# Transport Management

Anton.Boonstra@simplesolidsolutions.nl, *April 2025*

This article is the second in a series of four articles on Warehousing & Transport. The sections *"Introduction"* and *"Mapping the As-Is and To-Be in steps"* are the same as in the first article on Warehousing. Feel free to skip those if you've read them already. This article focuses on the reference model for 'Transportation'.

---

## *Introduction*

*This article is the second in a series of four articles on Warehousing & Transport. Before you can define a possible future (To-Be) for your company and determine which systems might support it, you first need to map out the current state (As-Is). This article explains how to do that mapping—both for the As-Is and the To-Be—and how to bridge the gap between them. We apply this method first for Warehousing and next for Transport. The third article will focus on selecting the software required to realize the To-Be, and the fourth will discuss how to run a tender to select the best service provider for Warehousing and Transport.*

*It is crucial to clearly separate the As-Is from the To-Be. They should be as distinct as black and white. If you don't, they'll get mixed too early. We often know what's not going well and have ideas for improvement, but we tend to overlook what is working. Without realizing it, we risk not incorporating those positives into the new design. That's why it's valuable to start with some "navel-gazing" into the As-Is. Once that's well understood, you can start dreaming about the To-Be—what the ideal future might look like, unconstrained by current limitations. Of course, reality must eventually return, and you'll need to define practical steps to transition from As-Is to To-Be.*

*The reference model is developed in parallel with the As-Is analysis and ultimately becomes a summary of the To-Be. The main goal of a reference model is to provide a yardstick against which to evaluate the As-Is: "Why don't we do it this way?" It helps map the current situation and potential improvements objectively. A reference model is also helpful for practical purposes, such as ensuring that no processes are overlooked. Once the As-Is is mapped, you should fully shift to the To-Be and imagine how the future could look. Then define the roadmap to that future, complete with timelines and responsibilities.*

*If you have significant experience, you may be able to build a detailed reference model. If not, try researching and reading to find or develop one. It doesn't need to be perfect from the start and can be refined as you map the processes.*

*Before diving into the details of a generic reference model for Warehousing, let's first go through the steps to define the To-Be: Preparation, As-Is Workshop, To-Be Workshop, and Synthesis.*

---

# *Mapping the As-Is and To-Be in Steps*

## *Intake*

1. *Identify the process to be assessed and the key steps you expect to be present. Ideally, you already have a basic reference model in mind. The reference model should stay ahead of the As-Is and reflect the challenges you foresee.*
2. *Observe the process in action. Accept what you see without judgment. Ask "why" repeatedly: "Why do you do it this way? Why not another way?" Try to empathize with the people involved and understand their reasoning. Be a chameleon—step into the shoes of the process owners.*
3. *Check whether you've seen all the physical and procedural details. Ask yourself, "Do I fully understand this process?"*
4. *Document each step in detail and continue refining the reference model.*

## *As-Is Workshop*

5. *Plan a half-day workshop with a group of recognized process owners (ideally 7–10 people). Fewer than 7 may cause gaps in representation, and more than 10 can become unmanageable. Of course, it depends on the size of the warehouse and number of FTEs.*
6. *Review each process step with the group and verify that nothing has been overlooked. Ensure everything is well documented.*
7. *Conduct a brainstorming session to identify problems. Discuss each problem one by one and suggest potential solutions. Avoid jumping ahead to the To-Be. The goal is to fully understand and agree on the As-Is and identify known problems. Summarize everything and send it to the participants for confirmation.*

