

# Online authorization pilot on Budapest's Airport Express: Reducing Uncovered Debt

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# Budapest is a Central European metropolis, which handles an annual 1.2 bn travels and operates an elaborate network of multimodal lines

## Budapest transportation at glance



~3.3 mn daily trips



Elaborate public transport system:

**4** metro lines  
~**290** bus lines  
~**40** tram lines



MaaS app with ~**1,4 mn** monthly users



Annual revenue of ~**280 mn** EUR



**3 mn people** live in Greater Budapest area



**6 mn** annual visitors

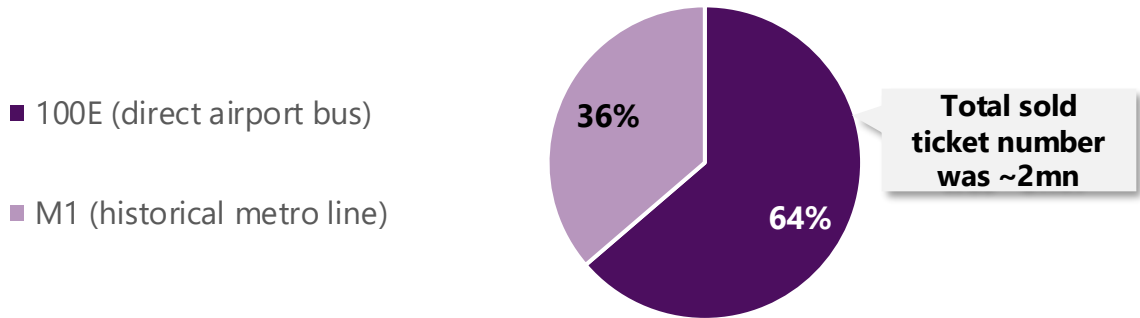


Since 2023, there is an operating pilot service of cEMV on 2 lines, the 100E airport bus and the historical M1 metro line, which already takes ~4% of total BKK revenue

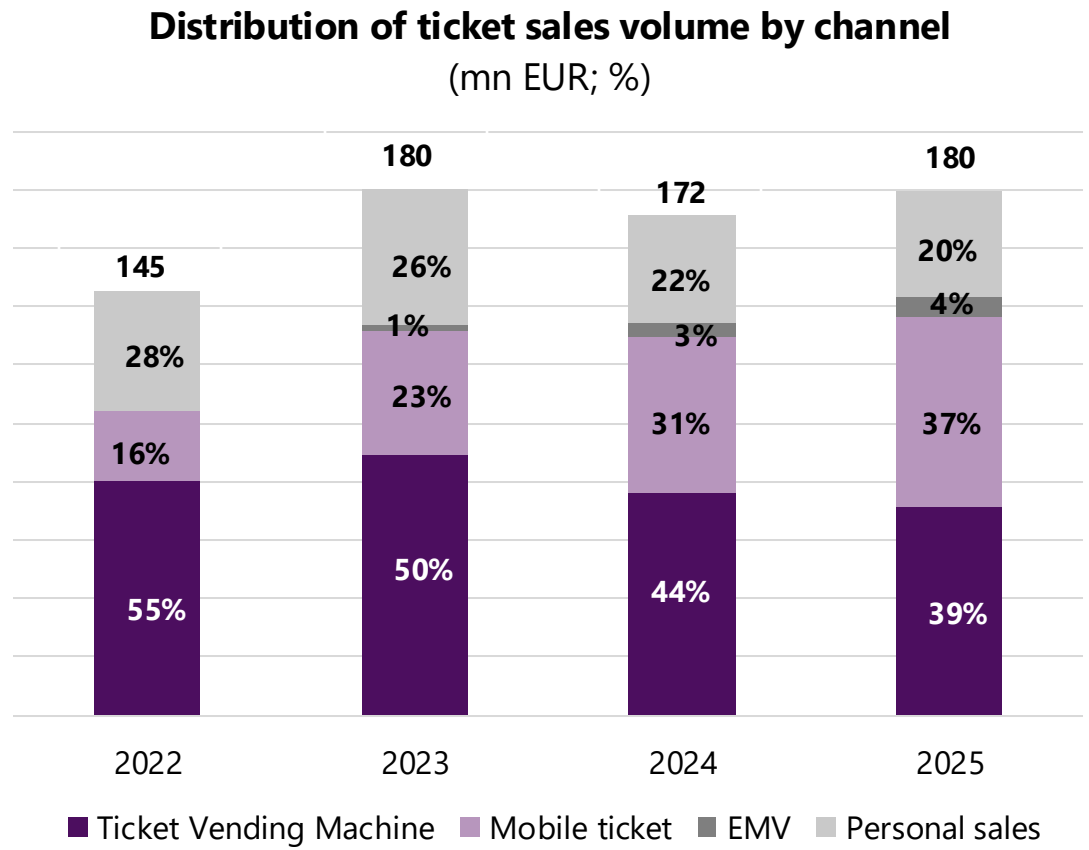
**cEMV usage in Budapest transport (Pilot system)**

