

BUS STATIONS - ARCHITECTURAL EXPRESSION, STRUCTURAL SYSTEMS AND MATERIALIZATION

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Summary: *A bus terminal is the point where a bus route starts or ends and in general, those are facilities which represent the door of the city and bring the first impression to visitor as a focal point at the entrance of every city. Purpose of this study is to research current condition of bus terminals in Bosnia and Herzegovina and present findings compared with modern global trends aimed to improve the quality of current condition, meet the standards, and fulfil the needs of diverse stakeholders. Analysis covers 20 case studies, 15 worldwide and 5 local bus stations. Case studies are examined through the desk top analysis of documentation combined with site visits and in situ analysis. After the analysis of current condition, research further considers on worldwide examples of bus terminals and their designs. The analysis covers modern global trends in terminals' design, including general urban, architectural, and structural approach in analysis. Emphasis of the analysis is dedicated to relationship between structural design and architectural expression. The goal is to show dependence of bus terminals' operability, considering functional attributes influenced by architectural expression and structural systems, including their impact on creating memorable and noticeable landmark.*

Keywords: *Bus Terminal, Design, Architectural Expression, Structural Systems*

1. INTRODUCTION

The term bus derives from the 19th century word omnibus, meaning "for all", which is derivate from *latin omnis*, meaning all. First bus dates from the 1823 when *Stanislas Baudry* started to offer transportation services with horse drawn omnibus. With first bus vehicle, the first bus station was formed in front of shop named *Omnes*, where omnibus had its regular stop. After Nantes, the bus services were established in Paris and after in London in 1929.

Established bus transportation was developing together with services which followed transportation service. With development of transportation network, expanding route lengths and enlargement of passengers' number, requirements for following services grew.

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From the early beginning, the quality of bus transportation and accompanying services reflected local community development and road network development. Further development of bus services were influenced by passenger demand and volume.

Bus transportation has many different kinds of following services that differentiate according to its complexity and level of service. Bus stop as a first and basic type of service provides most simple service to passengers. Bus stop is defined as a place where the bus makes short stop in order to onboard or release passengers. Since first bus stop in front of the small shop in Nantes, the bus stop has developed through the ages.

From the earliest bus transport and following infrastructure, there have been a lot of changes. Starting from the vehicle dimensions that changed through the years to the trends that are rapidly changing every few years, stations and municipalities have to follow all these trends, in order to keep the standards high. North America, Japan, Australia and New Zealand have clearly defined guidelines related to minimum requirements and suggested design of bus stops. Basic requirements related to function left enough space for the designers to develop most unusual, interesting and expressive designs.

Bosnia and Herzegovina has very developed network of bus traffic that is not followed by the bus infrastructure development. This research does not only emphasize the factors and considerations that are to be followed, it also compares the condition of Bosnia and Herzegovina bus stations compared to the stations worldwide. Correlative analysis can be used for further planning and infrastructure development. Local bus station analysis states the current condition in which are the bus stations and its infrastructure, which makes them comparable to the international case study analysis.

2. ARCHITECTURAL DESIGN AND CONSIDERATIONS

The increasing use of transportation in mid 20th century triggered the development traffic interchanges and stations. Bus station, from their early development, were developed next to the railway stations. Increased use of buses for a long intercity and international journeys were at its peak in the middle of past century. Trends in architecture and lifestyle of the time conditioned the overall design of the bus stations. Local conditions such as politics, economy and society affected the design mostly.

During the time, with lifestyle change, trends for designing the stations were evolving too. Today, bus terminal design considers more than designing a building that will serve its purpose. Spending time outside of the bus and making it comfortable is a new challenge for the designers next to making the facility serve its purpose. Following the design requirements such as design standards is not the only element that will generate good design. Civic facility such as bus terminal, bus station or interchange takes in consideration many urban factors such as providing public spaces for users and feeder area combined with it. The use of those space is very encouraged by urban designers as it is raising the quality of civic facility.

The complexity of designing lies in a holistic approach of combining many different factors, elements and considerations.

