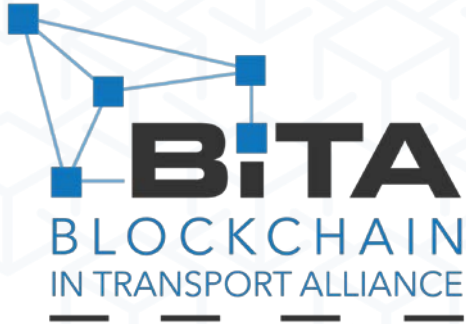# Digitization of
Freight and Transport

BITA.STUDIO

Digitization

To drive the industry forward, BiTA is committed to the digitization of analog and legacy data. Through the process of digitization, industry-wide benefits are created.
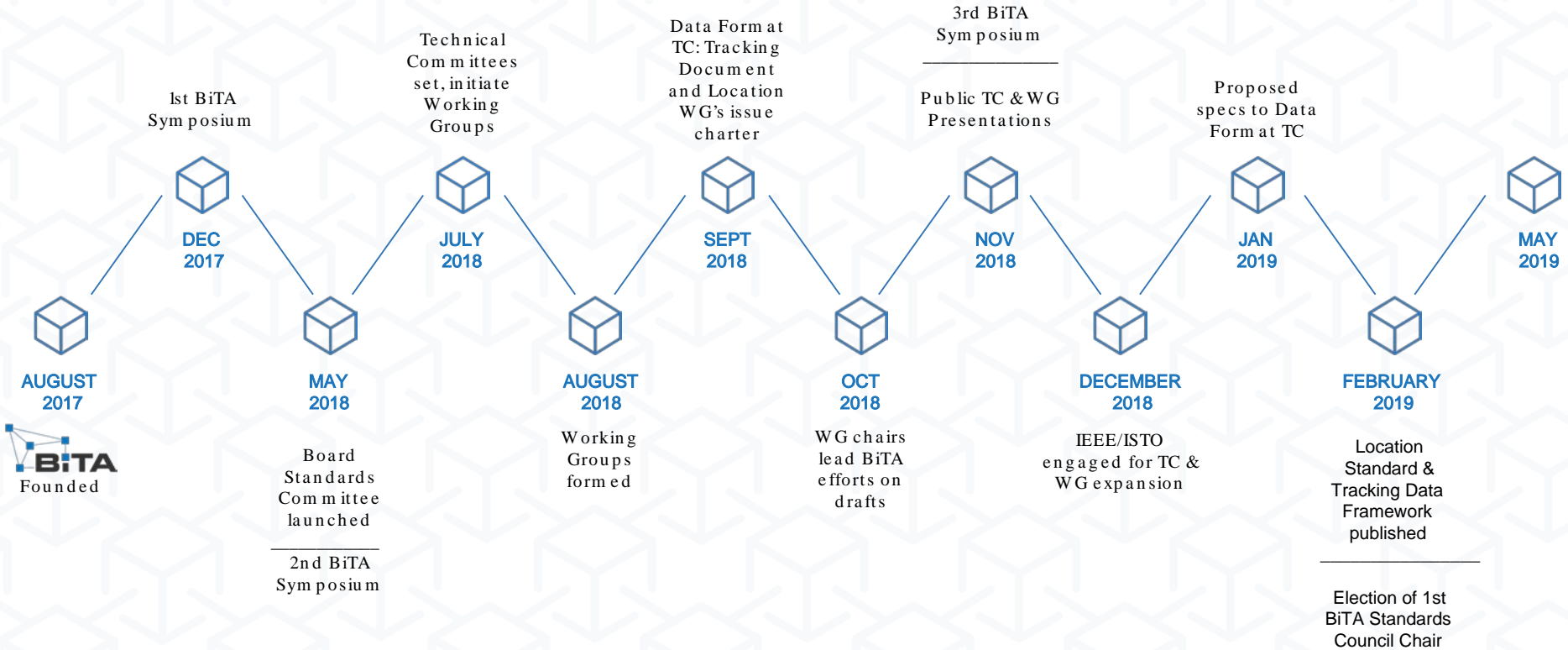
Purpose

Leveraging talent and resources from the world's most influential companies, BiTA is producing open source and royalty free data standards that will allow for interoperability between participants in the global supply chain.

We're a member-driven community focused on education, evangelism, networking and commercial outcomes around blockchain and other emerging technologies, and we're committed to overcoming geographic, language, and cultural hurdles to solve for seamless commerce.

The BiTA Community

BiTA Timeline

1st BiTA
Symposium

**DEC
2017**

Technical
Committees
set, initiate
Working
Groups

**JULY
2018**

Data Format
TC: Tracking
Document
and Location
WG's issue
charter

**SEPT
2018**

3rd BiTA
Symposium
_____

Public TC & WG
Presentations

**NOV
2018**

Proposed
specs to Data
Format TC

**JAN
2019**

**MAY
2019**

**AUGUST
2017**

BiTA
Founded

**MAY
2018**

Board
Standards
Committee
launched
_____

2nd BiTA
Symposium

**AUGUST
2018**

Working
Groups
formed

**OCT
2018**

WG chairs
lead BiTA
efforts on
drafts

**DECEMBER
2018**

IEEE/ISTO
engaged for TC &
WG expansion

**FEBRUARY
2019**

Location
Standard &
Tracking Data
Framework
published
_____

Election of 1st
BiTA Standards
Council Chair

BiTA Timeline

BiTA Spring Symposium

Patrick Duffy announced President of BiTA

Summer 2019

First use of Location Standard in real world product

Party component specification sent to TC for review.