- 1 **2023 June:** 100E (direct airport bus)
- 2 **2023 November:** M1 (historical metro line)
- 3 **2026 April:** M2-M4 metro lines (regular Budapest users)

**Distribution of sold tickets within the cEMV Pilot in 2025**

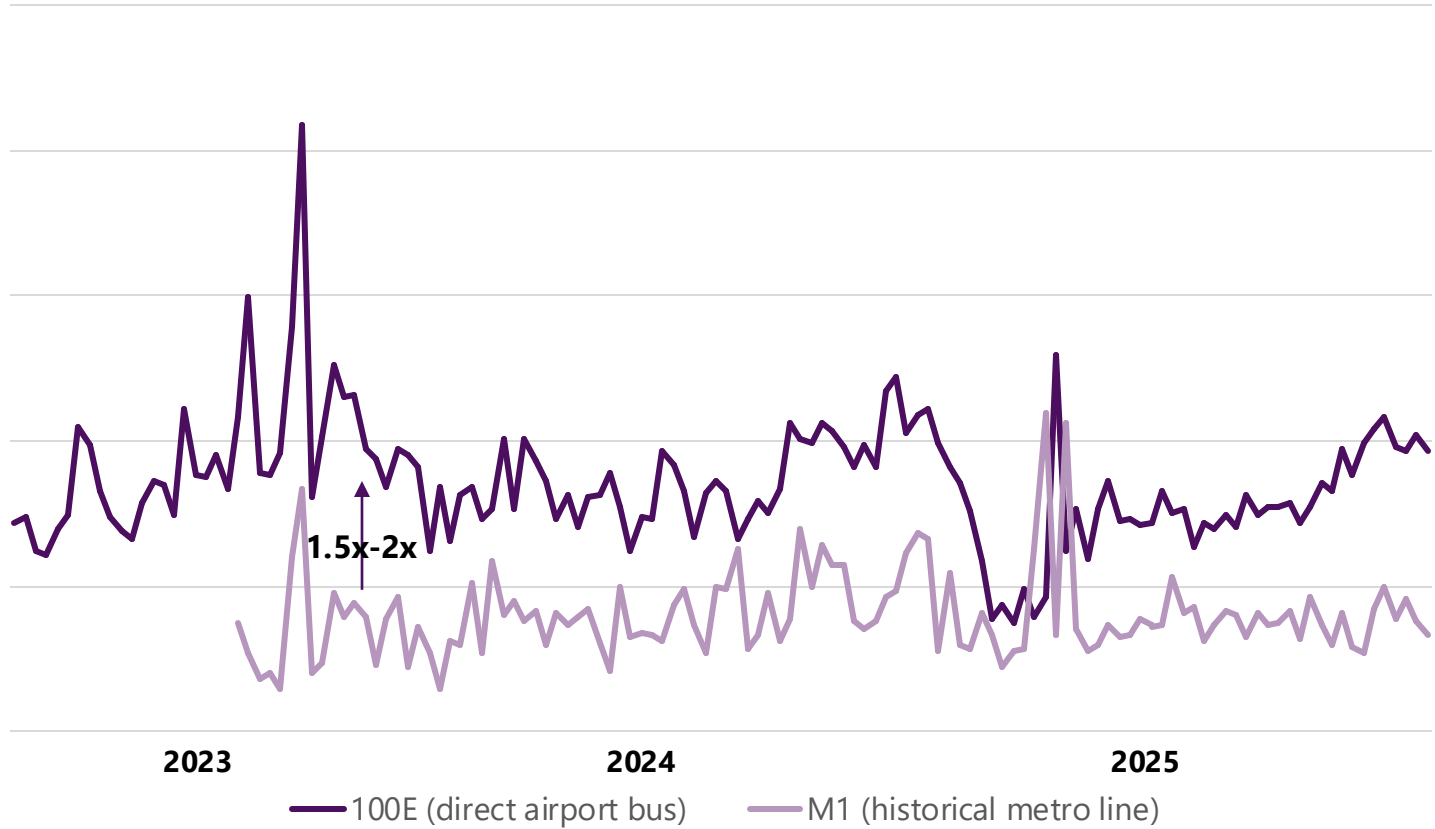


**Performance of major BKK sales channels (2022-2025)**



# There is a significant difference between the 2 lines in terms of unrecovered debt, therefore BKK considers multiple solution options how to mitigate risk

Comparison of unrecovered debt in the Budapest cEMV Pilot (debt between 15 and 90 days)

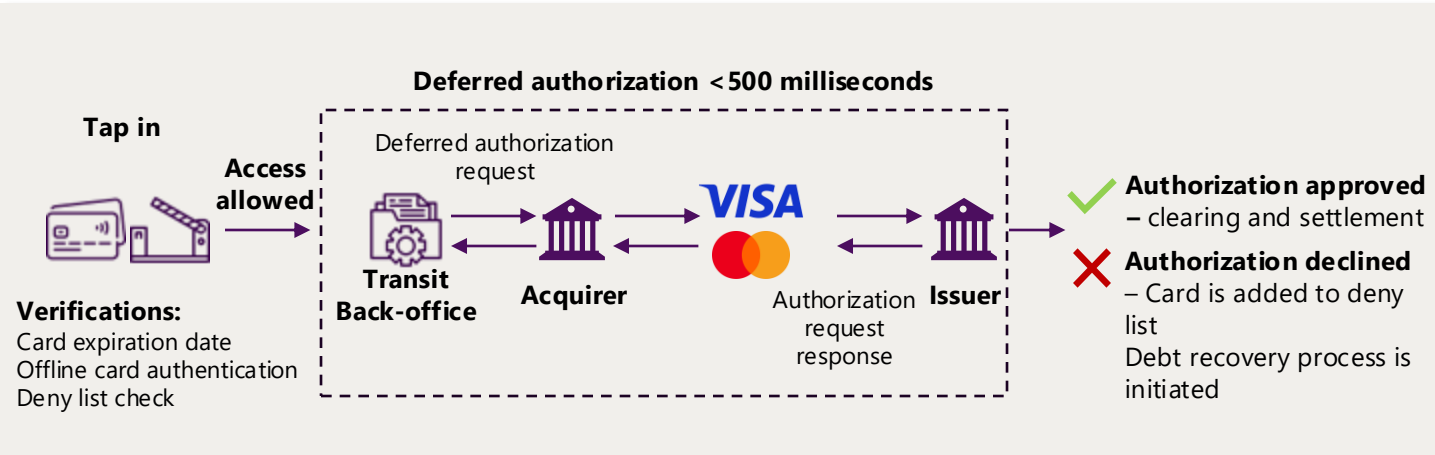


## Details

-  **Higher ticket prices on the 100E direct airport bus (5.2 EUR vs 1.1 EUR)**
-  Both lines are **mostly used by tourists**
-  **First-ride risk on the 100E bus** (first meeting point with the public transport system of the city, maybe the bank card is not yet uploaded with the required sum)
-  **100E is also the last meeting point with the Budapest public transport system** before departure (virtual cards can be closed, running out of currency, etc.)
-  **100E bus has significantly less stops and entering the vehicle requires more time compared to M1** (for instance due to baggage)

