In November 2008, the Princes Foundation for the Built Environment made a trip to Strasbourg to study what is considered to be one of the best examples of an integrated, multi-mode transport system in Europe. This document summarises the findings and draws some preliminary conclusions.
This report is born out of the goal of drastically reducing carbon emissions by 80 per cent by 2050 and the reality of ever increasing pressure on city centres from over-congestion coupled with over-burdened public transport systems.

The transport sector accounts for 24 per cent of the UK’s overall carbon emissions and the Confederation of British Industry (CBI), in its report ‘Time to change gear’ (2009), suggests there is a need for a long-term strategy and that ‘As the UK moves to a low-carbon economy, to have a high-quality, reliable transport network is essential.’ The CBI believes that carbon emissions can be significantly reduced in the transport sector by 2030 but that a ‘long-term vision’ is needed now. The tenor of the report is that additional capacity is needed across all modes of transport but leaves it to the government to ‘be mindful of the wider agenda in terms of climate change’.

The Princes Foundation supports the idea of sustainability being directly related to the promotion of mixed-use, polycentric, walkable, city neighbourhoods, which reduce dependency on the car. If we are to meet the targets for reducing carbon emissions, transport strategy will have to take account of all modes of transport which, of necessity, includes walking, cycling and the efficient use of a range of interconnected public transport modes in urban and suburban areas.

This report will show how the City of Strasbourg dealt innovatively with all these issues by making their city greener, more walkable, more socially inclusive and at the same time, economically better performing. By taking an holistic approach, the Mayor’s office, utilised the new integrated multi-mode transportation system to:

- reduce the congestion and pollution associated with excessive car dependence and improve citizen’s health and quality of life;
- increase economic activity and social inclusion within the city without any corresponding increase in car use;
- provide ecologically oriented public space; streets, squares and landscape corridors / armatures; and
- encourage vibrant, walkable, connected, mixed-use existing neighbourhoods and create transit nodes for future neighbourhoods.

All car-dominated cities should now consider reducing congestion and hence carbon emissions by applying the principles of integrated, multi-mode, transport-oriented developments which can deliver the above outcomes.

The authors of this report—following their study trip to Strasbourg in November, 2008 and at the request of Hank Dittmar, CEO of the Prince’s Foundation—are:

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In order to gain insight into the successful outcome of Strasbourg’s regenerated public realm and newly integrated multi-mode transport system, the Prince’s Foundation spent two days acquiring visual evidence and technical reports backed up with two interviews.

The interviews resulted in a clear perspective of design and delivery and traced the path taken to unify multiple actors to achieve the City’s strategic objectives. The two interviews drew on the knowledge and long project expertise of:

- Roland Niklaus from the Urban Community of Strasbourg (CUS) Transport department on Tuesday 25th November, 2008 (9.00 to 12.00 hrs) accompanied by Max Moden of the Association for the Strasbourg Urban Transport Users (ASTUS).
- Laurent Stemmelen from the Urban Planning Agency (ADEUS) on 26th November, 2008 (9:00 to 12:00 hrs).

The rest of the time was spent travelling the tram system, recording key dimensions, platform levels, track positions and overall road sections, including trees and building heights. The study began in the centre of the Old City of Strasbourg with its meandering medieval street patterns and tight corners and moved to the outer suburbs, from areas reflecting periods of German town planning and 1960s and ‘70s mega blocks, through to a variety of suburban settlements.

It quickly became clear what a positive effect the tram system had had on each of the very differently planned sectors of the city and on the city as a whole. Initially, the aim was to look at the recently completed new tram system in Strasbourg but it soon became apparent that the new tramway was a only part of an integrated multi-mode transport strategy.

Consequently, the study deals with a wider range of issues including how car dominance was radically reduced in the urban core of the city; how less prosperous parts of the city were linked to the centre; how the phasing secured early financial and political returns; and how the wide range of modal changes encompassing walking, cycling, trams, buses, trains, cars, were efficiently and attractively integrated into the city. What began as a mere modeling exercise of Strasbourg’s tram network evolved into a study illustrating an exemplar of transit-oriented development, where the principle of reclaiming the public realm has truly been achieved.

Governance & Delivery

An outline of the political expediency and governance scheme that produced such a well-integrated system, in spite of the multiple disciplines required for delivery, highlighting the ability to collaborate between professions, industries and sectors.

The Tram System

A description of the design principles and general specification behind the final choice of tram system for this Strasbourg project.