A terminal is a spatially enclosed unit a “place-junction“ in which there is a conversion (a change, transformation) of flows of one way of transport into the flows of another, or a change of the types of transportation. Recently for the term terminal, very often is used the term transport interchange. The terms bus station, bus stop, and base are very often used in literature that covers the transportation facility buildings topic, but the meaning is

significantly different between these. Each of these terms considers facility with different functions and purposes. While terminal or interchange considers transportation node where transportation means and users both satisfy their needs, bus station is less complex facility where transportation users begin/end or change their transport vehicle within same transportation mode. Bus station does not satisfy technological needs or provide extra services for users. Bus stop represents only one place on the bus line where vehicles stop to pick up or drop off passengers, without any technological or user services.

In addition to the primary, there is a list of other accompanying functions. The main role and importance of a terminal as an element of the transportation system is the enabling of the demands of the passenger traffic, as soon as possible, in a safe way and with as less negative impact on the environment as possible.

In terms of traffic, a terminal should imply a functionally structured built space unit i.e. "station-storage-gateway access", where primary initial-final and/or operations in the process of transport in the passenger and freight traffic are done between various vehicles of the same or different ways of transport, in which there is a flow conversion where passengers arrive and exit the transport vehicle, or other types of services are available.

According to [3] terminals are: Places, points, junctions of the transportation system where transport-technical demands of the passengers and the transportation means are met. Depending on the type, terminals have specific infrastructural elements with special purpose-specific equipment. They are located on either the end of the lines (track) of the vehicle motion actually on the modal network or they are regularly arranged along a network. Semantically speaking, a terminal marks something that has its length and end in terms of a traffic route.

Depending on the function and the infrastructure, various synonyms are used in practice (bus stop, passenger station, etc.)

According to [1], a station is a place in a system or an organization with special demands, equipped with special equipment and services.

The term stop is used in cases of short stops of vehicles on one track, only at a specific traffic sign or at a place marked with a timetable in towns or smaller places, for providing consecutive short-term services or by other demands. Also, the term base is used, which is linked to processes and it represents a place where specific activities are defined and from which all activities where there is basic functioning equipment begin or end. There are numerous terminal definitions, according to which their basic characteristics can be studied:

- A bus terminal is a stop where the bus arrives or leaves after a trip [4]
- A station where transportation vehicles load cargo or pick up passengers;
- A location on either end of a transportation line including servicing and handling facilities [5]
- A facility, notable for its size and complexity, where cargo or persons are loaded, unloaded and where various types of transport are handled. Terminal activities begin in places of the cargo destination and transit areas.

Terms bus terminal and bus station are used interchangeably in theory and in practice as synonyms for an organized area where buses begin, end and transit their ride, and make contact with passengers in terms of meeting their demands.

The term bus station is usually used for "off-road" locations with at least the basic elements necessary for the passengers, while a terminal refers to a completely equipped bus station with all its accompanying facilities.

Bus terminals are usually located in big cities where tours of two or three types of transport meet, begin and end. If passengers begin or end their tours by more types of transport at a single terminal, then a wider term such as "passenger terminal" is used.

Bus terminals are passenger stops where the transport-technological demands of the passengers and buses are met. There are many definitions, so they can be defined as:

- An organized area where travel begins or ends;
- A place where there is a contact between passengers and buses; and
- An organized area where various demands of the bus stop users are met.

Administrative classification involves the following classification - Intercity, suburban, transit – buses passing by, they are one of side stops and mixed or combined.

The type of a bus station is determined by the percentage of passengers who travel daily from the bus station in relation to the total number of passengers, thus, there is a differentiation of the following categories of passengers: suburban passengers – passengers who travel daily or often from the bus station regardless of the route length; and intercity passengers – passengers who travel occasionally or rarely from the bus station regardless of the route length.

The term "traffic terminal" should also include the complexity in terms of a physical existence of technological traffic elements and their functional connection on one or more technologically dependent locations. Denoting a single type of traffic as a traffic terminal is not considered right, although in practice such a classification in literature is not completely accepted. Recently, the term "logistics center" as a synonym for a traffic terminal has been used. Also, it is believed that the complexity of the functions of specific facilities define the terminal's status. It is not justifiable to define smaller complexes as terminals, especially if they do not encompass complex designing tasks and exploitation. Therefore, a traffic terminal implies a complex of traffic facilities in a place where two or more types of traffic are developed, which individually or mutually conduct operations of servicing transit, intercity and urban transportation of vehicles, cargo and passengers.

