomination of transport activity and the overlapping of local on global scales.

The 3 urban parameters: presence, diversity and accessibility referred to transportation hubs suggest that the primary function of processing transit with security aspects, orientation, distribution has some attributes to acquire notions of urbanity. The potential of engagement and interaction between people, crucial to urbanity, exists but is bound to the aspect of transit as prior function.

## 3. Hybrid transport infrastructures – Meta urban spaces

### 3.1. The hybrid structure of transport hubs: Between transit and urban

A further implication of the previously described premises can be drawn from recognition of duality in transitional processes itself. Transportation hubs are bidirectional interfaces coordinating flows of people with different motivations and transforming them from citizen to passenger and back between local urban context and transit space. This meta-urban condition addresses the specific notion of transportation hubs as hybrid typologies that are implemented strategically oscillating between the metapolitan realm of urban networks and the metropolitan realm of urban territory. This principle of the hybrid becomes evident when observing different types of transportation hubs based on their transport mode: airport, railway station and modal interchange (Figure 1).

Airports represent the most global type of transportation as a network of hubs creating a global city: "Aviopolis" [28] on different scales regarding their hub function and flight destinations. Due to their involvement of the atmosphere they punctual penetrate the territory as dots of a net and due to flight curves they are situated in peripheral position regarded from a metropolitan point of view, making it a necessity to be well connected by shuttle services connecting to the city. Thus airport are perceived as satellites or nodes in the periphery with an impact on their context [29]. International standards in proceeding passengers that are characterised by high security regulation determine the functional structure with high boundary between local context and transitional sphere [30]. This boundary is located in the middle of these two sides: landside – airside leading to a doubling of functions and services acknowledging that a lot of passengers stay in the meta-urban context during travel. This highly controlled

sphere is catered with theme shops and gastronomy as well as entertainment. Together with a complex system of orientation and information they create well tempered but artificial indoor atmospheres.

The development of "Airport Cities" as business centers, as in the case of Munich and Frankfurt for example, has long exceeded aviation. They are huge logistic enterprises and developers of businesses, entertainment- and conferences centers, hotels, shopping malls etc. extending the traffic node into a business and service district with high economical value for the local context, e.g. job opportunities. Due to their territorial isolation and security constraint, however, airports cannot really merge local and global scale regarding spatial relation. Thus it can be argued that airports tend rather to the metapolitan realm of urban space rather than being integrated in the urban context itself.

Railway Stations show a different spatial condition than airports. The boundary between urban context and transit space of platform is low. Meta urban and metropolitan sphere interweave. Due to their mostly central location in cities the open to the local context and integrate programs like convenience stores, business, accommodation, shopping that addresses both the local population and the traveller. Furthermore there is a diversity of social groups present using the station as an urban node rather than travelling [31]. There is a high potential of flow and encounter that create urban quality. A lot of railway stations around the world have been refurbished by today. In that processes the spatial resources of the old halls could be reactivated. The station Atocha in Madrid, for example, was transformed by implementing a huge indoor garden open to the public with coffee shops aside. The new Vienna main Station shows another form of hybridization: the sphere of the transit was isolated on the track and covered with a signal roof structure. The actual station was integrated into an urban block aside integrating meta-urban activities like business centers, shopping and railway services, hotels and modal interchanges. In these cases meta-urban space and metropolitan sphere are overlapping.
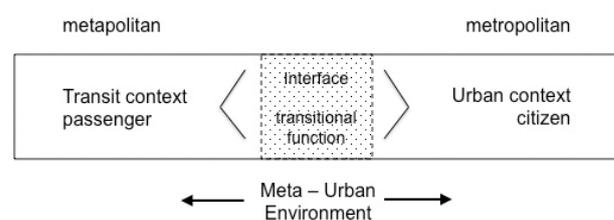


Figure 1. Hybrid structure of transit infrastructure

Another case is concerning rail stations as transit interchanges. Euralille, for example, is a large-scaled node of rail tracks and road transportation. The infrastructure was superimposed with urban programs like entertainment, shopping, hotels, conference centers and even dense residential blocks. Altogether, they form a comprised urban context as a densification of urban programs and open access. A second example can be observed in Stockholm´s "City Terminalen". This intermodal hub integrates bus services, railway and public transportation, especially metro. Central element is a spine that gives access to all modes of transport and additional programs as a distributor. The whole hybrid complex is situated in the metropolitan centre area with entries on several levels generating a high level of connection between transit and urban space. Both examples can be regarded urban nodes integrating the urban context while extending the traffic function.

