



**BUDAPEST
FEJLESZTÉSI
KÖZPONT**

Development of a new urban-suburban rapid transit rail system on the Budapest H5-H6/H7 HÉV-lines

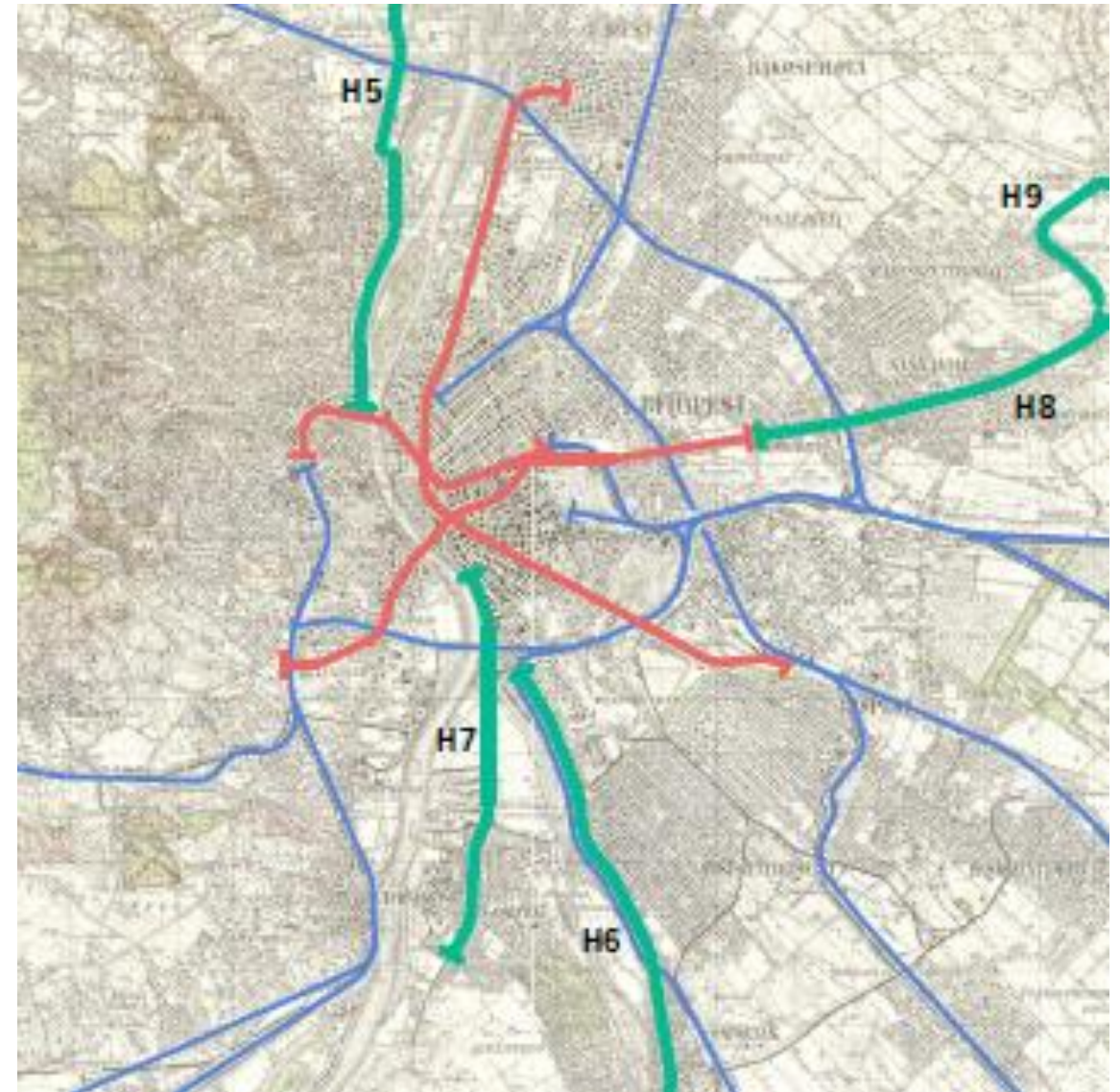
**Ádám Kangyerka, HÉV Development Project Director, Budapest
Fejlesztési Központ**

**InnoRail Conference, Budapest
November 17, 2021**



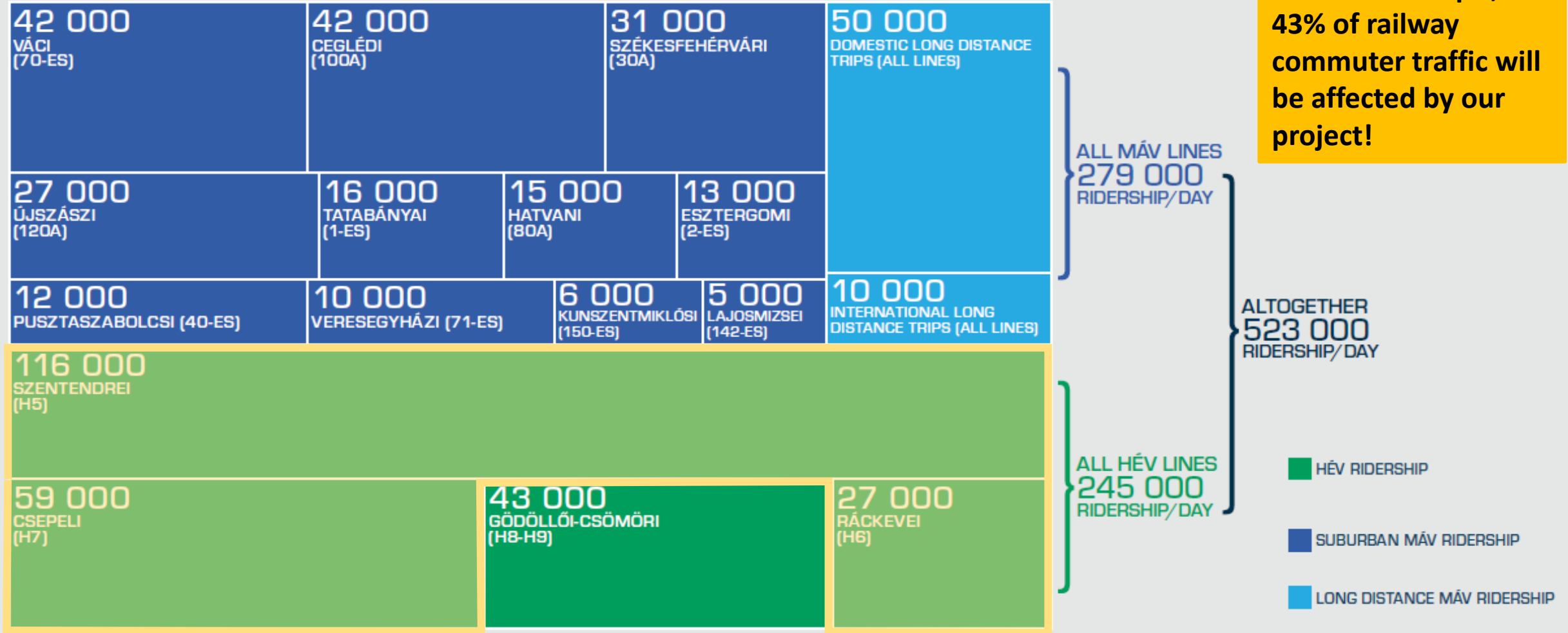
THE HÉV SUBURBAN RAILWAY SYSTEM TODAY

- HÉV Helyi Érdekű Vasút / Local Interest Railway
- Operated by MÁV-HÉV Zrt. subsidiary of the national railway, MÁV-Volán Group
- 6-40 km long rail-lines with mixed city and commuter passenger traffic
- Punctuality, reliability at 99%
- Provides good transport links for the served suburban settlements and districts of Budapest
- Substantial passenger traffic

