PHARMA AERO

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TECHNICAL REPORT

AIRPORT TO AIRPORT PHARMA CORRIDOR

JANUARY 2020

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1. Executive summary

Pharma.Aero's goal with the airport-to-airport corridor project was to provide the best assurance in handling quality to pharmaceutical shippers by connecting airports with CEIV Pharma certified airlines and cargo handling communities.

Pioneered by Brussels and Hong Kong Airport, the trial proves that CEIV certification provides unique quality assurance to shippers, BRU-HKG lane consistently adheres to high standards and achieve over 95% fulfilment to all operational KPIs and zero case of temperature excursion. Using thermo dollies as apron transportation has also mitigated the major risk and actualizes a seamless, temperature-controlled transportation on the ramp.

This project also examines the key KPIs of the corridor in order to ensure the quality assurance is indeed in place. This was achieved by defining a standard model and a validated protocol for a Pharma Corridor in a first phase. The mapping of the characteristics of the Pharma Corridor via data collection with live shipments was performed in a second phase.

Advocating high quality pharma supply chain solutions and the ability to monitor data across the multiple participants in a pharma supply chain corridor is crucial in achieving the Pharma.Aero mission.

The above was the starting point for the "**Pilot Airport-to-Airport Pharma Corridor**" project.

The project aimed to obtain :

1. Definition of requirements from corridor members in order to provide best assurance in handling quality to pharmaceutical shippers.
2. Roadmap clearly describing on how to monitor this pilot Pharma Corridor and any other future corridor mapping projects.
3. Protocol identifying all the requirements and key performance indicators (KPIs) for every stakeholder involved in the airport-to-airport monitoring and tracking of pharma shipments in air trade lanes before starting the project.
4. Dashboard to track the KPIs and to evaluate operational parameters using performance data. The dashboard prototype was built by means of a data sheet, where real data from 47 pharma shipments on the Brussels-Hong Kong trade lane were integrated.

After defining the Pharma Corridor member requirements, the execution of the corridor project was divided into 3 major workshops.

- Workshop 1: Establishing and validating a standard model and mapping protocol with the participating pharmaceutical shippers
- Workshop 2: Aligning all stakeholders in BRU airport with regards to project requirements
- Workshop 3: Aligning all stakeholders in HKG airport with regards to project requirement

We can conclude that the dashboard allows the user to visualize the internal handling Service Level Agreements (SLAs) of the operators in the Pharma Corridor and gives an indication on how the actual door-to-door performance is aligned with these SLAs and identified Key-Performance Indicators (KPIs).

This level of transparency of the entire pharmaceutical supply chain is unprecedented, giving an insight in the identification and performances of internal processes that very often remain hidden for pharmaceutical shippers.

The report summarizes the conclusions of the corridor mapping, the challenges faced and lessons learnt from each work package. An important recommendation for future corridor mappings is the need to focus on gathering all the data on the different KPIs and availability of sufficient thermo dollies.

The information obtained by this corridor mapping can be used to investigate and optimise the packaging of pharmaceutical shipments or to work with operators to optimise procedures in order to avoid potential temperature deviations. This study revealed the complexity of the supply chain, quantified the findings to profile the risk of a lane and underlined the importance to use thermo dolly both sides of a lane resulting in a measurable risk reduction when extending the predefined handling time KPIs. None of the shipments over the corridor lead to product loss as no significant temperature incidents were reported.

Based on these conclusion, it can be affirmed that the airport-to-airport Pharma Corridor model indeed gives the quality assurance that prevents pharma product loss and undesirable temperature excursion. This project invites for more corridor mappings so as to provide pharma shippers with more quality lane solutions and to have access to more in-depth analyses on the different KPIs.

2. Project charter and participation note

In December 2018, Pharma.Aero launched the project charter of Airport-to-Airport Pharma Corridor Project scope & goal.

2.1 Project leads and participants

Project leads

The standard model and mapping protocol was established and validated by Pfizer, MSD and Johnson & Johnson.

BAC and HKIA, Pfizer and MSD played a key role in the selection of the prototype lane and identification of the key players on the lane.

External consultant Geert Leroy was appointed as project manager with the assistance of Marie Bouillaud as project coordinator.

