Operational support and maintenance – Ferde Toll Collection systems

SSA-V, Appendix 3

Customer's Technical Platform and Physical Environment

Glossary and abbreviations

Autopass	An electronic toll collection system used in Norway. It allows collecting road tolls automatically from cars. It uses electronic radio transmitters and receivers
TC System (TCS)	Toll Collection System
RTC	Regional Toll Collector. There are 5 regional toll collectors in Norway
LPN	License plate registration number
OBU	Electronic on-board unit
TSP	Toll Service Provider
eFaktura	Norwegian electronic invoice standard for B2C invoicing

1. INTRODUCTION

This document provides a high-level description of the technical solution for the *AutoPass TC System*. This document describes the major components in the solution, the dependencies between them, and how they will work together.

1.1 Business Context

The TC is a company that has the authority to claim payment for road or ferry tolls for public use.

The TC is responsible for collecting tolls directly from all road users not having an AutoPass agreement with a Toll service provider and do not have an OBU for their vehicle. The billable information is based on the license plate (LPN) and the owner information is gathered through a lookup in the vehicle register (Autosys). There are 5 regional Toll Collectors in Norway. All the RTC's will be operating in their own regions and will be responsible for the toll collections and their value chain. This TC solution is used by 3 of the regional Toll Collectors (Ferde AS, Vegamot AS, BPN Nord).

The main operation of the RTCs is to procure financing and collection of road tolls pertaining to the respective projects within the RTCs or held indirectly by the RTC subsidiaries. The TC solution is receiving transactions from toll stations belonging to the Toll collector. The transactions are validated on import and then posted to a reconciliation account.

Based on thresholds invoice runs are done on a regular basis, the thresholds could be outstanding amount, oldest passage, date, combined with invoice channel etc. The invoice run result in Invoice distribution where invoices are distributed in several channels, some of these require an Invoice hotel and in Norway the banks have agreed upon several standards for integration for example eFaktura- these require the payer to register information and accept terms and conditions in the Nettbank (eBanking). The payment of invoices and receipt of payment result in reconciliation of bank accounts and customer reconciliation posts are settled.

If payments are not done according to agreements or due dates, a dunning process is started. This is done according to Norwegian law which regulate the number of days, and the possibility of additional charges.

If dunning does not result in payments, a debt collection process is started, this is done through a Debt collector service agreement

Below you will find a series of tables giving an overview of some of the main figures related to the 3 RTCs. The figures are estimates per 2019.

Ferde AS

Metric	Estimated volume (2019)
No passages (total)	288 million passages per year
No of invoices (incl. dunning)	2 million per year
No of toll stations	130
No of collection fields	190
No of vehicles (customers)	1,5 million

No of internal users (customer service and accounting)	20
No of telephone inquiries	70,000 per year
No of written inquiries	35,000 per year
No of active projects, including required periodical reporting (monthly/quarterly as well as mandatory annual accounts)	22

Vegamot

Metric	Estimated volume (2019)
No passages (total)	113 million passages per year
No of invoices (incl. dunning)	1 million per year
No of toll stations	30
No of collection fields	76
No of vehicles (customers)	1 million
No of internal users (customer service and accounting)	10-15
No of telephone inquiries	22,000 per year
No of written inquiries	17,000 per year
No of active projects, including required periodical reporting (monthly/quarterly as well as mandatory annual accounts)	6

Bompengeselskap Nord AS

Metric	Estimated volume (2019)
No passages (total)	54 million passages per year
No of invoices (incl. dunning)	550,000 per year
No of toll stations	30
No of collection fields	60
No of vehicles (customers)	250,000
No of internal users (customer service and accounting)	14
No of telephone inquiries	8,000 per year
No of written inquiries	5,000 per year

No of active projects, including required periodical reporting (monthly/quarterly as well as mandatory annual accounts)	6

1.2 Toll collection in Norway

The following illustration shows the value chain from Roadside through AutoPASS IP to the toll collector and toll service provider, with the AutoPASS HUB ensuring interoperability between the components and the integration with EasyGo and new commercial TSPs.
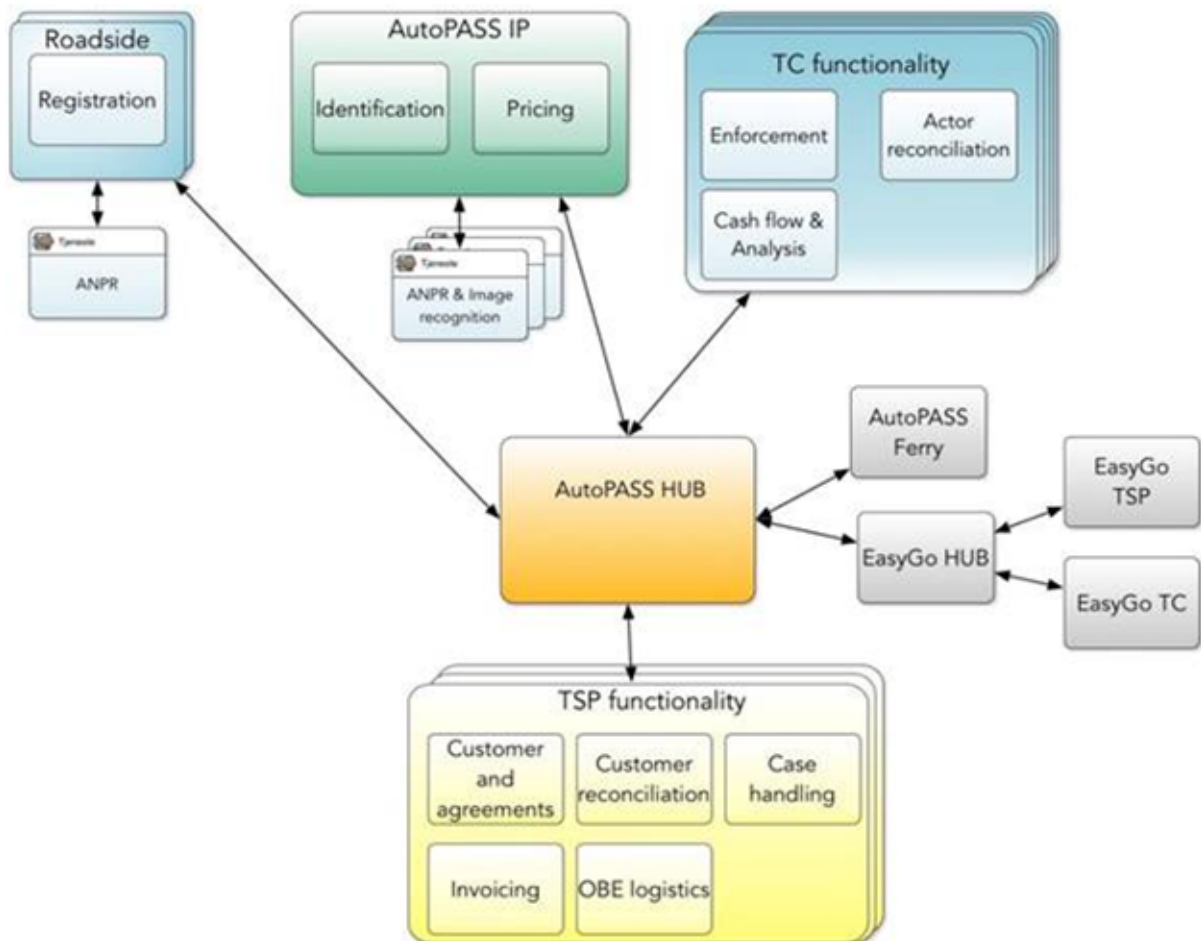

Figure – An illustration of the new system solutions for toll collection in Norway.