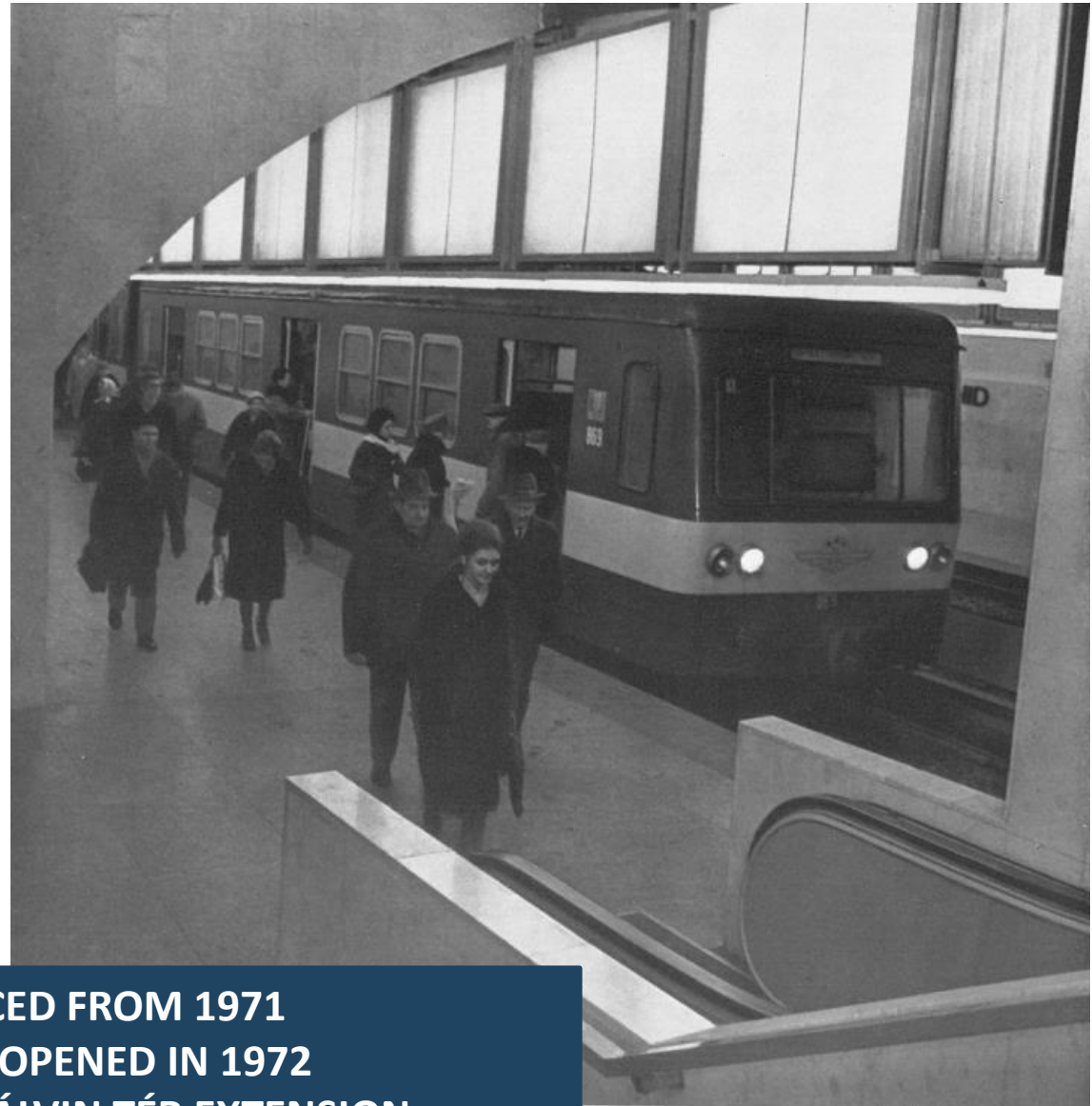
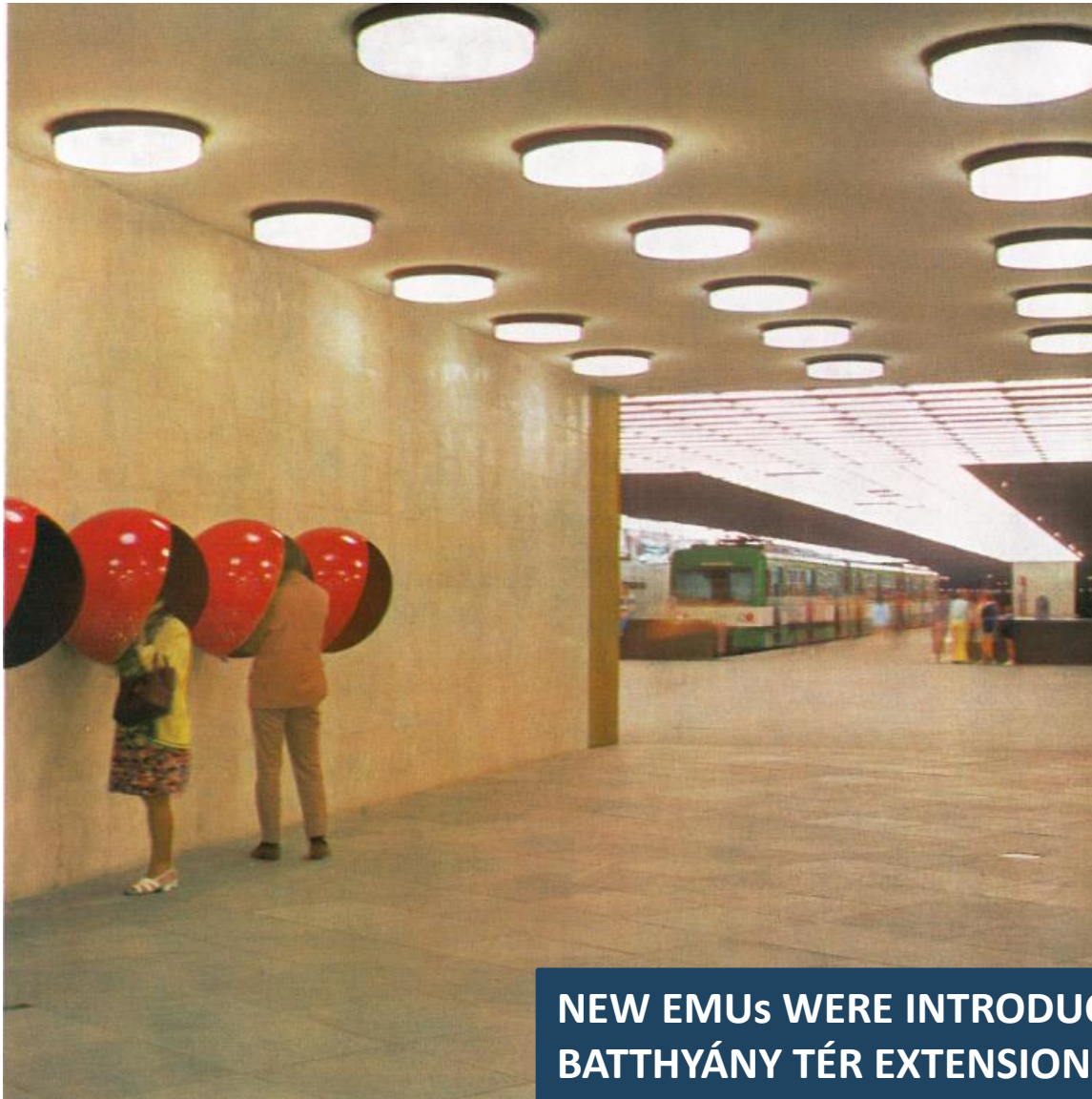


89% OF THE 523 000 TRIPS MADE DAILY IS COMMUTER TRAFFIC

DAILY RIDERSHIP ON BUDAPEST RAIL LINES



ATTEMPTS TO MODERNISE THE SYSTEM BACK IN THE 70'S



**NEW EMUs WERE INTRODUCED FROM 1971
BATTHYÁNY TÉR EXTENSION OPENED IN 1972
PLANS WERE MADE FOR A KÁLVIN TÉR EXTENSION**

HÉV VEHICLE FLEET TODAY

- Rolling stock is obsolete, at the end of it's life-cycle
- Level boarding not available, not accessible for people with disabilities
- Air-conditioning not available
- 1100 V DC traction-voltage (non-standard)
- Train control systems not available



BRANCH-LINE CONDITIONS, MAINLINE FUNCTIONS AND TRAFFIC



**NUMEROUS SPEED LIMITS ARE IN PLACE
AGEING INFRASTRUCTURE**

- Vonal vastagsága**

 - 2-8 perces követés
 - 10-15 perces követés
 - 20-60 perces követés

Vonal mintája

 - Vasúti viszonylat
 - Metróvonalak és hésvonalak
 - Villamosvonalak
 - Kiemelt autóbuszvonalak

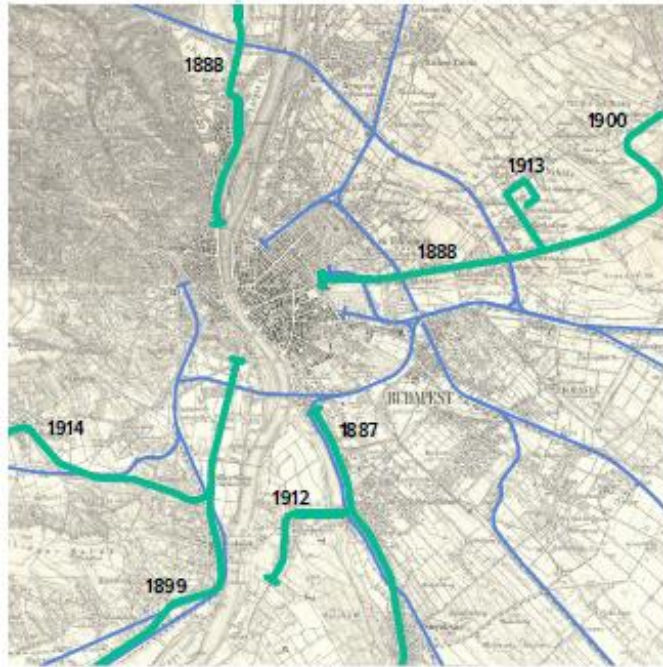
Vonal színe

 - Nyugati-Déli alagút érintésével közlekedő viszonylatok
 - Déli körvasút érintésével közlekedő viszonylatok
 - Belső körvasút érintésével közlekedő viszonylatok
 - Külső körvasút érintésével közlekedő viszonylatok
 - M5 alagút érintésével közlekedő viszonylatok
 - Keleti pályaudvarra közlekedő viszonylatok
 - Nyugati pályaudvarra közlekedő viszonylatok
 - Csatlakozó regionális vasútvonalak

