Transport Payment Processing Solution

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Introduction

Transit is one of the few areas in which payment systems and payment operators have not yet implemented large-scale solutions supporting two-way communication with consumers.

International payment scheme (IPS) specifications supporting mechanisms to pay for transit services based on scenarios of deferred authorization and authorization for aggregated transactions (Account based Transit Payments) are aimed at providing fast service at transit system turnstiles and readers and at decreasing the portion of the IPS fee in the cost of travel. In and of themselves, the aforementioned technologies are not tools for influencing passenger behaviour and do not provide the ability to offer passengers additional payment services and products.

The solution described in this document has been developed together by OpenWay and Visa. This solution is intended to promote contactless devices as a means of payment on public transit and to organise two-way communication between passengers and acquirers or transit system operators.[1]

In addition to standard payment mechanisms based on deferred authorization and authorization for aggregated transactions, the OpenWay and Visa joint solution makes it possible to reduce the risk of fare evasion by using configurable rules to select a payment scenario (online, deferred authorisation, or payment aggregation) based on data about the payment method (form factor, card number range, etc.) and the history of its use in the transit system.

The solution's functionality for issuing digital (cloud) transit wallets (DTW) linked to any issuer's arbitrary contactless payment instruments addresses several key tasks:

- The DTW supports issuing of prepaid transit products, which not only reduces the risk of fare evasion (as do configurable rules for choosing a payment scenario), but makes it possible to attract additional funds.
- DTW user interfaces in the form of targeted mobile applications and Internet offices for DTW owners make it possible to organize two-way communication with transit system passengers and cross-sell products and services.

[1] A passenger using cloud transit products is registered in the TPPS system and can be sent advertising messages on his/her mobile phone and e-mail. When topping up digital transit wallets through remote service channels (mobile application, Internet office, self-service-kiosk, ATM), the passenger will also see acquirer and/or transit organisation offers in the interfaces of these channels.

Chapter 1. Key concepts

Transport Payment Processing Solution (TPPS) – transit solution with issuing of digital wallets based on reloadable Visa prepaid products.

Payment instrument (PI) – contactless medium (device) with the payment application used to pay for transit services.

Form factor – technical implementation of the PI (payment card, mobile phone, ring, bracelet, watch, NFC key fob etc.).

Personal Transit Account (PTA) – functionality that implements specific payment scenarios and manages risks for each transportation type (or group of transportation types) with independent operative management (recording/reporting). A personal transit account can be opened in real time the first time the PI is presented in the transit system's terminal network. The payment instrument is the personal transit account's identifier.

Digital Transit Wallet (DTW) – method of organising payment, based on digital (virtual) prepaid products that are specific for certain types of transportation or general, like a digital prepaid Visa card, for example.

Open transit system – a transit system in which there is no control at the point of entry.

Closed transit system – a transit system in which the decision to admit a passenger is made at the point of entry. Closed systems usually have turnstiles.

Vehicle on-board system – system located on the vehicle; responsible for:

- Managing card readers on the vehicle.
- Interaction with the TPPS.
- Registering data presented for payment by the PI.
- Registering the results of authorization requests for the PI.
- Access to payment data from the controller terminal.

Capping – type of discount offered after a pre-determined limit is reached (for example, zone, fare, distance). When a cap is reached, payment is no longer charged for further travel until the end of a certain period, usually 24 hours or a week.

CMS – Card Management System, system for processing transactions with payment cards.

Chapter 2. Overview

The TPPS makes it possible to do the following:

