



**Safecube**  
SAFE ROUTES, SAFE GOODS, SAFE ENVIRONMENT

## **General presentation**

October 9th 2019

# We are Safecube!



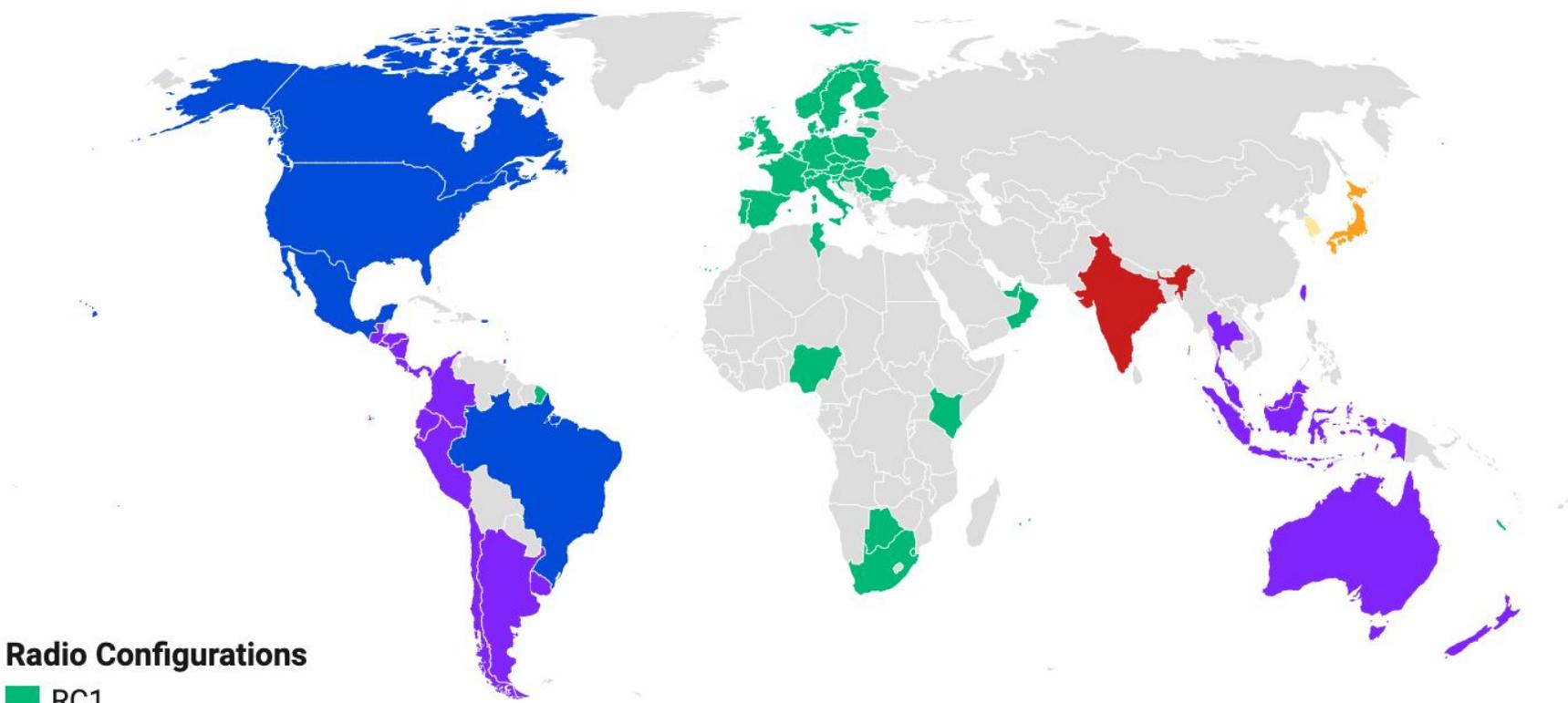
- 1 An affordable and agnostic tracking solution available across more than 70 countries
- 2 Empowering industry-leading companies around the world to connect their supply chain and improve their operational excellence with quick ROI opportunities
- 3 Strong partnership ecosystem with leading companies in Supply Chain and connectivity

ARGON  
CONSULTING



# **Monarch introduction**

# Sigfox Geographical availability



### Radio Configurations

- RC1
- RC2
- RC3
- RC4
- RC5
- RC6

# RC technical details

Sigfox Radio Configuration (RC) defines the radio parameters in which the device shall operate: Sigfox operating frequencies, output power, spectrum access mechanism, throughput, coexistence with other radio technologies, etc.

Each radio configuration includes 4 uplink classes: 0u, 1u, 2u, and 3u.

