Intermodal Container For Human-Scale Transport: A Concept For Boat-To-Bike Containers.

Steven Woods
Center for Post Carbon Logistics

Advantages of Containers:

Save time and labor

Security

Ease of loading and unloading

Modular requirements can be met (reefer, tank, bottle, etc)

Switch between modes easily (truck-train-ship)

LO-LO more space and weight efficient than RO-RO Operations

Safety

Problems With Shipping Containers

Space Inefficient unless absolutely full

Heavy, energy and materials inefficient

Infrastructure intensive and difficult to handle

Too wide and long for convenient urban deployment

Heavily reliant on fossil fuels and fossil fueled machinery

Designed for macro movement of cargo (distance and volume), not final delivery.

Jevons Paradox

The Hidden World Of Container Contents…

5 foot urban delivery vehicle width standard

Developed in detail by Rik van Hemmen.

Allows use of Pallet-wide containers with space for wheels on the outside.

More space efficient than 8 foot standard in urban environment.

Fits Well with Human-Scale Last-Mile Micro Cargo Deliveries such as bikes, LEVs.

Key Constraints

Cannot exceed 200kg Max Gross Weight (bike system common max weight)

Must fit within existing multi-modal urban delivery systems

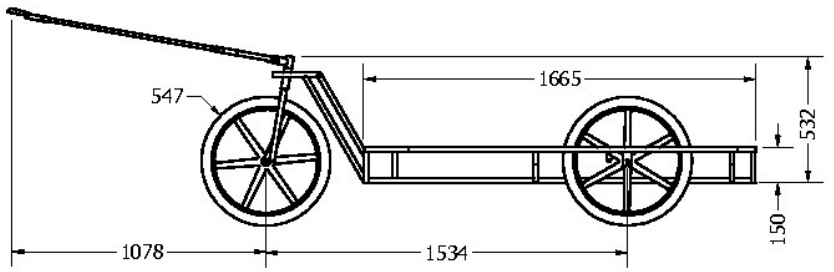
Must not require capital intensive handling tools

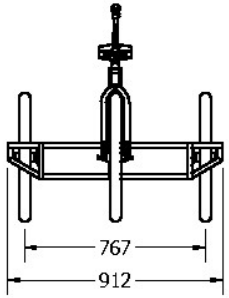
Must work with next-gen urban delivery tech (cargo ebikes, etc)

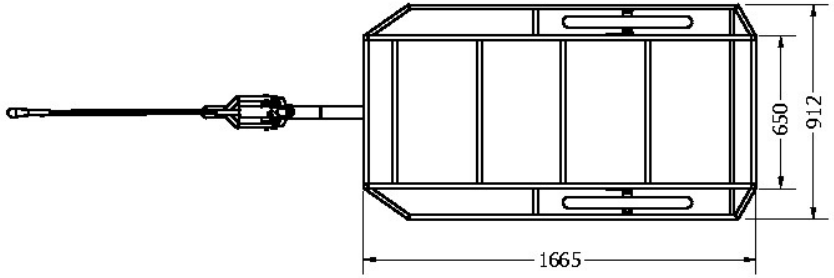
Must be inexpensive and sustainable to build (No Strategic Materials, etc.)

Must be easy for customers to use, but secure against unauthorized access.

Must Be LO-LO Capable.