It can be considered that traffic terminals together with the road network comprise basic infrastructural elements of the traffic system. Every transport starts and ends or transits there, and they are marked by extraordinarily great community service. Thus, those are places where initial-final operations with cargo, passengers, vehicles and cargo units concentrated on one or more close locations take place. Traffic terminals also include the territory where gathering and dispersion of passengers and cargo flow occur, which take place on highway, suburban and urban roads. Territorially speaking, traffic terminals can be found at a territory of 50 to 60 kilometers in diameter. When they can be found on more locations that are functionally linked, then they are considered industrial traffic terminals. Traffic terminals can be classified based on more aspects such as the nature of the work, types that serves, geographical location on the network, geometric features, ownership (state, private or mixed roles), business capacity and functions i.e. structure of technical transport subsystems etc.

Based on the types that they serve, terminals can serve as transfer points for various combinations of the types, e.g. – single-mode (road, railway, waterway, etc.), or intermodal: bimodal (road- railway, waterway-road, waterway- railway, etc.), trimodal (road-waterway- railway, etc.).

Based on the geographical location on the network, there are local (in urban areas), regional and global on EU TEN-T (Trans-European Transport Networks) networks.

Based on geometric features, they are solely classified, either visually based on the features of the highway road network, the location of roads in them, the ways of implementing links with public roads or their shape: radial, rectangular, extended (linear), radial-toroidal, radial-semi toroidal or combined. Highway networks, according to their position, in relation to the urban tissue can be set tangentially, longitudinally (passing) and/or combined, while the terminals are also set in the aforementioned positions in relation to roads.

Based on the capacity, they can be: small, middle or large depending on the type and structure of commercial operations or the number of passengers.

Every traffic terminal must have a specific structure of the technological-transport subsystems, i.e. functioning unities, which independently or mutually implement some of the following functions:

- Implementation of initial-final operations, admittance and dispatch of cargo and passengers;
- Collective, distributive or collective-distributive cargo transport;
- Loading-storing processes;
- Maintaining and supplying vehicles;
- Servicing cargo and passenger traffic in a material-technical sense; and
- Providing monitoring services in traffic, etc.

Based on the functions that take place within the terminal, basic facilities i.e. subsystems are being defined, such as passenger, cargo and combined terminal, special ones such as auto depots for servicing vehicles and other depots from the service industry (depots for maintaining roads and railways, equipment) and supplying fuel and operating materials. Starting from the demands set by the bus station users, categories of its users are determined as follows passengers (arriving, departing or in transit), visitors (depending on the size, location, the stop's facilities there is a number of visitors to the bus stop), companions (a category of users who see somebody off or welcome them), employees of the bus stop, bus and driving staff.

Depending on the types of bus station users, that is whether the bus lines connect two or more cities at greater distance or whether they connect the city with its nearby surroundings, stops are classified as intercity, suburban, mixed; and transit ones.

Intercity stops are defined by a small percentage of daily passengers, while this percentage is high at suburban stations. In practice purely suburban or purely intercity stations are very rare, thus, the greatest number of stations are the mixed type ones.

Transit stations are located in towns that are placed on the road between two major cities, and are usually stations where the drivers and passengers rest.

In every passenger terminal or station there can be made basic subdivision between three main parts of one transport system.

1. Drop in/drop off area - place from where passengers arrive/leave station, first meet with station and get the first impression, connection with all other means of traffic;
2. Bus Station Building - a place where all the facilities for terminal/station functioning are located, enables everything from arrival to departure of passengers;
3. Boarding area - space where buses arrive and leave with passengers, and parking for buses. Positioning the station within the urban tissue is conditioned by these three main parts of every terminal. It is preferable that Feeder infrastructure (drop

in/drop off) area is placed closer to the city center. By locating these three as following, it becomes easier to organize each of these within.