The above is a simple illustration of the New System solution for toll collection in Norway. A short description of the functionality of the different components are as follows:

- **Toll Collector functionality** contains the functionality needed for a TC to operate in the AutoPASS community. This includes, but is not limited to reconciliation, invoicing, interfaces to banks, debt collection, invoice distribution, external accounting and reporting.

- **AutoPASS HUB** is the component ensuring interoperability between the different components and the wider community, both during and after all new systems are established and all current companies using the Central System have migrated to the new system solutions.

The AutoPASS community consists of many actors, and these actors interact technically through exchanging messages and files. AutoPASS HUB is a transport infrastructure with the ability to send defined messages and files based on information given in the messages and files. AutoPASS HUB is mandatory for all actors in the AutoPASS community, as are the defined data formats.

- **AutoPASS IP** includes important common parts of the value chain for the toll collection; identifying passages based on information of agreements coming from the Toll service provider (TSPs), and pricing of passages based on the information in the agreement and the price rules and logic managed in the AutoPASS IP. AutoPASS IP further has the needed business logic to address the correct Toll collector (TC) or TSP, which should enforce the priced transaction. The solution will also manage all configuration such as toll stations and lanes, prices, status and codes. AutoPASS IP is mandatory for all actors in the AutoPASS community.

- **ANPR & Image Recognition** is the component that identifies the license plates for all customers that doesn't have an OBU in their vehicle or has an invalid agreement.

- **Toll Service Provider (TSP)** contains the functionality needed for a TSP to operate in the AutoPASS community. This includes, but is not limited to reconciliation, invoicing, OBE logistics, customer and agreements, self-service, case handling, interfaces to banks, debt collection, invoice distribution, external accounting and reporting.

- **The EasyGo HUB** is the HUB ensuring interoperability to and from all companies within the *EasyGo community*. Documentation regarding EasyGo is available through [EasyGo documents.](#) The EasyGo HUB will remain and have the same function as today.

- **The roadside equipment** varies in age and is owned and managed by each TC. Depending on the local setup, the roadside equipment will send passages on an hourly or daily basis. All roadside equipment stores passages for at least 3 days. The roadside will remain and have the same function as today. Today, there is no automatic verification of passages sent from roadside or that they are correctly received by the current Central System. Passages registered on the roadside are sent to the AutoPASS TC via the AutoPASS HUB.

2   CURRENT TECHNICAL PLATFORM

The TC system has a 3-tier architecture. In the data tier we have a separate SQL instance for each Regional TC. The user details are stored in a common database for all TC's. The .NET layer (service tier) is connecting the data layer with the presentation layer. The end-users are using Appian in the presentation layer.

For all the files that are moving in and out of the application there is a queue mechanism followed.
There are 2 queues maintained in the application.
1. Incoming queue
2. Outgoing queue

There are multiple entities connected to the TC application which send and receive data from the application. At one point of time, there will be only one incoming file processed across all TCs in the Autopass solution community.

Similarly, for files sent out of the application, the outgoing queue mechanism is followed.

Both the queues are running separately at all the instances.

AutoPass TC - High Level Solution Architect Diagram (Solution Overview)
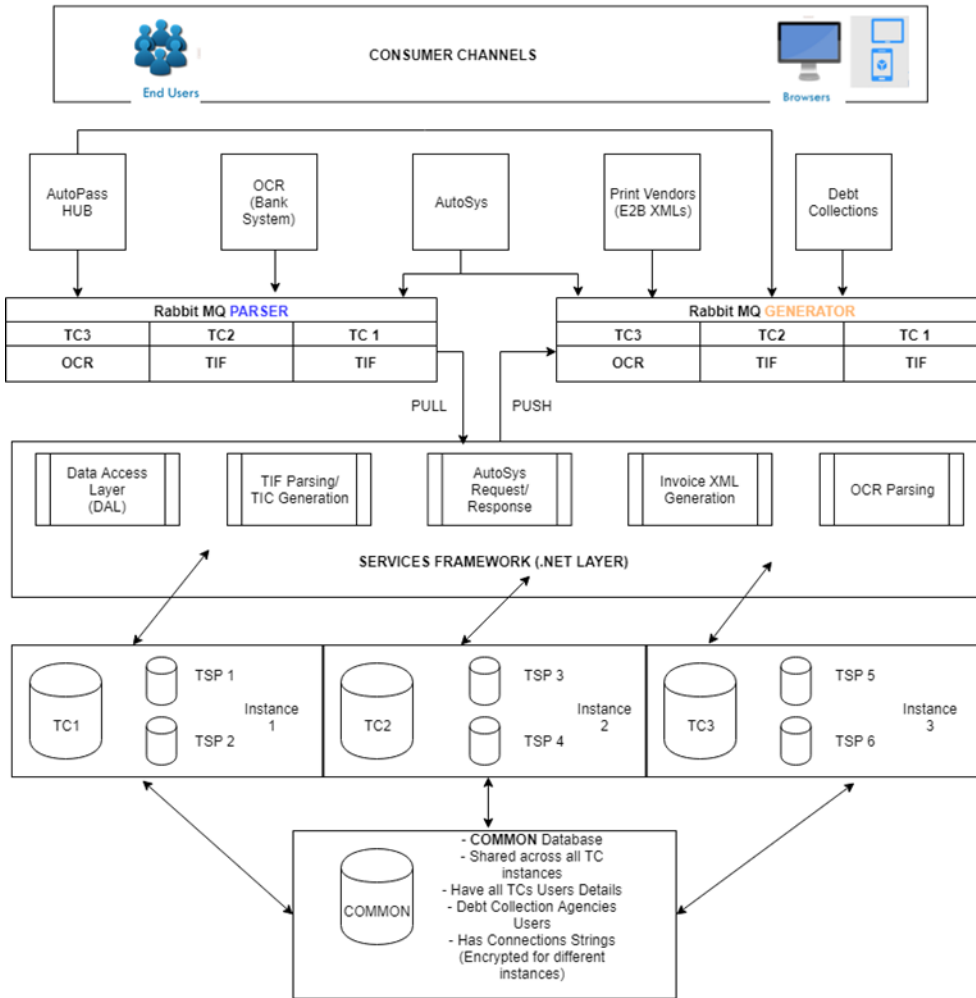
2.2 Technical Stack