## *To-Be Workshop*

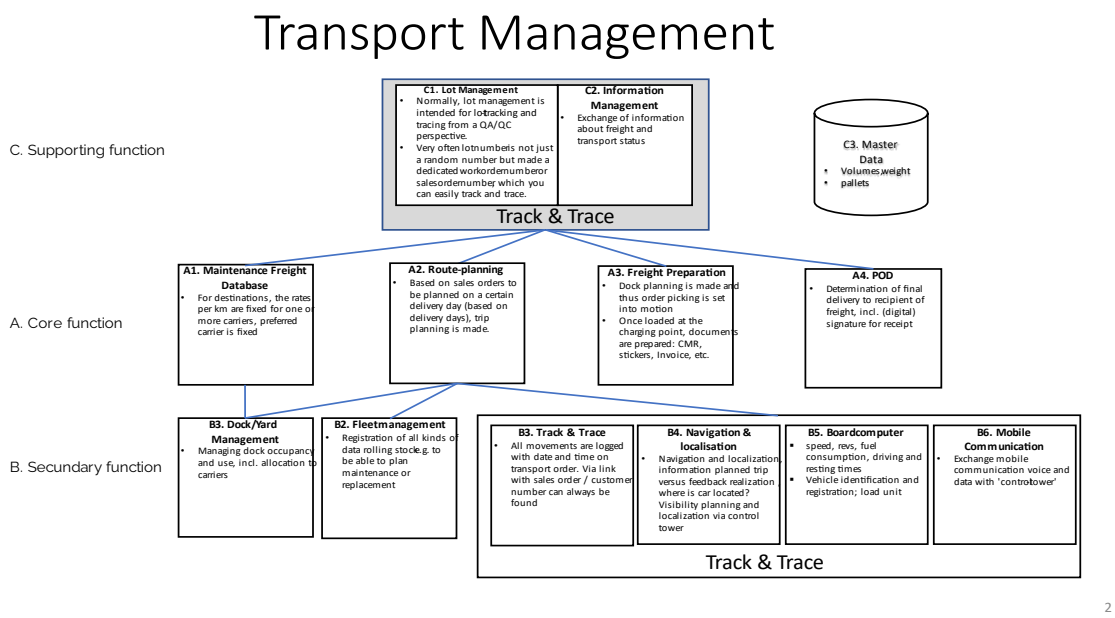
8. *Use the same group from the As-Is workshop. In the To-Be workshop, shift completely away from the current situation. "Dream" together about how the warehouse should operate in 4–5 years. Spend time crafting this vision, then work to bring it closer to reality by identifying what must happen to achieve it.*
9. *The result should be a clear vision of the dream state, the steps required to get there, and a first draft of a timeline.*

## *Synthesis*

10. *Document the To-Be in detail: the new process steps, a reference model summarizing the To-Be, a roadmap with a timeline, and a rough financial plan including ROI. Ensure the group fully supports the vision, then present it to stakeholders and decision-makers to drive implementation.*

---

# Reference Model for Transportation




This is an example of a reference model for transportation. You don't need to follow this format exactly—use what works best for your audience. The model includes three layers:

1. **Core Function** – These are the essential transportation processes.
2. **Secondary Function** – These support the core functions by informing or influencing decisions (e.g. planning).
3. **Supporting Function** – These are general processes that support transportation but are not exclusive to it.

We'll now explore the elements (or "blocks") of this reference model in more detail. This is specifically about **road transport**, not sea or air freight.

---

## A1. Freight Database Maintenance

This involves storing all quotations from different carriers for various routes in a centralized database. The system can identify the best offer at any given time and include it in the planning.

This sounds ideal, but it's more complex than it seems. One option is to first optimize route planning, then choose the cheapest carrier—a two-step calculation. Alternatively, pricing can be considered as part of the optimization algorithm itself—a single-step calculation. Both are valid approaches with many variations.

Maintaining this database is also a major challenge. To make comparisons meaningful, parameters (like pallet types or weights) must be standardized. Start by defining a "standard

pallet" with fixed dimensions and weight. All loads must be converted to this standard to allow apple-to-apple comparisons. The same applies to currencies—always calculate back to a standard.

This system is mainly useful for shippers with complex, varied routes. For those with routine routes, it may be overly complex and time-consuming to maintain.