Multi-modal transport system:

An examination of the multi-modal nature of the transport system in Strasbourg including, walking, cycling, trams, buses, trains, taxis and cars.

Spatial Analysis and the Transect

An analysis of the tram system as it interacts with the urban environment. In this report, for comparative reasons, we have looked at four typical neighbourhoods, each representative of significant historical periods of settlement though which the tram system has been routed and where a range of transport modes and interchanges can be observed. To this end we have used the idea of the ‘transect’, a way of describing the relative changes of urban context and density in a linear sequence from the central urban core to the peripheral suburbs. It is defined as part of the ‘Smart Code’, as formulated by Duany Plater-Zyberk & Company (DPZ). These transect studies can be found on pages 7—10 and include:

- T6 Urban Core: Medieval City Centre (11th to 17th century)
- T5 Urban Centre: German Quarter (18th and 19th century)
- T4 General Urban: Housing projects (1960s & 1970s)
- T3 Suburban: Suburbia (1900—1950s and 1980s—2009)

These studies are accompanied by drawn figure-ground studies to enable comparison of the changing urban grain descriptive of each transect zone.

Traditional Urbanism

It can be seen from this report that a well designed tram system can be a catalyst in the regeneration the historic core of a city. By extrapolation, it also creates the opportunity for future walkable neighbourhoods in the bleaker quarters of the city through re-urbanisation, based on the principle of sustainable urbanism focused at newly inserted transport nodes.
The political background and the eventual governance scheme which accompanied the inception and delivery of this multifaceted transit system are keys to understanding the successful outcome of this project. The following sequence of events and organizations employed to deliver the multi-mode transport system is a testimony to the successful collaboration of politicians, civil servants and professions which, in other contexts, more often than not conspire to prevent any kind of integrated and deliverable strategy.

Beginnings
The mayoral contest of 1989 triggered a dramatic shift in the development of Strasbourg, provoking an upheaval in its urban landscape and paving the way for a revolution in the way in which people would interact with the city. Strategically framing the election as a choice between an underground system and her preferred surface rail, Mrs. Cathrine Trautmann secured a firm victory. In fulfilling her promise, Mayor Trautmann took control of the city and regained the public realm in the process.

Politics
There was significant opposition to the idea of a tram system. Small business users believed that reducing cars in the centre of the city would reduce their business success and many voted with their feet. Mrs. Trautmann and others, argued that the tramway was more cost-effective than an automated underground system in serving the city’s strategic needs; that it would enable increasing pollution and congestion to be robustly dealt with, which would not be the case with an underground system; that businesses would, in fact, prosper; and that there would be money left over to improve the public realm. Thereby striking a cord deep within the electorate, she changed the face of politics in Strasbourg in mobilizing wide-scale support for public transit by demonstrating its virtues and, along the way, making the tramway a non-partisan issue. As Mr. Nicklaus remarked, “The tram was not political business anymore, it was a matter for everybody, for the whole city.”

Reclaiming the public space
Brushing away cars and providing a service-driven system that matched the needs of the city required the establishment of institutions with unrivaled power and reach to navigate the complexities of the French regime. French municipalities essentially direct mass transit development whilst the Département, covering a larger area, governs the departmental networks, including buses and local trains. There are 28 cities (or municipalities) in Greater Strasbourg and 36,000 cities or municipalities in France. After France regionalized governance, the region was given jurisdiction over the delivery and financing of regional railroads.

The role of CUS: The tramway department along with CUS or Greater Strasbourg, existing for around 40 years and empowered by a national law as the organizing authority, acted as major levers for the system’s implementation and financing. The state advanced these communities of municipalities, even in rural areas, to improve the management of services like mass transit. The Greater Strasbourg Council’s membership reflects the distribution of population across cities comprised within and its President is chosen from these members. Above all, it manages the transit system, coordinating urban planning services to work jointly, covering urban development, roads, traffic lights (excluding public lighting systems), waste management, water and sewage.

CTS study and collaboration
Embodying the mayor’s “political will” to execute a novel program, agencies and other bodies comprising diverse professions, combined their efforts to eventually “regain control of all public spaces.” This kind of collaborative system is a unique characteristic.
of the French system. The contracting party, Compagnie des Transports Strasbourgeois (CTS), Strasbourg Transport Company, managed the study and assessment process and the "integration was well-done." It tendered a call for proposals from engineers, landscapers, architects and designers to begin to study the project.