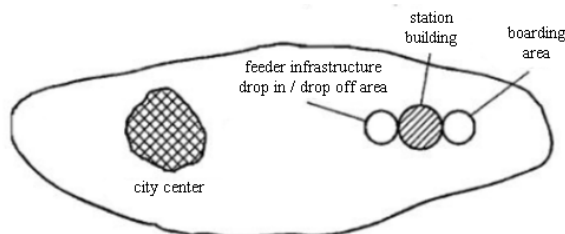


Figure 1. Positioning of the Station with the City [2]

3. MATERIALIZATION AND STRUCTURAL SYSTEMS

Transportation architecture is dominated by the concrete and steel as any other architectural facility and building today. What is characteristic to stations and other transportation facilities are specific spans necessary for the vehicle approaches and open space architecture for the buildings. Choice of material is conditioned mostly by the required spans and aesthetical approach of the designer. Every transportation facility has two structural parts that are most often independently built; stations building and canopy for the platforms.

Station building is usually built with reinforced concrete as a most common building material. Depending of architectural design, the use of material for structural system may vary. More requiring structural design is most likely to use the steel as a material but it is not exclusively the case just like with any other architectural building.

The difference stations are making is a wide range of possibilities for designing and building platform canopies. Lately, canopies are built separately of the building. During mid of 20th century, the canopies were not aesthetical element such as it is a case today. Platforms were sheltered usually by overhanging beams that were forming kind of balconies or terraces over the platforms. Built as reinforced concrete structures, those canopies were sheltering only front entrance to the bus station, or only passengers waiting in front of the bus.

Today, bus shelters are often designed as a canopies independent of the building. For that purpose, variety of materials are used. Spans are varying of the type of platforms and distance between two parked busses. They can be short as a width of a bus, width of a bus with passenger approach from the every side up to span that corresponds the whole platform area. The choice depends only of the design and architects approach.

Steel columns are most flexible for achieving the creative and innovative design, and it can be combined with different materials for the roofing. Aarau bus station, Gare do Oriente and Slough are probably the best examples where steel structures possibilities are presented up to maximum.

Steel columns combined with cement-bound plaster panels that form the surfaces of complex geometry as it is the case with Pforzheim bus station are another example how effective combinations steel is providing.



Figure 2. Aarau Bus Station [6]

Casar de Caceres stations demonstrated how concrete can be used both as an aesthetical element and structural element, especially for the platforms. Very effective, but only on a small scale stations where it is possible to achieve more complex form but regular rectangular columns between the platforms.



Figure 3. Casar de Caceres and Trujillo Bus Stations [7, 8]

Wood as a material for the transportation facilities is mostly used for bus stop structures and as a decorative element where one of the best applications is visible on Helsingborg station.



Figure 4. Helsingborg Bus Station [9]

While bus stations are rarely using wood as a material, bus stops as a smaller scale projects are very often introducing a wood as a material lately. One of the examples is University Boulevard Transit Shelters in Canada where wood is used to create human effect that will contrast the built environment.

Emsdetten bus station is one of few stations that incorporated plastic material, even though only as a roofing. It combines the steel frames and cables covered up with a yellow plastic sheets. Emsdetten bus station is providing only a bus shelter for the passengers without bus building, but it vividly shows all the potential for different material use.

Tensile structures are offering variety of possibilities for using a structure as an aesthetical feature. With its wide spans, they are enabling different platform arrangements underneath. They are mostly used for stations that do not require bigger bus facilities and buildings, therefore, it is more applicable for interchanges such as bus stop and tram stops at the same place rather than next to the building. Rosa Park Terminal in Detroit is an example of larger scale bus terminal where tensile structures are used as a canopy for platforms next to the terminals building.



Figure 5. Rosa Park Terminal in Detroit [10, 11]

4. ANALYSIS OF BUS STATIONS WORLDWIDE

The analysis of built stations worldwide has a multiple purpose for the research. Stations that are already built are not showing only the design and creativity of an architect and whole team, but also the outcome including perception of the building on the society and environment. Analysis include different elements that all together are able to provide answers on different questions. Background information include all the data that are telling the story behind the intention and the design, while the location will deal with the ambience and surrounding factors that are affecting the design. Basic information includes the data about scope of the work, architects and other similar facts. Size of the station is rather concerned with the volume of vehicles/passengers passing through the station than the physical dimensions of the building or site. Type of the station differs from bus station, bus terminal, interchange and even only an entrance for the station or public space analyzed for this purpose. Facility considerations briefly explain the stations building with its content. According to available information, they include all functional, aesthetical and other elements that are related to the building itself.