The Sigfox network globally works within the ranges from 862 to 928 MHz. But not all RCs require such a wide range of operation.

	RC1	RC2	RC3	RC4	RC5	RC6
<b>Uplink center frequency (MHz)</b>	868.130	902.200	923.200	920.800	923.300	865.200
<b>Downlink center frequency (MHz)</b>	869.525	905.200	922.200	922.300	922.300	866,300
<b>Uplink data rate (bit/s)</b>	100	600	100	600	100	100
<b>Downlink data rate (bit/s)</b>	600	600	600	600	600	600
<b>Sigfox recommended EIRP (dBm)</b>	16	24	16	24	14	16
<b>Specifics</b>	Duty cycle 1% *	Frequency hopping **	Listen Before Talk ***	Frequency hopping **	Listen Before Talk ***	

# Why Monarch?

## Enable 2 families of IoT use cases:



Provide seamless worldwide mobility to IoT objects to enable global applications with the respect of local telecommunication standards.



Allow single HW variant for different regions across the world, with simple software customization mechanisms... to benefit from major economy of scale for device makers.

# Monarch - Tech overview



After landing

2

A BS emits a beacon corresponding to its RC



Base stations



Multi-zone HW device with Monarch capabilities

1

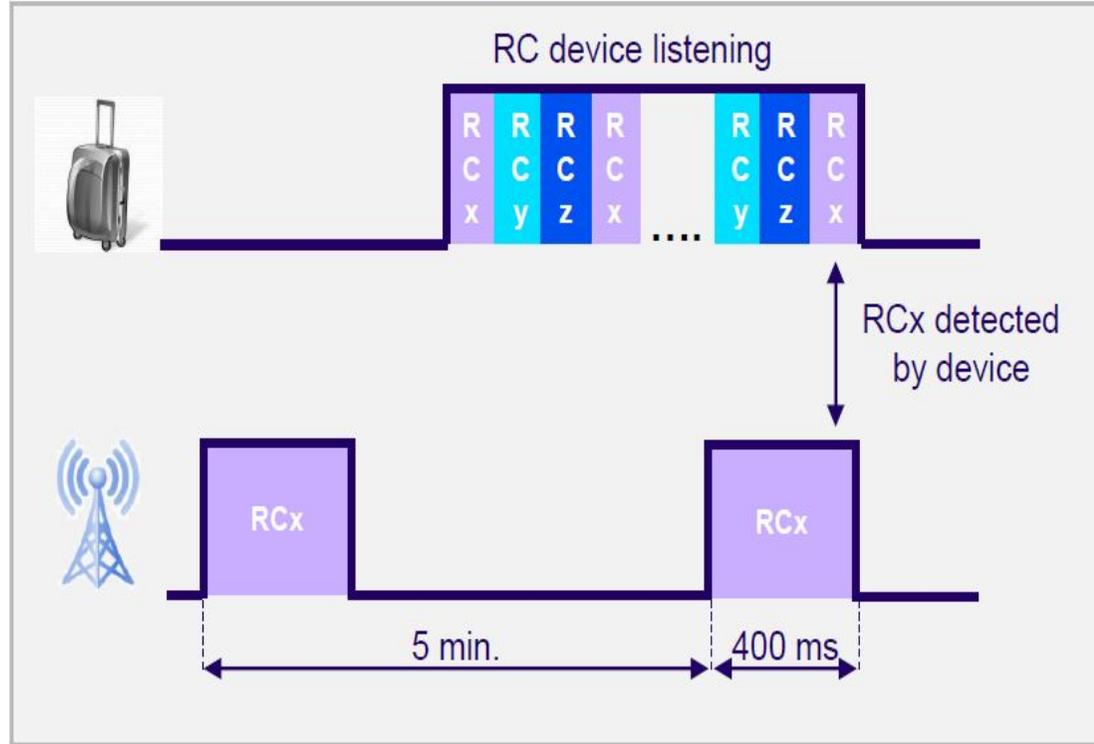
Device starts to listen successively on different frequencies