1. Accept different types of contactless payment instruments (1) on certain types of transportation, and in multimodal transit systems, when several types of public transportation are grouped into one or several groups and are under the operative management of one or several transit service operators.
2. Configure payment scenarios (risk management) using individual transit account functionality:
   - Payment in real time for On-us and Off-us transactions; for example, for specific issuers' payment instruments (for PIs issued by the transit system's payment acquirer itself, by its operator, etc.), and/or with a corresponding history of use and/or certain types of products (prepaid products, products for which Offline Data Authentication is not supported, etc.).
   - Deferred authorization for single fare payment transactions.
   - Aggregated fare payment transactions (limiters: maximum aggregation amount and/or period) according to set risk rules for payment instrument types or specific PI according to the history of use in the transit system.
   - Resending requests for declined authorization requests.
3. Issue digital transit wallets (DTW):
   - Containing digital (virtual) prepaid products, those common to a group of transportation types and special ones for specific types of transportation or transaction.
   - Allowing real-time payments for DTW products (accounts) in the transit system.
   - Using any payment instruments accepted for payment as a DTW identifier at turnstiles, card readers and regular POS terminals connected to the TPPS.
   - Providing owners access to DTW accounts/products through different service channels (self-service terminals, Web pages, mobile applications), including the following functionality:
     - Opening a wallet.
     - Registering payment instruments issued by different issuers as a wallet identifier and/or source for topping up DTW accounts/products (2);
     - Getting various prepaid transit products: single fare, fare packages, passes for certain time period, etc.
     - Payments and p2p transfers using a payment card linked to the wallet, or a Visa digital prepaid card issued in the TPPS.
4. Use mVisa technology (in On-us and Off-us modes) to pay fare (for example in open transit systems) and/or top up digital transit wallet

accounts/products. To do so, implementation of the TPPS includes the following:

- Development of targeted "passenger" mobile applications using mVisa technology or support of mVisa functionality in DTW mobile applications, the acquirer's or transit system operator's own mobile applications by providing interfaces and the corresponding software development tools (Software Development Kit – SDK).
- Support of mVisa technology in DTW ("issuing" part of TPPS) using Visa digital prepaid cards as the source of funds.
- Support of mVisa technology in an acquirer's CMS (in issuing and acquiring), in this system's interfaces to Visa, to the TPPS, in the acquirer's cardholder and merchant customer support workplaces.

5. Top-up (automatic top-up) of existing Mifare-based transit wallets using funds from IPS cards and local/domestic cards issued by the acquirer (see the section "Topping up Mifare-based local transit wallets using IPS cards and local cards").
6. A digital transit wallet may be the basis for a "City/country guest card" product – a single method of payment for goods and services in a foreign city/country. DTW payment is made using its mobile application or plastic prepaid card linked to this wallet as an identifier. The product may be attractive as it reduces the risk a cardholder's real payment instruments will be compromised when the cardholder is abroad) and because of loyalty programs stimulating its use.

   A city/country guest wallet can be topped up by preliminary authorization of an IPS card linked to the wallet as a source of funds for a specific period. Unused funds will be returned to the IPS card automatically after the "Guest card" expires or at the cardholder's initiative.

Chapter 3. How the solution works

Specifics of payment in closed transit systems

Payment using contactless payment methods in closed transit systems is made according to IPS transit specifications (deferred authorisation, authorisation for aggregated transactions) at the point of entry for flat fares and at the point of exit for fares calculated according to the distance and/or time the passenger was in the transit system. In addition to deferred authorisation for single and aggregated transactions, depending on the type of payment instrument and the history of its use in the transit system, the following payment modes can be implemented:

- Regular purchase (entry/exit is permitted when the TPPS gets a positive authorization request response from the issuer).
- On-us payment in real time using contactless payment instruments issued by the acquirer.
- On-us payment in real time using prepaid digital (cloud) transit products issued by the acquirer and linked to any issuer's contactless payment instruments; the PI is the means to access the digital transit product.

Specifics of payment in open transit systems

Payment in open transit systems is made with contactless instruments during travel:

- Using mVisa technology by reading a QR code containing the vehicle's unique identifier and the cost of a single fare.
- By presenting a contactless PI at the vehicle's payment terminal.

A feature of payment acceptance in open transit systems (usually ground transportation) is the absence of a guaranteed link for a vehicle's on-board terminals with the host part of the TPPS. Therefore the TPPS based solution for ground transportation assumes there is an on-board controller responsible for:

- Management of on-board terminals.
- Basic risk management functionality – checking whether a PI is in a stop list.
- Interaction with the host part of the TPPS through the mobile Internet or wire network used to provide electricity to electric transportation vehicles (trolleybuses and trams, for example) to send authorization requests and get responses, update the PI stop list.
- Support of the interface to the controller terminal for providing data about the status of a payment with a PI (optional). The TPPS can also deliver payment status data directly to the controller's terminal or to the passenger mobile application issued for the DTW.

