

Insights:

DESIGNING FOR THE FUTURE OF TRANSPORT HUBS



CHAPMAN TAYLOR
TRANSPORTATION



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CHAPMAN TAYLOR HAS CREATED AN INNOVATIVE CONCEPT DESIGN FOR THE PROPOSED NEW CENTRAL TRANSPORTATION HUB (CPK) BETWEEN WARSAW AND ŁÓDŹ IN POLAND, WHICH IS DUE TO SERVE AS A MAJOR MULTI-MODAL AVIATION AND RAILWAY INTERCHANGE SERVING 45 MILLION PASSENGERS ANNUALLY WHEN IT OPENS IN 2027.

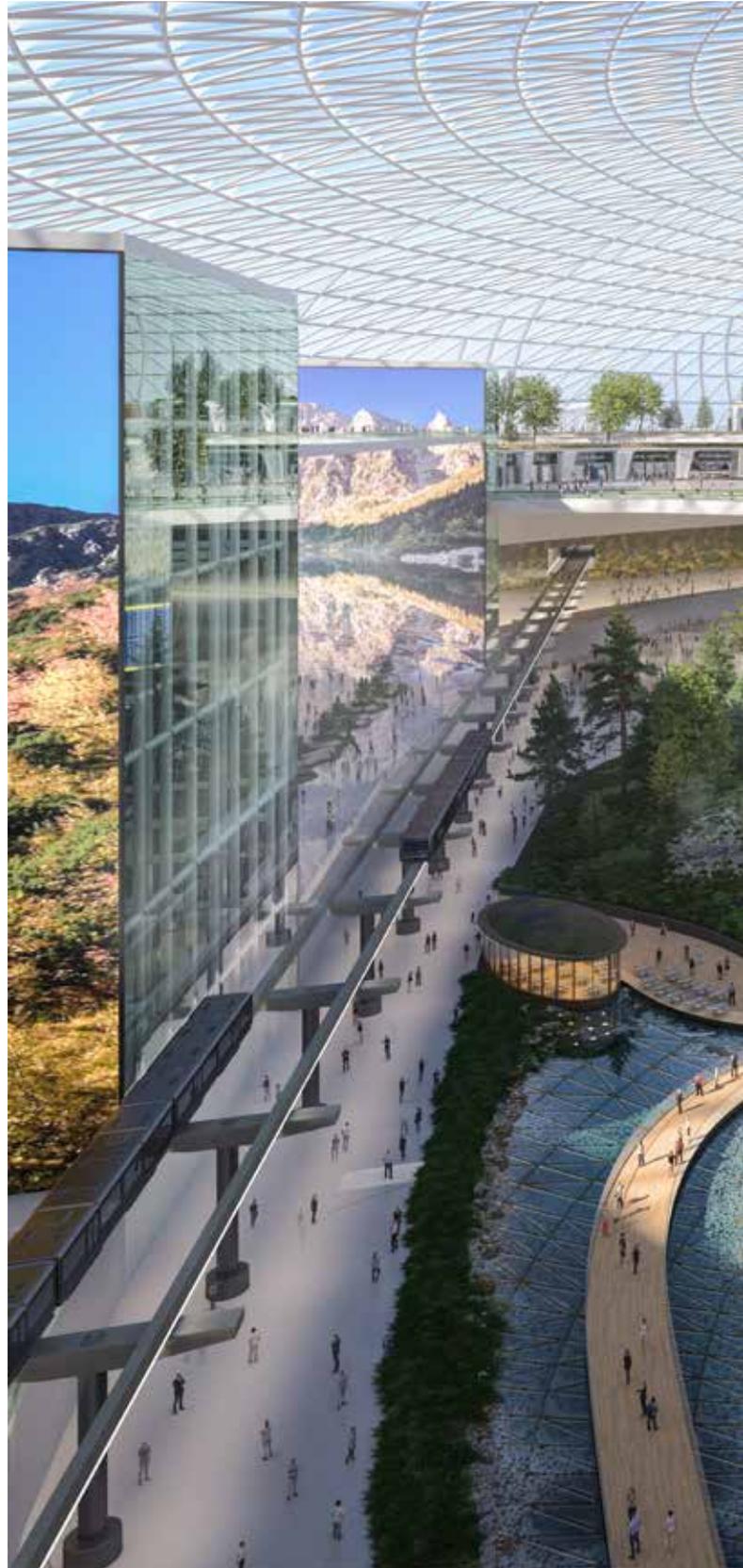
The concept envisages a six-level structure, named Solidarity Transport Hub, which will offer a new template for transport interchanges – creating an exciting, curated experience which will be proudly rooted in its location and offer a popular destination for travellers and non-travellers alike.