3

Device detects the beacon and the corresponding RC

4

Device starts to communicate

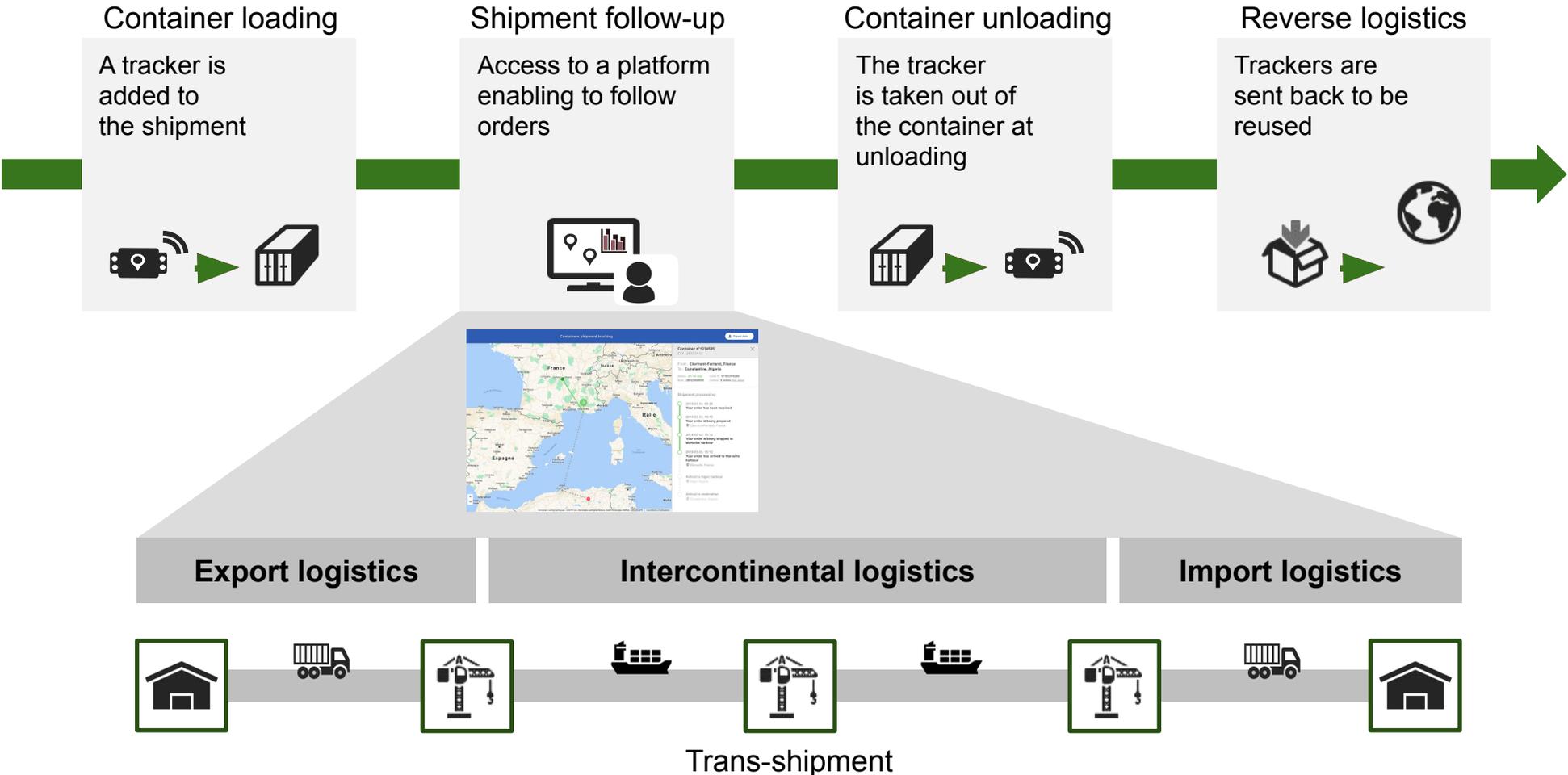


- Device application decides whenever to listen to beacons.
- Beacon frequency period set to 5 minutes today on activated outdoor base stations.

**The solution**

# An innovative IoT container tracking solution

We developed an cutting-edge IoT container tracking solution which provides reliable location and condition monitoring data (real-time and end-to-end)



# Key features of the platform

## 1 Real Time Event

- Unloading from vessel, departure from port, transshipment...)
- Global view on all in-transit shipments with possibility to focus

## 2 End to End

- From container loading to container opening
- In-transit tracking in complex multi-modal transportation

## 3 Goods oriented

- Follow-up based on carried merchandize thanks to pairing between trackers and containers

## 4 Prediction and Alerting

- Early / delays including missed ships and route deviation
- Pro-active shipments events alerts
- Sleeping containers