# Online authorization can mean a viable solution for decreasing risk of uncovered debt, building upon existing infrastructure, no need for costly development & new validators

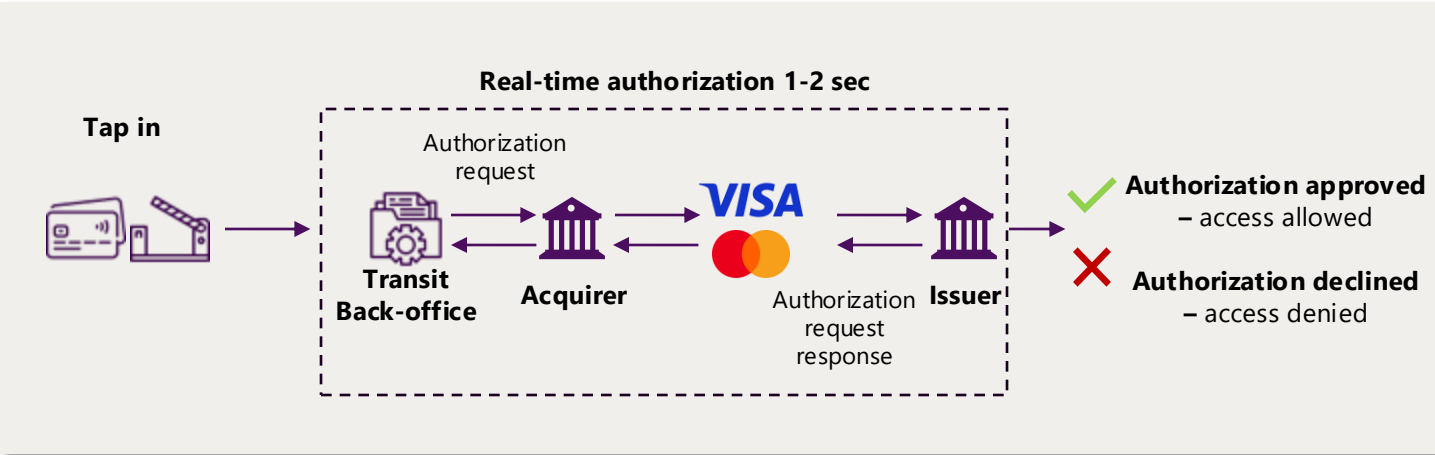
## 1 Deferred authorization with offline data authentication at readers



## Major characteristics

- **Transaction type:** Transit-specific online process
- **Response time:** Short, need for <math>< 500</math> milliseconds waiting time to allow for high throughput
- **Major advantages:** Overcomes potential poor connection and slow communication
- **Use case:** Busy urban environment with high throughput requirements; Environment with lower network connectivity

## 2 Real-time authorizations



- **Transaction type:** Classic retail process
- **Response time:** 1-2 seconds
- **Major advantages:** Authorization decision made at the gate:
  - No deny list or debt recovery needed
  - No negative cardholder experience for being on the deny list
- **Use case:** Appropriate for long distance rails with high ticket values and no fast throughput requirements

# The online authorization in a transit environment only works for a specific set of lines, where speed is not a key factor and there is a huge exposure to unsuccessful transactions. Wide usage within the BKK network is unlikely in the near future