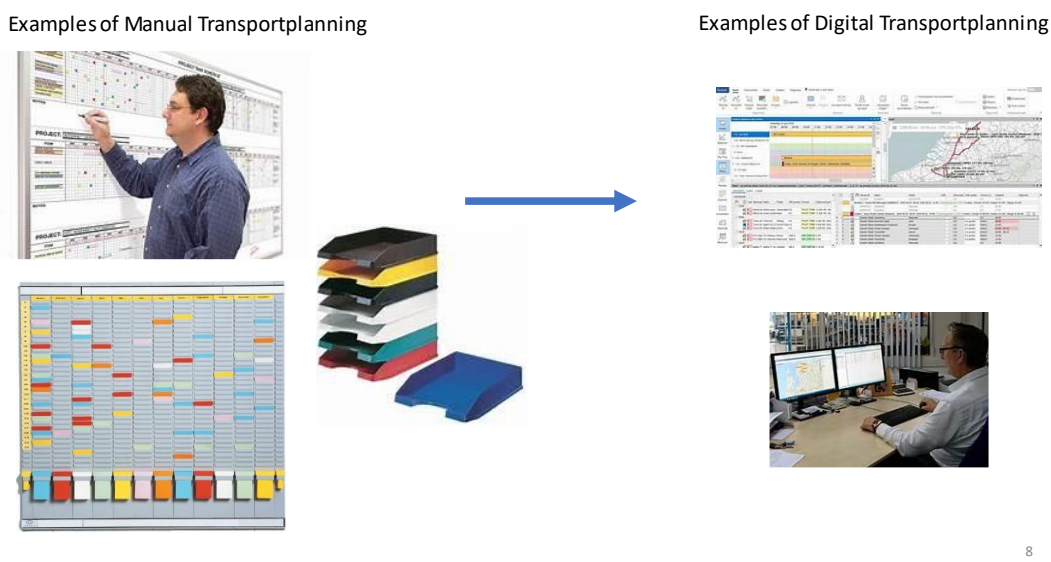
## A2. Route Planning

This is about optimizing trips within a defined time horizon, factoring in constraints like available drivers and vehicle types. Such software is widely available and based on advanced algorithms. Some of the key constraints include:

- Order/product: type, size, quantity, weight
- Loading/unloading: duration, location, time windows
- Addresses: delivery points, traffic access
- Trucks: availability, size, type
- Load instructions: stacking rules, maximum height
- Driving characteristics: speed, distance

The principle of calculation is usually not as different as until recently companies did on a planning board. Try to visualize how planning could be done manually on a planning board while reading the next few lines: -

1. Determine a window within which you want to optimize. What you often see companies doing, is that they usually take 2-3 weeks as a starting point for the calculation. Most companies work with the A for B principle: 'ordering, picking, and loading today for delivery tomorrow.' You will also come across the principle of ABC: 'order day A, is day B picking and loading, day C is driving out.' And of course, all kinds of other variants are possible here. Window refers to how many days ahead you optimize trip planning.
2. In fact, for the planning board, the delivery day/time is decisive. In our example, the planning board shows 3 weeks per day ahead. On a certain day I put the cards (in fact a stop) together whose addresses are close to each other.
3. As a certain delivery day gets closer, you have to become increasingly accurate and, for example, also look at the arrival time first address and return time from last address. Is ride still do-able? Or should I take a stop out of it and put it at another. I also make sure that I divide the tickets over the available cars. At the last minute I could decide to leave a car out or rent a car.




In fact, the algorithm of route optimization software is working in a comparable way. Only things are arranged much better in the digital world. For example, most packages use Geo-data nowadays, so those are really the coordinates. Older programs work with the zip code. Not bad, but less ideal. Geo-data is better.

When implementing a route planning package, I would do it in a similar order. So, start to plan manual by using a planning board or something similar. In a case, long ago a customer of mine had a lot of orders, so we start using sorting bins (like in the PowerPoint above) to sort on delivery date for instance. Be cremative and try without a computer first, then simplify, optimize, and finally translate that logic into an algorithm.

The use of this kind of automation is always possible. The software solution is close to how you would do it manual. It's a one-time exercise, and you end up having to do that calculation several times in a day. So, it's always extremely worth investing in. This saves a lot of time and energy that you can better put into other things.

