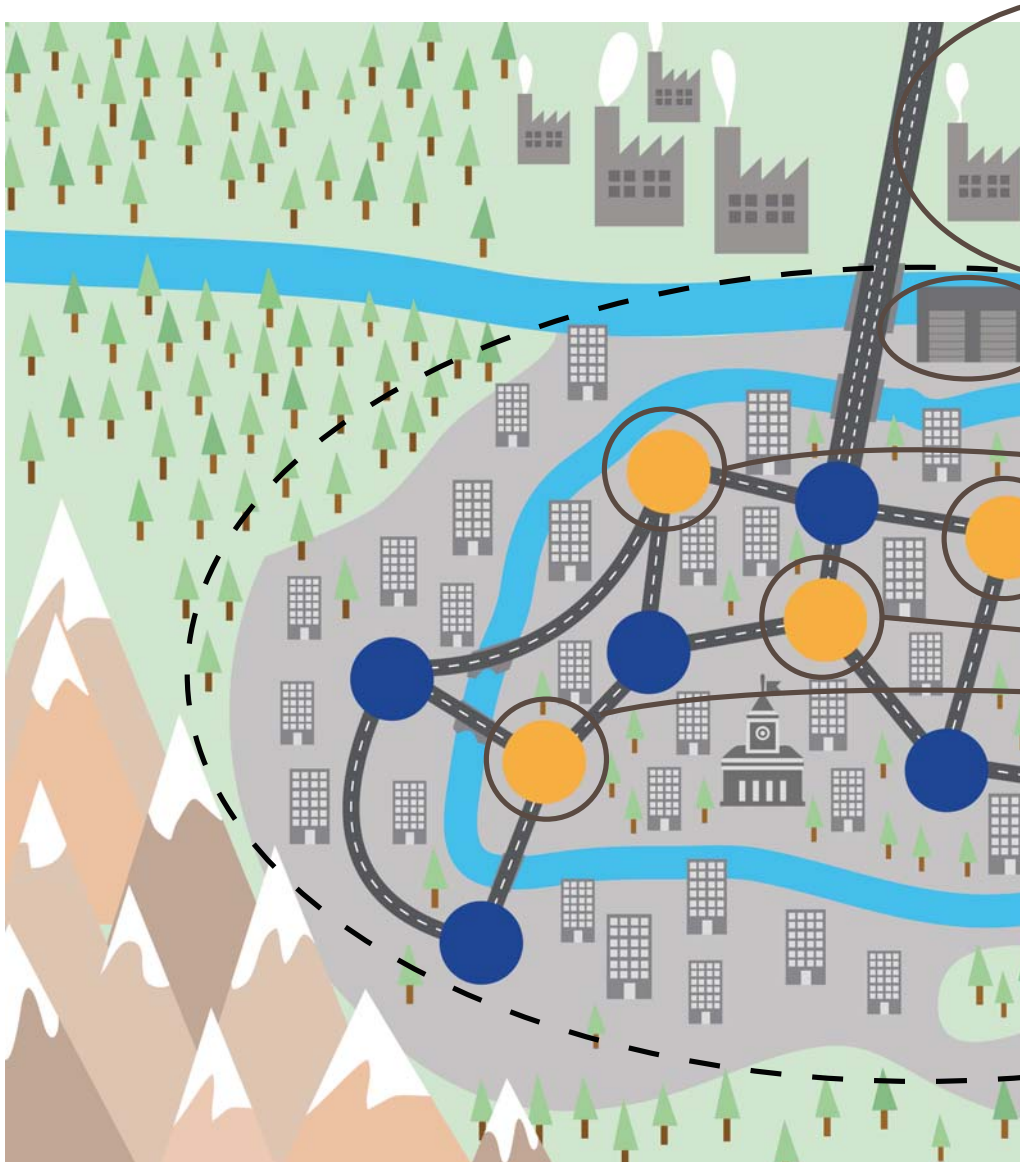


CITY LOGISTICS GAME



You and your fellow players are inhabitants of Concordia City. You all have different ways of making a living. Some of you are manufacturers and have a factory 80 km outside of the city, some are retailers, running several shops in the city center. There is also a hub operator, and a mayor of the city.