## Factors / Requirements for effective usage of online auth



**No serious time pressure** (huge number of passengers, gates)



**Reliable, fast internet connection**



**The price of the ticket needs to be known in advance (Fare price)**



**Significant exposure to uncovered debt** (high decline rates & relatively high ticket prices)

## Potential lines where online auth could be used



**100E direct airport bus**  
In most cases there is real-time assistance, people enter the bus with baggage



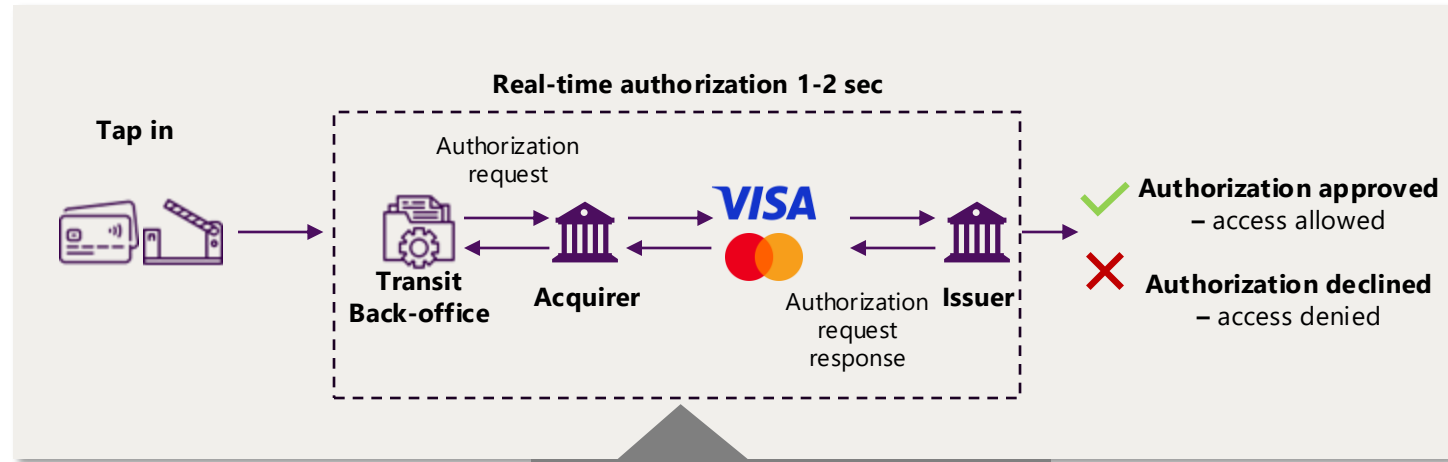
**Castle funicular (,Sikló')**  
Limited number of stops, no time pressure



**Long-term railways**  
No serious time pressure, no frequent stops, ticket value is higher

# We will have a fallback option & also thinking on other adaptive solutions in mid term

## Fallback-option



If any problem arises at this part of the process, there is a switch performed and deferred authorization takes place

## Other opportunities for an adaptive/hybrid modell



Switch depending on the price



Switch depending on peak hours / regular hours



Trust list based on previous customer activity

# There are multiple cases, where online auth cannot be applied, however BKK tries to limit uncovered debt in those cases too; therefore we try to motivate the relevant players by applying a risk-sharing model

## Risk-sharing model logic



**Motivation of all parties is a key**



**We will use a risk sharing model:** BKK / TP provider / PAD provider / ACQ provider will **share the uncovered debt**

## Tools to be used by relevant parties (examples)



**BKK**  
*Pricing policy, facilitating developments, data analysis*

**Transit processor service provider**  
*Fine-tuning processes, using fraud detecting tools, more sophisticated online / offline switch<sup>1</sup>*

**Payment acceptance device provider**  
*White list management, control of card details locally, fast/reliable communication with TP*

**Acquirer**  
*Analyzing, providing detailed informations*

**Schemes**  
*Managing / facilitating issuing banks where high level of uncovered debt is identified*

<sup>1</sup>For instance if users transacted multiple times successfully, they should not be subject online authorization all the time