

concept sketches and draft models

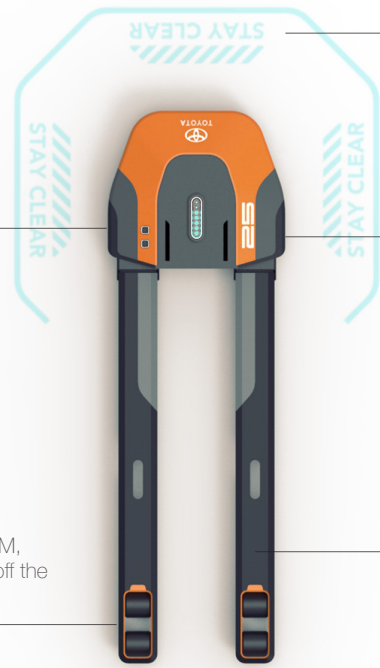
INTRODUCTION THE FLOCK SYSTEM

This concept explores on the question if a set of autonomous logistic vehicles can work together in a way that human-driven vehicles cannot. Pricing, eco-efficiency and overall workflow optimization were the design drivers addressed in this concept.

"The initial goal was the design of a practical, beautiful vehicle fit for both small and larger warehouse logistics. During my research, I adapted this initial target. While I quickly learned that a number of autonomous guided vehicles were already in use, I concluded that compatibility between these autonomous vehicles is close to non-existent. This presents ample opportunities for innovation. I set out to design a growable system of two vehicles that, through interoperability, can manage a warehouse in with an efficiency that human-steered vehicles cannot achieve."



front rotary wheelbase enables these vehicles to manoeuvre tight spaces in smaller warehouses



safety buffer clearance projected on the floor halts vehicle when crossed

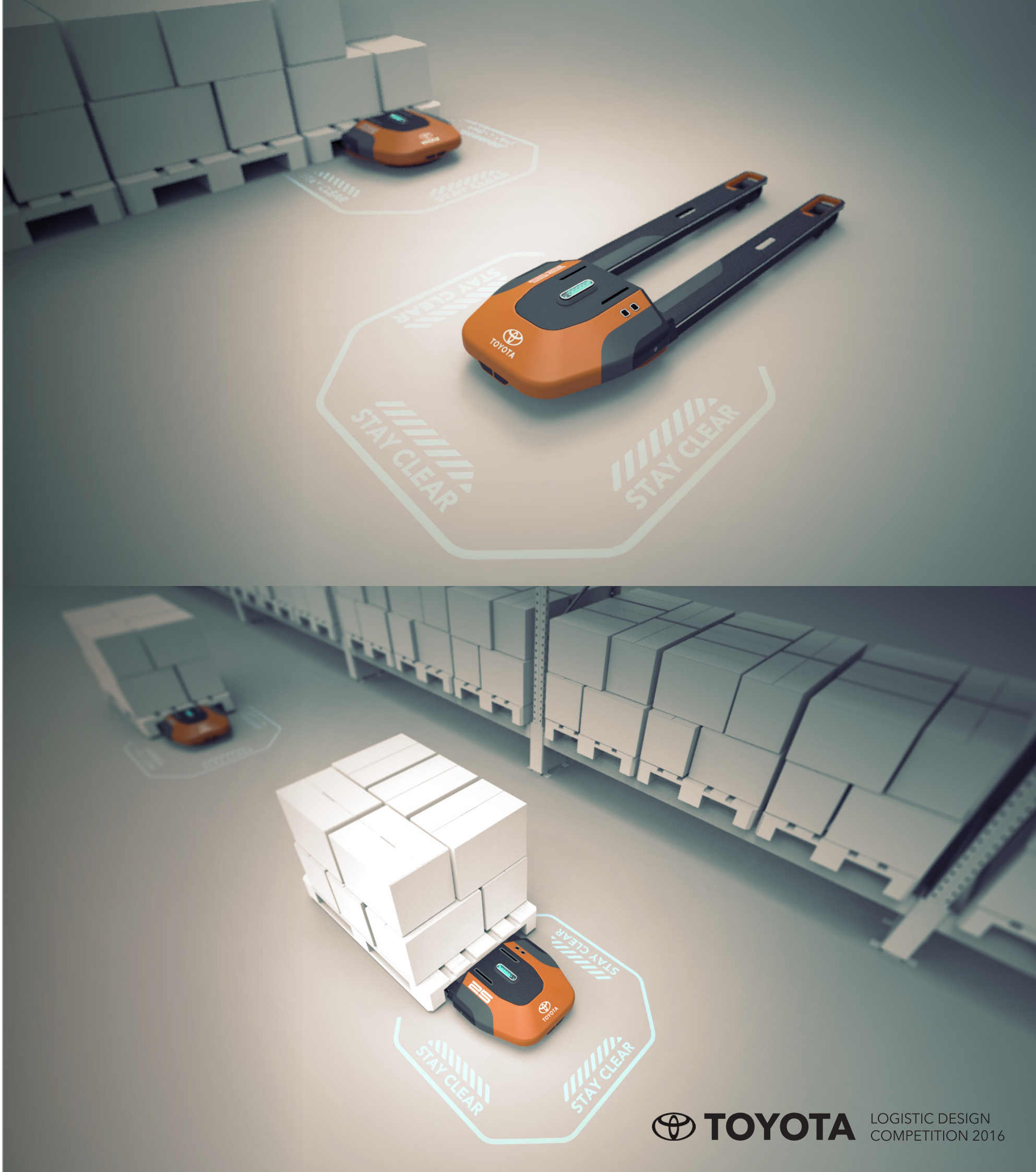
LIDAR-sensors on all sides serve for navigation purposes and personnel awareness