Indeed, the system governing transport is multi-faceted, powerful and robust, contributing in large measure to the effective delivery of the tramway and redistribution of space within the city and surrounding areas. CUS controls operations and the mayor is the president of the CTS—this arrangement is common in most cities because of the amount of money at stake. According to Mr. Stemmlen, "they decide how transportation policies are conceived, the manner in which planning documents are released and taken into account and how the tramway is integrated in these studies."

The Tramway Department, within the City local government departments was a solid fixture since the beginning of the programme and was designed to exert power, provided by the municipality, over other service providers and other departments "in order to push through the project." Coupling manpower and financing for the studies, "the department was entrusted to bring people on board with projects." With any Tramway Department proposal, "...there is a very strong chance of it being adopted even against other services. ... Whatever comes out of the tram department is going to have very strong priority over the prerogatives of other services and it comes from the mayor." 2

The Urban Transportation Planning Document (PDU), instituted in 1989 and then released in 2000, sets forth transportation policies over a 10- to 15-year period, including the tramway project amongst others. It is based on a mandatory national law, arising from air quality requirements. It urges local authorities to integrate their transportation policies into a greater city planning policy. The PDU, a partnership not merely involving the CUS but also the national government, the state, the Département and the region, was one of the first of its kind released in France. It ambitiously links the transport system to urban planning and environmental policy. "What seems normal today was not as normal when it was started.

The transportation policy is merged into a city planning policy. The plan continuously evolves with the project during implementation as there is process, action, evaluation at all times, creating a constant feedback mechanism."

There are four main goals embodied in the plan:

- Favour economic development and trade in the city by financing transport that facilitates movement around the CUS (Greater Strasbourg).
- Improve the quality of lifestyle and environment by renovating and refurbishing the centre.
- Foster social cohesion by providing an equal amount of services to the different communities within the CUS.
- Reduce car traffic by producing a multi-modal and coordinated system.

The Solidarity and Urban Renewal (SRU) was enacted in 2000 to govern planning law, provoking the authorities to develop planning documents on an even larger scale, resulting in SCOT, a territorial project to reach out farther than the CUS with 139 municipalities and a total of 577,000 inhabitants. The SCOT's perimeter surpasses that of the CUS, as it is 30km north, 30km south and 25 km west, entailing the most important cities within this territory, cities that will contain urban housing and economic activity.

The SCOT is a general tool, "an instrument through which the projects are led by the municipalities and the village community". The law requires the creation of a larger planning document addressing all aspects of urban planning, housing, economy, transportation and environment, amongst others, whilst comprising existing smaller scale documents.

ParCUS and parking

The majority of parking is delivered through public-private partnerships between the city and businesses. The major mixed syndicate is called ParCUS, governed by the CUS and created to manage the development of parking. Similar to the CTS, the operator of the transit system, ParCUS is the operator of the parking buildings. Apart from this, there are few privately owned car parks.

Overall control

Whilst there is still some segmentation in Strasbourg and territorial questions between services, there are two advantages to the tram system: there is only one territory, Greater Strasbourg; and, although the CUS finances the project with supplements from the state, CUS is still the manager of the project. Projects where the city, Département, region and state have to work together are necessarily more complicated.

Tax regime

The Versement de Transport, a transportation tax, enables the CUS to finance public transportation systems vis-à-vis a government levy of 1 per cent and in some cases 1.5 per cent of total wages paid within private companies in the Greater Strasbourg area. Although the tax does not provide total finance all the projects, it is of benefit. The system cost €97 million but, at €17 million per km this works out at a reasonable industry cost.

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1 Mr Roland Niklaus, CTS Compagnie des Transports Strasbourgeois (Strasbourg Transport Company) www.cts-strasbourg.fr; and from the Direction des Transports et des Déplacements—Communauté Urbaine de Strasbourg CUS (Transport and Mobility Direction—Strasbourg Urban Community). Interviewed on the 25th November, 2008: Strasbourg

2 Mr Laurent Stemmlen, ADEUS Agence de Développement et d’Urbanisme de l’agglomération Strasbourgeoise (Strasbourg Urban Planning Agency) www.adeus.org Interviewed on the 26th November, 2008: Strasbourg
The Strasbourg tram system has a comparably light visible engineering impact. This is achieved through use of platforms of minimal design; maneuverable, well designed carriages; and unobtrusive tram stops, all of which complement the existing city centre form with its traditional narrow streets and tight corners.