BiTA Timeline

BiTA Style
Guide
Created

Party
Specification
Draft Spec
Under Review

**Fall
2019**

BSC
Strategy
Session
Vision |
Mission |
Core Values

BiTA
Spring
Symposium
Nov 14
Chicago

BiTA Forecast

2019 — 2020 — 2021 — 2022 — 2023 — 2024 — 2025 — 2026 & Beyond

EDUCATION, CASE STUDIES, & EARLY ADOPTION

Industry -wide education on use cases outside of cryptocurrency.

Develop industry   -wide standards and apply to case studies.

Early adoption within innovative startups and pilot programs at large corporations with extensive resources (i.e., BP, Daimler, and Salesforce).

Regulatory authorities develop auditing and compliance practices.

GROWTH

Early adopters and standards activity provide greater clarity and minimize uncertainty, driving widespread adoption.

MATURITY

Blockchain is widely adopted and considered an integral part of the supply chain ecosystem.

Disruptive Impact
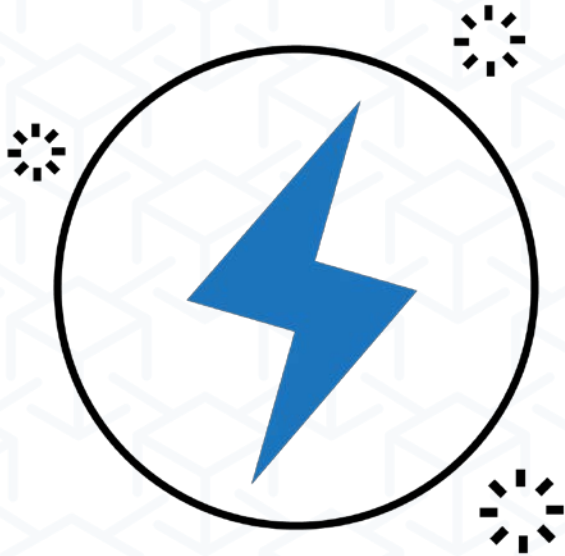
As blockchain digitizes, decentralizes, secures and incentivizes the validation of transactions, it will fundamentally change the industry.

Despite its initial reluctance, the transportation industry anticipates a widespread embrace of blockchain technology by 2020

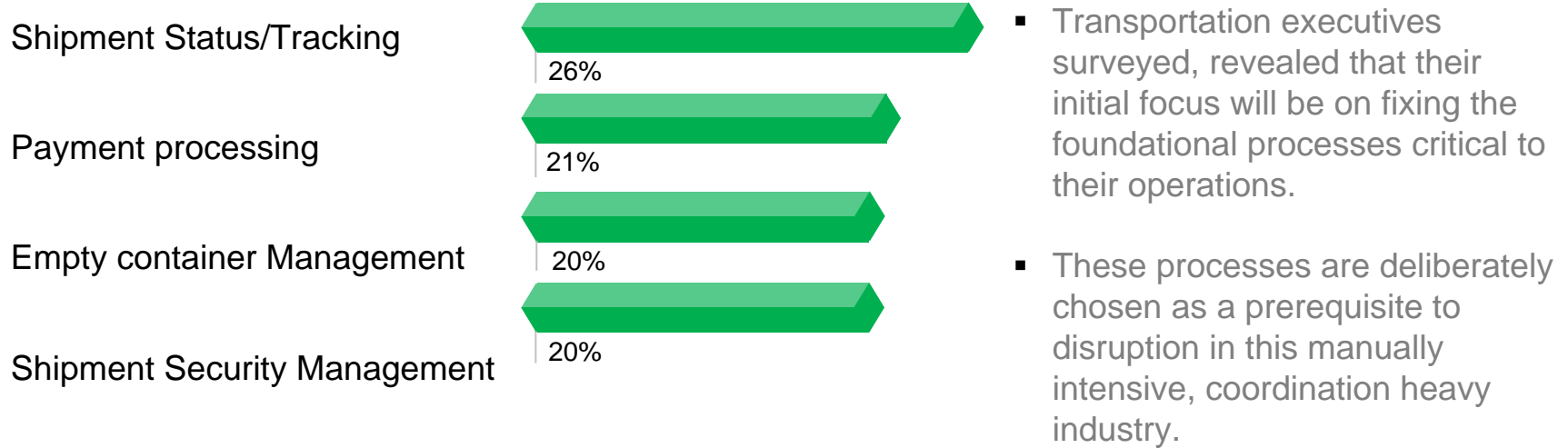## First wave industries vs. Transportation blockchain adoption