Type	Technology Layer	Technology Name
Database	Database	SQL Server 2017 Enterprise Edition
Integration	Web Services	Microsoft .Net
Consumer Channel	Front End (Consumers)	Appian Suite 20.1 (On-Premise)
DevOps		Jenkins
DevOps		Dockers
3rd party tools	Queue Mechanism	RabbitMQ
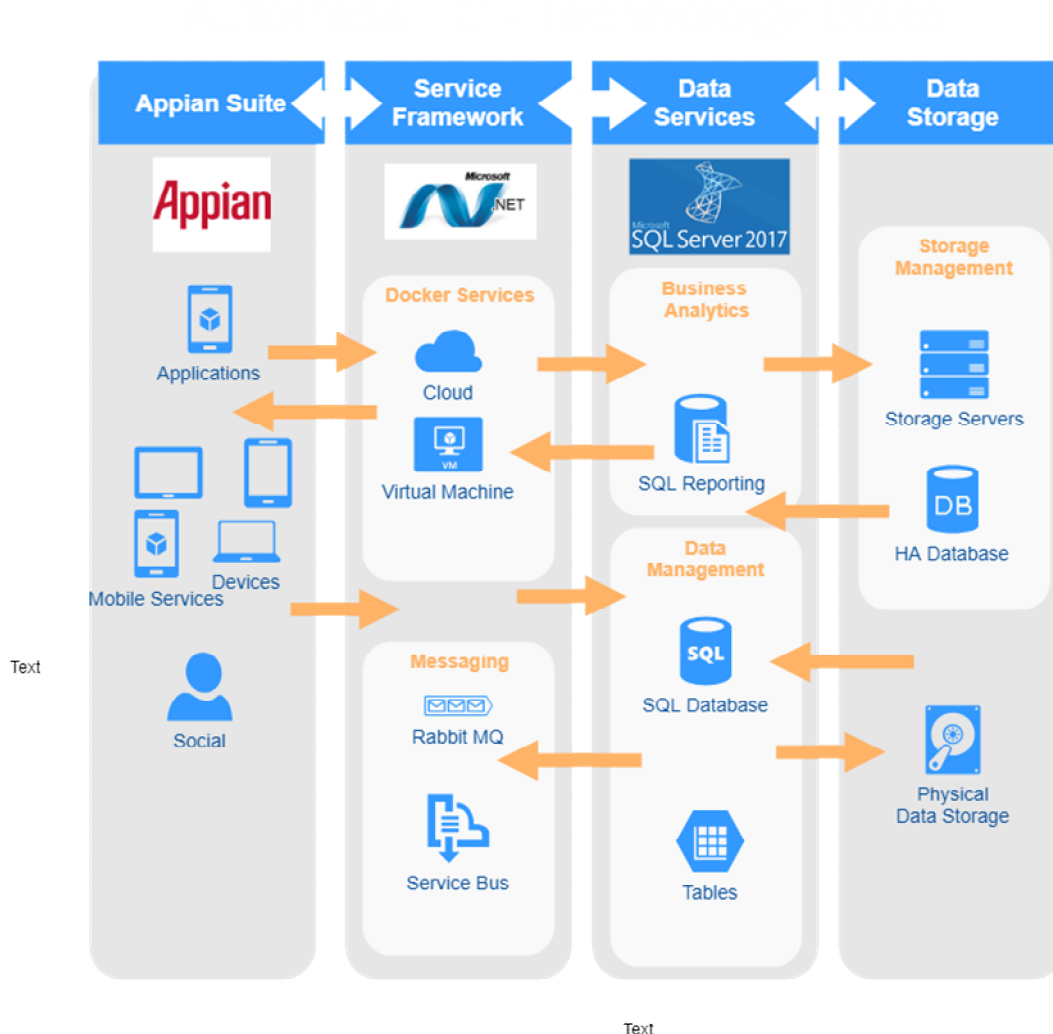
2.3 Authentication

System users Authentication are handled through Appian's default login mechanism, wherein users with valid Appian user accounts will only be able to log in the application.

2.4 Authorization

The authentication of the system users is done based on the different roles mapped on their individual accounts. Every service responsible for any read/write/update operation takes a context of user in form of user token to **AUTHORIZE** if the given user has the enough privileges to perform the operation or not. Only if the user does – then only the respective operation is granted to the given request coming from the user.
In this solution – since **there are multiple TCs (Multi-tenancy)** – there is a common database that contains all the user details of all TCs, with their appropriate roles along with which **ACTIVE** TC does the user have the access to at any given time (a user can **NOT** have access to see data of multiple TCs at any given time). Users in TC1 doesn't have access to TC2 and TC3. TC2 users has also access to TC3. The TC2 users has the possibility to switch the TC they are working in at any given time.

2.5 User Roles

The TC System has defined 5 different roles. Each user in the system is linked to one of these roles. The users are maintained in Appian.

- Case Officer

- Senior Case Officer
- Team Leader
- Admin
- Super Admin (Full access)

2.6 System Files

All system files related to applications and application data placed in a uniform way and hold at location /data drive in linux and D:/ and E:/ drives at microsoft windows operating systems.

Application	Operating systems	Data drive	Absolute path
Docker	Ubuntu LTS 18.04	/data	/data/docker
Jenkins	Ubuntu LTS 18.04	/data	/data/jenkins
Appian	Ubuntu LTS 18.04	/data	/data/appian
console apps	Ubuntu LTS 18.04	/data	/data/dotnetcore/
SFTP root	Ubuntu LTS 18.04	/data	/data/sftp
Mysql	Ubuntu LTS 18.04	/data	/data/mysql
MSSQL	Microsoft Windows server 2016	D:\\ E:\\	D:\\SQLDATA E:\\SQLLOGS

2.7 Environments

We have 5 environments. Dev, Testing and UAT Customer environments only contains artificial test data. The staging environment is a replica of the PROD environment and contains real transactional data.