Payment scenarios are implemented by the TPPS based on risk rules used by the acquirer and/or transit operator.

Examples of fare payment scenarios in closed transit systems

The solution allows flexible configuration of various payment scenarios depending on BIN, product types, card range numbers and the history of a specific payment instrument's use in the transit system. The scenarios shown below are simplified examples for the purpose of demonstration.

Payment with Mifare offline transit wallets

It is assumed that when the TPPS is implemented, the existing mechanism for payment with Mifare offline transit wallets at transit system terminals will remain.

The TPPS can support one or several scenarios for cashless top-up of Mifare offline wallets using funds from IPS cards and local/domestic cards (see the section "Topping up Mifare-based local transit wallets using IPS cards and local cards").

Payment with payment instruments for flat fare transit solutions (turnstiles only at point of entry)

Payment with IPS payment instruments for flat fare transit solutions is made as follows:

- In real time, the TPPS verifies the payment instrument's data sent by the transit system payment terminal: period of validity and whether the PI is in stop lists (common and custom, set up by the acquirer and/or transit system operator).
- If there are no reasons to decline the PI, the TPPS checks for an active digital transit wallet linked to the PI being presented.
- If an active DTW is found, the TPPS performs authorization for the corresponding DTW transit account/product and if the result is positive, returns a positive response to the transit system terminal (on-board controller for a ground transportation vehicle).
- If the result is negative, the TPPS changes the DTW's status and sends the corresponding response to the transit system terminal. The message "Top up the transit account" is shown on the terminal.

Optional:

- If the DTW identifier is a PI issued by the acquirer, direct authorization for this PI's account is possible.
- For a list of PIs set by an acquirer and/or transit system operator and according to the history of a specific PI's use in the transit system, it is possible to implement a standard scenario in which a new transit account (PTA) opened and deferred authorization.
- If an active DTW is not found, and the PI was issued by the acquirer (On-us), the TPPS performs authorization for the PI account in real time. The turnstile opens based on a positive response from the TPPS to the transit system terminal. If there are insufficient funds to pay the fare in the PI

account, the acquirer may allow overdraft (for a number of products/customers) or not allow the service (3).

- If an active DTW is not found, and the PI was issued by another bank (Off-us), the TPPS checks for records of this PI's previous use:
  - If this is the first time the payment instrument is being presented – first payment – depending on the product type, payment is made with deferred authorization or online authorization.
    - If the online authorization response is negative, the customer is informed about unsuccessful payment and rejected access to the transit system.
    - If the deferred authorization response is unsuccessful, repeat authorization attempts are made according to the transit system's regulations. If the result of the regulatory procedure is negative, the PI is put in the corresponding stop list (4).
  - If this payment instrument has been presented before, payment is made in aggregated authorization mode according to the transit system's regulations.

Payment with payment instruments for calculated fare transit solutions

TPPS actions when a passenger enters the transit system

When a passenger enters the transit system:

- In real time, the TPPS verifies the PI data sent by the transit system's terminal: validity period and whether the PI is in stop lists.
- If there are no reasons to reject the PI, the TPPS checks for an active digital transit wallet (DTW) linked to the PI and makes a pre-authorization request to the appropriate DTW account/product for the amount set by the transit operator. If the response is positive, the passenger's entry to the transit system is registered in the transit account for the place and time the service was provided and a positive response is returned to the transit system terminal.
- If an active DTW is not found and the PI was issued by the acquirer (On-us), the TPPS makes a pre-authorization request to the PI account for the amount set by the transit organization and returns a positive response to the transit system terminal. If funds in the PI account are insufficient for partial prepayment of the fare, the TPPS does not allow the service. For a number of products, with consideration of a PI's history, the bank can allow overdraft to pay a fare.
- If an active DTW was not found and the PI was issued by another bank (Off-us), the TPPS checks for previous travel using this PI:
  - If the payment instrument is being presented for the first time, the TPPS registers the owner's first entry into the transit system (by place and time) and returns a positive response to the transit system terminal.
  - If the payment instrument has been used before, the TPPS registers the entry into the transit system (by place and time) and returns a positive response to the transit system terminal.