70%

Mass adopters
53%

Followers
32%

Trailblazers
15%

23%

7%

2017   2018   2019   2020   2021
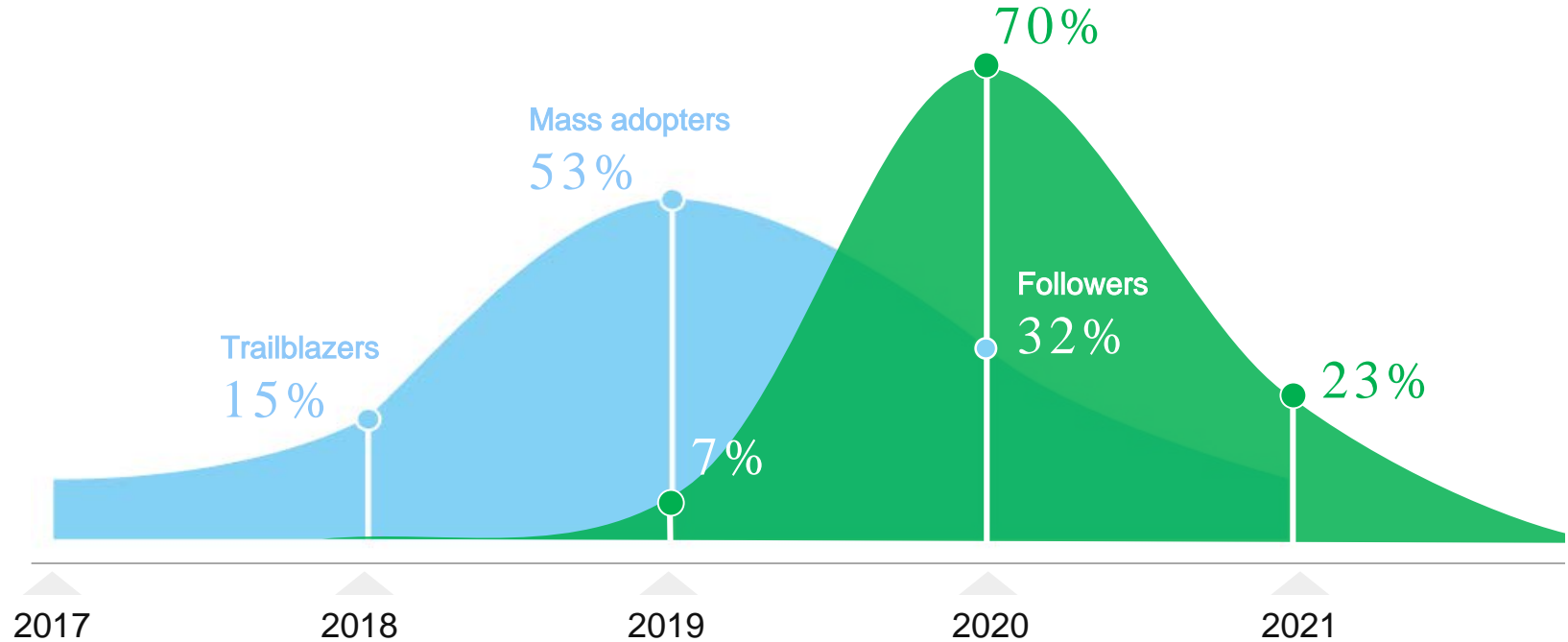
● First wave industries   ● Transportation industry

Transportation executives' initial investments in blockchain are focused on improving existing operational processes
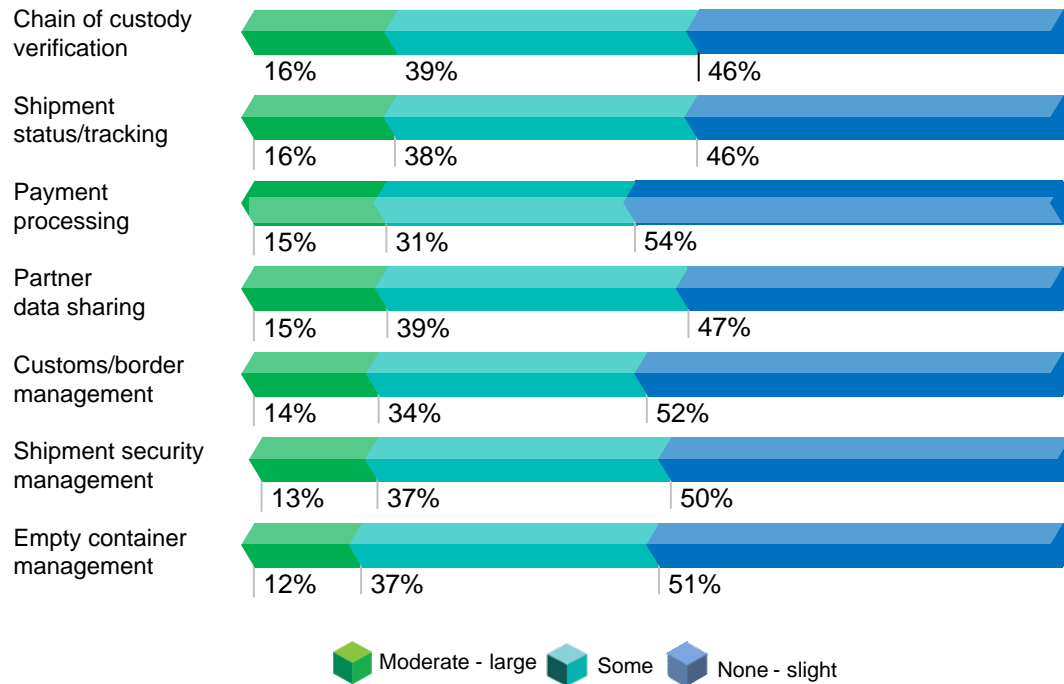
Top 2017 blockchain investment areas – all transportation firms

Shipment Status/Tracking

26%

Payment processing

21%

Empty container Management

20%

Shipment Security Management

20%

- Transportation executives surveyed, revealed that their initial focus will be on fixing the foundational processes critical to their operations.