History: The first tram line was inaugurated in 1994. The second, six years later, formed a cross extending to outer neighborhoods and intersecting in the city centre.

Although there was an older tram service until the 1950s, its routes could not be reused by the new system because of the difference in track gauge. There was also a particular objective for the first new line (Line A) to link a specific impoverished area in the north and a suburban area in the south of the city centre.

The total length of the system has grown from one line of 12.5 km in 1994 to 38 km with five lines currently. During this development period, the city planning department also focused on improving the uses and physical conditions of public space along the tram lines. Interventions often extended beyond the roadway itself all the way "from façade to façade" to integrate the new system with existing uses and to improve pedestrian and bicycle paths.

Public Space

The placement of tram tracks contributed in many cases towards recovering public space and pedestrian priority in squares and parks that had previously been auto-oriented roundabouts or parking. Two cases of particular note were "L’Homme de Fer" and Platz Kleber, respectively the main tram intersection and the main public square, in the city centre.

In 1992, Platz Kleber received 40,000 vehicles per day; it now receives no vehicles other than the permitted service vehicles and those only until tram. Local demand for parking has been relieved by an underground structure below L’Homme de Fer station just 80 meters from the north corner of the square.

The city took advantage of the extensive tram line interventions on main roads to insert new green areas and vegetation which were appreciated and celebrated by local communities.

Tram Vehicles

EUROTTRAM: The tram project team requested special characteristics for the vehicle itself that required a completely new design. The new "Eurotrams" were ordered from German firm ABB Henschel, designed by ABB in partnership with an Italian company and finally built in York and Derby (UK). Amongst their special features were:

- **100% low carriages floors to improve accessibility**
  To achieve this feature the powered carriages have one electric motor and one brake per wheel, thus eliminating the need for a perpendicular axle between the wheels.

- **Larger windows**
  The windows allow for better appreciation of the architectural and urban landscape and also for increased visibility of shops and commerce from inside the tram, even for standing passengers.

- **Wider access doors**
  Wider doors speed loading and unloading of passengers, resulting in less time spent at stops and improved service frequency and accessibility.

CITADIS 403: In 2005, with 53 Eurotram vehicles in service, a new model was launched in response to new demands for capacity and flexibility. The ALSTOM Company produced the Citadis 403 tram, which shared aesthetic characteristics of the Eurotram for visual consistency. The new vehicles had smaller carriages at the ends to improve flexibility, particularly on the narrowest routes. These trams can negotiate a margin of just 2.9m between tracks.
on straight sections and 3.2m on the tightest curves. This also allows for turning curves without overlapping pedestrian areas (unlike the London “bendy bus”).

The Citadis also offered a slight increase in capacity per train as well as a more secure wide access door system. Today, the original Eurotrams plus 41 Citadis vehicles run on Strasbourg’s tracks.

### Important technical data

- Vehicle floor height: 0.35m
- Vehicle total height: 3.34m
- Total width: 2.40m
- Maximum Capacity: 400 people (four Citadis type carriages)
- Length: 33.00m for three and 44.46 m for four carriages
- Average speed in service: 19 km/h (Although vehicles are able to run at up to 60 km/h)

### Infrastructure

**Tram Stops:** The low floor design of the Strasbourg trams allows stations and stops to be around 35cm high and can be aligned with a regular pavement horizontally and vertically. That is what has happened in Strasbourg’s case; the existing pavements serve as tram stops. In many parts of the city centre, the low tram ‘platforms’ rise up from the same adjacent surface areas shared by pedestrians and bicycles.

Although platform design is similar throughout the system, materials and track placement vary depending on the urban context. Thus the system can include both tram-exclusive green paths in the middle of a high street as well as tracks on pedestrian streets without physical barriers to delimit them.

These stations are equipped with one or two light roofed structures (the same as for bus stops), one ticket machine with an electric board showing times of routes and machines for renewing tickets before boarding the tram.

### Frequency

Location planning for tram stops took into account existing neighborhood centres as well as the distances between stops. The aim was to have stops an average of 580m apart outside the centre and between 290m to 400m apart within the city centre. The service frequency is from 2-4 minutes in the city centre to 4–7 minutes in the outer ring, with a maximum of eight minutes at the most distant stations.