elegant forks can rise up to 150mm off the ground much like a traditional pallet jack

fits between the forks of the AGLV-M, enabling the duckling to lift goods off the AGLV-M for ground transport

GROUND TRANSPORT AGLV-S DUCKLING

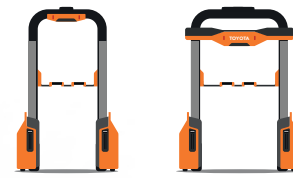
The first of the two is the light, versatile Duckling: the drone version of the standard warehouse pallet jack. It is a light, economic way of transporting heavy loads on ground level. The fully electric Ducklings are equipped with LIDAR-trackers for movement, and cameras for personnel recognition. Included with each duckling comes a unique charging station, to which the vehicles will automatically return to recharge their batteries after finishing their task queue. The Duckling fits right into pretty much any old supermarket warehouse. It really shines however, when working large scale logistics in unison with its bigger brother: the AGLV-M.



navigation module

"hollow" forks fit around the smaller duckling forks to pass on goods for ground transport.

front stabilizers retract while not loaded for the smallest possible wheel base



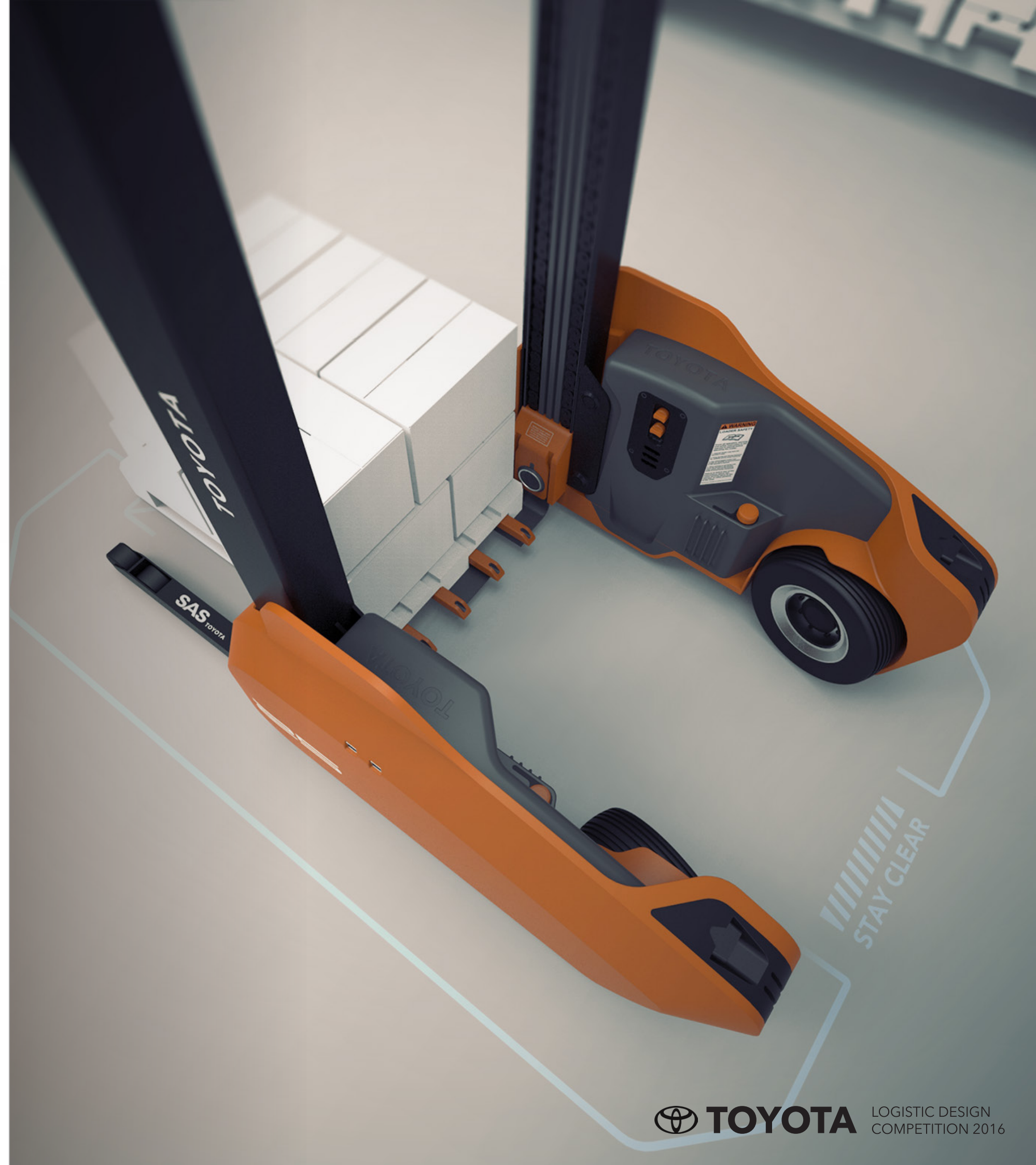
Basic Goose

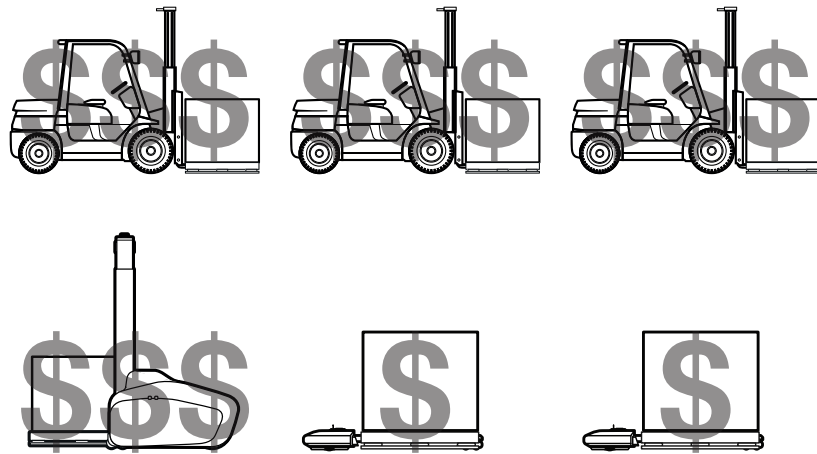
Big Goose

extendable mast reaches up to 5 meters in height. different mast options are available for larger sized loads and higher reach

HEAVY LIFTER AGLV-M MOTHER GOOSE

The second vehicle, nicknamed Mother Goose, is a heavy weight Automated Guided Logistic Vehicle. This high performance unit is fit for medium-to-large-sized warehouses. On its own the mother goose serves as a full-function unmanned forklift, but its real purpose is its role within the FLOCK-system. Essentially this