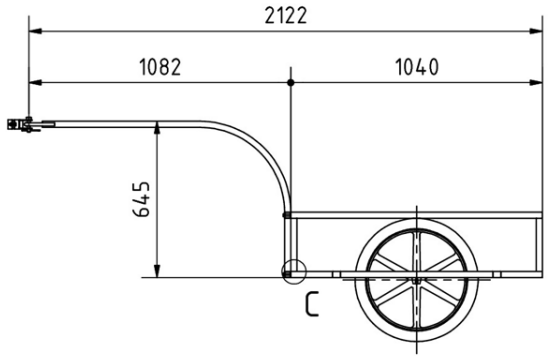


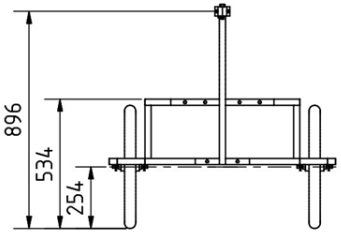


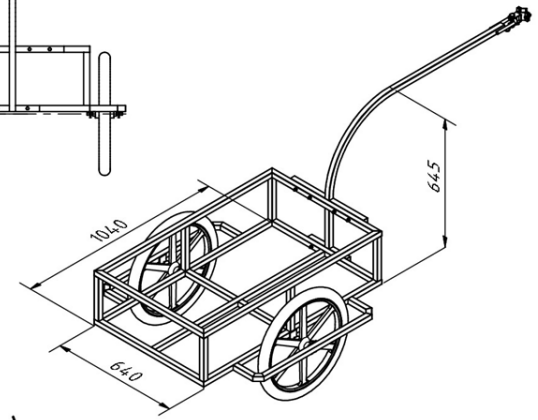
All permanent joints are welded

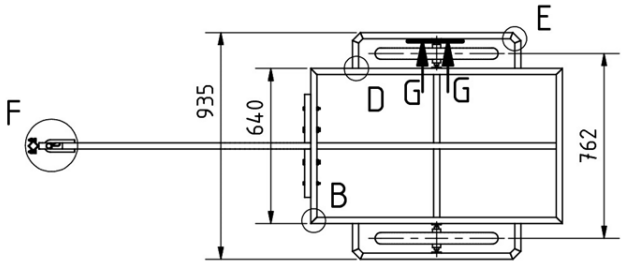
Proyect: Crowd bicycle trailer		Created by: D. Mosquera	Approved by: D. Jeager		
Part Name: Crowd-bicycle-trailer		Part Code: A1	Document Type: ASSEMBLY	Material: Steel C45	
Redesigned by:	Original drawing from:	License: CC-BY-SA 4.0	File Name: oseq cdt A1 crowd-bicycle-trailer	Version: 1.0	Quantity
			Scale: 1:12	Sheet: 1	Date: 04.12.20

Peso aproximado: 16 Kg, sin incluir las ruedas

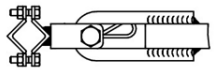


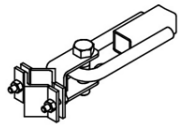


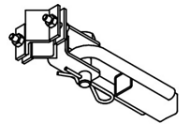




F (1 : 5)

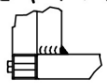




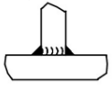


B (1 : 5)

C (1 : 5)

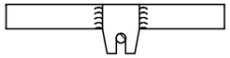


D (1 : 5)



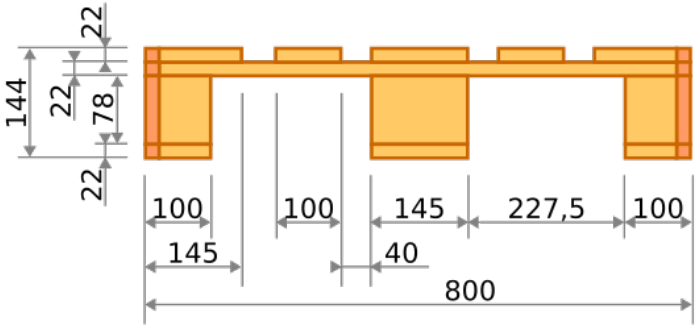
E (1 : 5)

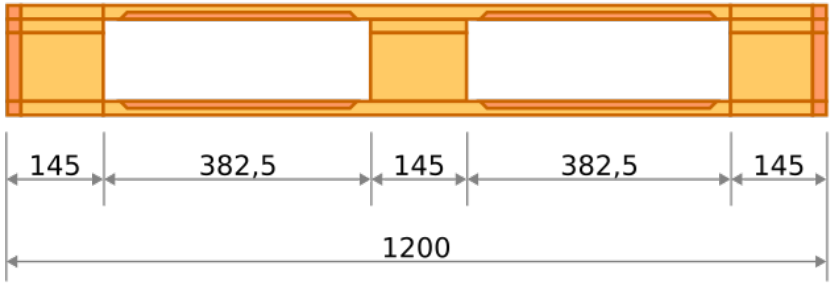
G-G (1 : 5)



PROYECTO	CREADO POR	APROBADO POR	FECHA	VERSIÓN
Mini trailer para bicicleta	A. Morillo	D. Jaeger	15-08-2022	0.01
NOMBRE DE PIEZA	ESPECIFICACIONES			CÓDIGO
Vistas 3D				A1
DESARROLLADO POR	REDISEÑADO POR	NOMBRE DE ARCHIVO		CANTIDAD
Basado en el trabajo de 'Hecho en Garage' - Youtube	OHO e.V.	Mini trailer para bicicleta.iam		1
		LICENCIA	TIPO DOC. / ESCALA	HOJA
		CC-BY-SA 4.0	Assembly / 1 : 20	1 /20