Hub Operator

Mayor

1. Be economically sustainable
2. Reduce emission

1. Reduce emission
2. Reduce traffic in the city
3. Increase economic viability

- City Hub
- Money

- Money

- Open/close the hub
- Arrange transport:
- Rent vehicles (diesel/electric)
- Sell transport service to manufacturers

- Ban vehicle type
- Tax/Subsidize vehicle type
- Set VAT percentage on sales
- Subsidize the hub

Costs

- Opening costs
- Transport costs
- Maintenance costs shop

Costs

- Providing subsidy for:
- City Hub
 - Vehicles

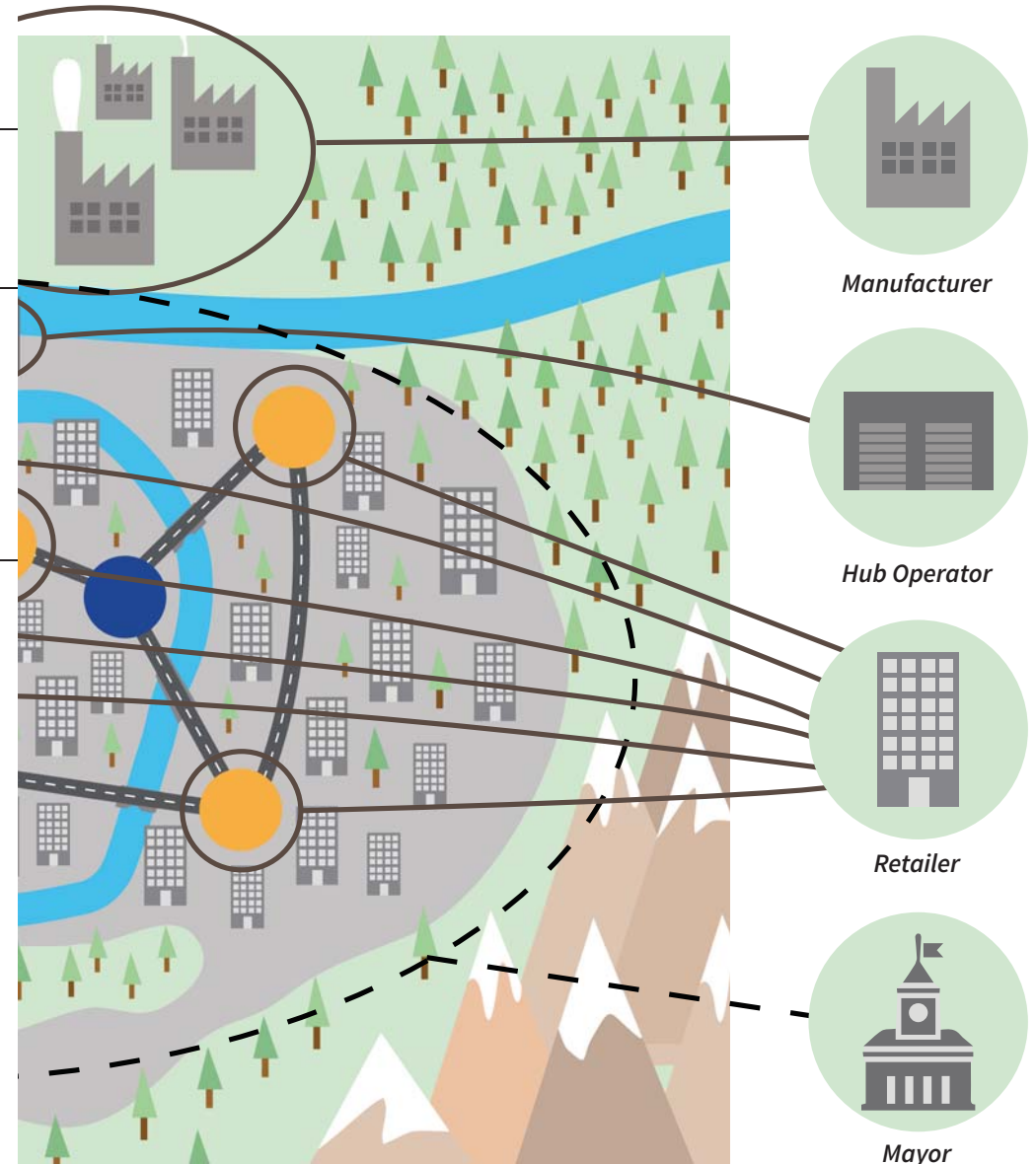
Income

- Payment manufacturers for LMD
- Subsidy

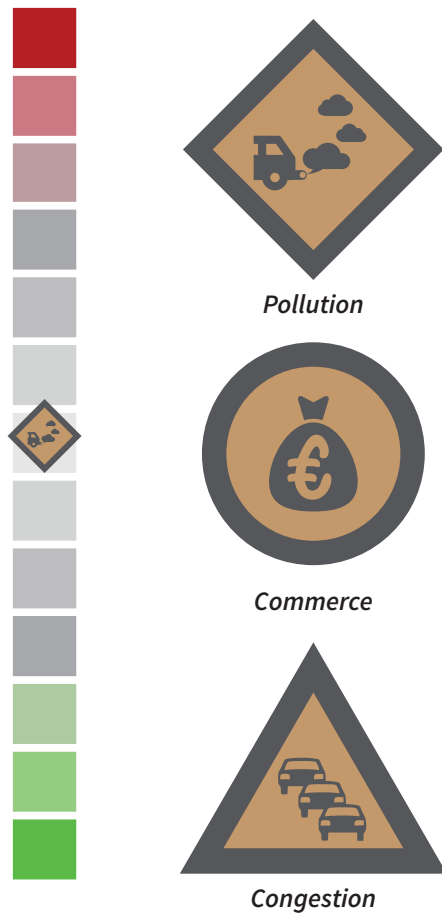
Income

- VAT
- Vehicle tax

	Manufacturer	Retailer
Goal	1. Make profit 2. Prevent escalation of emission	1. Make profit 2. Prevent escalation of emission
Assets	- Factory - Packages - Money	- Shops - Packages - Money
Actions	- Produce Packages - Sell packages to the retailers - Arrange transport: - Rent vehicles (diesel/electric) - Buy transport service from hub Operator	- Buy packages from the manufacturer - Sell packages to the citizens - Arrange delivery: - Set time windows
Business model	<u>Costs</u> - Production of packages - Maintenance costs factory - Storage costs factory - Transport costs <u>Income</u> Sales to the retailer	<u>Costs</u> - VAT - Buying packages from manufacturer - Maintenance costs shop - Storage costs packages - Operational costs (i.e. costs for receiving orders) <u>Income</u> Sales to the customers



You and your fellow players are all stakeholders in the city freight distribution of Concordia City. Each player will take a different role, there are manufacturers (2x), retailers (2x), a hub operator and a mayor of the city. Which of these roles you will play is decided by the game master. Each player has its own individual goal, assets to use, and actions to perform. Everyone also has one thing in common: their individual actions all have an impact on the health of Concordia City. The city's health is measured with three Key Performance Indicators (KPIs): emission, commerce and congestion. The performance of these KPIs is indicated with markers on the game board.



KPIs

As was already explained, the pollution KPI depends on the number of diesel vans in the city. The congestion KPI depends on the number of citizen cars in the city. Citizen cars appear after a congestion at a shop. Driving electric vans is thus a solution against pollution, but not against traffic congestion. The third KPI of the city, commerce, is determined by the number of packages sold by the manufacturers to the retailers.