Table 1. Analysis of Bus Stations Worldwide – Part 1

BUS STATION	Background information	Location	Type of Station	Facility	Specific Design
Aarau Bus Station	project as a result of partial renovation	between the railway station buildings	local and international interchange	basic services provided on platforms, additional content available at the railway	canopy and its structure
Angle Lake Transit Station and Plaza	station as a part of general city development strategy	SeaTac outskirts	Intermodal public transportation	no bus building	facade geometry
Blackburn Bus Station	Blackburn strategy for city centre renovation	city centre, main pedestrian street	intercity bus station	all required services provided inside the bus station building	building station columns
Casar de Caceres Bus Station	the main communication node for 5000 citizens of Casar de Caceres	across the school, within the city	bus station	basic services provided within the building	unique building design
Christchurch Bus Station	"An accessible city" strategy	on the corner of two very prominent streets	local public transport and intercity bus transport	provides all necessary services	roof structure
Gare do Oriente Interchange	EXPO 1997 access point	Parque des Nacoes, 5km away from the city centre	multimodal interchange	provides all necessary services	structural design both of the building and canopies
Knutpunkten Bus Station	entrance to the light railway	within the city of Helsingborg	local public transport interchange	no bus building	roof structure
Osijek Bus Station	renovation	outskirts of Osijek	intercity and international bus station	building provides all necessary services	transparent building
Pamplona Bus Station	both transportation and heritage project	centre of Pamplona	intercity and international bus station	building provides all necessary services	underground bus station
Preston Bus Station	iconic brutalism building	centre of Preston	intercity and international bus station	building provides all necessary services	prefabricated building
Santa Pola Bus Station	"Door to the city" project	outskirts of Santa Pola	intercity and international bus station	building provides all necessary services	bus platform canopy
Slough Bus Station	"Heart of Slough" project	industrial area of Slough	intercity and international bus station	building provides basic services	bus platform canopy and building form
Stuttgart Airport Bus Terminal	part of airport infrastructure	suburban area of Stuttgart	intercity and international bus station	building provides basic services	facade and simplicity of function
Trujillo Bus Station	third bus station for the city	entrance to the city of Caceres	intercity and international bus station	building provides basic services	structural design both of the building and canopies
Zagreb Bus Station	renovation	wider center of Zagreb	intercity and international bus station	building provides all necessary services	relation of platforms and bus building

Table 2. Analysis of Bus Stations Worldwide – Part 2

BUS STATION	Materialization	Structure	Public Space	Size/Volume	Urban Consideration
Aarau Bus Station	steel structure spanned with EFFE foil	Steel columns with cable structure	street furniture activating the platforms	medium scale bus station	built within the city centre and historical buildings
Angle Lake Transit Station and Plaza	steel and reinforced concrete	steel structure for the facade and reinforced concrete for the buildings	promenade and public space defined with steel geometry continued from facade	large scale public interchange	outside the city centre redefining public purpose
Blackburn Bus Station	steel and glass	steel U shaped columns	surrounded by city centre public space, 50 m away from main square	small scale	built within the city centre and historical buildings
Casar de Caceres Bus Station	concrete	folded reinforced concrete shell	bus station as a place of gathering	small scale	one of the few public buildings in the city
Christchurch Bus Station	concrete and steel	steel columns and steel roofing structure	providing additional content to the area	medium scale bus station	set within unbuild area that is to be completed
Gare do Oriente Interchange	steel, concrete and glass	steel tree like canopies, sculptural reinforced concrete columns and steel overhanging canopies	many different public places formed within the area of station	large scale interchange	biggest country transportation facility, enabling the city development within the area Parque des Nacoes and further
Knutpunkten Bus Station	steel and wood	steel roof structure set on four steel supports	entrance as a whole new public space oriented towards users	small scale	set to animate users for more frequent use
Osijek Bus Station	glass and steel	steel columns with glass facade	pedestrian entrance provides basic public space	medium scale bus station	located closely to the railway and tram station
Pamplona Bus Station	concrete	reinforced concrete columns and walls	green area above the station as main city public space	large scale bus station	built within the city centre and historical core, under the fortress without disruption
Preston Bus Station	concrete	reinforced concrete columns and walls	initial design did not consider any public space	large scale bus station	built as a part of city development, today out of the city centre
Santa Pola Bus Station	steel and concrete	reinforced concrete building and steel canopies	accommodating garden for bus station users within the site	medium scale bus station	built in the residential area at the entrance to the town
Slough Bus Station	steel	steel columns and steel trusses shaping the unique building form	not provided	medium scale bus station	part of a larger city transportation plan
Stuttgart Airport Bus Terminal	concrete and steel	reinforced concrete building with hanging steel facade	not provided	large scale bus station	improving the airport area and local industrial area
Trujillo Bus Station	concrete	reinforced concrete structure both for platforms and building	not provided	small scale	placed in rural area
Zagreb Bus Station	concrete and steel	steel structure for the platform area and reinforced concrete structure for the building	not provided	medium scale bus station	very good position towards city and other means of transport