These examples show an increasingly trend in diversifying infrastructure by means of hybridization. In terms of processing transport, airports have the highest security constraint, which effects also the relation between meta-urban and metropolitan sphere in the hub as interface. Lower boundaries in other transportation hubs exemplified melting processes of the two urban spheres, the metapolitan context and the metropolitan context by means of hybridisation in program and spatial interfering.

### 3.2. An hybrid bus terminal: Case for a meta-urban interface

To understand the previously described tendencies of hybridisation and meta - urban relationships in transport infrastructure better a studio design course was held by the author during winter term 2014 to 2015 at the Institute of Architecture Technology TU Graz examining the urban potentials of transit in architectural terms by investigating a further type of transport hub: the bus terminal.

The design investigation was based on a statutorily liberation of regulations concerning long-distance road transports to a wider range of distances and providers in Germany 2013. That deregulation of the market allowed bus transport to revive and has led to an immense increase in bus routes, bus providers and users that has been gradually consolidating now [32].

The increasing bus market caused concern especially with the German railway company Deutsche Bahn that had to face strikes during the launching phase of new bus routes which revealed quickly to be a relevant alternative with comfortable new buses, direct connectivity, simple booking processes, web access and most of all fairly low pricing [33]. These advantages led

to an increase of passengers from 2,9Mio to 8,2Mio per year in 2013 equalling a growth rate of +178%: almost 3times more than 2012. The larger German cities have been facing sever congestions at their bus stations since then and, except of Hamburg and Munich, are in need of upgrading their mostly worn out terminals.

Especially Berlin´s ZOB (central bus station), a node in European and national traffic, can hardly meet the new capacities and is in need of refurbishment or renewal [35], providing an opportunity to rethink the modern concept of the bus terminal typology as mono-functional traffic infrastructure and transforming it into an urban node.

So the following scenario was conceptualised as base for the design studio: The worn-out ZOB, which was opened in 1966, is deconstructed to give extension options to the trade fair Berlin which is situated next to it. A wasteland next to the former plot on the on side and to the Berliner Ring on the other as well as the ICC was chosen to densify and re-use a leftover traffic site and to use the potentials of the close by train station to create potentials for the bus terminal to be thought of as urban and modal interface especially in regard to the trade fair Berlin rather than being transport service solely. The objective was to create a hybrid architectural design that is capable of integrating more convenience for passengers as well as a clear relation to the city´s context. To foster this approach an open structural frame had to be designed to integrate additional but undetermined programs.

In this scenario the quality of the urban interface becomes crucial for programs to establish but also an economic potential for the Stakeholder of the terminal following examples of airport cities (Figure 2).

The following 4 case studies present basic approaches proposed in the design process that showcase the possibilities of linking transit hub and urban space in an hybrid structure by reconsidering the prescribed criteria: presence, diversity and accessibility with different strategies.