- These processes are deliberately chosen as a prerequisite to disruption in this manually intensive, coordination heavy industry.
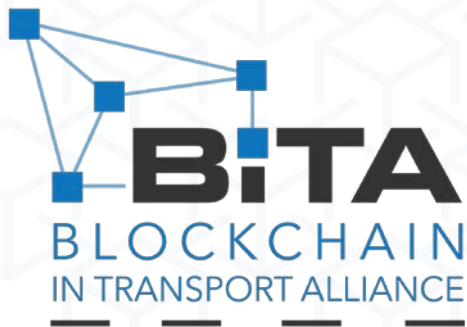
But executives also believe that blockchain disruption opportunities exist
across several areas of the transportation value chain

Anticipated disruption across all transportation organizations

Chain of custody verification
16%   39%   46%

Shipment status/tracking
16%   38%   46%

Payment processing
15%   31%   54%

Partner data sharing
15%   39%   47%

Customs/border management
14%   34%   52%

Shipment security management
13%   37%   50%

Empty container management
12%   37%   51%

Moderate - large   Some   None - slight

* Percentages may add up to over 100% due to rounding
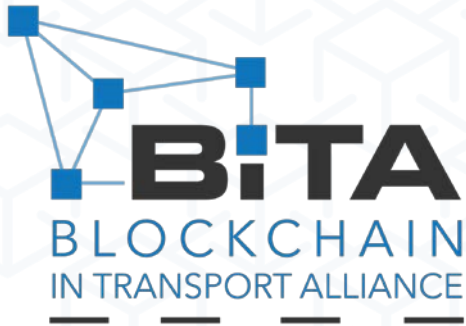
BiTA Standards Council (BSC)

Vision: Provide the open -source standards powering blockchain-enabled global commerce.

Mission: AS a global community, we produce, publish, and certify BSC standards.

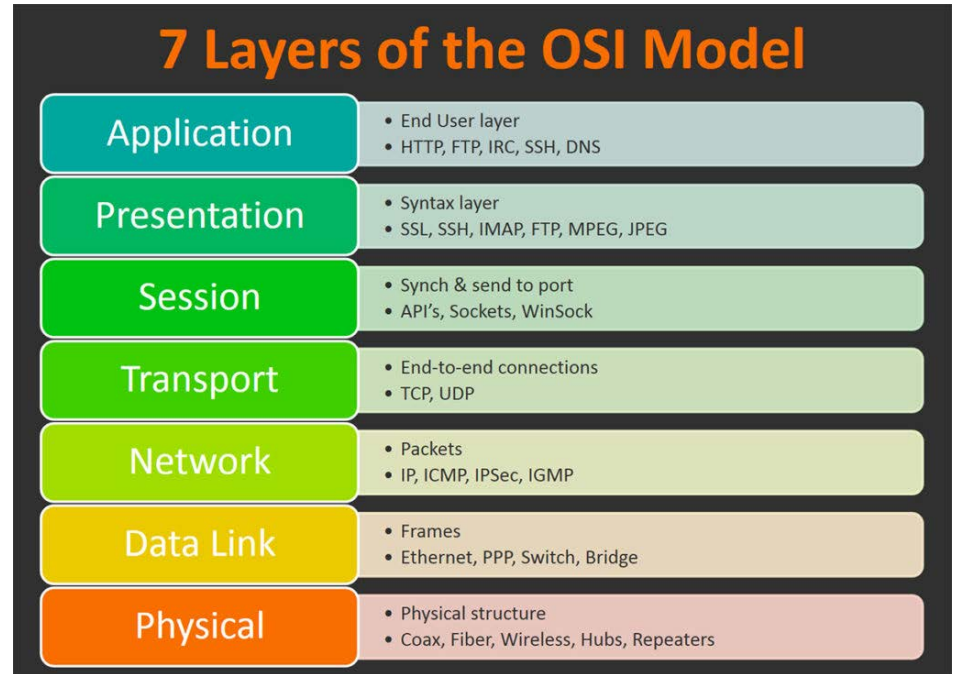Core Values: Trust | Inclusion | Transparency

BSC Working Groups

- Location Specification Working Group (Published and Paused)
- Tracking Documentation Working Group (Published and Paused)
- Party Specification Working Group
- Shipment Specification Working Group
- Bill of Lading Specification Working Group
- Standards Review Working Group
- Smart Contracts Working Group (Q120)
- Equipment Working Group (Q120)
- Commodities Working Group (Q120)

Foundation Profile – Layered Model

Layer	Foundation Profile
Physical	**ShipUnit, HandlingUnit,** Conveyor
Data link	**TrackableEntity**, **TrackableEvent**, Link
Network	**Location, Position, Address,** Lane, Route
Transport	Trip, Service Offers
Session	**Party**, ShipOrder, ScheduledOrder, Rates
Presentation	**BOL**, BUBBA/EMIT
Application	Traceability, Chain of Custody