The hub's magnificent circular dome will house the diverse activities within, including traditional commercial offers, such as retail and F&B, as well as conservation, cultural and entertainment amenities. In this paper, our Transportation Director, Peter Farmer, describes the thinking behind the well-received design, innovative ideas which address the logistical challenges of multi-modal transport interchanges and the elements of the design which will ensure Solidarity Transport Hub is prepared for advances in transport technology and the advent of personal drone travel.

The concept: A symbol of national unity

The design principles underpinning Solidarity Transport Hub reflect some of the key aspirations of Poland as a country and as a people – unity, sustainability and sense of place:

- **Unity:** Rail is a medium which unifies Poland and its people, while aviation unifies people and nations internationally.
- **Sense of Place:** A statement of national identity with a unique 'wow' factor on arrival and departure, leaving a lasting and positive impression on passengers and visitors.
- **Sustainability:** Environmentally positive design and technologies will make Solidarity a new leader and exemplar for the industry.





SOLIDARITY OFFERS A NEW TEMPLATE FOR TRANSPORT INTERCHANGES, CREATING AN EXCITING, CURATED EXPERIENCE WHICH WILL BE PROUDLY ROOTED IN ITS LOCATION.

A circular dome is the focus of the hub, its circular form symbolising the unity of Poland and the connectivity at the heart of our concept. The patterned glazing of the high-specification domed roof features an abstract interpretation of the feathers of the white eagle, a symbol of the nation and its resilience.

Solidarity offers a new template for transport interchanges, creating an exciting, curated experience which will be proudly rooted in its location and offer a popular destination for travellers and non-travellers alike.

Context

The Solidarity Transport Hub will connect the nation with itself and with the world, acting as a focal point for the planned high-speed regional and national rail network while hosting a new, state-of-the-art international airport.

Offering opportunities for local businesses to participate in the daily life of the facility and to interact with the travelling population, Solidarity will be rooted in the community but will also act as an ambassador for Poland's identity, culture, history and aspirations.

The circular base of the hub's central dome symbolises the unending unification of the nation, while the internal hierarchy of uses is inspired by the six main landscapes of Poland:

- Departures: **pas pobrzeży - Coast**
- Arrivals: **pas pojezierzy - Lake District**
- APM: **pas nizin - 'Polish Plain' / Lowlands**
- Rail interchange: **pas wyżyn - Uplands**
- Lounge: **pas kotlin - Valleys**
- High-speed station: **pas gór - Mountains**

Connectivity

The essence of Solidarity Transport Hub is connectivity – connecting modes of transport, connecting people, connecting towns and cities, connecting countries and connecting digitally.

Internal connections within the airport will be planned to provide an efficient and seamless experience for transiting passengers. Wayfinding and circulation will be optimised and intuitive, with clever and efficient connections between areas and levels.

Whether passengers or visitors, transferring travellers or day-out shoppers, people will have a relatively effortless experience moving between areas. They will be able to choose to navigate the dome level-by-level or to skip levels. Unassisted walking distances are kept to less than 250m between reset points, and people requiring assistance, such as wheelchair users, will be able to navigate the complex without interruption.

Surface access tends to become more concentrated the closer it gets to a transport hub. Rather than accepting that this density, and the associated bottleneck problems, are inevitable, we propose reducing the numbers of vehicles approaching the centre.

Given that the core of the Solidarity Hub is rail connectivity, restrictions on car access will complement the idea of the Hub being linked to a network of parkway stations as well as the regular station network. These parkways will provide additional surface access options for private cars, cycles, taxis, bus and coach services.

Integration within the regional transport strategy and the remote aggregation of passengers will further enhance the sustainability of the development. In addition, the parkways could potentially provide additional Hub services, such as check-in and baggage handling and forwarding.

These features will greatly expand the physical network and connectivity of the Solidarity Hub, far beyond the immediate Hub perimeter.





Culture

Solidarity Transport Hub will be a social experience as much as a transport interchange, creating a national 'town square' – an open public space of markets, entertainment, social expression, community interaction and fun. The complex will include focal points which showcase national and regional culture, including a curated craft and art gallery.

The magnificent dome is the attractive visual focal point, housing the diverse activities within. The space will accommodate traditional commercial offers, such as retail and F&B, as well as conservation, cultural and entertainment amenities. Welfare facilities will be gender neutral and cater for people of all levels of ability. Additional segregated facilities will be provided for those who so prefer.

The development of a sense of place is key to ensuring that visitors enjoy their experience and to encouraging extended dwell time and commercial activity. It will also create a positive long-term impression on those who pass through, providing the ideal backdrop for social media sharing.

Sustainability

Aiming to create an industry leader in sustainable transport, the masterplan for Solidarity Transport Hub includes many innovative environmental initiatives. The tempered dome hub will reduce energy loads traditionally associated with this type of development, while the rail and aviation functions will be seamlessly integrated for intuitive wayfinding.