FORRÁS: TRENCON

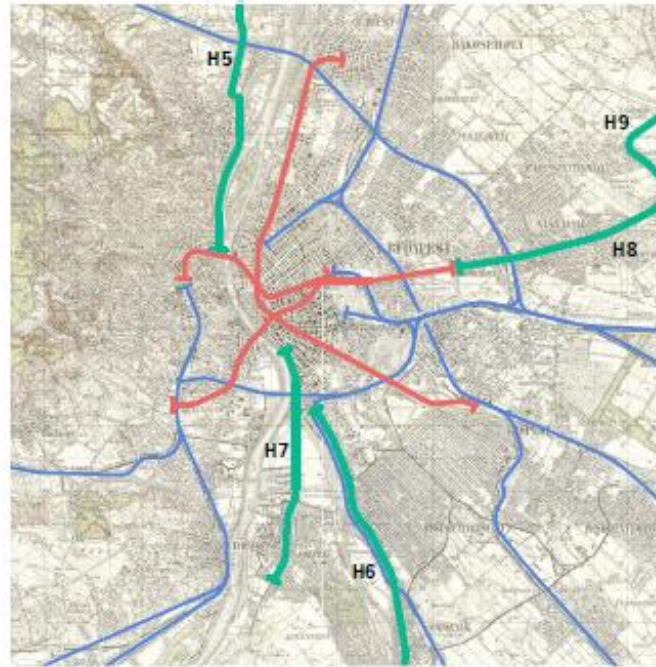
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FROM THE PAST TO THE FUTURE: METRO LINE M5



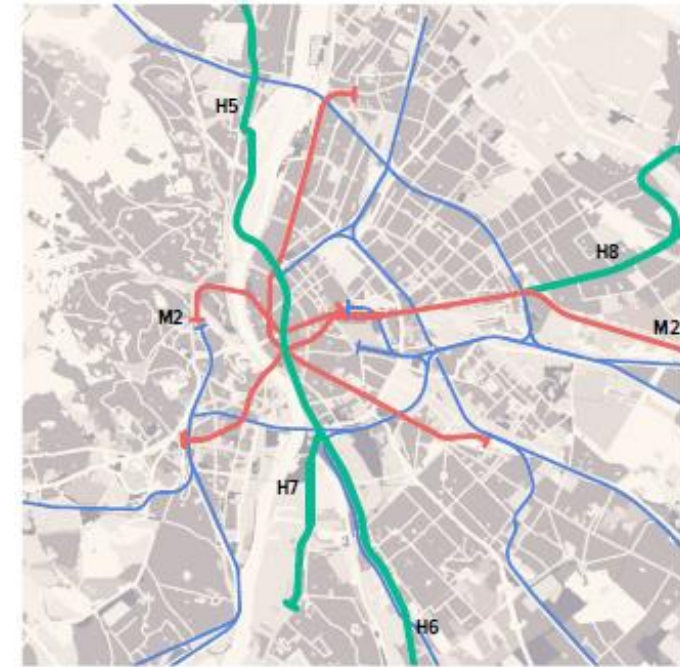
THE BUILDING-UP OF HÉV-LINES

The HÉV lines we know today were established to supplement existing railway-services. In case of the lines with national importance the need for connecting the railway terminus stations risen up early. The 'Left riverbank circular railway' opened in 1889. At the time local interest railway lines (HÉV lines) yet not reached the level of significance to create a unified system....



PRESERVATION OF ISOLATED OPERATING SECTIONS

The Budapest HÉV system reached its current form through the construction of the metro. The historical HÉV lines were either integrated into the Budapest tram system, replaced by metro or closed entirely. The remaining lines regained popularity due to the newly built housing estates concentrated to the outer districts of the city.

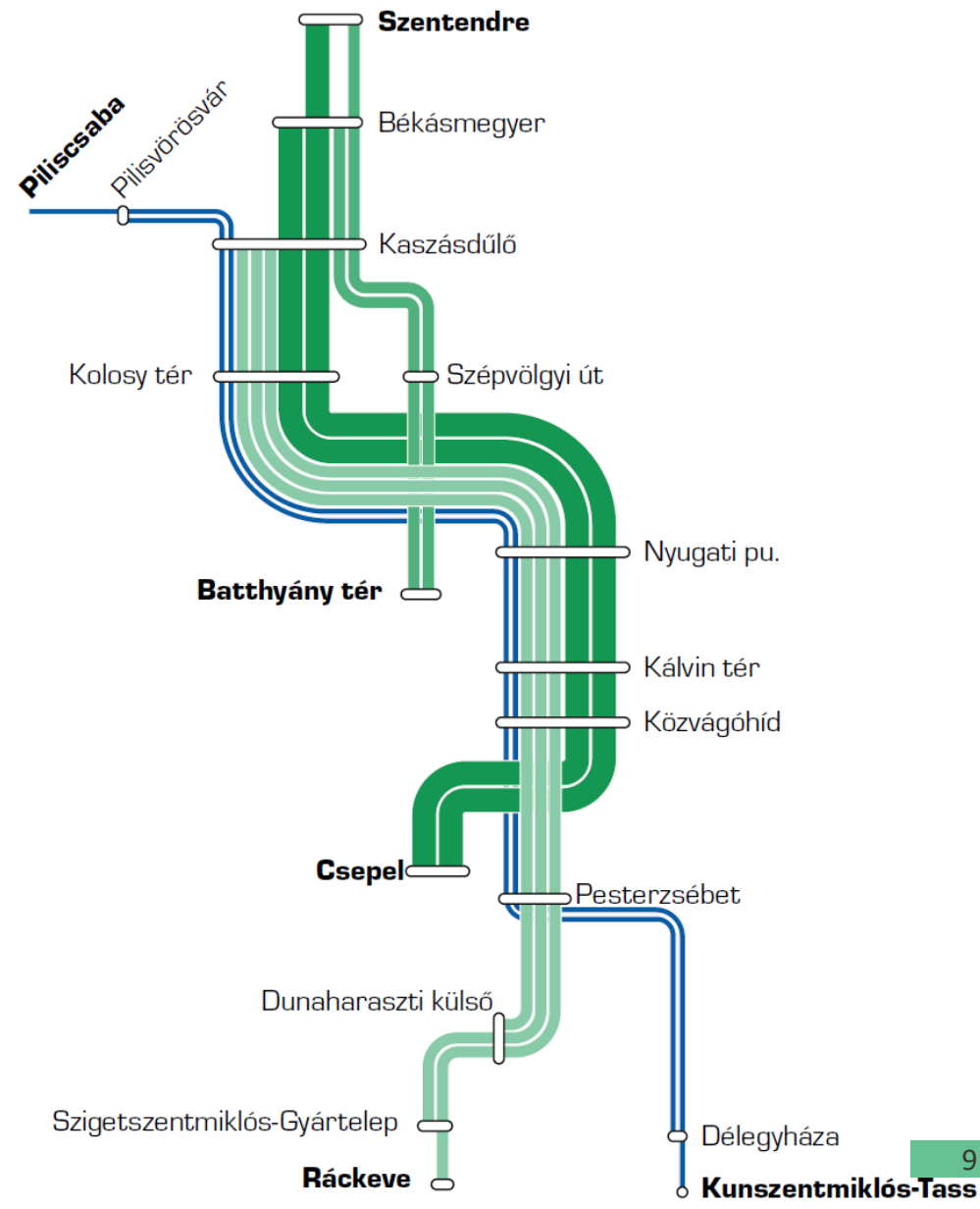
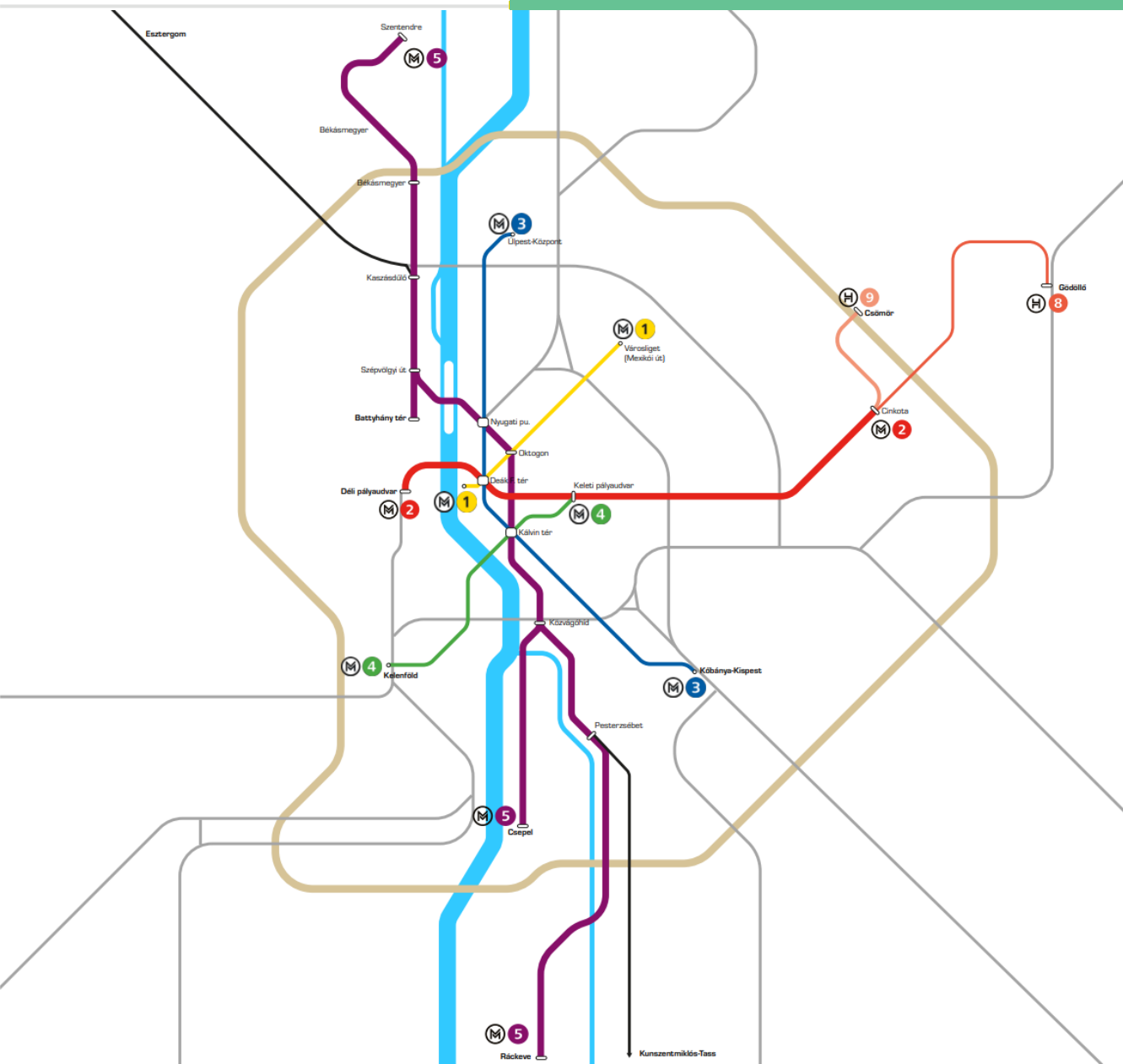