7 Layers of the OSI Model

Layer	Description
Application	• End User layer • HTTP, FTP, IRC, SSH, DNS
Presentation	• Syntax layer • SSL, SSH, IMAP, FTP, MPEG, JPEG
Session	• Synch & send to port • API's, Sockets, WinSock
Transport	• End-to-end connections • TCP, UDP
Network	• Packets • IP, ICMP, IPSec, IGMP
Data Link	• Frames • Ethernet, PPP, Switch, Bridge
Physical	• Physical structure • Coax, Fiber, Wireless, Hubs, Repeaters

Source: Ben Kothari, Ampliflex

Tracking Foundation Profile

Source: Ben Kothari, Ampliflex
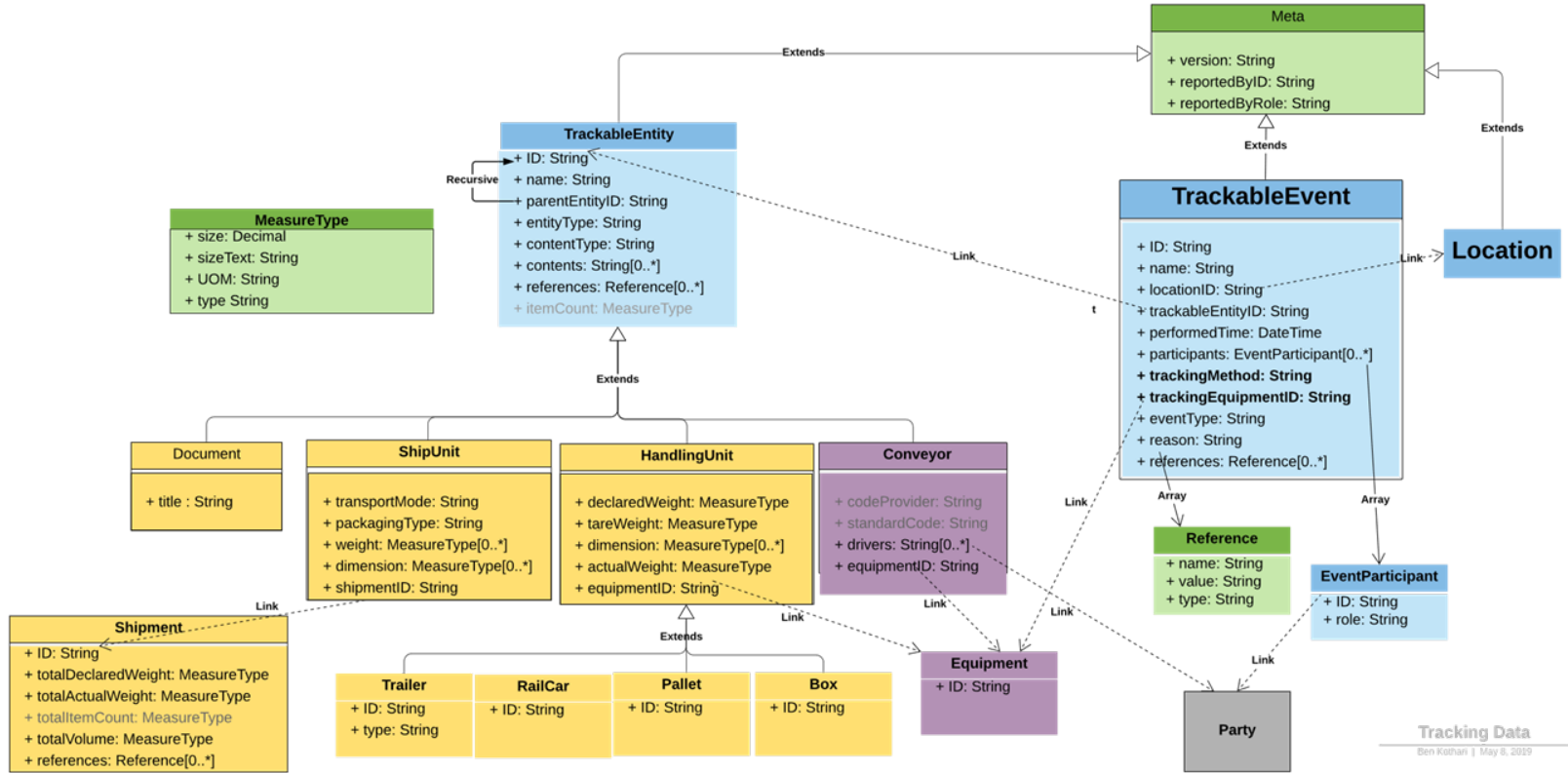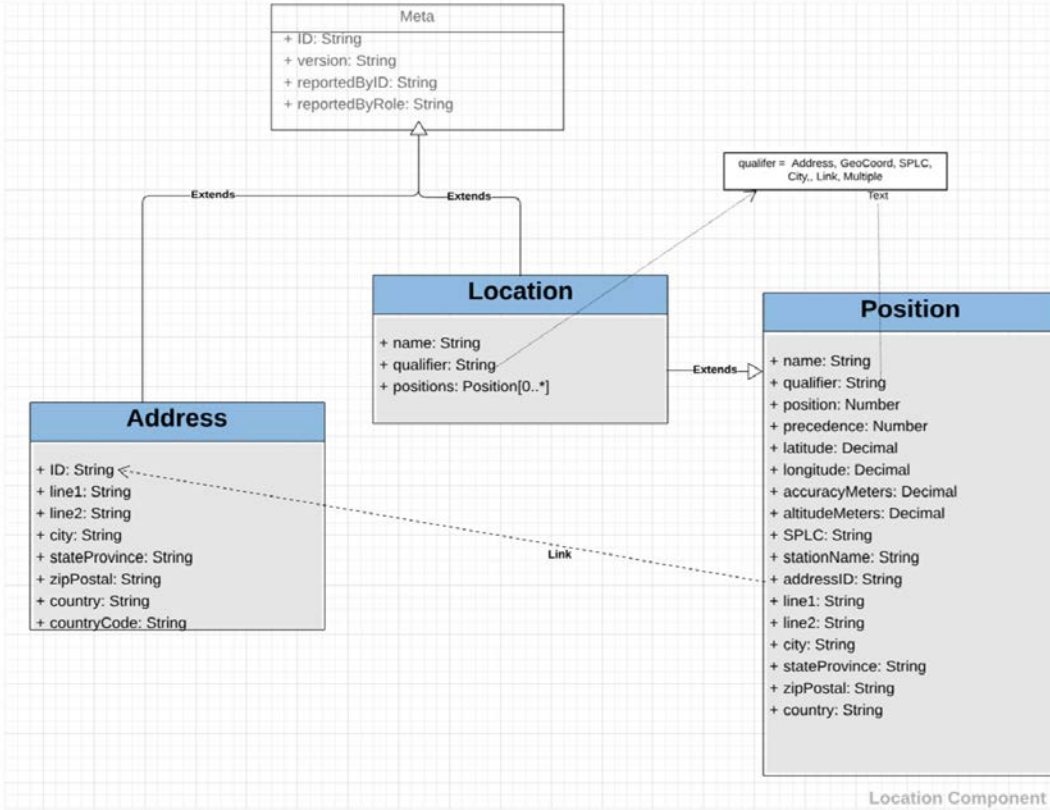
# Location


```
location = {
    "ID" : "1234",
    "name": "SERVPROV-5_413-426",
    "qualifier" : "Mulitple",

    "positions": [ // positions array begin
        {
            "position": 1,
            "qualifier" : "Address",
            "Address1" : "10 Alpine Dr",
            "Address2" : "",
            "City" : "Closter",