Environments	Priority	Status	Location
Development	Medium	Available	Ferde
Testing/UAT	Medium	Available	Ferde
UAT Customer	Medium	Available	Ferde
Staging	Medium	Available	Systor – Hosting Provider
Production	High	Available	Systor – Hosting Provider

2.8 Infrastructure Technical Architecture (Principal draft)
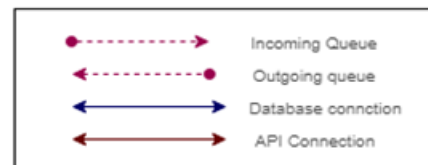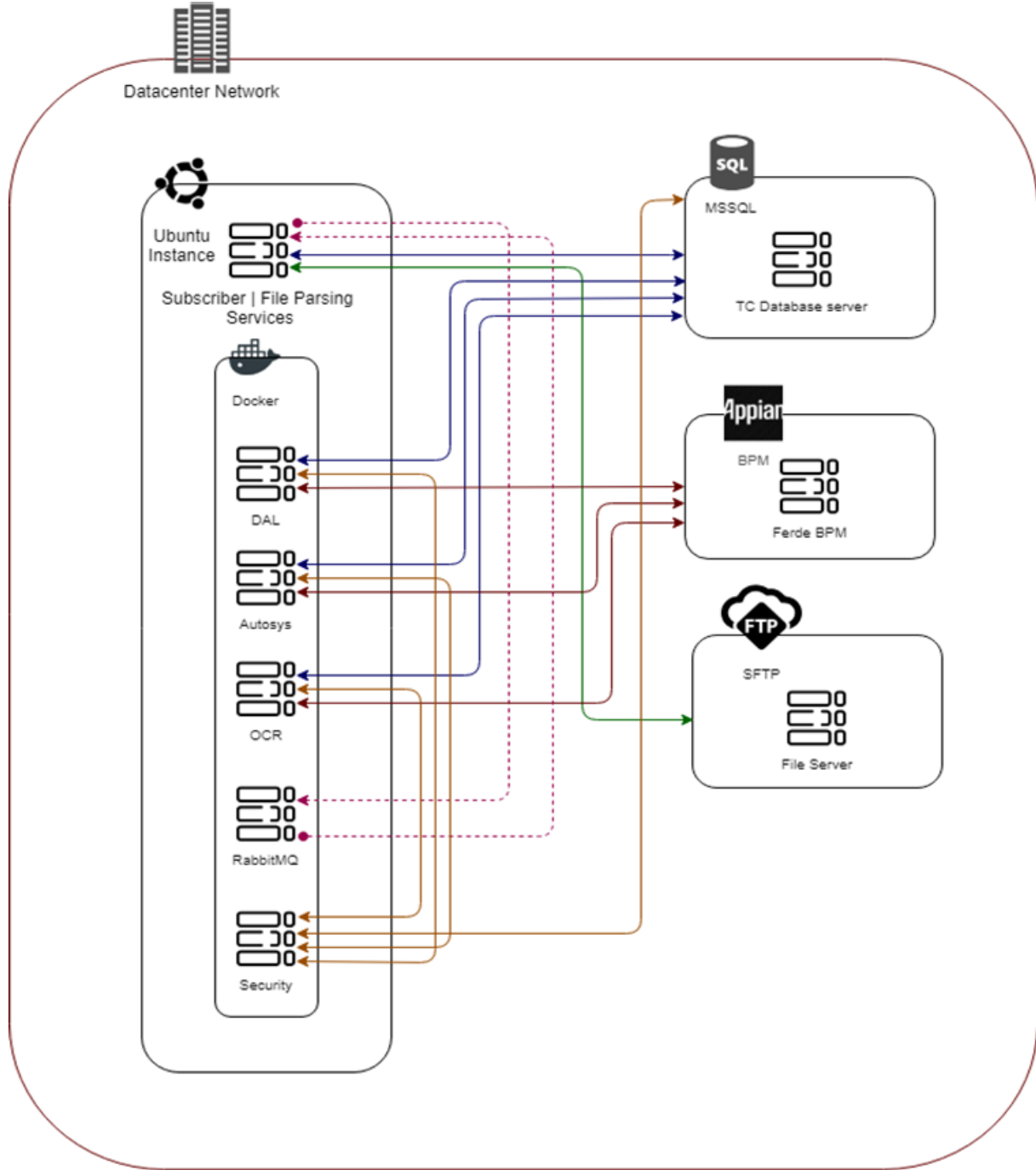
2.9 Infrastructure Resources

Our infrastructure resources are described with their capacity, configurations and details in terms of their specifications below.

Hostname	Operating System	Environment	Purpose code	Location
TC-DEV-SQL01	Windows server 2016	Development	SQL Server Standard Ed. 2017	Ferde
TC-DEV-APP01	Windows server 2016	Development	APP Debug	Ferde
TC-DEV-APPIAN01	Ubuntu Linux 18.04.01 LTS	Development	Appian	Ferde
TC-DEV-BACKUP01	Ubuntu Linux 18.04.01 LTS	Development	Internal Backup	Ferde
TC-DEV-DOCKER01	Ubuntu Linux 18.04.01 LTS	Development	Docker Hosting	Ferde
TC-DEV-FS01	Ubuntu Linux 18.04.01 LTS	Development	File Server	Ferde
TC-TEST-SQL01	Windows server 2016	Testing UAT	SQL Server Standard Ed. 2017	Ferde
TC-TST-APP01	Windows server 2016	Testing UAT	APP Debug	Ferde
TC-TST-APPIAN01	Ubuntu Linux 18.04.01 LTS	Testing UAT	Appian	Ferde
TC-TST-BACKUP01	Ubuntu Linux 18.04.01 LTS	Testing UAT	Internal Backup	Ferde
TC-TST-DOCKER01	Ubuntu Linux 18.04.01 LTS	Testing UAT	Docker Hosting	Ferde
TC-TST-FS01	Ubuntu Linux 18.04.01 LTS	Testing UAT	File Server	Ferde
TC-STG-SQL01	Windows server 2016	UAT Customer	SQL Server Standard Ed. 2017	Ferde
TC-STG-APP01	Windows server 2016	UAT Customer	APP Debug	Ferde

TC-STG-APPIAN01	Ubuntu Linux 18.04.01 LTS	UAT Customer	Appian	Ferde
TC-STG-BACKUP01	Ubuntu Linux 18.04.01 LTS	UAT Customer	Internal Backup	Ferde
TC-STG-DOCKER01	Ubuntu Linux 18.04.01 LTS	UAT Customer	Docker Hosting	Ferde
TC-STG-FS01	Ubuntu Linux 18.04.01 LTS	UAT Customer	File Server	Ferde
FD-TEST-JUMP		Staging	Jump and adm server for test	Systor
FD-STAGE-WEB1	Windows Server 2019	Staging	Web Server	Systor
FD-STAGE-APP1	Ubuntu Linux 18.04.01 LTS	Staging	APP Debug	Systor
FD-STAGEAPPIAN1	Ubuntu Linux 18.04.01 LTS	Staging	Appian	Systor
FD-STAGE-DCK1	Ubuntu Linux 18.04.01 LTS	Staging	Docker Hosting	Systor
FD-STAGE-FS1	Ubuntu Linux 18.04.01 LTS	Staging	File Server	Systor
FD-STAGE-SQL1	Windows server 2019	Staging	SQL Server Standard Ed. 2017	Systor
FD-PROD-JUMP		Production	Jump and adm server for prod	Systor
FD-PROD-WEB1	Windows Server 2019	Production	Web Server	Systor
FD-PROD-SFTP	Ubuntu Linux 18.04.01 LTS	Production	SFTP Server	Systor
FD-PROD-APP1	Ubuntu Linux 18.04.01 LTS	Production	APP Debug	Systor
FD-PRODAPPIAN1	Ubuntu Linux 18.04.01 LTS	Production	Appian	Systor
FD-PROD-DCK1	Ubuntu Linux	Production	Docker Hosting	Systor

	18.04.01 LTS			
FD-PROD-FS1	Ubuntu Linux 18.04.01 LTS	Production	File Server	Systor
FD-PROD-SQL1	Ubuntu Linux 18.04.01 LTS	Production	SQL Server Standard Ed. 2017	Systor

Systor Jump hosts has the following software: Microsoft SQL Server Management Studio

2.10 Infrastructure Components

Infrastructure involves the components described below inside Linux/Windows operating system layers.