### The ticket pricing system

Offers inexpensive deals for travelling over more than one route or with a group of people. There are at least 14 different ticket types responding to the needs of the user. They include: 24-hour tickets for individual tourists or groups; cards with multiple journeys for the common user; economical Park-and-Ride deals with return tickets for all the passengers in the car; and 24-hour regional (and, in this case, international) tickets for individuals and groups.

### Tariffs

Range from €1.40 for a one-way individual ticket to €33.5 for a card with 30 simple journeys. In between are rates such as €7.50 for a ‘transfontalier’—a regional ticket that also covers public transport in nearby cities including the German neighbours, Kehl and Offenburg.

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3. “In some other cities you have to increase by 1 metre, you have to go from 2.9 to 3.9 when you have a tight curve, whereas, in Strasbourg, because of that design you go from 2.9 to 3.2, increase by only 30cm, for a 25-metre radius.” From: Niklaus, Roland. Ibid.
Multi-modal transport integration

TRANSPORT COVERAGE BY TRANSECT ZONE IN STRASBOURG

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<tr>
<th>T1 Natural Zone</th>
<th>T2 Rural Zone</th>
<th>T3 Suburban</th>
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Section multi modal transport integration. Illkirch Lixemuhl station. T3. Strasbourg. See photograph overleaf
Strasbourg excels in how well all modes of transport work together. Bicycles, trams, pedestrians and the car can often be spotted on the same photograph, such is the high frequency of the tram service and the popularity of the bicycle.

The tram service can be considered the backbone of the transit system, but its success relies on coordination with other modes of public: train, bus, tram, bicycle, taxi and the new car-sharing service. Except for the inconvenient temporary connection between the airport and the tram system, all transit means are remarkably passenger-oriented, with interchangeable systems and optimized journey times. The fact that all systems are managed by the same transport company assures permanent feedback with each of the other modes.

**Tram—Train**

Two tram lines reach the main train station through a section which runs underground. In addition to these, there are three other interchanges between tram and train within Strasbourg where, although not all sharing the same station platform, walking distances from stops are less than 100m.

Line F, named also Tram-Train, is being implemented from 2008 to 2014 to achieve more regional coverage. Vehicles on this line will run on both urban and regional tracks, thus improving connections between commuter town centres and Strasbourg.

**Buses**

The congestion of previously existing bus routes—because of the dramatic increase in cars in the 60s and 70s—was a main reason for finding an alternative new public transport system. The bus system was reorganised at the same time as the tram was implemented in order to cover the entire city. Currently, the rolling stock count stands at 201 Standard and 85 articulated vehicles.

The principal role of the bus system is to link all neighbourhoods and peripheral areas with tram stations. Bus coverage extends from very low-density areas in the outskirts to the busy boundaries of the city centre. Buses cannot enter the city centre, but there are several multimodal stations around the centre linking to bus stops and cycle parks.

The bus system also addresses weak points in the tram network. For example, since the tram lines interconnect primarily in the centre, some bus routes work in concentric rings, connecting peripheral neighbourhoods without having to pass through the centre.

**Cars**

From the beginning, the tram project aimed to encourage the use of public transport in place of cars. This determination was expressed in the way public interventions took space formerly dedicated solely to car use and allocated it for pedestrian use or green areas.

At the same time, the number of parking lots outside and near the city centre increased substantially but were taken away from public spaces. Near the city centre alone there are approximately 3528 parking lots per km2 within buildings and 2363 lots per km2 on the streets. The transport authority provided the city with nine “park-and-ride” locations where users leave their cars to take public transport, making use of inexpensive return tickets covering up to seven people per car.

Private cars are only allowed in the city centre until 11 am, mainly for delivery. After this, bollards are raised at the centre zone boundaries and only taxis can lower them. Even when trams run in segregated lanes, the route separation divisions are low enough to allow other vehicles to cross them and to drive on the tracks in case of emergency.

**Bicycles**

With approximately 130,000 cyclists and 490km of bike paths, Strasbourg celebrates and encourages the use of bikes as the most noiseless, healthy, adaptable and ecologically responsible means of transport.

Currently there are around 25 roofed bike-parking locations (Véloparcs) with 32 more planned for 2009. These are typically less than 2.5km apart.
Like any European Cathedral city, the central core of Strasbourg is organic, traditional, urbanism with meandering narrow streets, frequent squares, high levels of mixed-use fronting onto the streets and considerable pedestrian permeability. When the time was ripe to upgrade public transport in the city, Strasbourg did not shy away from creating a multi use shared-surface public domain despite the health and safety challenge. In fact, they have created one of the most enjoyable, walkable city centres in Europe where vehicles are restricted to service vehicles and shop fronts are situated a mere arm's length from moving trams.