21ST CENTURY : INTEGRATED DEVELOPMENTS

The key principles in the development of the HÉV to be integrated into the city's transport system and to become part of the transport network. These aims are provided through a direct transfer to the Metro-system and the connection of HÉV lines



A VISION FOR THE FUTURE: M5 METRO LINE



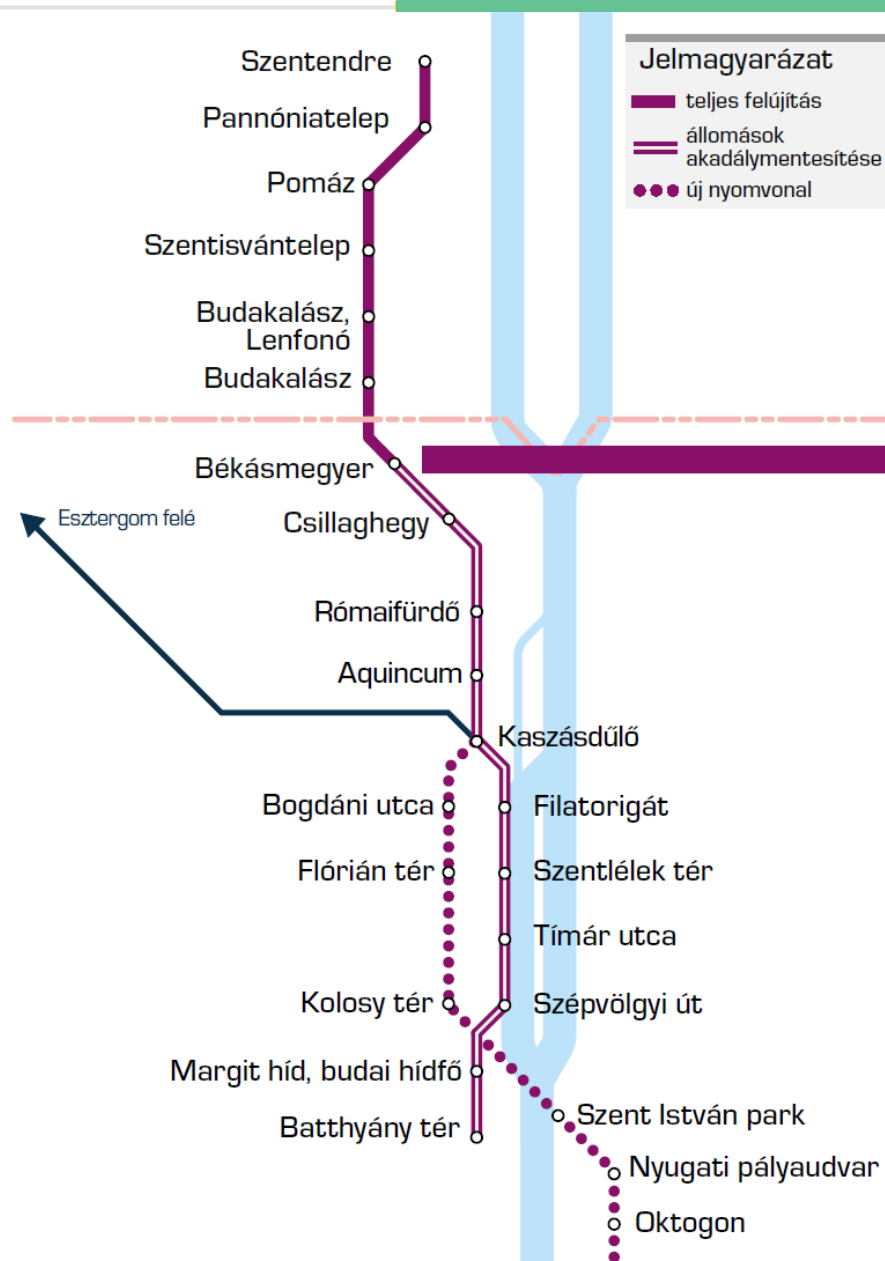


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THE FIRST PHASE OF THE DEVELOPMENT: RECONSTRUCTION OF H5, H6 AND H7 LINES



THE FIRST PHASE OF THE DEVELOPMENT: H5 LINE – GENERAL PARAMETERS



- Full reconstruction between Békásmegyer and Szentendre: tracks, electric power-supply system, signalling, stations, P+R facilities

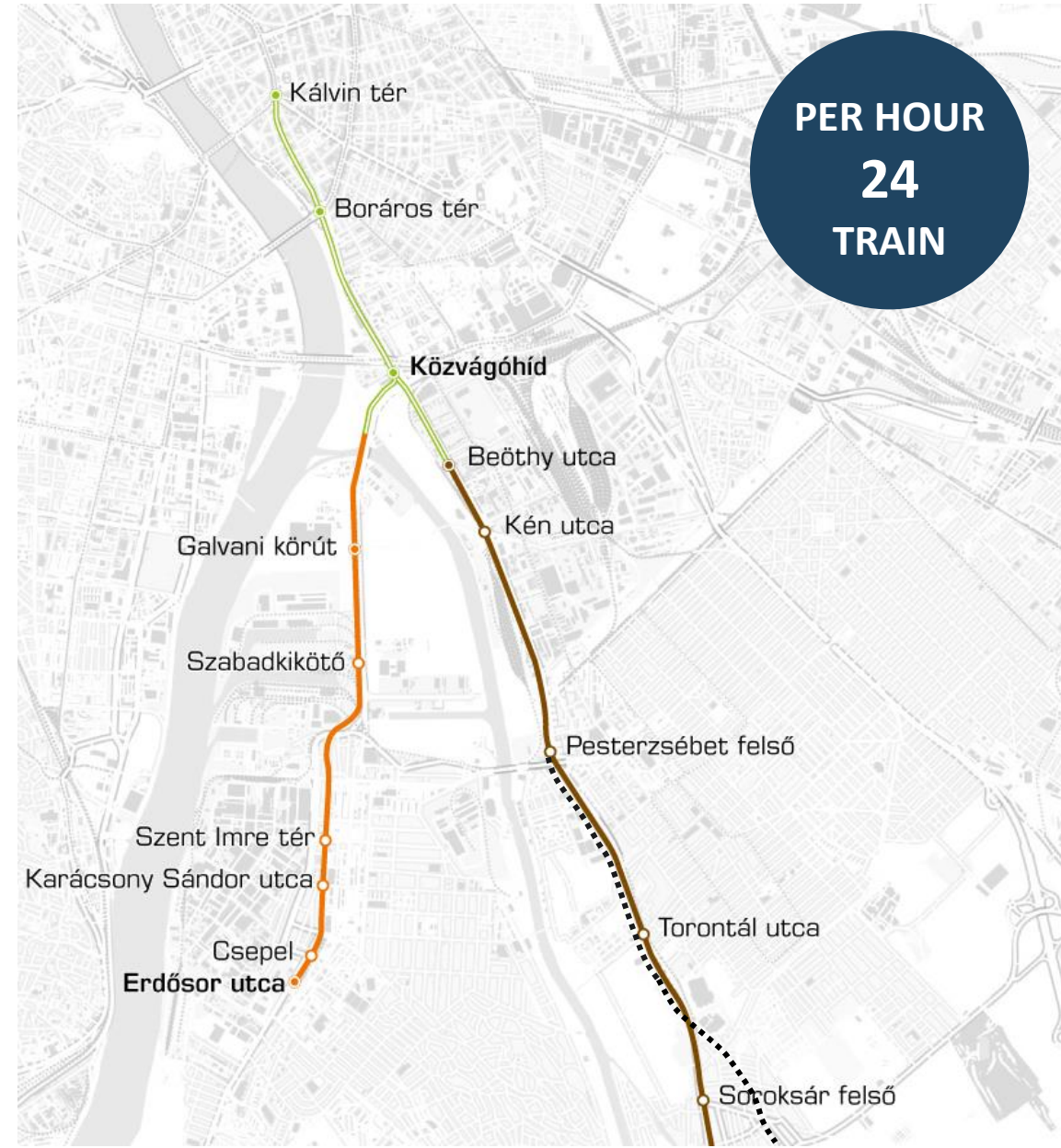
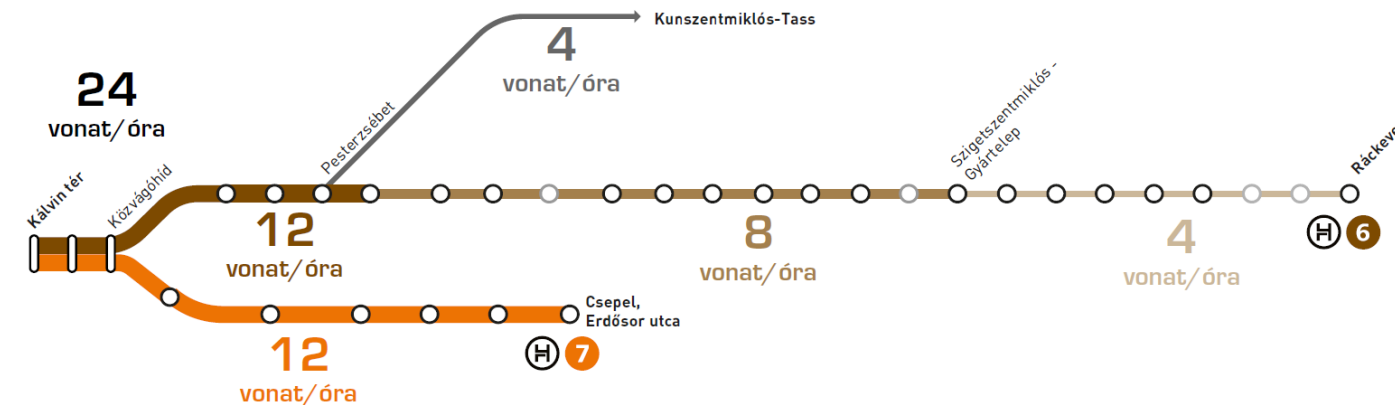
Trains running from Békásmegyer every 4 minutes