- Appian
- SFTP Server (Linux Native SSH)
- Jenkins
- GIT
- .Net core API
- Docker
- Rabbit MQ
- Microsoft SQL Server 2017 (Developer | Standard)
- Splunk

3 EXISTING APPIAN APPLICATIONS

- TC Solution
  - Toll Collection application – core business application for running the Toll collection. All 3 RTCs (Ferde, Vegamot and Bompengeselskap Nord) are using this application.
- Customer Service Application (Customer case management system)
  - This application is mostly used for mail correspondence with the customers. Only one TC (Ferde) is using this application.

4 INTEGRATIONS

Interface	Type	Host	Description	Document reference
AutoPass HUB – File Notification/File Transfer	AMQP/REST	Systor	The AutoPASS HUB is responsible for message routing and delivery to other modules in the AutoPASS environment. Communication in AutoPASS is file based, so the HUB Interface is implemented through a combination of:	Integration AutoPASSHUB 1.1.pdf

|				
			• A token-based REST API for downloading and uploading files • An AMQP broker where URIs to files are sent/received when uploading/downloading outgoing/incoming files The AMQP interface is implemented with RabbitMQ, and uses Topic Exchange	
AutoPass HUB - Image Database	REST (and GUI)	Systor	A token-based REST API for downloading transaction images from roadside (read only), as well as an external GUI where images can be displayed for a transaction and license plate can be corrected.	Integration autopass-AutoPASSImageDBRESTAPI v1.1.pdf
Invoice Distributor	SFTP: XML (and CSV in return)		Transfer XML via SFTP and receive CSV in return	Integration Invoice Print E2BXMLStructure.xlsx
Invoice Hotel	Encrypted URL Generation	Invoice Distributor	We have access to invoices through encrypted URLs that are generated automatically	
EA – Address Update	SFTP: CSV		We receive CSV files via SFTP with address updates	
External Accounting	REST	TC	Postings are pulled by external accounting system.	Integration External Accounting REST API Guideline v1.6.docx
Bank – OCR	File import, OCR format (SFTP)		Payment files from bank via SFTP.	Integration OCR giro - System manual.pdf
Debt Collector	REST	TC	Rest API where DC pulls new cases, and changes to existing cases, with confirmation. DC pushes settlements in return.	Integration Debt Collection REST API Guideline v1.8.docx
External Passage Handling	REST	TC	Passages for foreign vehicles with no agreement are handled by one or more external passage handlers (EPH). These are available through Rest API where EPH pulls passages and pushes claim results.	Integration EPH integration v1.5.docx
Autosys	REST	SVV	Customer onboarding. Lookup on license plate for name, address details etc.	Integration Autosys+Vehicle+API.docx
Bank Remittance	SFTP: XML (iso format)		SEPA files transferred to bank via SFTP	
Invoice Details TSP	REST	TC	The AutoPASS Toll Service Provider - Issuer of the OBU. The TSP can request a list with transactions that was invoiced	

External Partner Password Change	REST	TC		
Qlik Sense	REST, OLEDB	TC	Qlik Sense is fetching data from the TC solution for reporting purposes	

5 BUSINESS PROCESSESS

The main work flow in the TC System:
1. Receive passages
2. Customer Onboarding
3. Invoicing
4. Payments

Example of built-in functionality from the Menu screen in TC System:
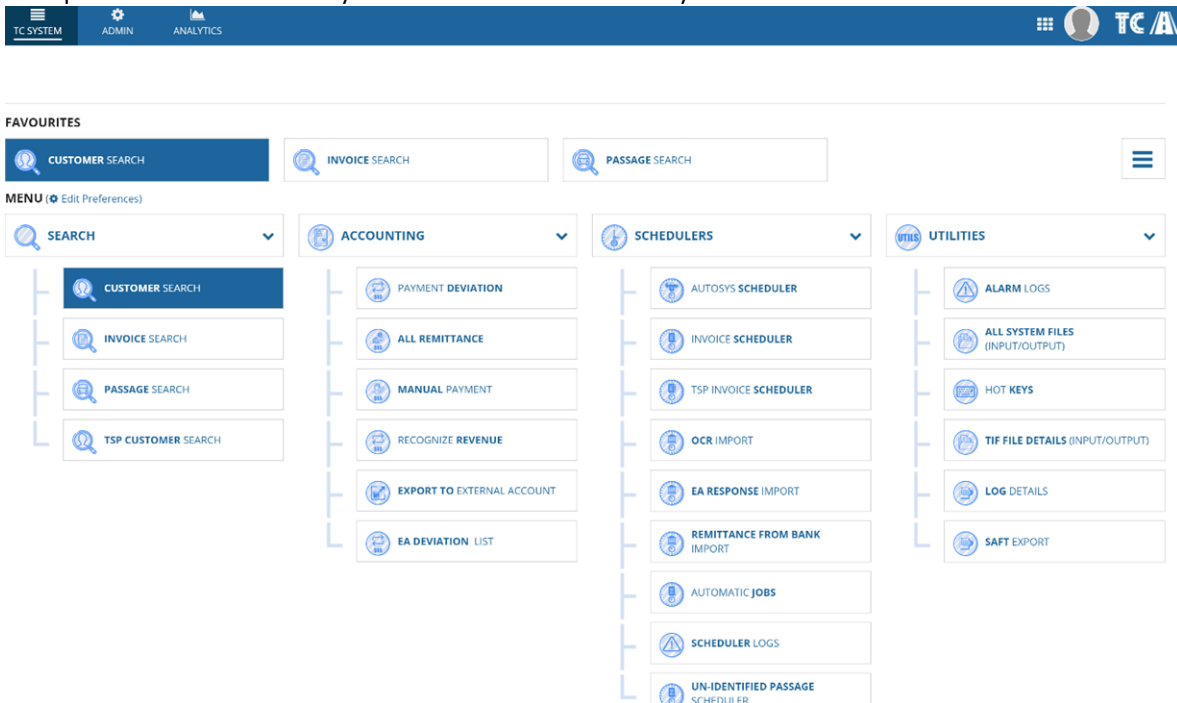
5.1 TC Passages and customer onboarding

AutoPass HUB will be sending and receiving files to AutoPass TC Solution via RabbitMQ.
AutoPass Hub will be pushing TIF file path as a message in the queue maintained at RabbitMQ and thus AutoPass TC Solution's services will consume those messages and will result in the parsing of the TIF file as received by the Hub. Transactions will be imported into the application.
When TIC is generated for the TIFs imported, the same is placed in the outgoing RabbitMQ and the above-mentioned process is followed.