vehicle serves as the heavy lifter. Its forks reach heavy loads on high storage locations. It can then place these loads onto the Ducklings for ground transport. A large warehouse can function using just a few of these machines, combined with smaller Duckling units, resulting in a solution that is both eco-friendly and financially optimized.





Example: In any warehouse, to carry three loads from one location to another, one Mother Goose and two Ducklings can do the work of three full-blown forklifts.

THE FLOCK WORKING IN UNISON

These two products best display their qualities when working in unison. With a Mother Goose, working alongside a number of Ducklings, one can do the work of traditional forklifts faster, and at a fraction of the cost. Here's how they work. The AGLV-M, which is a traditional heavy lifter, positions itself directly in front of the shelf. It may then lift a load from the rack using its shifting load-bearing arms. A Duckling rides in at the base of the machine, and the load is lowered onto the forks of the Duckling. The Duckling then lifts the load on its own fork (seperating the load from the Mother Goose) to transport it to its designated location. The Mother Goose can then pick up another load, or move to another pickup/ drop-off location. Instead of 3 heavy forklifts making tedious trips back and forth to pick up and deliver goods, a warehouse can now rely on one heavy unit, and two pallet jacks to do the same job. Ducklings manage almost all transport over ground, leaving the larger Mother Goose the time to move to the next storage rack, instead of having to deliver the load itself. The direct result is faster, cheaper, better warehouse logistics.