## 5 Route Optimization

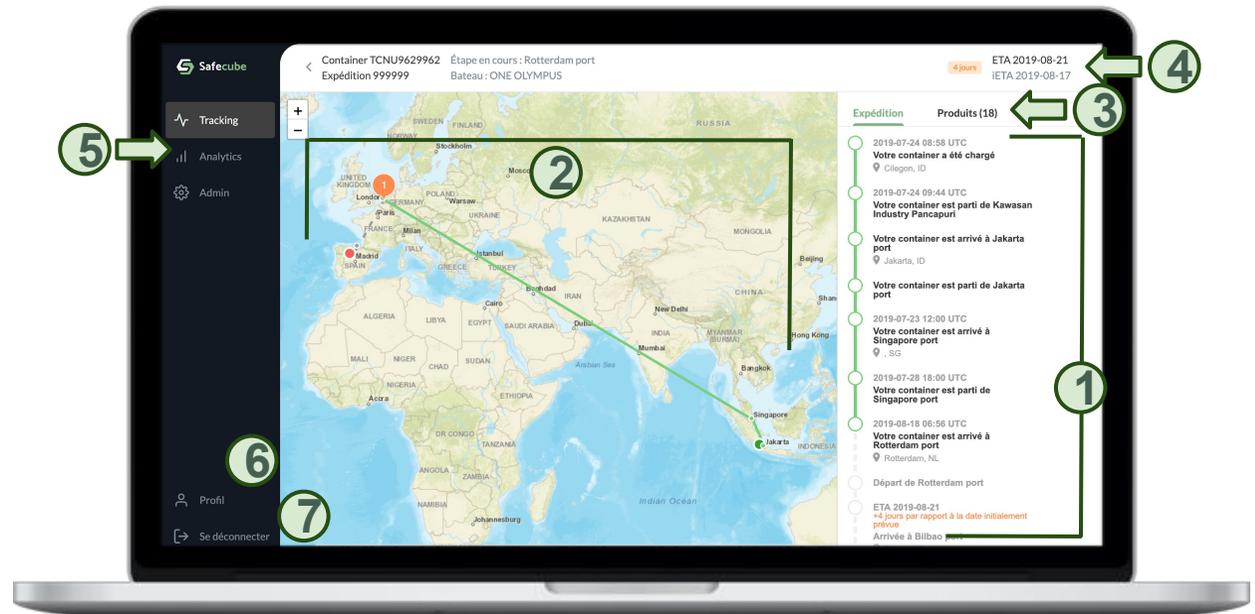
- Detailed analyses of lead-times per route and shipping lines

## 6 Condition monitoring

- Temperature, shocks
- Unexpected opening of the container

## 7 Secured access

- Possibility to give access to all or part of the functionalities for specified flow to internal and external clients



# Our solution offers several opportunities to reduce cost, inventory and exposure in a VUCA environment

- 1** Reduced in-transit lead time and inventory



Several days reduction by using real-time data to speed-up operations at the port of arrival
- 2** Reduced demurrage fees and detention costs



By having real time information on unloading activities and alerts on sleeping containers, reduce drastically your demurrage fees and detention costs
- 3** Alerts in the event of delay or depending on transport conditions



Priority management of critical shipments with real time and customized alerts  
Exception management on transport conditions changes (temperature, humidity, shocks)
- 4** Visibility for customers



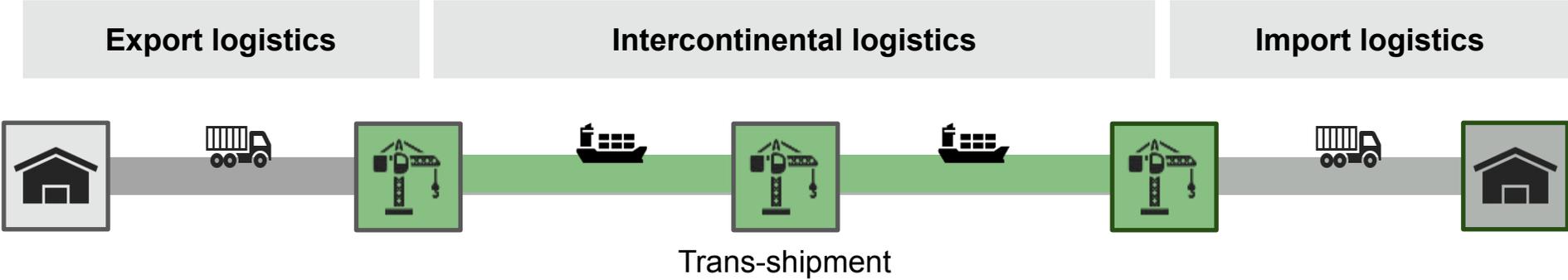
As a new value for end customer
- 5** Routes optimisation



Based on the accumulation of detailed tracking data across a large number of shipments