The authors of the technical report are:

Brussels Airport Company: Nathan De Valck

External consultants: Geert Leroy, Marie Bouillaud

Hong Kong International Airport: Ian Kwok, Queenie Yip, Caroline Cheung

Pharma.Aero: Frank Van Gelder

Pfizer: Eddy Weygaerts

Airport-to-Airport Group members	
Company	**Category**
Brussels Airport Company	Project lead, Airport
Hong Kong International Airport	Project lead, Airport
MSD	Pharma Shipper
Johnson & Johnson	Pharma Shipper
Pfizer	Project Co-sponsor, Pharma Shipper
Corridor operators	
Company	**Category**
Cathay Pacific	Airline
Swissport	Transport Handler at Brussels Airport
World Freight Services	Warehouse Handler at Brussels Airport
Cathay Pacific Services Limited	Cargo Terminal Operator at Hong Kong Airport
Hong Kong Airport Services Ltd	Ramp Handler at Hong Kong Airport
Brinks	Operator of thermo dolly at Brussels Airport

Table 1: Project participants

A special thanks to the following people actively involved in the project (in alphabetical order):

Brussels Airport Company: Nathan De Valck

Cathay Pacific Cargo Team

External consultants: Geert Leroy, Marie Bouillaud

Hong Kong International Airport: Ian Kwok, Queenie Yip, Caroline Cheung

Pharma.Aero: Frank Van Gelder

Pfizer: Eddy Weygaerts and Yvan Lauwers

MSD: Debby Mattys and Axel Hartmann

Johnson & Johnson: Pieter Doms and Ronny Litsenborgh

2.2 Mapping road-map and protocol

The mapping model or road-map is providing a clear model of all requirements and Key Performance Indicators identified to monitor a corridor from a defined origin airport to a defined destination airport.

1. Product temperature excursions throughout the whole journey
- Temperature graphs to be provided by shippers after delivery at final destination
2. Documentation
- Number of correct instructions
- Number of variations between AWB and shippers instruction
- Number of Missing IATA Time & Temperature label on products
- Number of variations between temperature on IATA label and AWB
- Number of incomplete acceptance checklists
- Number of missing documentations
3. Delays
- Number of Late delivery to Ground handler
- Number of Delays due to X Ray Congestion
- Number of variations in internal transport from acceptance to cold room, cold room to build-up, build-up to handover to ramp handler
- Number of variations for tarmac transportation compared to the pre-defined time frames
- Number of variations in build-up, break-down compared to the pre-defined time frames
- Number of variations in loading/unloading of A/C compared to the pre-defined time frames
- Number of variations on On-time departure of A/C
- Number of variations on On-time in Full shipments
- Number of Offloads
4.Quality
- Number of non-compliances related to Integrity of the shipment
- Number of damages
- Number of variations in Sealing of delivery truck upon arrival at ground handler at origin
5. Equipment
- Is a thermo dolly used or not
- Minimum and maximum temperatures during tarmac transport
- Cold rooms : temperature graph to be provided by ground handlers
- Number of excursions compared to the relevant temperature of the cold rooms and thermo dollies
- Temperature mapping and calibration reports of the cold rooms and thermo dollies

2.3 Pilot corridor definitions

Prerequisites for the corridor project members

The following prerequisites required from members forming the corridor for the pilot project were set and define the correct definition of a Pharma Corridor :

- Participating cargo handling communities must be CEIV certified
- Participating airlines between the airports must be CEIV certified and offer PIL services
- Participating Cargo Terminal Operators (ground-handlers / ramp-handlers) must be CEIV certified and provide temperature controlled temporary storage
- Participating ramp-handlers must be CEIV certified and provide temperature controlled tarmac transportation

Lane identification

After alignment between all potential participants in this pilot project, the BRU – HKG Air trade lane was defined by the project team as one-way between BRU and HKG, consisting of direct shipments between BRU and HKG, as well as trans-shipments via HKG where only the leg BRU-HKG was considered in the monitoring dashboard.

The Pharma.Aero members active on the lane formed the Project Pilot Group members. All Pilot Group members actively contributed to the project by providing access to data.

Shipment identification

The trial shipments in this pilot corridor were identified as live shipments consisting of real consumer orders. Dummy-shipments were also considered but it was not feasible due to customs complications.

The minimum number of shipments was identified as 30 shipments for statistical data accuracy reasons, for this pilot corridor mapping project, 47 shipments in total were measured in 2019.