            "stateProvince" : "NJ",
            "zipPostal" : "07627",
            "country" : "USA"
        },
        {
            "position": 2,
            "qualifier" : "GeoCoord",
            "lattitude": 40.03657,
            "longitude": -75.38013,
            "accuracyMeters": 10,
            "altitudeMeters": 5
        },
        {
            "position": 3,
            "qualifier" : "SPLC",
            "SPLC": "NYK",
            "stationName": "Newark"
        },
        {
            "position": 4,
            "qualifier": "City",
            "City": "Closter",
            "stateProvince" : "NJ",
            "country": "USA"
        },
        {
            "position": 5,
            "qualifier": "Link",
            "addressID":  8907  // link to address shown below
        }
    ] // positions array end
} // location end
```
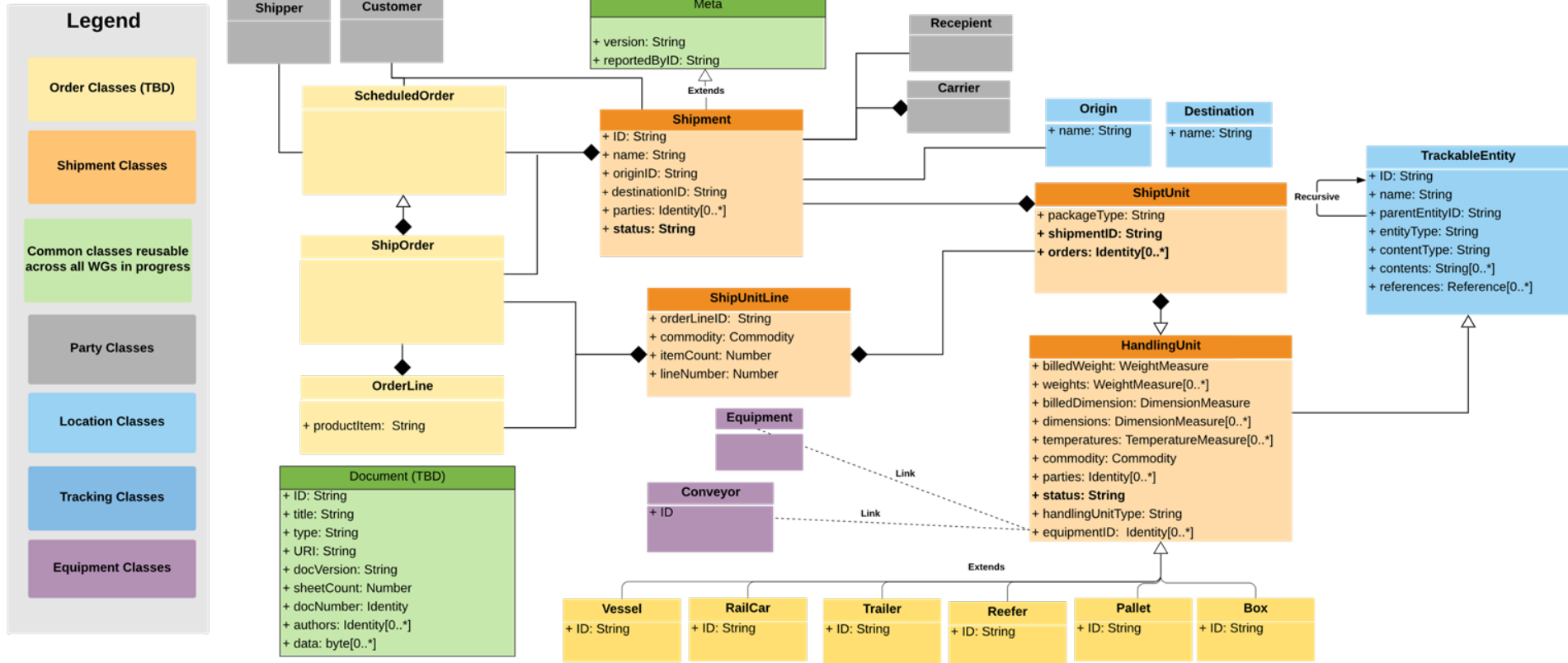
Source: Ben Kothari, Ampliflex