Specific design aspect collects the data for which the station is characteristic, and mostly it is the specific choice of structural system that at the bottom line is creating the volumes as an aesthetical feature. Materialization explains what are the materials used for bus station general, and it emphasizes the creative ideas. Urban consideration explains the position of the bus station within the urban fabric, its correlations and effects on the overall urban design. It explains how the station design contributes to the urban realm. Public space is concerned with the third component of every bus station, space where feeder activities are present and space for the public use and explaining different ways how to animate the area in a secure way and motivate users for use. Accessibility and traffic is

concerned with the approach to the station related to all means of transport. It explains the path of passenger and possibilities for continuing the travel from the station. *Tables 1* and *2* present summary of findings.

5. ANALYSIS OF BUS STATIONS IN BOSNIA AND HERZEGOVINA

Very similar concept for all stations in Bosnia and Herzegovina is present in all major bus stations in bigger cities. All built with a greater plan, taking in consideration all important factors such as volume and its increase, position within the city, and position next to the railway station, but also the aesthetical elements that were striving for a universal beauty. All stations were built within approximately same period of time, and aesthetical features are very similar therefore. They reflect the modernist architecture of the time in accordance with an ambience of their existence. Repeated elements that are forming volumes with different functions are representing the brutalism in these designs together with honesty of a material that is the most important characteristic of the brutalism.



Figure 6. Some Bus Stations in Bosnia and Herzegovina [12, 13, 14, 15]

All stations mentioned previously can be compared with Preston bus station. Built with only few years' difference, all buildings are examples of brutalism. The honesty of material is visible on the pictures of original design that unfortunately is not saved or in a good condition today. Inappropriate interventions related to the renovations or purely keeping the buildings from devastation changed the look very much. Therefore, it is hard to recognize its original value and designer's primary intention. *Tables 3* and *4* present summary of findings.

Table 3. Analysis of Bus Stations in Bosnia and Herzegovina – Part 1

BUS STATION	Location	Type of Station	Facility	Specific Design
Sarajevo Bus Station	second zone, closely to the city centre	intercity and international interchange with railway and public transport	basic bus station services	no specific design
Tuzla Bus Station	second zone, closely to the city centre	intercity and international bus station	basic bus station services	brutalist building
Zenica Bus Station	entrance to the city	intercity and international interchange with railway and public transport	basic bus station services	brutalist building
Banja Luka Bus Station	second zone, closely to the city centre	intercity and international interchange with railway and public transport	basic bus station services	no specific design
Mostar Bus Station	entrance to the city	intercity and international interchange with railway	basic bus station services	brutalist building

Table 4. Analysis of Bus Stations in Bosnia and Herzegovina – Part 2

BUS STATION	Materialization	Structure	Public Space	Size/Volume	Urban Consideration
Sarajevo Bus Station	concrete and steel	concrete structure for the building and steel canopy for the platforms	pedestrian entrance includes small square for the bus station users, additional public space provided in front of railway entrance	medium scale bus station	built on the edge of city centre, very good positioned, surrounded by public buildings
Tuzla Bus Station	concrete	reinforced concrete structure with overhanging beams as a canopy for buses	no public space provided	medium scale bus station	built on the edge of city centre, very good positioned, surrounded by public buildings
Zenica Bus Station	concrete and steel	concrete structure for the building and steel canopy for the platforms	shared public space, both for bus and railway station	medium scale bus station	built at the entrance to the city, surrounded by residential buildings
Banja Luka Bus Station	concrete and steel	concrete structure for the building and steel canopy for the platforms	no public space provided	medium scale bus station	built on the edge of city centre, very good positioned, surrounded by public buildings
Mostar Bus Station	concrete	reinforced concrete structure with reinforced concrete canopy for buses	shared public space, both for bus and railway station	medium scale bus station	built at the entrance to the city, surrounded by residential buildings

6. CONCLUSION

Bus stations were not build only for a present time but to serve for many years after building. Even though the emphasis was on a functional features, the aesthetical elements were not neglected at all. Structural elements that are integral part of aesthetical expression of the design are still remarkable elements of these transportation buildings.