- Integration with the national railway network: connection of the Esztergom commuter railway line to Batthyány tér

THE FIRST PHASE OF THE DEVELOPMENT: H6/H7 LINES

- Full reconstruction, modernisation and improving accessibility on Csepel (H7) és Ráckevei (H6) HÉV lines
- Connection and extension of the two line to Kálvin tér, Direct transfer to M3 and M4 metro lines.
- Extension of H7 line in Csepelen until Erdősor utca, construction of P+R parking
- Integration with the national railway network: connection of the Kunszentmiklós commuter railway line to Kálvin tér

PER HOUR
24
TRAIN

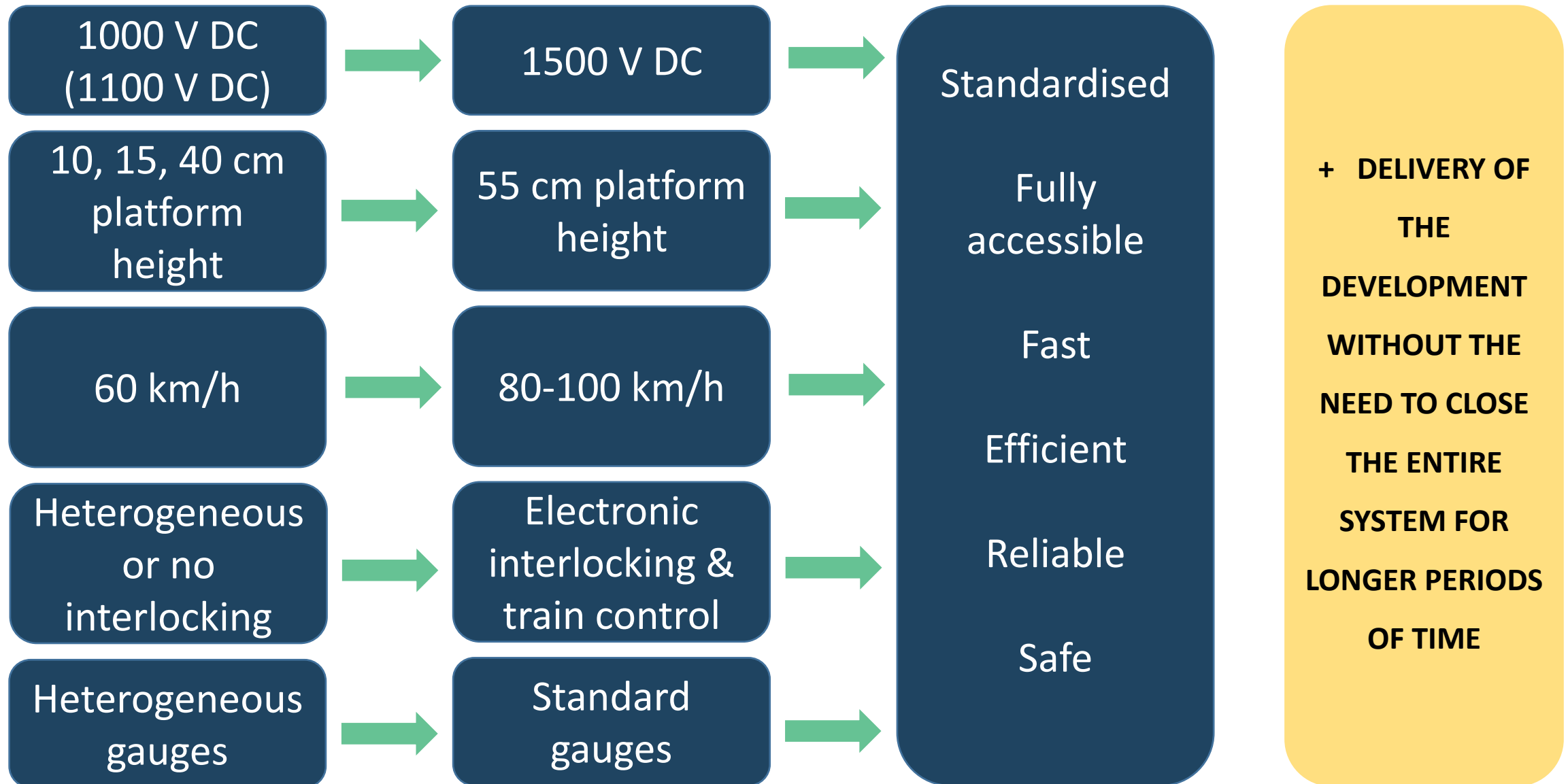


THE FIRST PHASE OF THE DEVELOPMENT: H6/H7 LINES – GENERAL PARAMETERS

- 120 m long accessible platforms with a height of railtop level + 55cm
- Stations with uniform design, comfortable platform equipment, platform covers, real-time passenger information
- Construction of P+R, B+R parking
- Energy supply, track infrastructure reconstruction
- Speed increase to 80 km/h, sometimes 100 km/h
- Optimising station allocation, relocation of platforms
- Renovation and extension of bridge and underpass structures



COMPLETELY NEW ENGINEERING FRAMEWORK





GREAT OPPORTUNITIES

④ 5



+15,7%

④ 6



+218%

④ 7

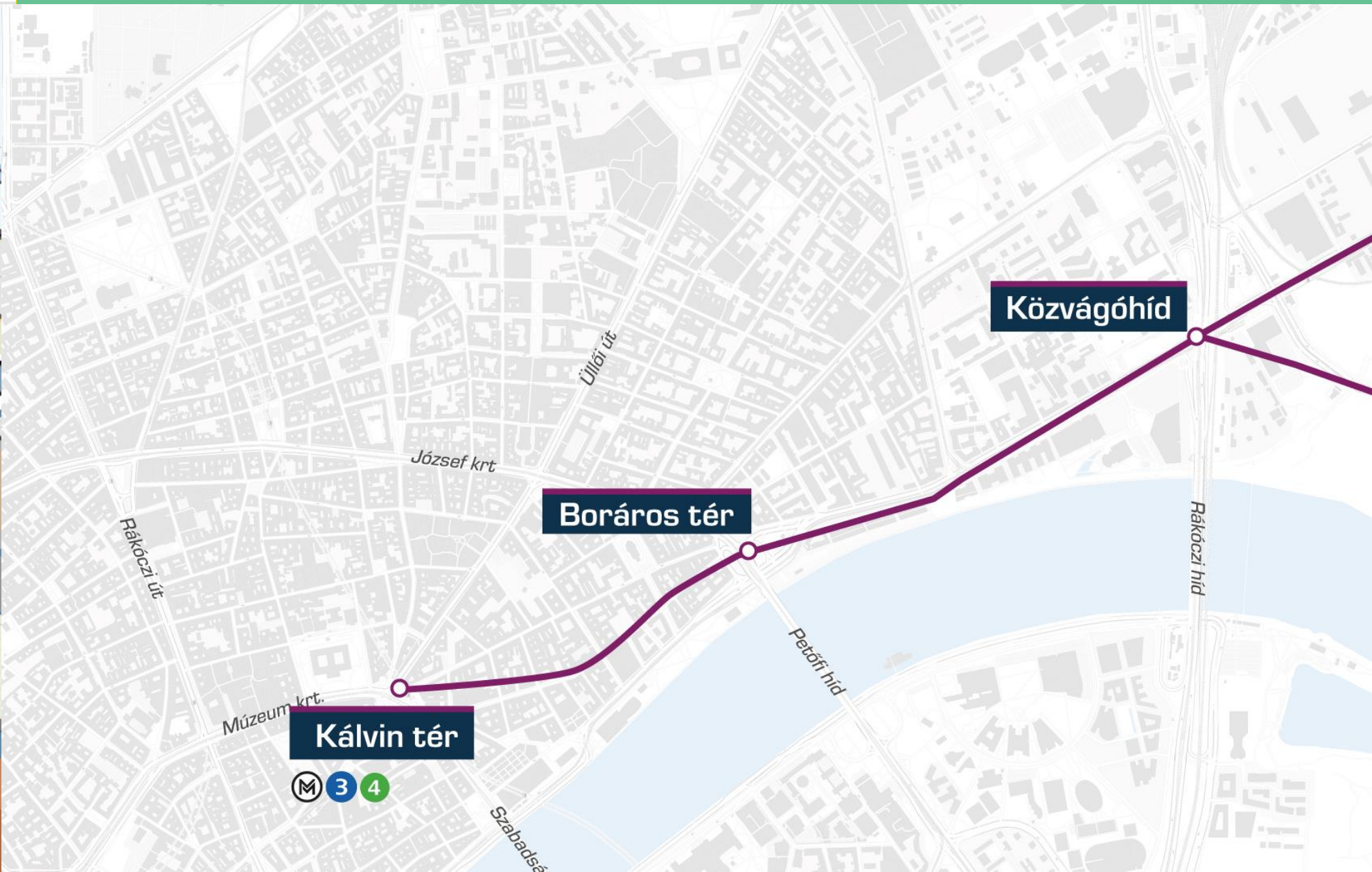


+35,4%

WHAT DO WE EXPECT FROM MODERNISATION OF THE LINES?