The first approach re-introduces the plaza as a spatial type. This plaza is hovered over the terrain making a clear distinction towards road traffic and bridging the exit lane of the A100 Ring motorway crossing the site. Under the roof buses are parked. While other programs can be implemented in a long bar protecting the plaza to the motorway and focusing the relation between trade fair and subway station. The plaza serves as a distributor and transforms the functional platform into an urban element of communication allowing for open access, diverse programs. The orientation of the framing building parts towards the plaza supports the presence of people by overlapping access and the possibility of programmatic extension on the plaza (Figure 3).
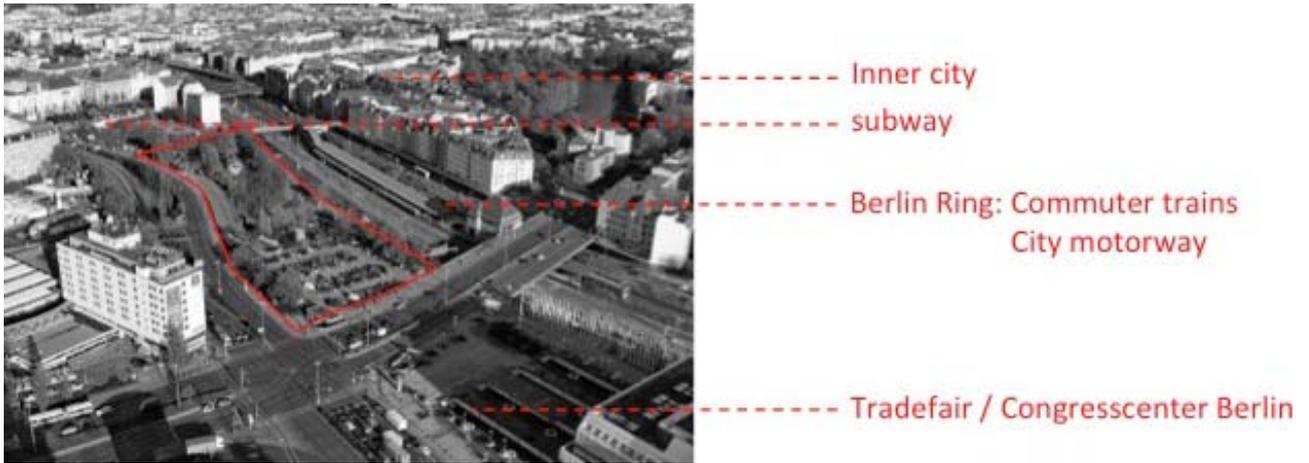
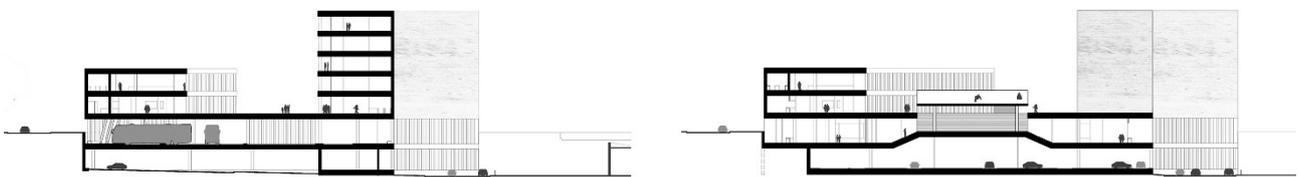Figure 2. Site between Berlin Trade Fair, Ring Motorway A100 and Railway



Figure 3. Section through Plaza (Copyright: Institute of Architecture Technology, TU Graz, 2015)
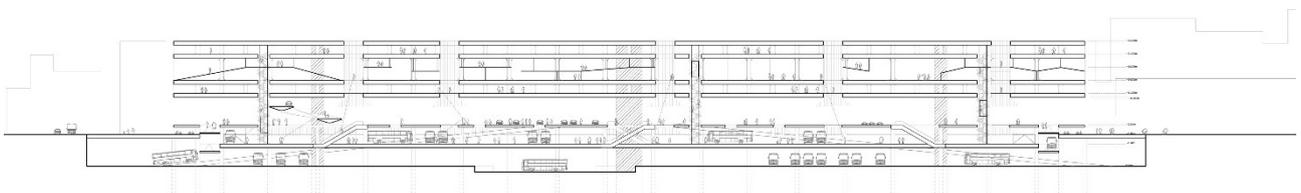


Figure 4. Section showing Hall Type (Copyright: Institute of Architecture Technology, TU Graz, 2015)
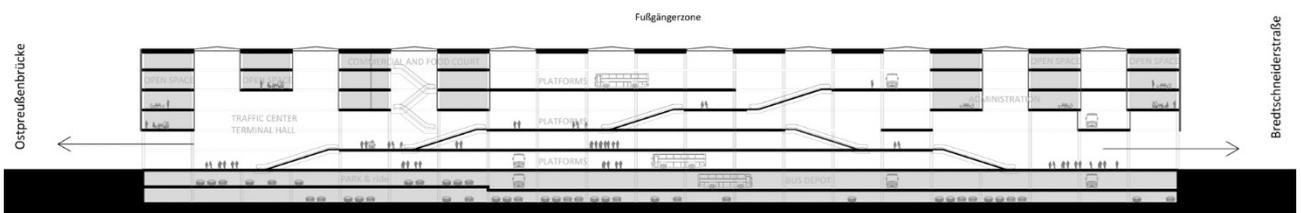