All goods were loaded onto a ULD (Unified Loading Device), and only one ULD can be loaded in a thermo dolly. As different dollies might show a variation in temperature, the project team decided to consider one ULD as one shipment to be monitored.

The participating pharma shippers recommended that trial shipments should consist of :

- Shipments within transportation temperature range 2 to 8°C
- Shipments within transportation temperature range 15 to 25°C
- Active controlled packaging material was identified as 1 per temperature range due to the low risk of temperature excursions
- Passive controlled packaging material for both temperature ranges
- Single cooled box

It was suggested to have a sufficient number of the different temperature ranges in order to evaluate the monitoring results.

2.4 Project structure

To examine the performance of the corridor, the corridor monitoring project was established and divided into 4 work packages, each focussing on a specific working area. The work packages were executed sequentially.

- **Work Package 1 - Pilot onboarding:** This phase focused on securing the buy-in from the pharma shipper and the different stakeholders in the BRU-HKG airport community
- **Work Package 2 – Project clarification**
  This phase was split in two separate workshops, one in each participating airport, with the aim to clarify all requirements and expectations related to the corridor project before starting with trial shipments
- **Work Package 3 – Monitoring of trial shipments**
  This phase included the development of the corridor monitoring dashboard, as well as the gathering of all data required for the mapping of the corridor and monitoring of the trial shipments
- **Work Package 4 – Evaluation of the monitoring**
  Once the trial shipments were finished, the project team evaluated the results of the KPI monitoring in the dashboard

3. Project Outcome

3.1 Key Performance Definitions

Key Outcome - Shippers

As the primary stakeholder, the **pharma shippers inputs** towards the project were key.

The shippers principal value driver is the **increased handling quality assurance and transparency** in the characteristics of the corridor. The dashboard allows the user to visualize the internal handling SLAs of the different stakeholders in the Pharma Corridor and gives an indication on how the actual door-to-door performance is aligned with these SLAs.

This level of transparency of the entire pharmaceutical supply chain is unprecedented, giving an insight in the internal processes that very often remain hidden for pharmaceutical shippers. The information obtained by this corridor mapping can be used to optimise the packaging of pharmaceutical shipments or to work with operators to optimise procedures in order to eliminate temperature deviations.

Pharma shippers typically **lack visibility** in the handling standards applied and the associated **risk of excursions**. So it is logical that any solution in these two areas is perceived as very valuable. The pharma shippers were directly involved in setting up the key performance indicators for a Pharma Corridor.

Financial impact is seen as a secondary business value driver for the pharma shippers. This financial impact includes the potential downgrading of the packaging material due to a secured and consistent temperature controlled shipping lane.

Key outcome - Stakeholders

All stakeholders in this corridor project are interested to increase the transparency of handling standards and to improve their ability to handle and grow the handling of high value temperature controlled pharma shipments. This will also provide the airports a competitive advantage in the long run.

In order to fulfill the expectations and requirements, all stakeholders are investing in quality certification, digital traceability, temperature controlled warehouses and equipment such as thermo dollies.

Corridor mapping road-map

One of the aims of this pilot project was to develop a road map with clear indication on how to perform a corridor mapping. During this pilot corridor project, the following handling characteristics were identified to be monitored and included in the road-map :

TEMPERATURE EXCURSIONS

Transportation temperature excursions
- Temperature measurements of cold rooms at origin / destination
- Temperature measurements of thermo dollies used at origin / destination
- Tarmac transportation time exceeding the pre-defined timings when no thermo dolly is used
- Build-up and break-down of ULDs in non-temperature controlled handling area exceeding the pre-defined timings
Product temperature excursions
- Temperature measurements provided by the pharma shipper upon arrival at final destination
Operational performance
- Result of the Acceptance of the goods at origin ground handler
- Transportation time from acceptance area to temperature controlled room
- Transportation time from temperature controlled room to ULD build-up area
- Actual time for build-up of ULD
- Transportation time after build-up to handover point to the ramp-handler
- Actual transportation time from handover point to ramp-handler to position of the aircraft
- Actual loading/unloading time of the aircraft
- Is a thermo dolly used for the origin / destination tarmac transportation time?
Documentation
- Correctness of the shipping instructions by the shipper (required transportation temperature – use of thermo dolly required or not)
- Correctness of AWB
Security
- Shipment integrity (use of sealed truck for delivery / potential theft or counterfeit)
Lead times
- Number of off-loads
- On time departure

Summary

We found strong alignment among all supply chain partners on the relevant business value drivers. They adhered to the SLA and KPI established during CEIV certification and hence affirming the quality assurance of the corridor model.