TPPS actions when a passenger exits the transit system

When a passenger exists the transit system:

- The passenger shows the TPPS the PI used to enter the transit system.
- The TPPS sends data about the passenger's entry and exit to the module that calculates the fare and gets this fare from the module.
- If the fare is being paid from the corresponding DTW account or On-us from the account of a PI issued by the acquirer or transit system operator, the TPPS cancels the pre-authorization made on entry and authorizes the actual amount of the fare in real time.
- If payment is being made by another issuer's PI and the PI is not registered as a DTW identifier, the TPPS:
  - Makes the first payment in deferred authorization mode.
  - Makes subsequent payments in aggregated transaction mode.
  - If a response is negative, makes repeat authorization attempts according to the transit system's regulations. If the response is negative after the regulation procedure, the PI is put into the corresponding stop list.

Chapter 4. Topping up a DTW

The section shows examples of a digital transit wallet's use (see Table 1).

Table 1. Examples of scenarios for opening and topping up a DTW

Customer group	**DTW identifier and product description**	**Sales channels**	**Channels for topping up and managing accounts**
Customers who do not have payment instruments with a contactless interface	**Reloadable Visa Prepaid Contactless card**. It is assumed that a DTW is opened when a card is issued and initially contains two accounts: • Account in the domestic currency – for crediting funds and payment in the domestic currency. • Account used to pay for transit services. *Limitations:* used to pay for transit services, in retail has limits on the balance amount for prepaid cards. *Development:* • After the customer is registered on the site, he/she is offered the ability to link cards for manual and automatic P2P top up and payments and P2P transfers in a personal office. • If local legislation permits, anonymous plastic "Visa Prepaid Contactless" cards are issued.	Transit operator's ticket offices and vending machines. Acquirer bank branches, etc.	**Top-up**: Ticket offices and self-service kiosks of the transit operator and acquirer. Acquirer ATMs with "Cash In" functionality. P2P transfers to a "Visa Prepaid Contactless" account – if these cards are issued for an international BIN. Personal office on a website and mobile application for smartphones (option for this customer group). **Registration in a personal office**: the customer goes to the site shown on the card, enters a mobile phone number, e-mail address, other data depending on the project's requirements, and gets a wallet identifier. Subsequently, the identifier and SMS one-time password is used to log into the personal office. **At a self-service kiosk** the registration procedure is the same as in the personal office. **Personal office** accessed through the Internet, mobile application, self-service kiosk. Manual and automatic **P2P top-up** on different channels.

Customers who have mobile phones with NFC support	**Token (VDEP)** Issued for "Digital Visa Prepaid", which is automatically issued by the TPPS when the customer requests registration of the mobile application. A DTW is opened when the mobile application is registered and initially contains two accounts: • Account in the domestic currency – for crediting funds and payment in the domestic currency. • Account used for transportation. *Limitations*: transportation, in retail – limits for prepaid cards.	**Android Market** Internet link to download the mobile application can be delivered through a standard QR code (poster on transportation).	**Registration**: the customer personalizes the mobile application and gets instructions in it for accessing the personal office through the Internet. The mobile application and personal office make it possible to link cards for payments and arbitrary P2P transfers. **Personal office** with access through the Internet, mobile application, self-service kiosk. **P2P top-up** manually and automatically, on any channels available to the customer, transfers are made to his/her "Visa Prepaid" card number.
Customers who have contactless IPS payment instruments	Existing payment instrument in the form of a contactless plastic card (PAN), card that is tokenised according to HCE (APAN) and VDEP/MDES (Token) technology.	**Android Market, iOS** transit mobile applications without support of NFC **Web portal:** the address is specified in marketing material, including as a standard QR code on a poster, **self-service kiosks** of the transit organisation's and acquirer's contactless interface.	**Registration**: the client goes to the site at the address specified, enters a mobile phone number, e-mail address, other data depending on the project's requirements, and gets a wallet identifier. The identifier and an OTP can then be used to log into the personal office. **At a self-service kiosk** the registration procedure is the same as on the site. **Mobile application** is personalized after downloading. The mobile application and personal office make it possible to link cards for payments and arbitrary P2P transfers. **Top-up channels**: P2P manually or automatically in the personal office and in the mobile application on any channels available to the client, transfers are made to his/her "Visa Prepaid" card number.