All passages are imported in the TC system. TC passages, TSP passages and passages with foreign vehicles. The passages are priced by IP.
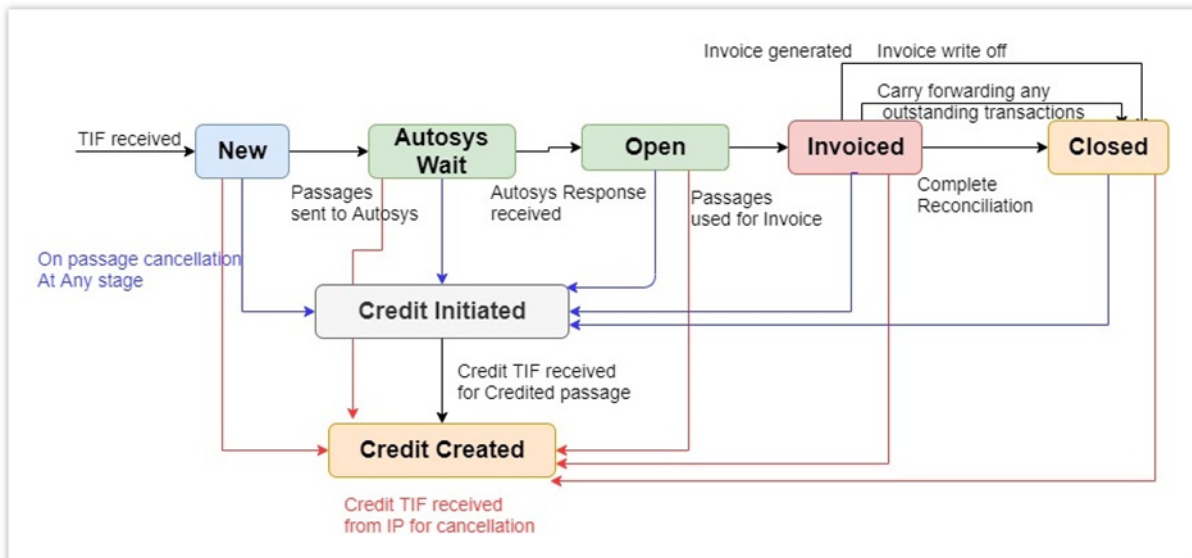After being imported in the TC system passages are sent to Autosys for owner identification. Only norwegian vehicles are sent to Autosys. Latest passage for each vehicle is sent to Autosys and information about vehicle owner and the vehicle is imported to the TC system. Passages get updated with owner information and the

customer is then onboarded and passages for each vehicle is onboarded to the customer. The passages are now ready to be invoiced.

Example of Passage Search screen in TC System


Example of lifecycle for TC passages:

Passages can be corrected if needed, both invoiced and not invoiced passages. This is typically initiated by a complaint from the customer that one or more passages are wrongly invoiced. We will then credit the passage and/or refund the money to the customer.
When a passage is cancelled a TIC file is sent to IP to get the passage reprocessed. The TIC will refer to the original TIF file for this transaction.
Passages can also be cancelled by a credit TIF rom IP.

Example of process flow for corrections of passages:
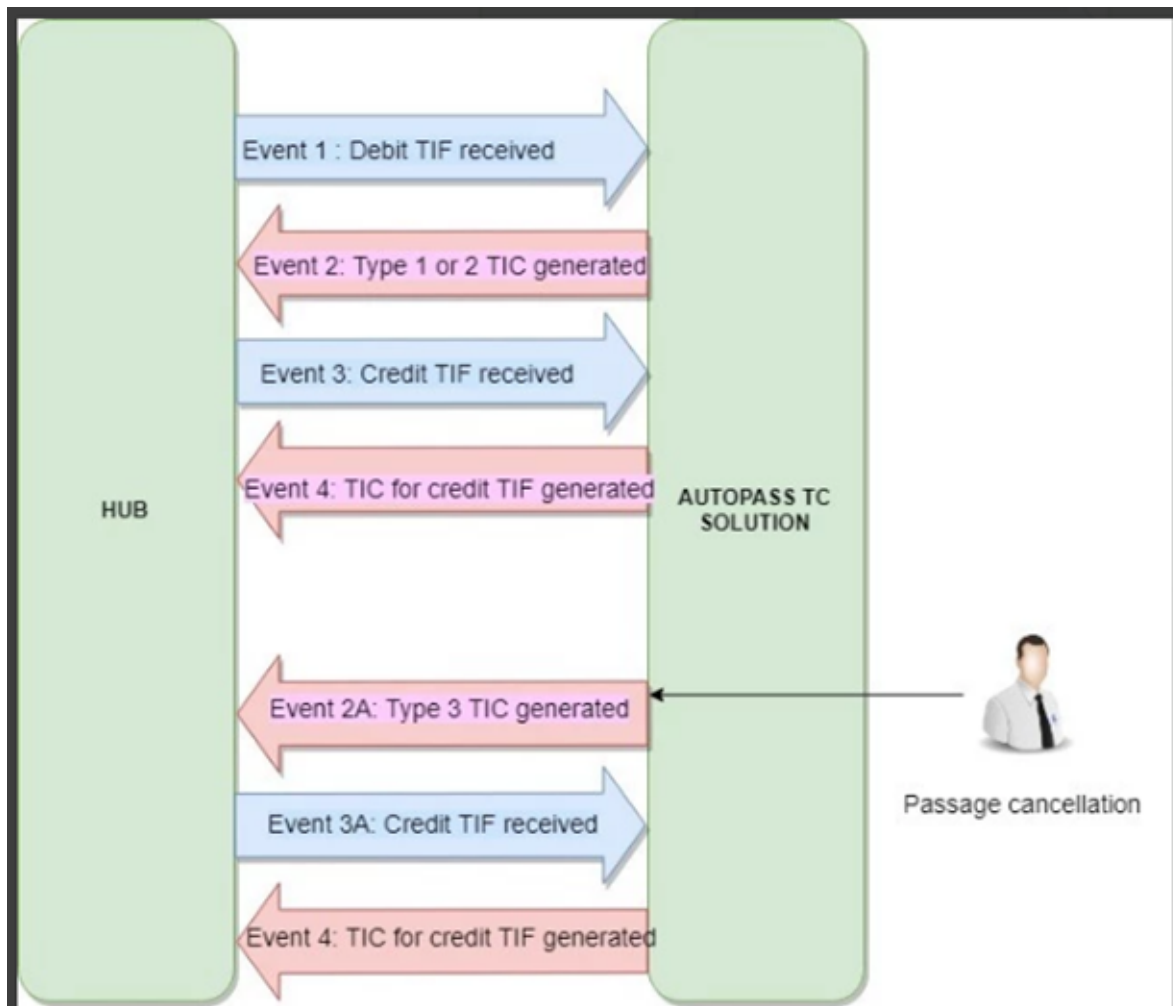
5.2 TSP passages

TSP passages are imported in the TC system and the TSP system. The TSP will invoice the owner of the agreement of the passages and handle the agreement details between customer and TSP.
The TC will invoice the TSP for all the passages for a specific period (e.g. monthly). This can both be scheduled and initiated on an ad-hoc basis.
Payments are received from TSP and reconciled against the issued invoice.
Corrections can also be performed on TSP passages.