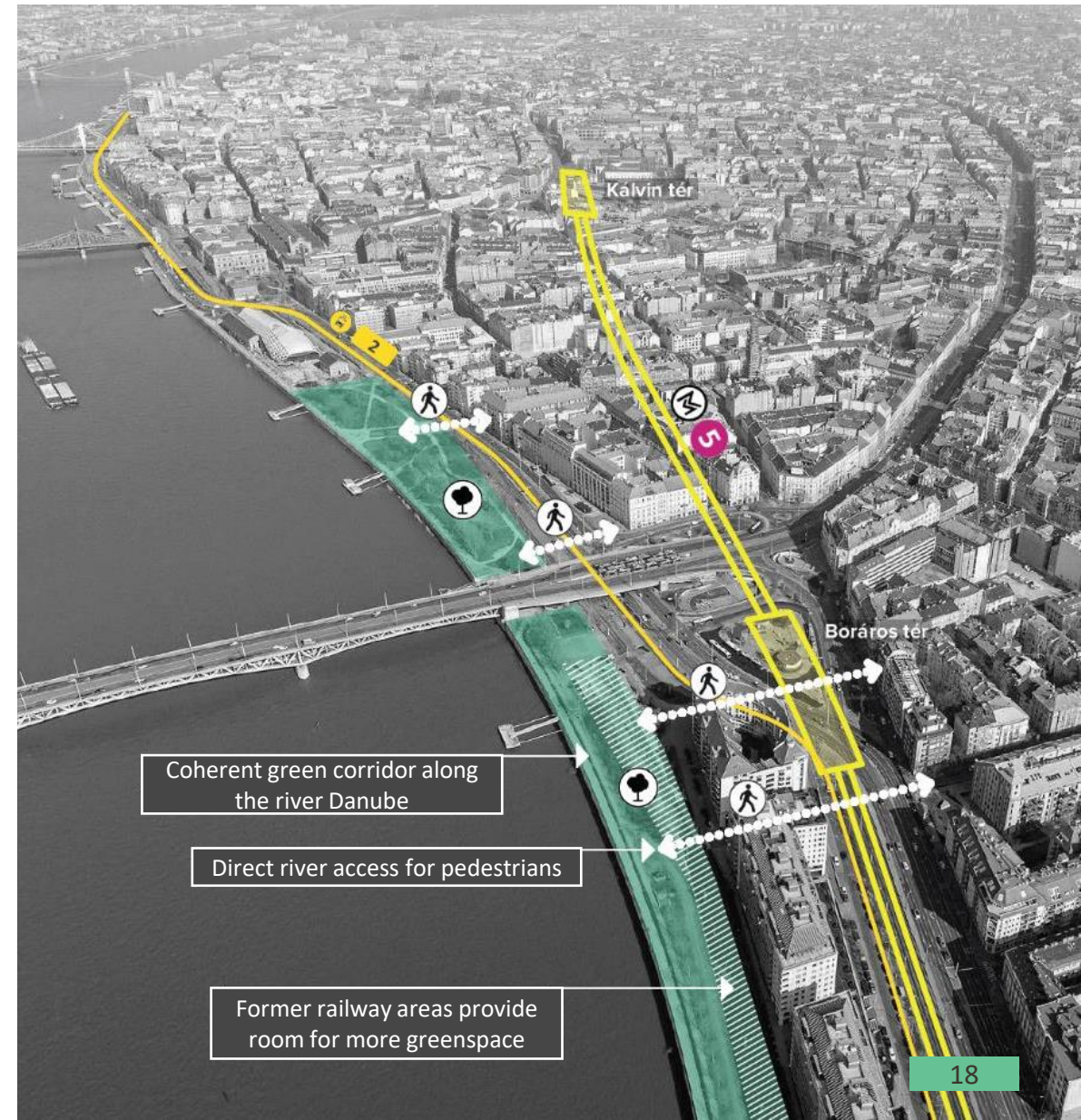


TUNNEL BETWEEN KÖZVÁGÓHÍD AND KÁLVIN TÉR



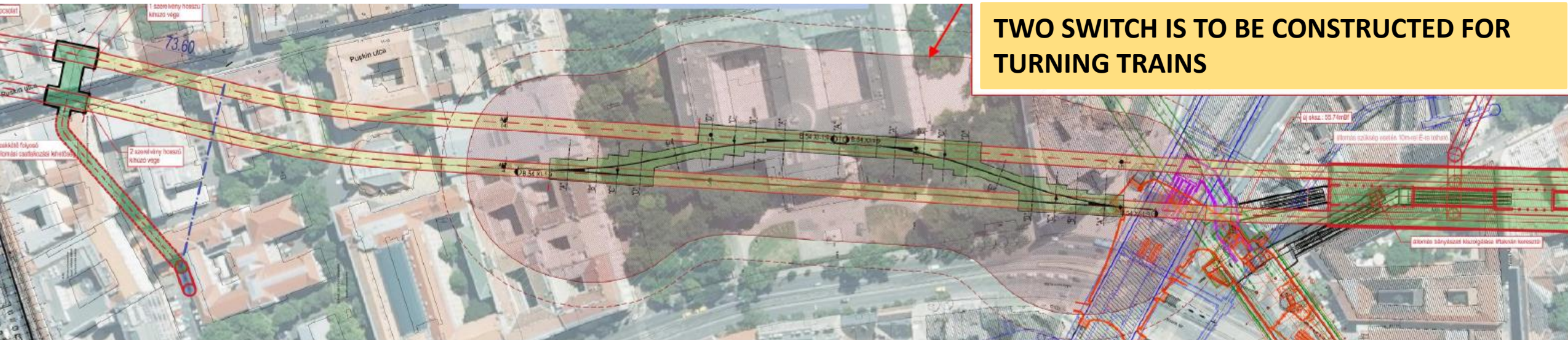
NEW PROMENADE ON THE DANUBE RIVERBANK

- The relocation of HÉV tracks to the tunnel liberates the Danube riverbank .
- The area may be revitalised with new functions, green-zones.
- Comfortable, safe pedestrian and cycle path could be allocated
- With the full reconstruction of Pest „alsó rakpart” in different projects the people of Budapest can regain access to the Danube riverbank.



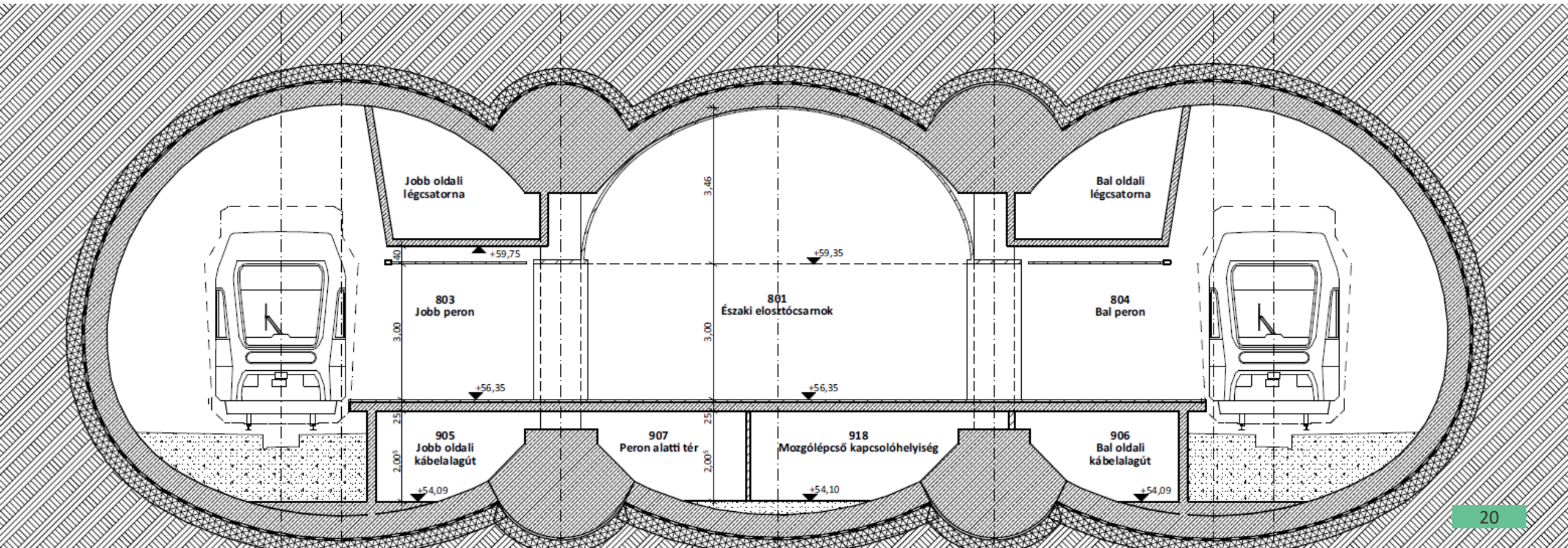
KÁLVIN TÉR DEEP-LEVEL STATION

- Two switch track towards Astoria, with using two simple switch
- Trains run at higher speed to provide greater turning capacity at the sidings
- Storage tracks with capacity up to 4 trains at the same time
- Favourable solution from a mining and construction engineering perspective