The consensus was that the monitoring dashboard provided :

- Transparency in the handling times defined by the origin and destination ground-handler
- Transparency in the tarmac transportation times defined by origin and destination ramp-handler
- Transparency in the capability of the airline to maintain the required transportation temperature
- Transparency in the performance of all stakeholders involved
- Enhanced knowledge of the build-up / break-down process of ULDs which is not performed in the required transportation temperature range, handling times are company specific and defined based on individual risk assessment
- Performance of the corridor members adhere to the CEIV certification

3.2 Development and implementation of monitoring dashboard

The preferred approach for this pilot project was a manual monitoring dashboard built with data recorded by the participating stakeholders along the supply chain. The different stakeholders in the pharma supply chain were asked to fill in their part of data on the different KPIs. Data were gathered retrospectively and updated in the dashboard. As one of the points of attention raised during this phase was the fact data were retrospectively and manually plotted into the dashboard.

3.3 Details of the data set

The analyses were performed (table 3) on a total of 47 shipments between Brussels and Hong Kong, a first leg of shipments with either final destination Nagoya or Sydney. In total 2 pharma shippers included shipments, which were booked by 2 freight forwarders, handled by four ground (ramp and warehouse) handlers, 1 thermo dolly operator and flown by 1 airline. Of the 47 shipments, 44 (93,6%) were in the tempertaure range 15-25 °C, and 3 (6,4%) were in the range 2-8°C.

Table 3: overall data

Overall data	
Stakeholder	n
Pharma Shippers	2
Airports	2
Handlers	4
Airlines	1
Freight Forwarders	2
Thermo Dolly Operator	1

Based on the different KPI data, the analytics were grouped according to the different sub-groups and stakeholders. No new KPIs were defined by the project members. Only existing KPIs and SLAs were implemented into the corridor monitoring.

3.4 Details of the controlled temperature

Table 4 shows the different storage room temperatures (average / min/ max and spreading of the data plots) including the coldroom at origin and destination and the thermo dolly temperatures. From the aircraft we could only refer to "ambient" settings of the cargo bay on board. This highlights the need to further development of specific temperature settings in aircrafts, of which reports and data could be shared in the full transparency of a corridor.

Table 4: Transport data

Transport temperature data (°C)	Average	Min	Max	+/-STDV
Temp Coldroom origin	19,6	18,5	21,4	+/- 0,8
Temp thermo dolly	17,8	14,4	24,1	+/- 2
Temp Cold room destination Lowest	18,2	16,9	20,2	+/- 0,9
Temp Cool room destination Highest	19,6	18	21,3	+/- 1,24

3.5 Details of KPI performance

Table 5 and 6 show all the data on the operational performances of the different stakeholders within the corridor. Table 5 highlights the frequencies and the percentage of performance match, while table 6 unveils the in-depth analyses of averages, minimum and maximum, and the spreading of the data by the standard deviations.

Table 5: Operational Performance data

Operational performance data	N frequency	Performance %
On-time delivery GHA origin	47	100
Intern transport (acceptance to build-up / or cold room) origine within 45 minutes	47	100
KPI Handover to ramp-handler within time frame 45 minutes	47	100
KPI uncontrolled temperature conditions during Tarmac Transport at origin within 30 minutes	47	100
KPI uncontrolled temperature conditions during Aircraft loading within 60 minutes	47	100
KPI Destination Aircraft unloading within 40 minutes	46	98
KPI Handover to destination GHA within 65 minutes (n=44)*	42	95
KPI internal transport from acceptance to storage within 60/150 minutes (n=44)*	42	95

Based on the definitions, times were calculated based on the defined KPIs.