Grande Ille

The central core of Strasbourg, the Grande Ille, is circumscribed by the twin branches of the river Ill and was named a UNESCO World Heritage site in 1998. The centre retains its medieval street patterns, with a number of overlapping natural neighbourhood centres. The twin armatures of Rue des Francs Bourgeois and Rue du Vieux Marche aux Poissons together with myriad cross-streets create a fine grain of high density urbanism with a high level of mixed uses including shops at ground level. This is a perfect condition for maximizing the usage of key tram stops which are, on average, 370m apart bringing added vitality and commerce to the shops.

Commercial Vitality

At the time of the early proposals, discussions with the small, original smaller retail traders were met with opposition. It didn't take long for the larger fashion labels to spot the advantage of reduced car numbers, a good quality, regular tram system and a higher quality public domain. These larger brands, such as Cartier, immediately set about locating themselves in the key locations and the result is now a very vibrant core retail sector albeit more up-market than before. The preponderance of high quality retail has benefited the city within its regional context at the expense of smaller local traders who have, in some instances, simply moved to the fringes of the centre. This was answer enough to the critics who thought that ridding the city centre of cars would be detrimental to trade and commerce.

Public Domain

Place Kleber now has a small, well appointed shared surface finished in granite sets with a thriving market where bikes, pedestrians and trams happily coexist. Shops front naturally onto both the tram lines and the 350mm raised level platform at the tram stops with a minimum of fuss and few railings. At the junction of Rue du 22 Novembre and Rue Quai Desaix de Veygoux (near Alt Winmarik Station), a corner store is located a distance of only 2.83m from the actual tram line without any railing at all.

Cars

Limited access is given to cars into the central core. Vehicles are only allowed into the centre until 11am each day for access to shops and office traders. Other cars are given only limited access at three loops which take the cars back out in the same direction as they entered. Here the maxim enforced stated that ‘if you don't have business in the centre of the City, you have no business driving through it’. The city is thus handed over to the pedestrian and so is able to preserve the character of the historic site whilst returning it to its commercially vibrant and sustainable origins prior to the effects of cars and pollution. The city is a case study in car reduction due to the tram system which is a clear signal for creating greener places with reduced carbon footprints.
Density: 360 to 724 dwellings/hectare

Uses: Housing, Offices, Boutique Shops, retail, Tourism services, Public institutions and Education.

Distance between transport stops: 290m to 400m

Section of Langtross Grand’ Rue Station. T6
The German, Beaux Artes-planned quarter of Strasbourg extends the quality of urbanism from the old centre but jumps up a scale; evidenced by the monumental institutional buildings, aligned axes and grand formal gardens. The tram system has been designed to take this change of geometry in its stride—where students from the university use the tram stop and long and elegant bike racks are aligned and dispersed amongst the regular tree trunks of the French avenues.

**History**

This area was mainly developed at the end of 19th century, when Strasbourg was, for the last time, a part of Germany. The unity in the architectural style, the placement of the most important buildings around the green square of the “Republique” and the large boulevards provide the place with a distinguished character.

**Uses**

The Republique square (the former Kaiserplatz) and the Palace of the Rhin (the former Kaiserpalast) were built in 1884 to create a place of reception for the German emperor and, at the same time, a symbol of imperial power. Today, the Palace of the Rhin and two other great buildings shape this cultural centre housing the Strasbourg National Library, the Theatre, the Regional Direction for Cultural Affairs and the Central Commission for Navigation on the Rhine.

**Planning**

The planning of the tram system has been carefully integrated with the Beaux Artes city planning, taking care to skirt around the circular ring of the Place Republic. This decision was aided and abetted by the existence in the gardens of four Ginkgo Biloba trees, a present to the Kaiser from his Japanese allies. In the early stage of the latest development these gardens
saved more rationalist plan options from gaining support as the plans proposed a route straight through the gardens.

In Avenue de la Marsaillais, the careful crafting of tram station platforms in complete alignment with the central avenue of trees is an essay in good urbanism. The bike lane also uses this central avenue, making use of the station platform, combining existing elegant French landscape design with function, through the dual use of each element.