Chapter 5. Solution architecture

The Transport Payment Processing Solution includes acquiring and issuing parts (see Fig. 1).

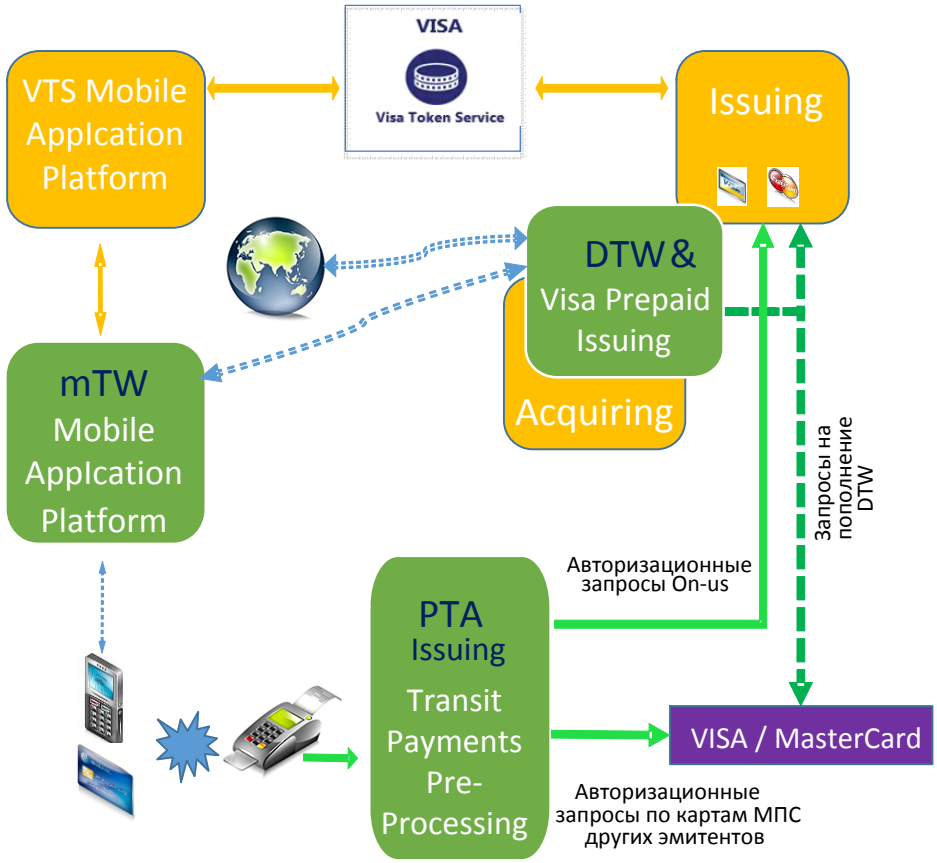

Fig. 1. Transport Payment Processing Solution architecture

Acquiring

The solution's acquiring part includes (see Fig. 1):

- General "Acquiring" block; for this solution, enables functionality for DTW top-up from the cards of other issuers.
- "Transit Payment Pre-processing Host" – new special module supporting TPPS operation.

The Transit Payment Pre-processing Host is responsible for the following:

1. Managing payment acceptance terminals at fare payment devices and transport commercial infrastructure.
2. Interaction with ground transportation's on-board system services (not included in the solution described).
3. Processing fare payment transactions at fare payment devices in flat fare systems with support of online payment, deferred authorization for single and aggregated authorization requests.