Today, architecture of transportation facilities is trying to achieve many goals at once. One of them is also making the station place a landmark and increasing the public space use. Many of the station sites are not able to provide spaces large enough for a public activities and proper access for all users at the same time. When it is about achieving the landmark and preserving the identity of a place, the example of Slough bus station showed how even 'out –of –space' design sometimes is not enough for such impression, but a building such

as Preston bus station still captivates the passengers attention and leaves even more positive impression.

Buildings neglected during a long period are very difficult to maintain today, and different views on future of such buildings is always the subject of architectural discussions. Preston Bus Station is a perfect example where the exactly same dilemma has occurred, but also an example how should this architecture should be treated.

Blackburn Bus Station, Casar de Caceres, Gare do Oriente, Trujillo and Preston Bus Station are the best examples where structural system is at the same time architecture. Creative and innovative form has honest approach to the structural system, and they are the same element without any hidden structure. Where structure and architecture are one, the landmark is inevitable result. If followed by clear function and unobstructed use, stations are succeeding in their role completely.

Bus stations are more than transportation buildings, and it is proven that they are only one part of the infrastructure serving for the transport. Bus stations where the attention is put not only onto building itself but on a whole experience, including bus shelters, public space, entrances, feeder area and all other, are the ones that have positive effect on all users. The creative and innovative approach with structural system does not necessarily have to impact the operational and functional features of the station. Very simple structures are still enabling good function to be performed if they are not obstructing the required spaces. While there is no significant impact of structural system onto functional requirements, the overall form and architecture of the bus station is influenced mostly by the choice of structural system. All analyzed examples of already built bus stations and their elements are confirming how important role structure has. Honest approach to the structure is providing a highest quality form, without hiding or covering the core of the building. Structure as an architecture is a principle that can be applied to the design of bus stations or any of their following elements. The function is successfully organized within any good structure either it is creative and innovative or not, but the use of it is mostly encouraged if the appealing design is achieved with all aspects.

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АУТОБУСКЕ СТАНИЦЕ – АРХИТЕКТОНСКИ ИЗРАЖАЈ, КОНСТРУКТИВНИ СИСТЕМИ И МАТЕРИЈАЛИЗАЦИЈА

***Резиме:** Аутобуиска станица је мјесто гдје аутобуиска линија почиње или завршава, односно уопштено говорећи, то су објекти који представљају врата града и као фокална тачка уласка у град представљају мјесто гдје посјетиоц ствара први утисак о граду. Сврха ове студије је истраживање тренутног стања аутобуских станица у Босни и Херцеговини у упоредби са савременим свјетским трендовима у циљу побољшања квалитета тренутног стања, испуњавања стандарда и потреба са различитих аспеката. Анализа обухвата двадесет студија случаја, петнаест аутобуских станица у свијету и пет локалних аутобуских станица. Студије случаја се испитују кроз деск анализу документације у комбинацији са посјетом локација и “in situ” анализом. Након анализе постојећег стања, истраживање даље разматра примјере аутобуских станица у свијету и њихове пројектне претпоставке. Анализа обухвата савремене глобалне трендове у пројектовању аутобуских станица, укључујући урбане, архитектонске и конструктерске приступе у анализи. Нагласак у анализи је посвећен односу између архитектонског израза и конструктерског аспекта. Циљ је показати зависност функционалности аутобуских терминала узимајући у обзир њихове практичне могућности, под утицајем архитектонског израза и примјењених конструктивних система, укључујући и њихов утицај на стварање упечатљивог и уочљивог искуства.*

***Кључне ријечи:** Аутобуиска станица, Архитектонски израз,
Конструктивни систем*