*3 shipments are tarmac-transfer, hence n=44

Table 6: Operational analytical data

Operational performance data	Average	Min	Max	+/-STDV
KPI Handover to ramp-handler time analytics	17	14	45	+/-4,85
KPI Tarmac transport origine within 30 minutes time analytics	33,5	10	173	+/-39
KPI Aircraft loading within 60 minutes time analytics	61,7	34	98	+/- 21,65
KPI Destination Aircraft unloading within 40 minutes time analytics	28	19	42	+/- 7
KPI Handover to destination GHA time analytics (n=44)	53	33	63	+/- 8
KPI internal transport from acceptance to transport to break down cold room time analytics	61,29	3	136	+/- 42,53

3.6 Identification of temperature exposure risk

We also did a comparison between different KPIs in order to calculate the risk of shipments not being stored under temperature controlled conditions. These specific calculations underline the use of thermo dollies in case of no protection. In 42 of the 47 cases a thermo dolly was used on both sides of the lane, representing 89% of all shipments. In this scenario - where shipments are transported in a thermo dolly during the airside transport - the potential risk of temperature exposure outside of coldrooms on the airport was completely eliminated. For 5 shipments no thermo dolly was used at both sides of the supply chain. We defined 3 different analytics in order to calculate the exposure and the associated risk in case of no thermo dolly. Specifically 7 potential identified risk zones over the corridor were identified (Table 7):

1. The time between acceptance from the truck unloading at departure until storage in the cold room
2. The internal transport time at the warehouse handler
3. The total unprotected exposure time (1 + 2) at the warehouse handler = total time in unprotected temperature conditions
4. The time between leaving the cold room and aircraft loaded
5. Total potential Brussels exposure time (3+4) if no thermo dolly was used
6. Total potential Hong Kong exposure time if no thermo dolly was used (opening the cargo door at destination until stored in the cold room)
7. Total potential exposure time on tarmac over the corridor (4+6) if no thermo dolly was used

3.6.1 Scenario: no use of thermo dolly

In table 7, the analysis was specified, over the corridor in the scenario where a thermo dolly would not have been used. We calculated in minutes both sides the corridor the potential temperature exposure.

The risk calculation of a shipment being not in "protection" if no airside thermo dolly is used during a total transport of a pharma shipment shows that the average total time would be 175,19 minutes over the entire corridor with a minimum of 74 minutes and maximum 285 minutes.

Table 7: Analysis of temperature exposure risk: scenario "no Thermo dolly used"

Operational analytical data	Average	Min	Max	+/-STDV
1. The time between acceptance from the truck unloading at departure until storage in the cold room (min)	17	14	45	+/- 4,85
2. Internal transport time at warehouse handler (min)	28	17	48	+/- 3
3 Total unprotected exposure time at the warehouse handler (min) (1+2)	44,13	36	73	+/- 7,8
4. Time between leaving the cold room and aircraft loaded	69,77	32	145	+/- 21,8
5. Total potential Brussels Exposure time if no thermo dolly was used (min) (1+2+4)	119,3	59,2	171,4	+/- 34,9
6: Total potential Hong Kong exposure time if no thermo dolly was used: time between opening the aircraft door until stored in the cold room	61,29	6	108	+/- 42,53
7: Total potential exposure on tarmac over the corridor if no thermo dolly was used (min)	127,8	99,3	184,2	+/- 56,1

3.6.2 Scenario: systematic use of thermo dolly

In table 8, the analysis was specified, over the corridor in the scenario where a thermo dolly would systematically have been used. We calculated in minutes both sides the corridor the potential temperature exposure. In order to simulate this scenario we made the assumption that at destination the handling time for unloading the shipment from the thermo dolly, registration and storage in the cool room takes 30 minutes (corresponding to the internal SLA). The risk calculation of a shipment being not in "protection" if an airside thermo dolly is used systematically during a total transport of a pharma shipment shows that the average total time would be 74,13 minutes over the entire corridor.

Table 8: Analysis of temperature exposure risk: scenario "Thermo dolly used"

Operational analytical data	Average	Min	Max	+/-STDV
1. The time between acceptance from the truck unloading at departure until storage in the cold room (min)	17	14	45	+/- 4,85
2. Internal transport time at warehouse handler (min)	28	17	48	+/- 3
3 Total unprotected exposure time at the warehouse handler (min) (1+2)	44,13	36	73	+/- 7,8
6: Total potential Hong Kong exposure time if thermo dolly was used: time between unloading thermo dolly until stored in the cold room	30			
7: Total potential exposure on tarmac over the corridor (min)	74,13			

6.3.3 Comparing both scenarios

Comparing the scenario of systematic use of a thermo dolly against the scenario of no thermo dolly, we see a reduction of the potential risk from an average of 175,19 minutes to 74,13 minutes. This represents a reduction of the potential average risk with 101 minutes or 58%.