Lifecycle of TSP passages:
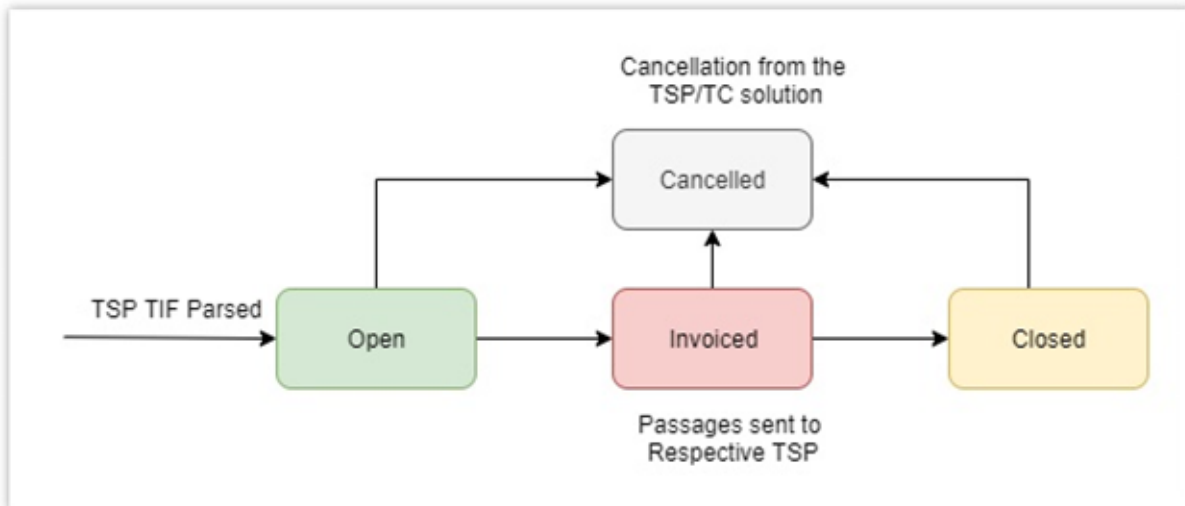
5.3 Foreign passages

Foreign passages are passages with nationality other than Norwegian. These are TC passages, but are not identified and invoiced by the TC. These passages are requested by EPH through a Rest API and identified and invoiced by the EPH. The EPH sends payment messages through the same API and can also send cancellation messages for passages that needs to be cancelled or is to be written off.

Lifecycle of foreign passages:
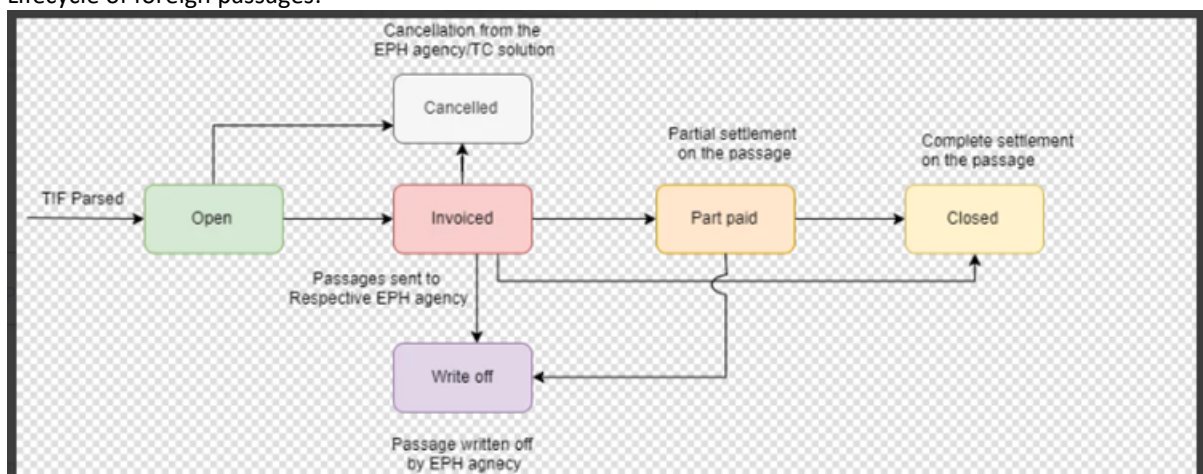
5.4 Invoicing

Once the passages are identified with an owner and is onboarded in the system as a customer and after a configurable number of days, the passages will be invoiced to the associated customer. One invoice can contain passages for multiple vehicles and passages from multiple toll projects for the TC specific region. The settings for invoicing is configurable and includes:

- Fee amounts
- Due days
- Waiting days
- Different text for different invoice types
- Invoice limits
- Thresholds e.g. for minimum amounts for invoicing, penny difference and over/underpayments.

This is a scheduled process and can be initiated on an Adhoc basis. On the customer dashboard, invoices are displayed with the amount, date of generation, type and other relevant details.

When invoices are created postings are made in accounting. This is an example of one invoice with two toll projects, A and B.

	1510		1520		1920		3110		3120	
	D	K	D	K	D	K	D	K	D	K
Passages	500(A)							500(A)		
Passages	200(B)							200(B)		
Invoice		500(A)	500(A)							
Invoice		200(B)	200(B)							
Fees invoiced			10							10

When invoices are not paid within due date, reminders are created according to invoice sequence and setup. This is found in the global invoice configurations.

The endpoint of the invoicing process for phase 1 is the generation of E2B XML at a designated location. The files can be downloaded from this location and can be sent to the print vendor manually.

Corrections can be performed on an invoice if needed.
- Cancellation of passages: If a passage is cancelled the amount is credited from the invoice or the amount is carried forward to the next invoice.
- Credit Fee: Fees can be credited.
- Invoice write off: An invoice can be written off either partly or completely.
- Cancel invoice: if an invoice is not correct there is a possibility to cancel the invoice. All the transactions (passages, underpayments etc) will be invoiced in a new invoice except passages that is credited or other corrections. In that way the customer can receive a new invoice without errors if needed.