4. Processing fare payment transactions in systems with calculated fares (depending on distance, time, etc.) in deferred authorization mode for single and aggregated authorization requests.
5. Support of fare schemes based on the functionality of the personal transport account (PTA) "opened" for each payment instrument presented in the transit system ("account based" payment scheme, "PTA Issuing" module, see Fig. 1) (5).
6. Routing authorization requests in the solution architecture shown. In the example (see Fig. 1) requests for "off-us" cards are routed directly to the IPS, while requests for payment instruments issued by the acquirer are sent through an H2H interface to its issuing system.

   In alternative architecture, all requests may be sent to the acquirer's front-end system, which will be responsible for routing them to the IPS.

Issuing

The issuing part of the solution includes (see Fig. 1):

- "Issuing" module for issuing IPS products.
- "VTS Mobile Application Platform" ("MAP") – module for issuing and managing mobile applications for an acquirer's tokenized cards.
- "mTW Mobile Application Platform" – module for issuing and managing mobile transit wallet applications (mTW) with support of payment using tokenized cards through a mobile phone's NFC module.
- Mobile transit wallet application with support of payment using tokenized cards through a mobile phone's NFC module.
- "DTW & Prepaid Issuing" – module for issuing prepaid products and digital transit wallets with Web and Mobile interfaces.

Issuing module and "VTS Mobile Application Platform"

The modules implement the corresponding standard issuing functionality.

Mobile transit wallet application (mTW)

Tasks resolved by the mobile transit wallet application with support of payment using tokenized cards through a mobile phone's NFC module:

- Managing the DTW through a mobile access channel: application to issue a prepaid card, application to tokenize a card, token management.
- Linking a transit wallet to other issuers' cards/accounts.
- Top-up of transit prepaid card accounts, enrolment in loyalty programs.
- Payments and transfers in the DTW using the funds of linked cards, two-way communication between the bank and DTW owner, etc.

"DTW & Prepaid Issuing" module

The "DTW & Prepaid Issuing" module is used for the following:

1. Issuing digital and regular prepaid reloadable Visa products to pay for transportation ("Visa Prepaid" and "Visa Digital Prepaid"), the following are also supported:
   - Prepaid transit products (fare packages, travel pass for a period) by managing special accounts and implementing special accounting rules for these products.
   - Various tariff models for the transport operator with discounts, including capping, package and progressive discounts (discount on a new ticket depending on travel history).
2. Online authorization for on-us transactions with the corresponding DTW or "Visa Prepaid" account.
3. Issuing digital wallets linked to "Visa Prepaid". The source for topping up a digital wallet may be other issuers' IPS payment cards, local/domestic payment methods (for example, "Prostyr" and "Mir" cards, e-money accounts, current accounts for payment through the SEPA infrastructure).
4. Support of loyalty programs for other project members – acquirer, merchants on transportation, etc., by managing loyalty accounts and implementing rules for accruing and spending loyalty points (tickets) in a DTW.
5. Cashless top-up (automatic top-up) of transit wallets based on Mifare technology using IPS cards, local/domestic cards, e-money accounts. Support of online synchronization of a transit account and offline wallet in a transit card in online self-service devices.

Digital transit wallet (DTW)

A digital transit wallet contains:

- "Visa Prepaid" card data (wallet's main identifier) and linked off-us cards/accounts.
- Alternate identifiers and verification rules for each identifier. Besides "Visa Prepaid", the following can be used as DTW identifiers:
  - Loyalty program identifiers.
  - Identifiers of other linked payment instruments.
  - Wallet owner's mobile phone number.
- Special purpose accounts and rules (instruments) for recording wallet owner activity in order to accrue and use bonus points or awarded tickets.
- Personal information about the wallet owner (with his/her consent) for use in loyalty programs and to analyse the transit system's passenger traffic.

A digital transit wallet provides Internet and mobile interfaces, making it possible to:

- Show information about the state of "Visa Prepaid" accounts, bonus accounts, travel history, accrual and use of bonus points, linked cards and accounts.
- Link off-us IPS cards, local/domestic payment instruments as payment sources. For example, "Prostyr" and "Mir" cards, e-money accounts, current accounts for payment through the SEPA infrastructure.