Estimated costs

To make certain decisions you might want to know what would be the consequence of this decision in terms of financial costs or benefits. These costs often depend on the actions of other players and can therefore not always be accurately predicted. The application offers you a best guess of the estimated costs, which is based on the assumption that all the other players behave exactly the same as in the previous round. It might happen that the actual costs happen to end up very differently than the estimated costs. This usually means that one or several players made different decisions as was the case in the previous turn.

Let's play!

To start the game, follow the instructions given to you by the game master. We will start the game with a practice round. During the practice round, you might start with some packages in stock. Your stock is displayed on the game board, and at the top of your application.

After the practice round your balance and your packages in stock will be reset. Retailers start with some packages in stock, which they can already sell in the first round. Before getting started, feel free to take one more look to the overview of all the game roles on the next page.

Good luck!

The vans entering the city are randomly placed on the game board. For each diesel van entering the city, the pollution KPI increases one step. The congestion KPI increases as the consequence of a traffic jam. Traffic congestion occurs when a fourth vehicle is about to be placed in front of a shop. Because there is no space to move a vehicle at this shop, the to be placed vehicle moves to one of the adjacent shops. Also, there are citizen cars getting stuck in traffic at the other adjacent shops. Each citizen car appearing on the game board increases the congestion KPI with one step.



In this example there is an electric van to be placed at a shop with three diesel vans.



The electric van is causing congestion, and is placed on one of the adjacent shops. On the other adjacent shops there is placed a citizen car.



In this example there is an electric van to be placed at a shop with three diesel vans. Like in the previous example this is causing congestion. Now the citizen car which was caused by the congestion will cause another congestion.



Citizen cars are placed on the shops next to the second congested shop. A second congestion will not cause an extra congestion on the place of the first congestion.