At this multi-modal intersection trams share the same surface with cars, bikes and pedestrians. The more spacious planning of this quarter provides an ideal opportunity to create a good number of transport mode changes for buses and trams. Here buses which are not allowed to penetrate the historic central core can pick up passengers to take them to the quarters of the city not served by the trams.

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1 The Regional Direction for Cultural Affairs
www.alsace.culture.gouv.fr/cgi/index_noframe.php?milieu=/fr/ladrac/milieu.htm
www.alsace.culture.gouv.fr/fr/ladrac/palais.html
The penetration of the outer suburbs helped to create a sense of connection to the centre of Strasbourg, particularly for those without cars or considering life without a car. The interchange with buses to cross-cut the city to areas the trams don't serve was well planned. In a few of the final destinations, large park-and-rides had been provided.

Suburban routes
Where possible, tram lines have been routed not on the major road system but on the secondary network, bringing the tram lines to and through existing neighbourhood centres. This links more naturally with pedestrian and cycle routes and the modal interchanges with the bus system which links neighbourhoods concentrically rather than radially. This arrangement of the primary road network also brings the added benefit of additional commercial activity for the existing mixed-use neighbourhoods.

Zoned planning
In more recently built areas of the city, the separation of use functions, for example in the EU complex of mega monoblocks, tends to distance the transport corridors from the urban context with a clear deference to the car. This can be disturbing where the tram stops have no built context, forcing unpleasant walks to the nearest building or street.

Urban context
The distinctive quality of the centre of Strasbourg and the role of dense mixed-use urban fabric provides lessons that do not appear to have been applied in more recent development. Where there are existing neighbourhoods, the trams enhance the quality of the experience by both improving both the public spaces and bringing more commerce and general activity. More recent development does not seem to capitalize on the vast heritage of sustainable urbanism, rather capitulating to the latest ‘trends’.
as seen in the latest architectural magazines.

**Park and Ride**

At the end of some lines, park-and-ride facilities have been provided which are linked to regional train networks. The car parks dominate the landscape. In time these places could become mixed-use centres in themselves linking a number of local neighbourhoods. In this case, car parking could be incorporated into a stronger urban context of building structures, blocks, streets and public places. The current trend to appoint architects with ‘de-constructive’ tendencies to build their graffiti stained sculptural buildings at the park-and-ride termini may undermine these future possibilities.
The penetration of the outer suburbs helped to create a sense of connection to the centre of Strasbourg, particularly for those without cars or considering life without a car. The interchange with buses to cross-cut the city to areas the trams don’t serve was well planned. In a few of the final destinations, large park-and-rides had been provided.

Suburban routes
Where possible, tram lines have been routed not on the major road system but on the secondary network, bringing the tram lines to and through existing neighbourhood centres. This links more naturally with pedestrian and cycle routes and the modal interchanges with the bus system which links neighbourhoods concentrically rather than radially. This arrangement of the primary road network also brings the added benefit of additional commercial activity for the existing mixed-use neighbourhoods.

Zoned planning
In more recently built areas of the city, the separation of use functions, for example in the EU complex of mega monoblocks, tends to distance the transport corridors from the urban context with a clear deference to the car. This can be disturbing where the tram stops have no built context, forcing unpleasant walks to the nearest building or street.

Urban context
The distinctive quality of the centre of Strasbourg and the role of dense mixed-use urban fabric provides lessons that do not appear to have been applied in more recent development. Where there are existing neighbourhoods, the trams enhance the quality of the experience by both improving both the public spaces and bringing more commerce and general activity. More recent development does not seem to capitalize on the vast heritage of sustainable urbanism, rather capitulating to the latest ‘trends’ as seen in the latest architectural magazines.

Park and Ride
At the end of some lines, park-and-ride facilities have been provided which are linked to regional train networks. The car parks dominate the landscape. In time these places could become mixed-use centres in themselves linking a number of local neighbourhoods. In this case, car parking could be incorporated into a stronger urban context of building structures, blocks, streets and public places. The current trend to appoint architects with ‘de-constructive’ tendencies to build their graffiti stained sculptural buildings at the park-and-ride termini may undermine these future possibilities.
Density: 65 to 125 dwellings/hectare
Uses: Education, housing, shopping malls, public institution
Distance between transport stops: average 540m

Junction Route du Rhin and Rue du Travail

Section Route du Rhin, south suburban neighbourhood
Conclusions

Esplanade station. Low floor and wide doors to improve accessibility.
Environmental integration and a multi-mode transport solution

When considering a new transport system, take the opportunity to consider the total integration of all modes of transport including walking, cycling, tram, bus, rail, taxi and car.