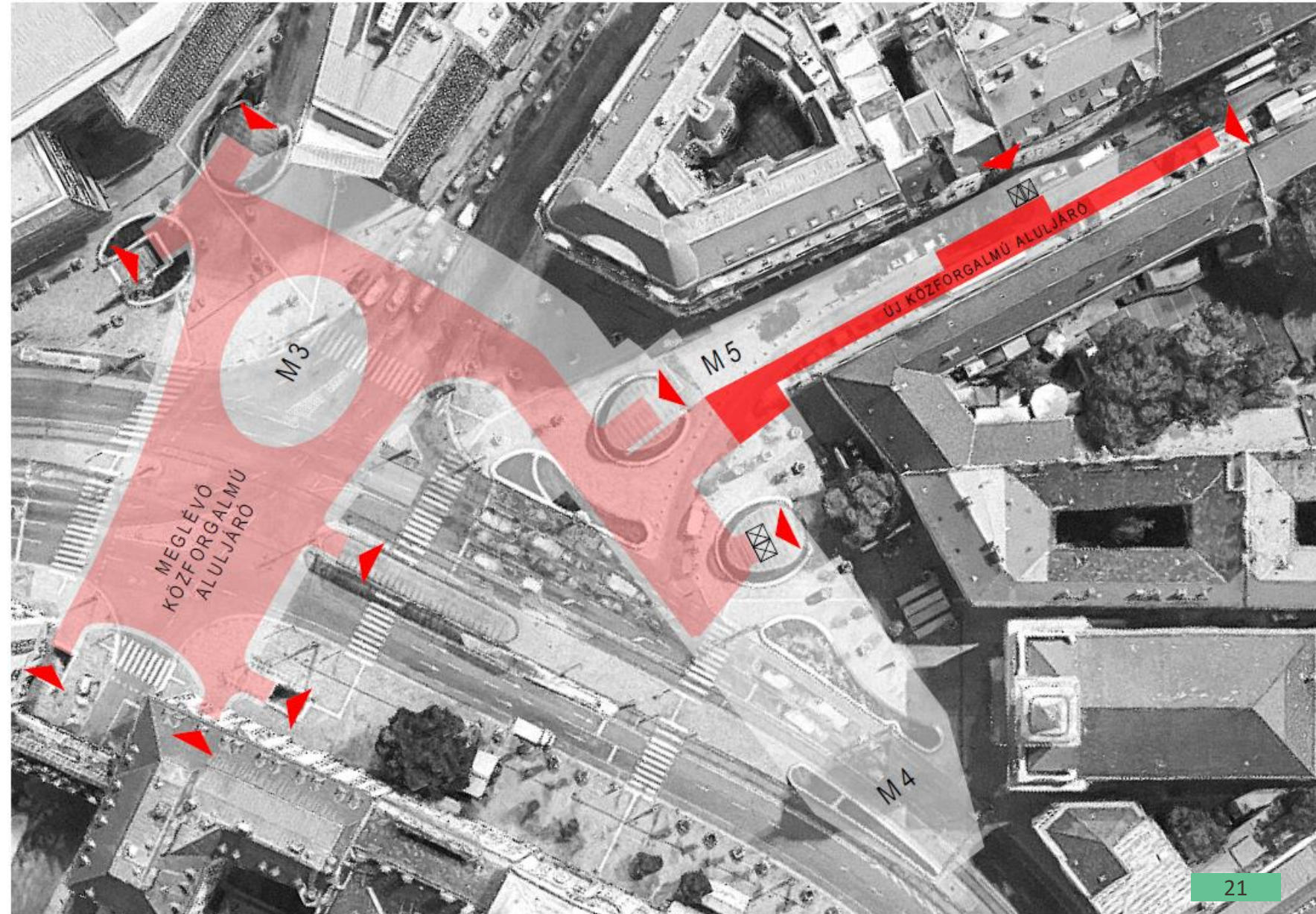
KÁLVIN TÉR DEEP-LEVEL STATION

- Three tube designed pylon station, TBM transferable through the station
- The Deep-level station is be constructed with mining method, up to 300 m² of soil to be mined.
- Deepest station at Kálvin tér, under the M4-M3 metro transfer-corridor

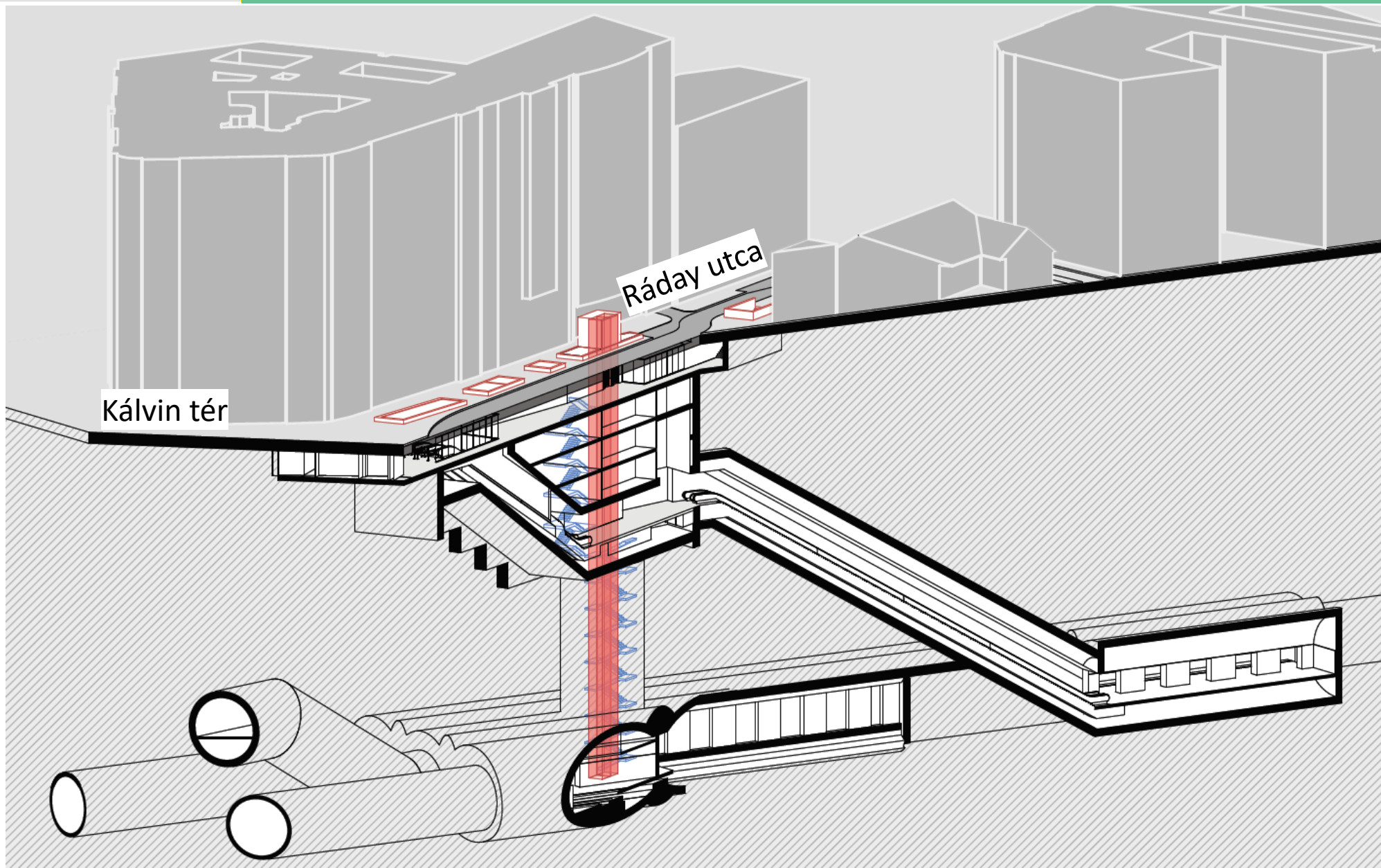


KÁLVIN TÉR DEEP-LEVEL STATION

- Connection to the existing metro system
- Connecting to the existing underpass-system while extending it



KÁLVIN TÉR DEEP-LEVEL STATION



BORÁROS TÉR STATION

- Full surface public space redensing, station exits are accommodated to the new desing
- The surface bus-station to be abolished
- Road-network scaled for traffic levels lower than today
- More direct connection with the line 4-6 trams
- Accessible transfers
- Substantial growth of green spaces in the area