Figure 5. Section showing passage in block structure (Copyright Institute of Architecture Technology, TU Graz, 2015)
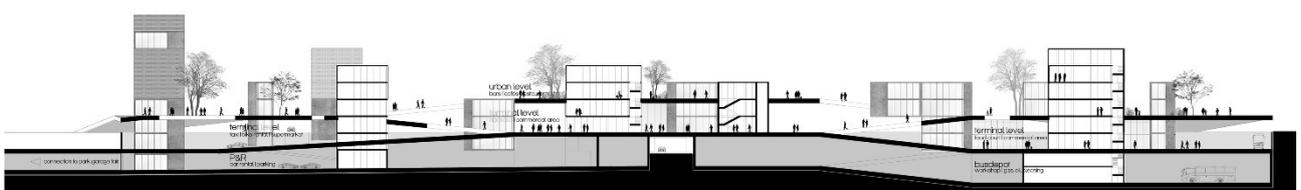


Figure 6. Section showing folding and vertical connection by perforation and towers
(Copyright Institute of Architecture Technology, TU Graz, 2015)

The second case study recovers the type of the hall as a public interface by using the means of mega form. The main entrances are placed in a split-level edge situation in connection with existing bridges towards train station. The bus station is split up. 2 ramps lead the buses from street level to the platforms in the sunken part. An elevated hall on top of the base is configured by an empty space forming a connector between city and bus but also main hall for further programs independent of traffic. Vertical openings establish visual relationships between people and vehicular transport. The hall has the potential to operate as a shared open living room that is despite its split-level access connecting to the context (Figure 4).

The third concept is based on the assembling of blocks that create an urban fabric. Taking up the typology of the Berliner Block the structure allows for extending programs to the inner patios. All the blocks are connected by a meandering public zone that allow for a total mixing of transport, commercial and other programs while still being separately accessible by the urban structure of the block that is opened to all sides. This proposal attempts to transfer the mall back to the city as a strategy to link different programs and establish a connective urban passage (Figure 5). The fourth example uses the method of folding to establish a continuation of urban space, which accommodates the transit function as a roof shelter. The strategy of continuation allows for addressing main directions of access and the equal use of the site as traffic and urban node. By a perforating the folded plate both layers: traffic and urban are intertwined and as well visually as physically combined. This connection is supported by vertical towers of different sizes that penetrate both layers and thus can be programmed as mixed-use in terms of service functions or different urban functions (Figure 6).

All 4 case studies show the immanent potential of opening up the functional layout of bus terminals to urban qualities addressing the topics of presence, diversity and accessibility in different strategic ways. They are also examples of how known spatial typologies can be re-introduced as tools for this transformation into meta-urban environments.

## 4. Conclusion

The paper discussed the urban dimensions in long distance transport. The approach was to understand the structure of transport hubs, their increasing tendency to accumulate multiple programs and with it the spatial character of these technical-anthropological spaces in the urban realm as hybrid structures.

By the theory of the Metapolis transit spaces can be defined as "meta-urban" environments. A comparison of the functional criteria showed that constraints of the transport procedure are prior due to functional reasons in the transport system. Thus, an urban quality in the sense of established criteria of urbanity is difficult to trace depending on criteria of location, accessibility, economic uses and security aspects. Another implication, however, could be traced in the constituent principle of hubs being interfaces between the meta-urban environment of transit and the local urban context. This understanding allowed to define transport hubs as hybrid typologies the communicate flows between two urban spheres. Here examples showed that a crucial threshold for the mixing of urban and transit spaces is the spatial and regulatory formulation of the boundary between transit and urban interface. The example of the design for a bus station in Berlin showed that this typology has high potential of melting with the urban context due to its location and low boundaries. To hybridise such transit spaces can foster urban qualities transforming the transit node into a meta-urban environment.

## References

[1]   Smithson Alison, Smithson Peter, *Team 10 Primer*, The MIT Press, 1974, p.51.

[2]   Bourdin Alain, Eckhardt Frank, Wood Andrew, *Die ortlose Stadt: Über die Virtualisierung des Urbanen*, Transcript Verlag, Bielefeld, Germany, 2014, p.90.

[3]   Cisar Sasha, Hillreich Jörg, *Increasing Mobility: Architecture and Urban Design in the Global Age, An Interview with Bernard Tschumi*, in TransIt, 2009, pp.66-69.

[4]   Sheller and Urry, 2006, *New Mobility Paradigms*, in Environment and Planning, Vol. A38-2, 2006, pp.207-226.