How to win

Everybody has their own personal goals. The aim of the game is for each player to achieve its personal goal:

<p>Mayor:</p> <ul style="list-style-type: none"> - All the KPIs are in one of the three green fields 	<p>Hub operator:</p> <ul style="list-style-type: none"> - All the KPIs are in a neutral position or better - No loss of money
<p>Manufacturer:</p> <ul style="list-style-type: none"> - No KPI can be in the worst state - Make more money than the other manufacturer 	<p>Retailer:</p> <ul style="list-style-type: none"> - No KPI can be in the worst state - Make more money than the other retailer.

You are a winner of the game if you have reached your personal goal after eight play rounds. On the game board it is indicated with a smiley whether you would have reached your goal, would the game end at this particular moment.



You are losing



You are winning

There is only one way in which all the players can collectively win the game, this is when the KPI markers of pollution, congestion, AND commerce all reach its best possible state.

How to lose

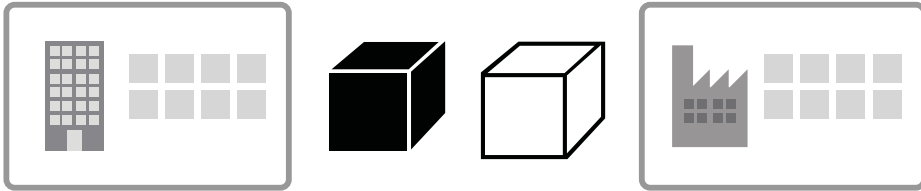
You lose the game when you did not manage to reach your goals before the end of the eighth play round.

Also, you can all collectively lose the game. This is the case when one of the KPI markers reaches its most negative value. In this case the health of the city is so much damaged, that the city 'dies'. There are thus three ways to collectively lose the game:

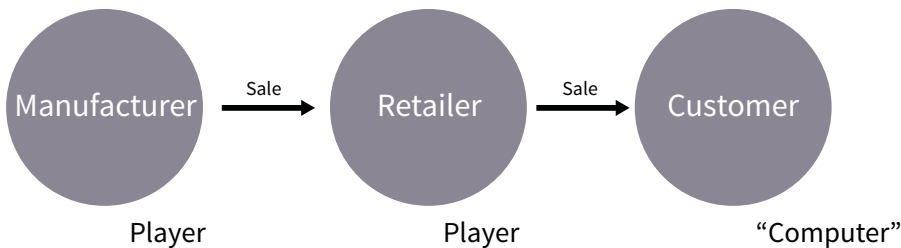
- There is too much pollution: no one wants to live in Concordia City anymore
- There is too much traffic congestion: no one can reach any commercial center anymore
- There is not enough commerce: the city's economy collapses and people will move out

TRADE

During the game, the manufacturers are producing two different type of products. One product is packed in white packages, the other one in black packages. The manufacturers want to sell their packages to the retailers with maximum profit. Packages are stored in the warehouses of the factories and the shops. Storing packages will cost you a fixed price per package.



The retailers want to buy the merchandise from the manufacturers for the lowest possible price, to sell it in their shops. In the shops the packages are sold to the citizens of Concordia City. The prices citizens are willing to pay depends on the health of the city's economy (i.e. the commerce marker). The amount of citizens who want to buy something (i.e. the demand) depends on the accessibility of your shop, i.e. the number of vehicles in front of your shops. The citizens of Concordia City are, in contrary to the manufacturers and retailers, not represented by players of the game.



TRAFFIC

There are three types of vehicles driving around in Concordia City: diesel delivery vans, electric delivery vans, and citizen cars. Delivery vans are used for delivery of the packages at the retailers. How many and what kind (diesel or electric) of delivery vans appear depends on the volume of the orders, and the transport policies of the players which were decided in the first two phases of the game round. Citizen cars appear when there are too many delivery vans blocking the routes.



Diesel van



Electric van



Citizen car

The diesel vans are one-on-one related with the pollution KPI. For each diesel van entering the city, the pollution KPI increases with one step, and for each diesel van leaving the city, there is a decrease of one step. The same relation exists for citizen cars and the congestion KPI.

Leaving vehicles

Phase 3 always starts with two vehicles leaving the city. Which of the vehicles is leaving the city is randomly determined. It can be either diesel vans, electric vans, or citizen cars. For each diesel van, the pollution KPI decreases one step, the same is happening with the congestion KPI for each removed citizen car.

Entering vehicles

In the first two phases of the game round players decide on their transport policy, and retailers order their merchandise at the manufacturers. These orders have to be delivered, which is carried out by transport vans entering the city. The number of vans to enter the city depends on the volume of the orders (how many packages were sold?), consolidation of the deliveries (is transport going through the hub or not?), and freedom of route-planning (do retailers set time windows for the delivery?). The type of vans (diesel/electric) entering the city depends on the choices of the transporters.