Once the planning has been made, you also want to be able to follow the realization. The best thing is, if you can see on a map how the trip is planned, and how the realization will be and that you can 'intervene' or 'support' from a control tower if necessary. To be able to do that you need communication with the car, and you need navigation & localization.

## A3. Freight Preparation

At the loading point, documents such as the CMR, labels, and invoice should be prepared and available digitally on the driver’s mobile device. These should reflect all last-minute changes. Manual, paper-based systems are time-consuming and error-prone. Digital documentation is faster, cheaper, and more reliable—a no-brainer.

## A4. Point of Delivery (POD)

This is the final delivery to the customer. Payment often occurs at this stage, as does the capture of a digital signature. This signature automatically triggers an email to the customer with all relevant delivery documents (invoice, packing list, brochures, etc.).

---

## B1. Fleet Management

Fleet Management provides technical and logistical data on vehicles (trucks, reach trucks, lease cars, and increasingly, robots). Key data includes:

- Mileage, speed, fuel use
- Maintenance schedules and lifecycle status
- Availability and capacity for planning

Advanced systems also track $CO_2$ emissions and driver behavior to support sustainability monitoring.

## B2. Dock/Yard Management

This concerns the management of dock usage, both for internal and external vehicles. External parties can often log in to book available time slots themselves.

## B3–B6. Track & Trace

**B3. Goods Tracking**
All goods movements are logged with timestamps and linked to sales or customer orders. Customers increasingly expect visibility, but preferences vary—some want real-time updates, others only care about delivery time. Discuss this during the sales process and define a communication strategy accordingly.

**B4. Navigation & Localization**
Navigation ensures the driver follows the planned route. Localization (via GPS) allows the system to track vehicle positions and statuses (e.g., moving, delayed, or at customer site).

**B5. On-Board Computer**
Captures key data: milage driven, speeds, fuel use, etc. Supports fleet management and can be read regularly for insights or incident analysis.

**B6. Mobile Communication**
Includes mobile phones and direct communication systems with vehicles, allowing updates and coordination.

---

## C1. Lot Management

Lot tracking and tracing is covered in the Warehousing article, but for Transport it plays a different role. Originally a QA/QC tool, it's now used to give customers insight into their orders—especially in e-commerce. Lot tracking allows customers to see where their order is and how it got there.

*Text Warehouse article on lot tracking and tracing:*

Lot management enables full traceability throughout the supply chain. A supplier assigns a lot number to each production batch, which is then linked to purchase orders, production orders, and sales orders in your system.

- **Tracking** follows the path downstream—where the product has been shipped.
- **Tracing** works upstream—from a consumer product back to the materials used in production.

This is especially critical in food and pharma sectors for safety and regulatory compliance, but it also applies in maintenance and manufacturing environments

### C2. Information Management

Covers the exchange of freight and transport status data between systems and stakeholders.

### C3. Master Data

Given the system requirements, Master Data Management (MDM) is critical. Assign multiple people to maintain accurate, up-to-date master data. This is a shared organizational responsibility.

---

# Closing Words

Try to keep the As-Is and To-Be clearly separate. Understand *why* the As-Is is the way it is—not just what's wrong, but what works well. When change begins, you must know your starting point.

The reference model helps challenge both the As-Is and To-Be perspectives. Use it to dream big, then define practical steps to move from point A (As-Is) to point B (To-Be). Break that journey into smaller, manageable phases with clear milestones and timelines.

We explored the sub-processes of transportation—not to dictate the one right way, but to offer inspiration. In transportation, multiple databases are combined into algorithms to define optimal trips. That makes the planning logic more complex than in warehousing, where each function can often be optimized separately. Transportation is also more loosely connected to ERP systems than warehousing, which tends to be tightly integrated.

In the end, you'll have the As-Is, the To-Be, and a summarized reference model. Then comes the plan to get from A to B—step by step, milestone by milestone.

**Good luck!**
P.S. Feel free to reach out if you have questions or comments—I genuinely enjoy helping others move forward.

-/-/-