[5]   Taylor&Francis, *Mobilities*, Journal, Aims and Scope, http://www.tandfonline.com/action/journalInformation?show=aimsScope&journalCode=rmob20#.VjYEIekzn4w2011, accessed: 15th March 2015.

[6]   Creswell, *On the Move Mobility in the Modern Western World*, Routledge, New York London, 2006, p.07.

[7]   Creswell, ibid., pp.04-06.

[8]   Castells, Manuel, *The Rise of the Network Society The Information Age: Economy, Society and Culture*, Vol.1, John Wiley&Sons; 2. Edition, 2009.

[9]   Castells ibid.

[10]  Vázquez Carlos García, González Martínez Plácido, *Metapolis*,

http://www.atributosurbanos.es/en/terms/metapolis/, accessed: 20th April2015.

[11]   Bourdin Alain, ibid., p.91.

[12]   Oswalt, Phillip, Interview with Cedric Price, *Die Freude am Unbekannten*, in *Peripherie ist überall*, Campus Verlag, Frankfurt Main, Germany, 1998, pp. 330-337.

[13]   Augé, Marc, *Nicht-Orte*, C.H.Beck oHG, Germany, 2010, pp.83-84.

[14]   Bourdin, Alain et al., ibid., p.91.

[15]   Castells, Manuel, *Informationalism and the Network Society, Epilogue to Pekka Himanen's The Hacker, Ethic and the spirit of Informationalism*, Random House, New York, 2001, pp.155-78.

[16]   Bourdin, Alain et al., ibid., p.16.

[17]   Whiteside, Andrew, *Life in the fast Lane: Service Areas and the Emergence of infrastructural Urbanism*, Trans, Vol.16, TransIt, 2009, pp.126-133.

[18]   von Gerkan, Meinhard, *Black Box BER*, 2013, pp.18-24.

[19]   Bourdin, Alain, 2014, p.89-90.

[20]   Eurocontrol, *Five major challenges of Long-term Air Traffic Growth*, www.eurocontrol.int/eec/public/standard_page/ETN_2009_1_Growth.html, accessed: 16th July 2015.

[21]   Edwards Brain, *Sustainability and the Design of Transport Interchanges*, Routledge, New York, USA, 2011, pp.20-21.

[22]   De Aguiar Vieira Douglas, *ibid.*

[23]   Sennett, Richard, *The Public Realm*, www.richardsennett.com/site/senn/templates/general2.aspx?pageid=16&cc=gb, accessed: 16th July 2015.

[24]   Bourdin, Alain et al., *ibid.*, p.123.

[25]   De Aguiar Vieira, Douglas, *ibid.*

[26]   Sennett, Richard, *ibid.*

[27]   De Aguiar Vieira, Douglas, *ibid.*

[28]   Fuller, Gillian, Harley, Ross, *Aviopolis A book about airports*, Black Dog Publishing Limited, London, United Kingdom, 2004, p.11.

[29]   Hartwig Nina, *Neue urbane Knoten am Stadtrand? Die Einbindung von Flughäfen in die Zwischenstadt: Frankfurt / Main – Hannover – Leipzig / Halle – München*, VWF, Berlin, Germany, 2000, p.2.

[30]   Fuller Gillian, Harley Ross, *ibid.,* pp.16-18.

[31]   Hartwig, Nina, *ibid.*, p.21.

[32]   Presse des Bundesministeriums für Verkehr und digitale Infrastruktur, *Bundesrat beschließt Novelle des Personenbeförderungsgesetztes*, 2011, http://www.bmvi.de/SharedDocs/DE/Pressemitteilungen/2012/243-ramsauer-fernbusse.html, accessed: 20th April 2015.

[33]   Doll, Nikolaus, *Fernbusse günstiger und sauberer als die Bahn*, 2014, http://www.welt.de/wirtschaft/article134950233/Fernbusse-guenstiger-und-sauberer-als-die-Bahn.html, accessed 30th January 2015.

[34]   Leonard Christiane, *Fernbuslinienverkehr in Zahlen*, 2014, http://bdo-online.de/themen-und-positionen/fernbus/fernbuslinienverkehr-in-zahlen, accessed: 10th March 2015.

[35]   Neumann, Peter, *Der Busbahnhof platzt aus allen Nähten*, 2014, http://www.berliner-zeitung.de/berlin/zentraler-omnibusbahnhof--zob--der-busbahnhof-platzt-aus-allen-naehten,10809148,26910196.html, accessed: 30th October 2014.