The new complex will encourage people to use the railways instead of short-haul flights, reducing the carbon legacy of travellers and allowing the airport to focus on wider international connections. It will cater for rail-connected cargo, which will increase efficiencies and reduce negative environmental impacts.

Other sustainability features include:

- Ground-source heating and cooling
- Natural lighting
- A snow bank, with gathered winter snow providing cooling during summer
- Biomass fuel generation, tri-generation and photovoltaic energy
- Rainwater and greywater harvesting

- An on-airport CHP plant
- All-electric ground vehicles
- An alternative aircraft fuel research centre
- A rail-supplied fuel farm which can flexibly adapt to alternative fuels.

Efficiency

The dome will create a flexible, weather-proofed environment that allows cost-effective evolution over time, as required. Early investment in the dome will reap considerable subsequent economic savings and save much potential disruption, allowing earlier operational functionality and less need for costly adaptations and retrofitting later.

The operational planning of the hub is designed to enhance the flexibility of functions, particularly processing, by placing difficult-to-move elements such as cores to either side so that the central space can adapt quickly and easily to requirements. In addition, the strong and flexible configuration includes:

- A single on-airport cargo process facility.
- A central baggage system feeding four MARs stands, reducing airfield vehicle movements.
- A single-mode transfer for persons of restricted mobility.
- A consolidated logistics centre.
- Biometric passenger identification throughout the airport, allowing for opt-outs.
- 90% of stands to be MARs to provide maximum flexibility.
- Rail connected cargo for consolidated regional distribution.

FUTURE-PROOFING IS CRUCIAL FOR THE LONGEVITY AND RELEVANCE OF THIS HUB. THIS PLAN WILL ENSURE THE VIABILITY OF ANY EXTENSION OF RAIL PLATFORMS AND RUNWAYS, AS NEED GROWS.

Growth

- Future-proofing is crucial for the longevity and relevance of this hub. This plan will ensure the viability of any extension of rail platforms and runways, as need grows. The plan also allows for the easy incorporation of new modes of personal transport.
- In addition to established modes of surface access, the masterplan considers emerging technologies such as driverless cars and eVTOL drones.
- The concept of personalised air travel via associated vehicles (PAVs) has been around for a long time, but we are now on the brink of the vision becoming reality. Due to urban pressures, thinking has been mainly centred on Vertical Take-Off and Landing (VTOL) capability. Environmental considerations have been another key driver, with a focus on electric and hybrid-electric propulsion (hence “eVTOL”).
- While mass ownership of PAVs may be some years away, the potential of air taxis is generating increasing interest and excitement. Initially, some of the eVTOL's carrying capacity may be taken up by a driver, but drone technology is expected to take over in time. The design of Solidarity Transport Hub has been future-proofed to allow for quick and easy adaptation to such an exciting development.
- A rigorous structural geometry enables a flexible layering of uses which can be sculpted and added to over time. Clear vertical cores act as a counterpoint to the fluidity of the plan, providing easy inter-level access as well as supporting a strategy of intuitive wayfinding.
- Structures will be capable of easy and cost-effective supplementation and reconfiguration as uses change or grow with exponential passenger growth. This adaptability means that the infrastructure can move and grow with increased demand and that the hub will remain relevant to the nation it represents as Poland itself evolves.

Commercial

The traditional commercial offer of individual units will be reduced in favour of a showcase marketplace full of variety and innovation. Offers will be curated alongside the entertainment and other attractions, and visitors will be able to sample offers, immerse themselves virtually or stand and watch.

There will also be an emphasis on experience and service, with leisure facilities including spas, grooming parlours and tasting bars. Galleries will be arranged to optimise views of the diverse activities and entertainment for those who prefer watching rather than participating. An auditorium will provide a venue for diverse uses, including installations and offers which showcase the regions, increase Poland's global status in the gaming industry and provide the perfect location for other social, cultural and economic opportunities.

Commercial activity will be enhanced by the sense of place and the experience on offer, increasing dwell time and attracting people to work, rest, learn and play. Extensive digital LED technology will provide a dazzling, entertaining and useful means of communicating offers and functional information while adding to the sense of place and experience. The end result will be a commercially and operationally successful place to which people will repeatedly return and which will soon become a major destination in its own right.



About the author

Peter heads up our Transportation sector in the UK. He undertakes a key role in the continuing development of this sector, related research, masterplanning, due diligence and sustainability.

With over 25 years' specialist experience across the UK, Central and Eastern Europe, the Middle East, Asia, Australia and the Caribbean, he has an in-depth understanding of the political and business drivers of projects with multiple stakeholders and complex design and delivery teams. Special areas of interest is the emerging PRS / Build-to-Rent sector where she is a regular contributor at round table events and guest speaker at residential sector industry events.