BORÁROS TÉR STATION



The site today, Google



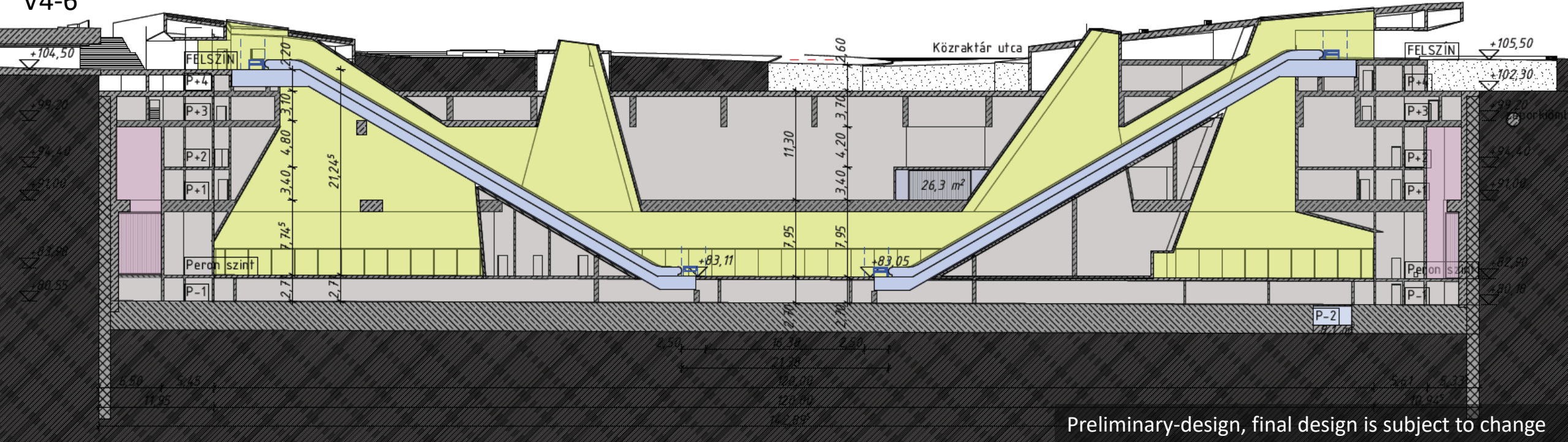
Preliminary-design, final design is subject to change

BORÁROS TÉR STATION

- Island platform in a concrete box-structure built by cut and cover method
- Two exit open towards north and south
- 3 escalator and 2 lifts on each side
- Service areas are located mainly above the tracks

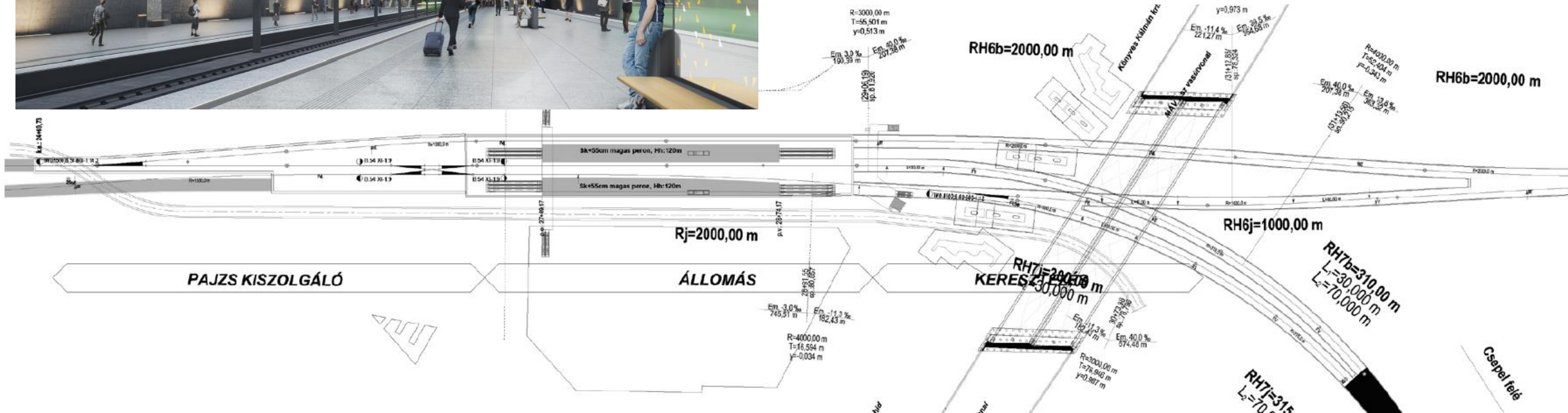
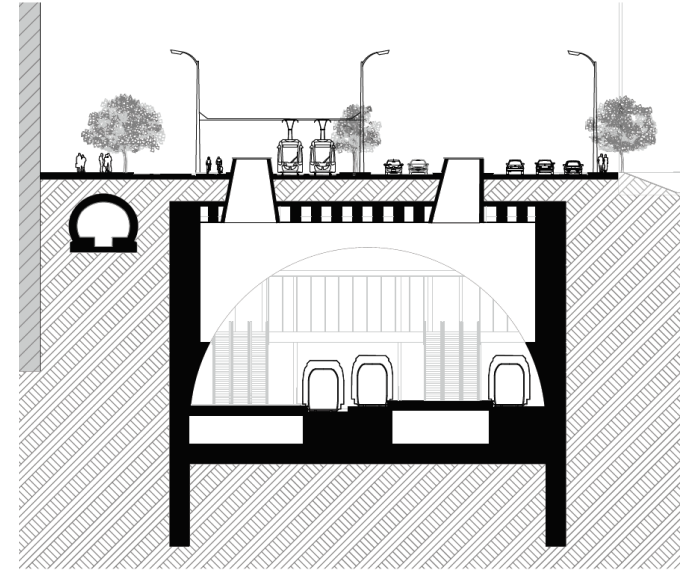
Petőfi híd
V4-6

Soroksári út →



REVITALISATION OF THE KÖZVÁGÓHÍD AREA





REVITALISATION OF THE KÖZVÁGÓHÍD AREA



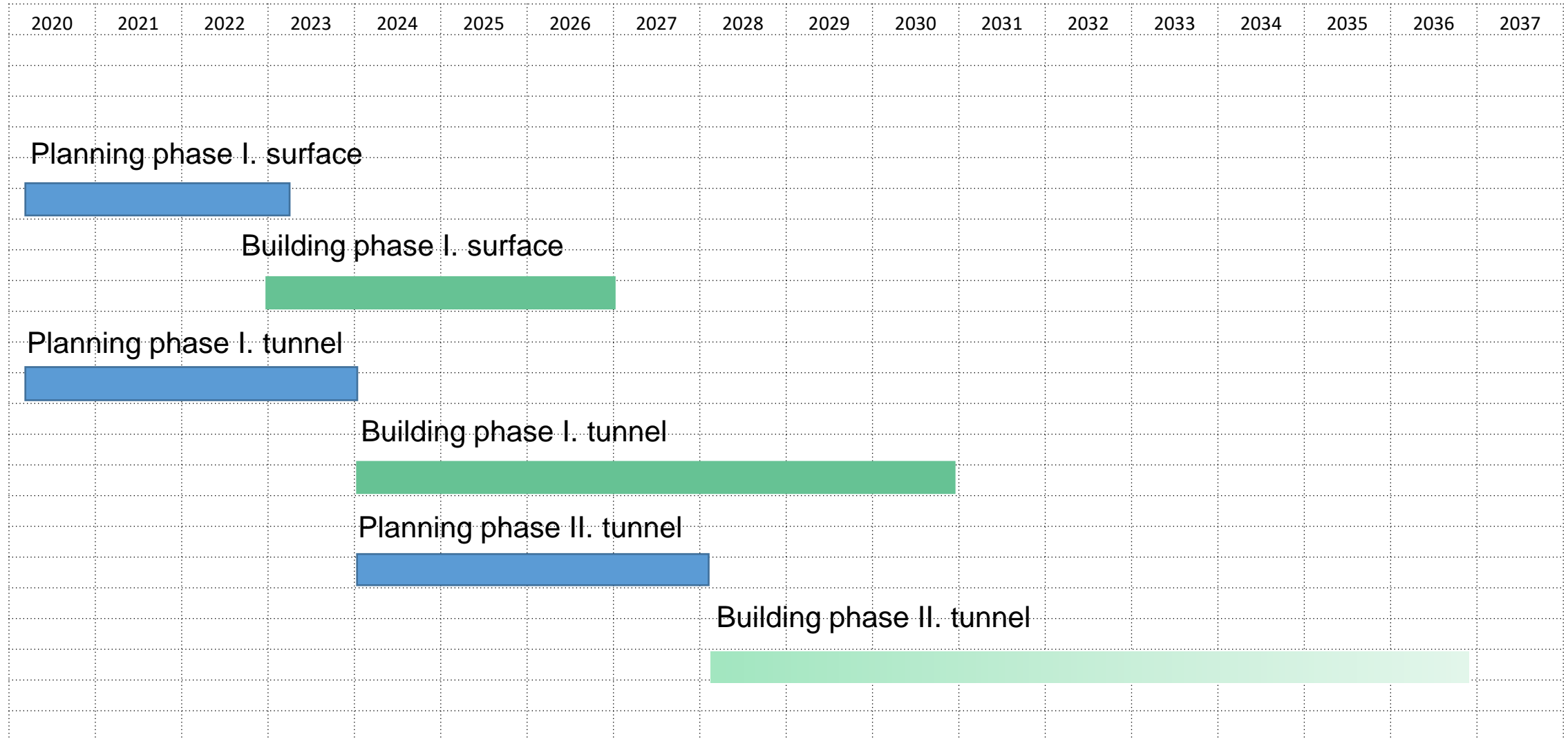
Preliminary visualisation, final design is subject to change

REVITALISATION OF THE KÖZVÁGÓHÍD AREA



Preliminary visualisation, final design is subject to change

SCHEDULE OF THE DEVELOPMENT PROGRAM





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Thank you for your attention!

**Ádám Kangyerka,
HÉV Development Project Director**