Phase 1: Strategic decisions

A game round starts by the mayor setting the transport regulations. These regulations include taxing/subsidizing of diesel fueled or electric vehicles, banning diesel/electric vehicles, subsidizing the city hub and determining the height of VAT on sold packages by the retailers. Then the other players make strategic decisions. The hub operator decides whether to open the hub, and which type of vehicles to use. The manufacturer how many packages to produce and what vehicles to use, and the retailer how many packages to sell and whether deliveries should be delivered within certain time windows or not.

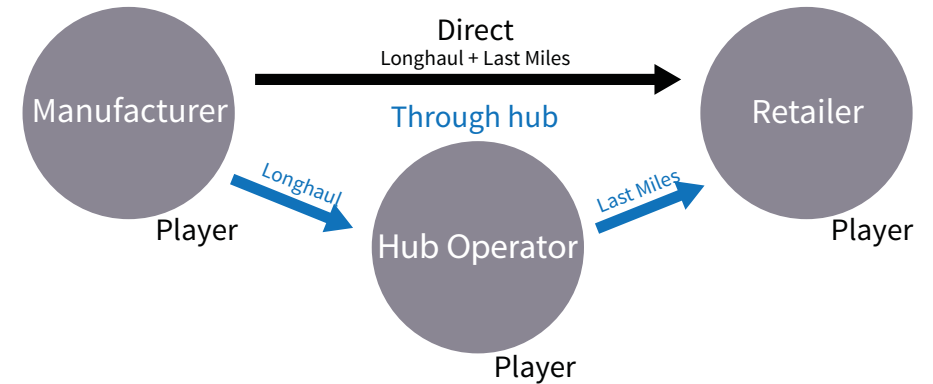
Phase 2: Trade

Phase 1 is followed by two minutes of sales negotiations between the manufacturers and the retailers. The retailers can choose what they want to order, and offer a price. The retailer orders its merchandise including shipping costs. These shipping costs will be paid by the manufacturer, and depend strongly on the decisions players made in the first phase, and also on the volume of the order. When there is a deal, the manufacturers can negotiate for another two minutes with the hub operator. They now negotiate about a price for the last mile delivery with the hub operator. After these negotiations with the hub, all phase 2 ends. It is now time to view the consequences on the board.

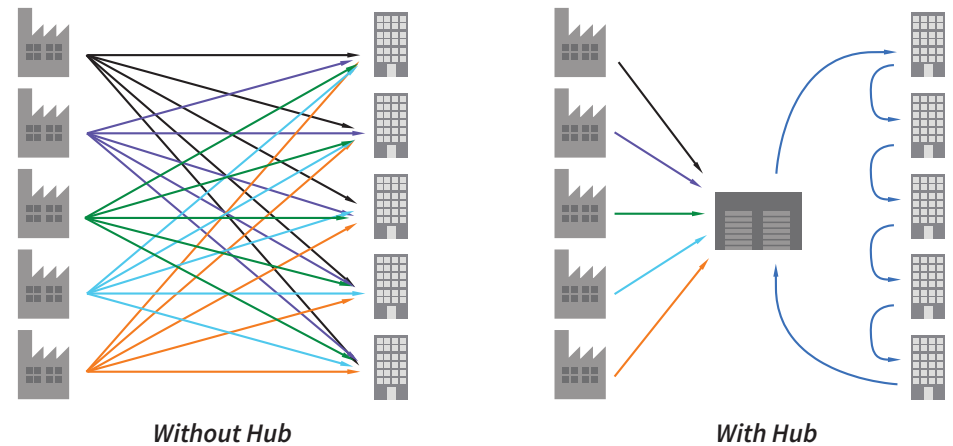
Phase 3: The city

In phase 3 it becomes clear what is the impact on the city, caused by all the decisions made by the players in the first two phases. It is the phase where the traffic in the city is moving, and where the KPI scores are changing.

The packages which are bought by the retailers of course need to be transported into the city. The retailers always buy their order including shipping costs. The manufacturer can decide how he wants to deliver his order: directly, or through the city hub. When orders are transported through the city hub, the manufacturer pays the hub operator for transporting the last miles of the order.



The more manufacturers are using the city hub, the more efficient transport can be organized:



PLAYING THE GAME

The game consists out of eight game rounds. Each game round is divided in three phases. In the first phase you and your fellow players all make strategic decisions. Then, it is time for trade. You and your fellow players will negotiate about trading merchandise and transport.

In the last phase of the game round, it becomes clear what is the consequence for the city of the outcome of everyone's actions in the first two phases. Some actions occur through the game's application, others occur on the game board.