4. Conclusion and next steps

The overall conclusion of the pilot project underlines the handling quality delivered according to CEIV certification and the importance of constant monitoring of performances and measuring KPIs. The project group was able to identify weak links and defining the need for more detailed mapping and analyses of different data.

The overall conclusions identified are:

- Shipper could entrust the Pharma Corridor, consisting of CEIV certified operators, as a token of quality handling, providing assurance of high CEIV certified handling to their pharmaceuticals.
- Over all 47 shipments, no significant temperature excursions were registered, leading to no incidents or product loss.
- The airfreight life science logistics stay a complex supply chain, driven by the involvement of different profiles within the different stakeholder companies, as well as the different stakeholders involved as such. Monitoring performance data underlined the difficulties of gathering data along the supply chain. Hence the trustworthy corridor model will provide pharmaceuticals shippers with more ease in selecting lane solutions.
- To perform this exercise highlighted again the need for making the supply chain more transparant and sharing data on performance.
- The project opens the possibility to visualize the risk profile of lane, by quantifying conclusions through mapping and comparing data by putting them into certain relations. The results underlined the need for using protective measures, on those identified weak links in the chain. The fact thermo dollies could be available to bridge the average exposure of almost 3 hours over an entire lane in uncontrolled conditions, was identified during the project.
- The systematic use of thermo dollies at origin and destination has a big positive impact on reducing the potential exposure time to uncontrolled temperature and as such improves the reliability of performance of the Pharma Corridor. Over all 47 shipments, no significant temperature excursions were registered, leading to no incidents or product loss.
- The pilot project identified the challenges and lessons learnt to create and define a “Pharma Corridor”. It underlined the need for more corridors to be enrolled, in which data should be monitored through different tools like for instance the Global Pharma Tracker, through capability mapping of corridors and through packaging solution, all involved in follow-up corridor projects.
- The benefits of mapping a pilot corridor project increased the confidence by mapping all data over the corridor, identify the weakest links and analyse different data not fragmented but over the entire corridor. Certain potential risks could be quantified through combining different measured and mapped data.

4.1 Challenges encountered in mapping a corridor

After defining and establishment of the Pharma Corridor, the corridor monitoring project took longer than initially planned, due to various circumstances such as :

- Shipper's migration to a new freight forwarder during start-up phase
- Shipper had to re-route shipments (via BRU and HKG) instead of another airport
- Lower frequency of "life shipments" since these are depending on real commercial orders
- Unclear communication lines
- Struggle to gather all the required data for the monitoring of the corridor
- Availability of sufficient thermo dollies at both origin/ destination airport
- Data transparency and availability are in contrast with the CEIV principles

4.2 Recommendations for future corridor monitoring projects

Stakeholders

All stakeholders need to be involved and need to be aligned before starting the trial shipments. The role of the freight forwarder is essential in transferring transportation requirements.

A clear communication matrix and direct communication lines between project management and all involved stakeholders is recommended for all future corridor projects.

Verify whether all stakeholders have sufficient knowledge and/or are trained in the handling of temperature controlled pharma shipments.

Equipment

Verify if all equipment, such as thermo dollies and cool rooms are properly temperature mapped and sensors are calibrated.

With regards to the aircraft used, it is recommended to have more in-depth knowledge of the temperature range capabilities of the aircraft.

Handling

It is recommended to include before start-up the handling times and Key Performance Indicators internally defined by each stakeholder separately.

Data sharing

Verify to what extent the stakeholders comply with the CEIV principles with regards to data transparency.

Additional General recommendation

For future corridor monitoring projects, it is recommended to:

- Although all our shipments had access to the use of thermo dollies, we realize that not all airports are equipped today. It is not a mandatory equipment under CEIV but we make "temperature controlled tarmac transportation" as a recommendation.
- Shipper to provide the indication on trial volume and expected time to complete as the project leads may not realise the shipping pattern of each participating shipper, hence making it hard to close the trial
- A regular review between Project Manager and shipper. Also keep the project leads updated
- Clear understanding of all pre-defined process KPIs applied by the operators by using the checklist in addendum prior to start performing test shipments
- Better alignment between all stakeholders on the whole process of trial shipments
- Analyse historical data to get knowledge on the number and type of shipments passing through the corridor and evaluate option to use dummy shipments if the number of live shipments is too limited during the duration of the monitoring

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