# **Michelin use cases**

# Use Case Michelin: route optimization from Antwerp to Chicago



*Roll out of Safecube solutions for shipments transiting by Chicago (more than 500 containers per month)*



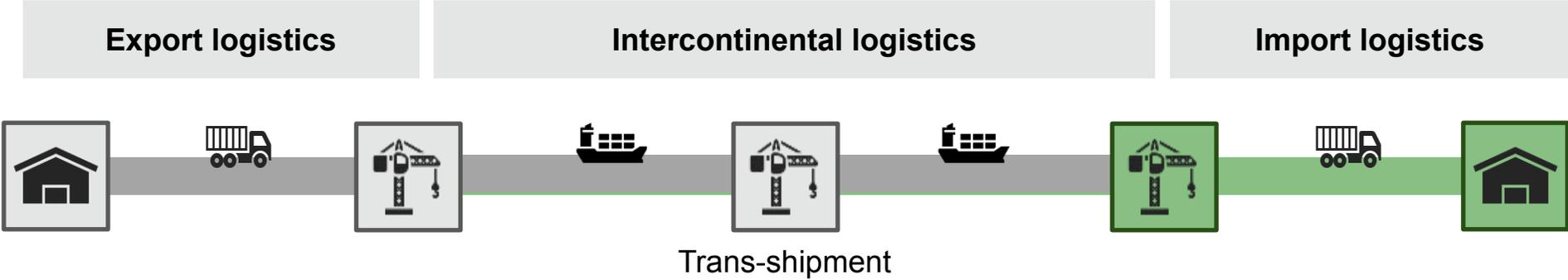
*Identification of an additional stop in New York between the trans-shipment in Norfolk and the final destination*



*Redesign of intermodal route with container unloading and New York and rail transit from New York to Chicago*

**Reduction of 4 days of in transit inventory, representing more than \$2.4M of CAPEX**

# Use Case Michelin: Terminal choice in Chicago train station



*Roll out of Safecube solutions for shipments transiting by Chicago (more than 500 containers per month)*



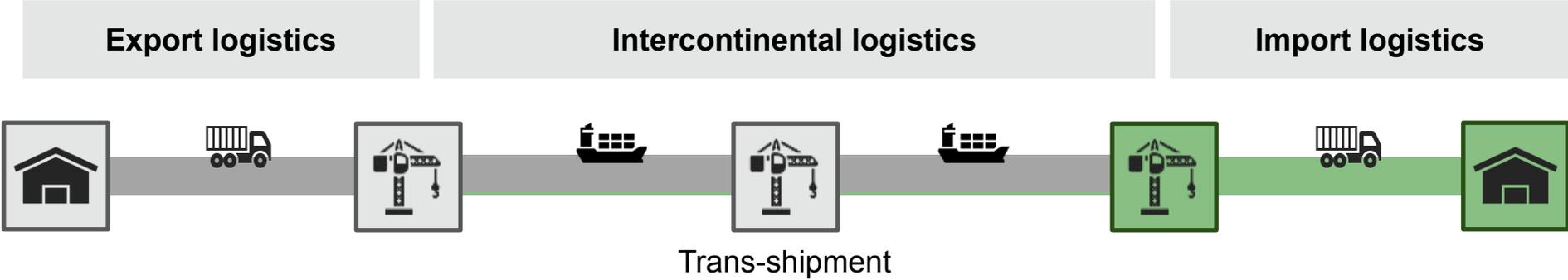
*Identification of 1 terminal performing better than the other with an ATA in average 1 day before*



*Renegotiation with the shipping line - for the same price - of terminal selection in Chicago*

**Reduction of 1 day of in transit inventory, representing more than \$600k of CAPEX**

# Use Case Michelin: Import operations optimization from Chicago



*Roll out of Safecube solutions for shipments transiting by Chicago (more than 500 containers per month)*



*ATA in Chicago port received in average 1 day before*



*Better synchronization for the last truck leg*

**Reduction of 1 day of in transit inventory, representing more than \$600k of CAPEX**

# **Annex**

## Monarch - How?

- The hard way: pass Sigfox Verified certification to integrate low level drivers on transceiver...BUT pricey & complex
- The easy way: Monarch-compatible modules

**LITEON**



**JORJIN**  
TECHNOLOGIES



**muRata**

# UnaMKR - Monarch for developers

- Arduino shield based on LiteOn module (Sigfox monarch + BLE)
- Multiple sensors: temp, humidity, pressure, accelero, magnet, light, air quality
- Different modes: AT commands, Arduino shield, standalone with STMicromicro SDK (soon)