This provides the opportunity for vast environmental improvement of the city through the reclamation of the public realm from car domination and its associated ills and, in its wake, reducing the carbon footprint.

Tram is an ideal tool for sustainable development and environmental improvement

The choice of a tram system prevailed over an underground system because it reduces car dependence at street level in the city together with pollution, congestion, carbon emissions and, significantly, construction costs. The programme of delivery is also speedier and enabled the rapid completion of the first line which, once in place, overcame opposition from the sections of the community as they realized the benefits to themselves as well as the city.

The insertion of the tram system offered a once-in-a-lifetime opportunity to address the quality of the public realm from the central historic core to the outer suburbs. Town squares, formerly dominated by grid-lock congestion, were handed over entirely to the citizen and became pedestrian–prioritized, shared-surface public places.

Social Integration

Equality of expenditure on tram line infrastructure was maintained, from the centre to the periphery of the city, including routing through social housing projects. The improvement in quality of the environment through landscaping was appreciated by all social groups and helped gain their support.

Rapid building of the first tram line (line A) strategically linked the most populated but least prosperous areas of Strasbourg to the city centre. This also gained support from wide-ranging social groups, produced the quickest financial returns for the project and overcame general resistance to the project.

Economic Prosperity

Contrary to the views of local business traders in the central urban core, the tram system increased the footfall on the pavements, thus increasing business to the retail sector and attracting investment from other parts of the retail industry.

However, the outer areas did not automatically get the same result as the urban density and intensity of use is not yet at a sufficient threshold. The architectural approach being taken by the city in some of the outer areas seemed to be in danger of reducing future opportunity for creating high-density, mixed-use, walkable neighbourhoods in keeping with sustainable practice.

Reduce traffic increase pedestrian flow

City planners were empowered to preclude cars from accessing the city by time and space; “If you don’t have business in the centre of the City, you have no business driving through it”

Architects and planners devised a strategy which aimed to continue the flow of traffic at same rate, whilst increasing economic activity in the city centre and allowing for population growth.

Buses were excluded from the central area but play an important role in linking neighbourhoods to the tram system.

Political will and strong executive Leadership

The delivery of the Strasbourg integrated transport system would not have succeeded had it not been for the strong leadership and initiative from the mayor’s office which precipitated the emergence of the tram system as a tool to regenerate the city through integrated land-use policies and transit oriented development.

Regional and local coordination of policy and governance of the tram system was testament to the successful cross discipline collaboration at all levels.

Tram is given paramount funding priority: Urban Community of Strasbourg (Communauté Urbaine de Strasbourg) installed a governance body to deliver the tram system in light of resources, with funding priority for the tram system over all other governmental departments.

Acting on lessons from Strasbourg

Strasbourg offers every city a model not only in the application of a tram system but a strategy to regain the public realm, reduce carbon emissions and most of all ensure the long-term vitality and prosperity of the city.

Further research of other transit-oriented exemplars should be carried out for comparison and on that evidence, propose an ideal transit-orientated centre of town and associated neighbourhoods diagram.
Documents:
Stemmelen, Laurent (project chief), Bilan LOTI des lignes B et C (Report LOTI for lines B and C) ADEUS: Strasbourg (February 2007).
CUS Tram—train / Tram F. Strasbourg—Bruche—Piémont des Vosges. Ville et Communauté urbaine de Strasbourg (City and Strasbourg Urban Community), SNCF, Réseau Ferré de France, Région Alsace and, Conseil General du Bas-Rhin. Strasbourg (June 2008)
Interviews (Key contacts):
Mr. Laurent Stemmelen, ADEUS Agence de Développement et d’Urbanisme de l’agglomération Strasbourgeoise (Strasbourg Urban Planning Agency) www.adeus.org Interviewed on the 26th of November, 2008: Strasbourg

Related Links:
Programme de Recherche et d’innovation dans les transports terrestres (Research Programme for Land Transport Innovation) www.predict.prd.fr/predict3/homePage.fo
International Association of Public Transport www.uitp.org
Groupement des Autorités Responsables de Transport (Association for Transport Authorities) France. www.gart.org
Avenir Transports. Transport International Routier Aerien Transport Maritime Ferroviaire Particuliers Urbain www.avenir-transports.org/avenirtransports