5.5 Debt collection

Invoices that have reached the stage where a collection notice have been sent to the customer and the customer hasn't still paid the expected amount, are sent to the debt collection agency for recovery through a REST API.

The debt collection process is triggered for invoices that match the following:

• Unpaid invoices and part paid invoices where the outstanding amount is above the reminder threshold.

• In addition to the above threshold, there will be a minimum invoice amount (excluding reminder fees) for debt collection. Threshold: Minimum Amount For Debt Collection

• With the due date on the collection notice more than NN number of days ago. (parameter) (Threshold: Number of days after Due days for sending an invoice to a debt collection agency)

•If there are any overpayments, credit passages on the customer, this should be checked before the case is sent. This case will trigger an alarm on the day invoice becomes eligible for sending to debt collection agency(due date + waiting number of days)

The debt collection agency collects the outstanding amounts from the customers and sends settlement message to TC.

The DC agency can write off the claim in case it identified such situation.

Debt collection workflow:
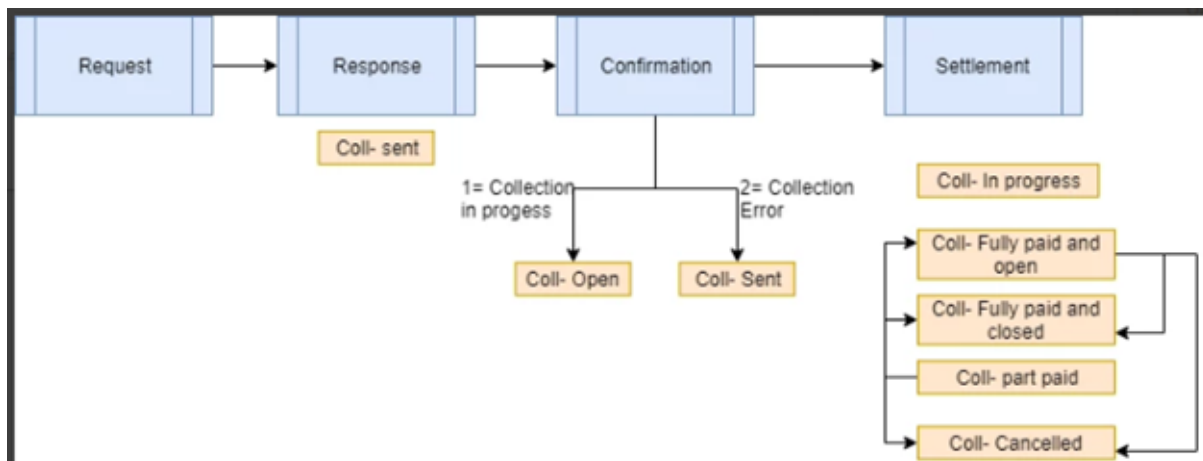
5.6 Payments

When invoices are issued the TC can receive payments through multiple sources and be reconciled in the system according to accounting set up.
- OCR file parsing
- Manual payment registration
- Payment Deviation

There can be two types of reconciliations in the system
1. Auto Reconciliation (Through OCR parsing)
2. Manual Reconciliations (Payment deviation)

If the system is not able to automatically reconcile a payment it will go through manual payment deviation handling. Manual payments can also be registered in the system for payments that will not come in the standard OCR file.

All payments to an invoice is split on the different passages for each projects according to the share of each projects amount. E.g. if the invoice amount on Invoice 1 is 500 NOK and 200 is the sum of passages from project A and 300 NOK is the sum of passages from project B, the split will be 40% on project A and 60% on project B. A payment of 400 NOK to invoice 1 will be posted as 160 NOK on project A and 240 NOK to project B.

Example of payment reconciliation for an invoice with two toll projects and exact payment:

Lagre	1510		1520		1920		3110		3120(Fees)	
	D	K	D	K	D	K	D	K	D	K
Passage	100(A)							100(A)		
Passage	100(B)							100(B)		
Invoice		100(A)	100(A)							
Invoice		100(B)	100(B)							
Fees			20							20
Payment					100(A)	100(A)				
Payment					100(B)	100(B)				
Payment					20	20				

All payments are posted in the system according to accounting set up and dimensions. This includes under/overpayments that can be carried forward to the next invoice. This can be handled both automatically and manual and is based on the accounting setup.

When remittances have been initiated either from Customer dashboard or Payment deviation screen, an entry gets created on 'All Remittance' screen with status Open. The user can come on this screen and select one/multiple remittances and choose to approve/reject the entries after adding a mandatory comment. If the user approves the cases, a SEPA file gets generated. As soon as the SEPA will be generated after selecting the transactions to be sent, the generated file will be shown on the UI only so that the user can download it.

Example of postings in the system for a remittance:

	1510		1520		1920		3110		1740(Interim)		3122		1760	
	D	K	D	K	D	K	D	K	D	K	D	K	D	K
Passages	500(A) 200(B)							500(A) 200(B)						
Invoice generate		500(A) 200(B)	500(A) 200(B)											
Full payment received					500(A) 200(B)	500(A) 200(B)								
Passage Cancelled				100(A)			100(A)							
Credit Note (from Credit Passages)	100(A)				100(A)									
Reverse of Passage Invoiced			100(A)					100(A)						
Dummy payment to get rid of dimension					100					100				
Posted in Remittance account									100					100
When Approved						100					100			
When Rejected, No postings														

5.7 Export to external accounting

An aggregated postings report is sent to the external accounting system when the data is requested.
This is sent through a REST API in the form of JSON.
This transfer is considered on 3 levels: Passages, invoice and reconciliations.

Passage:
- System will loop all transactions with transaction date in a given interval that has not been marked with New Passage transfer.
- The transactions are marked as transferred with today's date and the Transfer ID.
- Sum all transactions grouped on passages type and dimensions (project), and produce a file.

Invoice:

- The system will loop all transaction with an invoice date in a given interval that has not been marked with Invoice transfer.
- The transactions are marked as transferred with today's date and the Transfer ID
- Sum all transactions grouped on passages type and dimensions (project), and produce a file.

Reconciliations:
- The system will loop all Reconciliation posts with reconciliation date in a given interval that has not been marked with Reconciliation transfer.
- Follow reference to Invoices, Payments, and transactions.
- For all reconciled invoices (including credit notes), sum all amounts split by the dimension specification and grouped on dimensions (project).
- For all reconciled payments, sum all amounts split by the dimension specification from the underlying invoice(s) and grouped on dimensions (project). Also, group on the OCR reference in the payment.
- For all reconciled invoices (including credit notes), sum all amounts split by the dimension specification and grouped on dimensions (project).

The posting data is aggregated on different levels such as

- Project
- Subgroup
- Posting date
- OCR file
- Account header

All exports are given an Id and can be found in a log dashboard. There is also functionality for resending an export if it fails.