- Integrate with the Visa CheckOut service as a source of data about the wallet owner's cards.
- Manually or automatically use P2P to top up accounts linked to the "Visa Prepaid" card wallet.
- Make payments and P2P transfers, including predefined ones (one touch service): top up one's own phone account and that of relatives, transfers to relatives' cards, etc.

Chapter 6. Solution advantages

Implementation of products with prepayment for travel and online payment reduces risks of non-payment and makes it possible for banks and transit organisations to attract additional funds.

The TPPS provides:

1. Flexible settings for tariff schemes and settlements between transit payment participants (passenger, acquirer, transit system operator).
2. The ability to implement complex loyalty programs and social programs on transportation: offer discounts or free tickets when prepaid products are used on transportation and in merchant networks.
3. Secure payment using prepaid products as a PI or digital transit wallet identifier: a passenger's real payment instruments (sources of funds for topping up the DTW) are not presented for payment at terminal networks.
4. The DTW's contactless interfaces make it possible to pay for the following:
   - Travel tickets and purchases using the funds of local/national and other payment instruments not directly accepted for payment in transit systems.
   - Purchase through the Internet using the funds of local/national and other payment instruments not accepted by Internet merchants (through Visa prepaid products linked to the DTW).
5. The ability to create niche products supporting benefits and subsidies (special products like "City/country guest card").
6. The ability to support complex loyalty programs on transportation and in merchant organisations acquired by the acquirer, for example bonus points for purchases in loyalty program member shops may be used to pay for travel tickets.

Chapter 7. Solution specifics

1. The solution does not include turnstile/terminal payment acceptance software. Terminal software, depending on the project's requirements, must allow acceptance of IPS contactless cards, Mifare cards, IPS payment applications on smartphones, watches, bracelets, etc. with an NFC interface (HCE, tokenization), media with QR codes, RFID stamps, etc.
2. A PI is registered (linked) as the source of funds in the standard way: using 3D Secure, Visa Checkout services, technology for cardholder identification on the acquirer side in by processing a test transaction for an amount or one-time password that the acquirer sends in an SMS message to a mobile phone number provided by the cardholder.
3. Online payment for flat fares is applicable if the time for it to be performed meets payment system requirements; otherwise, a scenario with deferred authorization can be used.
4. Removal from a common stop list is performed according to payment system regulations. Removal from stop lists created by the acquirer and transit system operator in the TPPS is automatically performed when debt for travel is repaid or manually by a bank employee when the PI owner contacts the bank.
5. A transit account's (PTA) functionality, despite being issuing in nature, is closely linked with the specifics of acquiring payments on transportation and is considered in the acquiring part of the solution.
6. A transit turnstile terminal can be used as a location for topping up wallets based on Mifare technology, since it is assumed that On-us transactions will not be made frequently (also see Chapter 8).

Chapter 8. Topping up Mifare-based local transit wallets using IPS cards and local cards

Digital wallets based on Mifare cards (Mifare Wallet) can be topped up through a linked digital transit wallet (DTW) containing a special account for topping up Mifare cards (top-up account).

The owner can independently transfer funds to the top-up account, using DTW services, or with an automatic top-up mechanism from linked IPS cards according to customisable rules.

A transfer from a cloud top-up account to a digital wallet in a Mifare card can be made when the card is presented at various service points (see Table 2).

Table 2. Topping up transit wallets

Mifare Wallet top-up location	**Cashless top-up method**		**Customer verification**	**Scenario specifics**
	For a predefined amount	**Manual entry of an amount**		
Transit turnstile terminal	Possible, the wait time at the turnstile is important (6)	Not possible	Not possible	If funds are insufficient, the turnstile terminal sends the transit solution's host an online top-up request for the amount predefined in the DTW.
Self-service kiosks without keypad	Possible	Not possible	Possible: verification request to a mobile phone and response also through the mobile channel.	At the kiosk, the customer selects the option to top up from the DTW; the kiosk sends an online top-up request for the amount predefined in the DTW.
Self-service kiosks with keypad	Possible	Possible	Option 1: login/password. Option 2: one-time password sent by SMS or offline password generated by the passenger's mobile application.	The customer is served with or without verification. Top-up can be implemented for an amount predefined in the DTW or for an amount entered manually.