Shipment Example

Passive vehicle resources which are responsible for bearing or storing the load of ShipUnits are collectively referred to as HandlingUnit (HU). HandlingUnit is a recursive/hierarchical representation; Each HU may be tracked separately, or an HU group may contain multiple HUs which may be tracked together as a single entity.

A Shipment is Goods or Products that may be transported under the terms of an Agreement (TBD) authorized by two or more Parties. As a grouping of Ship Units, the shipment is moved at the same time and transported by means of a transportation service offered by the Carrier or any Transportation Service Provider (Party) and requested by the Shipper (Party) who is at one Origin (Location) to one Recipient (Party) who is at one Destination (Location), and with respect to the total number of Ship Units and their respective piece counts, total weight, total cube, pallet counts etc. A shipment is also uniquely identified from among a set of Shipments at any given time, but tracking occurs at the individual Ship Unit level.

Source: Ben Kothari, Ampliflex
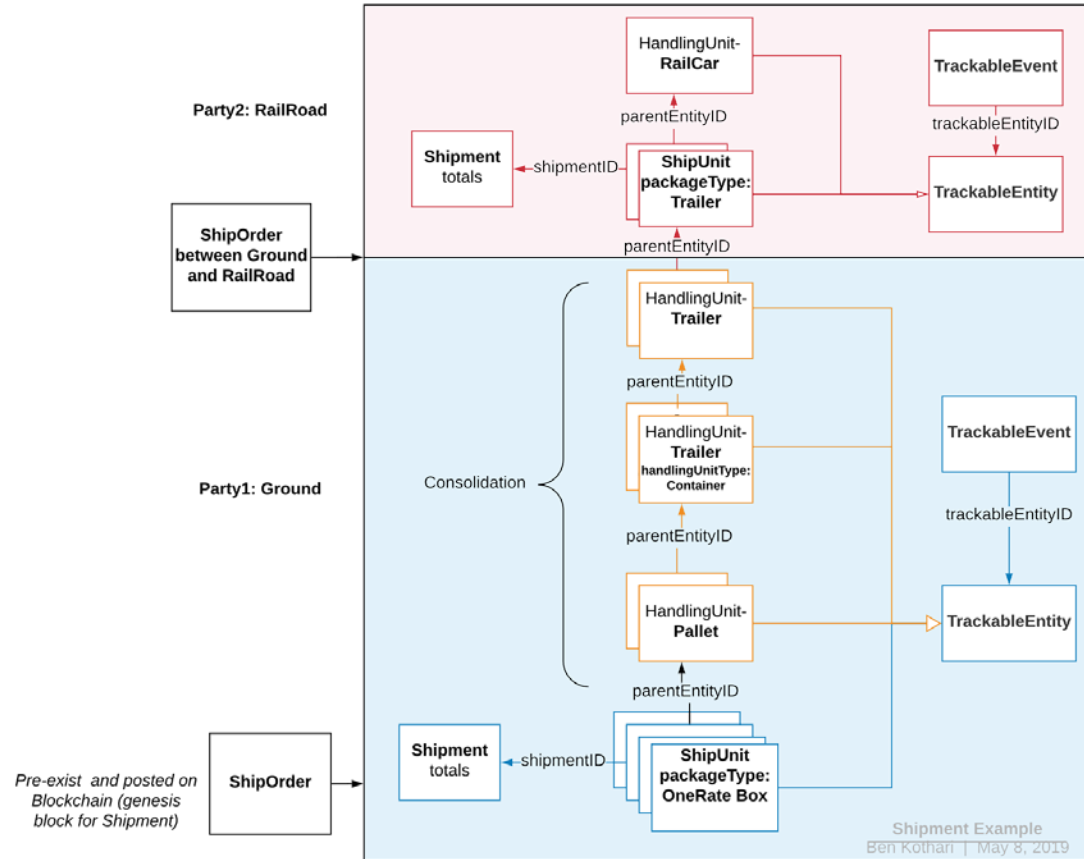
Shipment Model

Source: Ben Kothari, Ampliflex

Party Model

Party can be any Enterprise (Company, Corp, LLC, etc.) that participates in or provides products and/or services within the transportation network.
Party may also represent any individual person or organization who participates within the network or fulfils a general role related to the products and/or services offered.

Source: Ben Kothari, Ampliflex

Meta
+ version: String
+ reportedByID: String
+ reportedByRole: String

Extends

ContactMethod
+ partyID: String
+ locationID: LocationPUDWindow[1..*]
+ email: EmailType[0..*]
+ phone: PhoneType[1..*]

Party
+ ID: String
+ role: String
+ nameLine: NameLineType[1..*]
+ type: String
+ associatedAccount: Identity[0..*]
+ additionalAssociatedPartyID: Identity[0..*]

NameLineType
+ name: String
+ line: String

LocationPUDWindow
+ locationID: String
+ pudReadyDateTime: String
+ pudCloseDateTime: String

EmailType
+ address: String
+ type: String

Identity
+ ID: String
+ type: String
+ IDAuthority: String

PhoneType
+ prefixCode: String
+ areaCode: String
+ number: String
+ extension: String
+ type: String

Benefits to Enterprise

- Frees up capital
- Lowers transaction costs
- Speeds up processes
- Provides security and trust
- Market transparency
- Operational efficiency
- Carbon friendly
- Risk management
- Promotes interoperability

Cost of Trust

- ## Processes and procedures for integrity
  - Duplicate records, audit, investigation, antifraud, penalty structures, etc.

- ## RMIT University Blockchain Innovation Hub
  - Preliminary study on cost of trust
  - As high as 35% ($30T)

- ## WTO analysis that smart contracts on blockchain can
  - Increase world GDP by 5%
  - Increase world trade volume by 15%

Source: Dean Tribble, Agoric

Use cases build on each other

- Driver credential verification (authentication)

- Chain of custody transitions (data)

- Payment in shipping transactions

  - Currency conversion

  - Automated (partial) payment release

  - Automated A/R loans for completed delivery

- Links to associated financial transactions

Source: Dean Tribble, Agoric

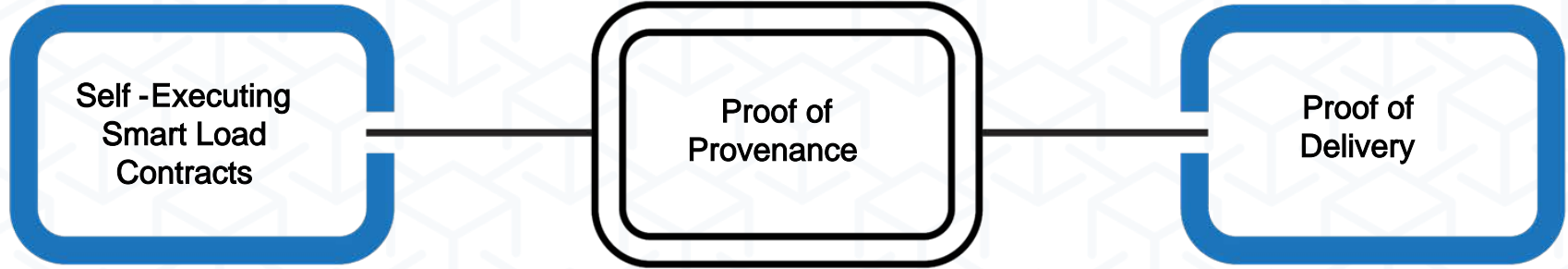# What is a Smart Contract?

A contract-like arrangement, expressed in code, where the behavior of the program enforces the terms of the contract

It's not all or nothing

Hybrid smart contracts

- The real arrangement includes both *code* and *prose*
  - Code portions are enforced by the smart contract system
  - Prose portions are enforced by people

- Oracles

- Dispute resolution

- Exceptions

Source: Dean Tribble, Agoric

Potential Use Case

Self -Executing Smart Load Contracts

Proof of Provenance

Proof of Delivery

Contracts executed and arbitrated using blockchain, lowering risks and costs for both carriers and shippers.

Verifiable provenance with long supply chains.

Recorded on blockchain, available to relevant parties.

BiTA Forecast

| 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 & Beyond |

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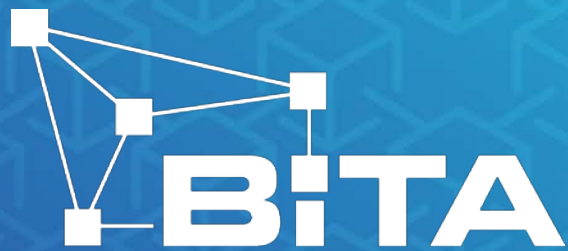
Stay up-to-date

Visit **BiTA.studio** to join the BiTA Blockchain in Transport Alliance

CONCLUDING THOUGHT

It's not just a tech play,

it's a business model change.

Oliver Bussmann

BITA.STUDIO