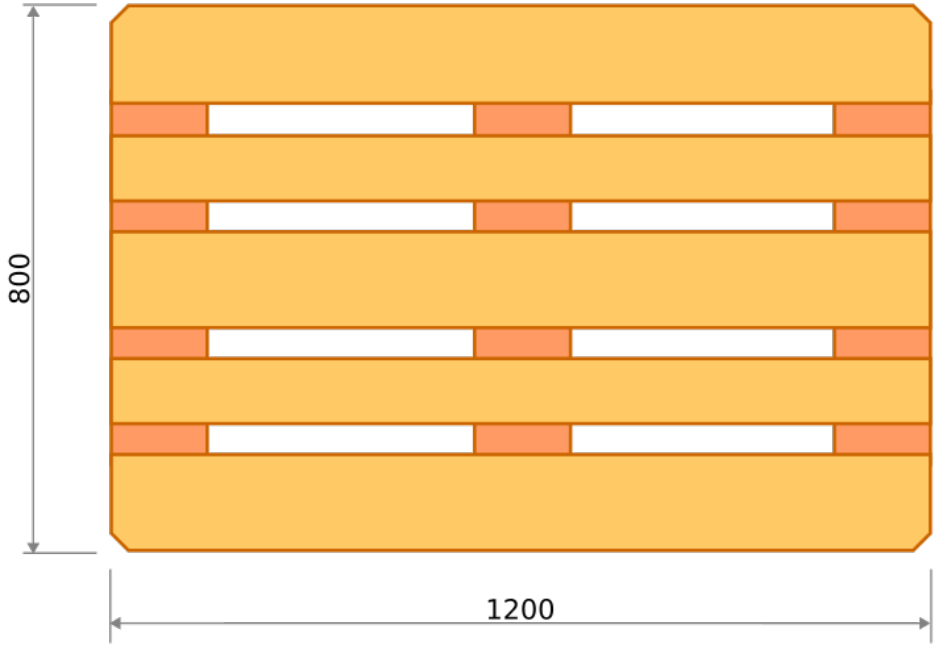

Flexi-modal



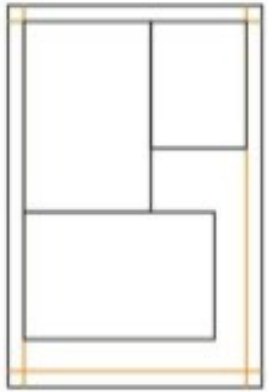


PALETTE EUR-EPAL ©

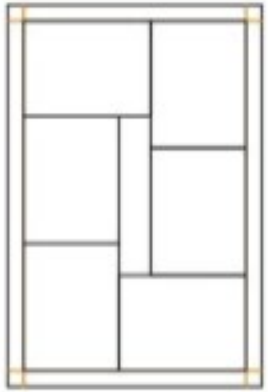
EPAL EUR



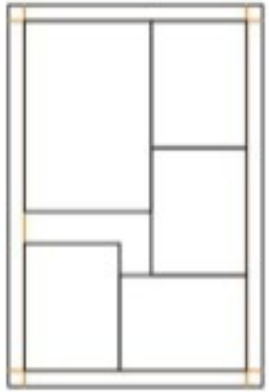
Pallets And Containers As A System:



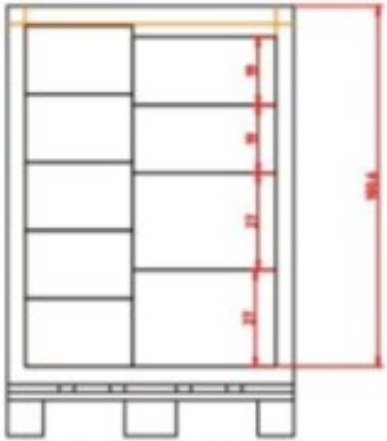
1 x 40x60
4 x 40x30



0 x 40x60
6 x 40x30
cooling space in center



1 x 40x60
4 x 40x30



Sketches of container system
based upon Euro system
5mm insulation drawn, would be build with 45mm
6 towers of 40x30 vege boxes allos a central cooling tower.
This could be frozen and then cool slowly to maintain
temperature in the box.

Time's Up

MAJOR ATTRIBUTES:

Weight: Not More Than 40kg (20% of gross load)
Expected weight of about 25-30 kg (15% of max gross weight)
Dimensions: Euro Pallet Standards 1, 2, 6 (ISO 1,2,0).
120 cm tall, with half-height box available at 60 cm.
Stackable 2-3 high.
Compatible with all existing pallet handling infrastructure.
Allows direct LO-LO capabilities onto small trucks, bikes, ships, LEVs, etc.

Human scale: Can be handled without capital intensive hardware.
Requires only pallet jacks, a loading ramp, hand trucks, and a few bars.

Locking system similar to those used in ISO shipping containers.

Variants

Tanker:

Able to take 150 Liters up to 150 kgs.

Baffles, exterior framing, drains, inlet hatches impose higher unit weight.

Reefer:

Insulated and provided with cold source at point of loading.

Requires drain system for potential condensation or melt water.

Essential for local delivery of fresh food and other perishable goods.

Additional tools:

Manual Lifting Bars

Lifting Frame for LO-LO Operations

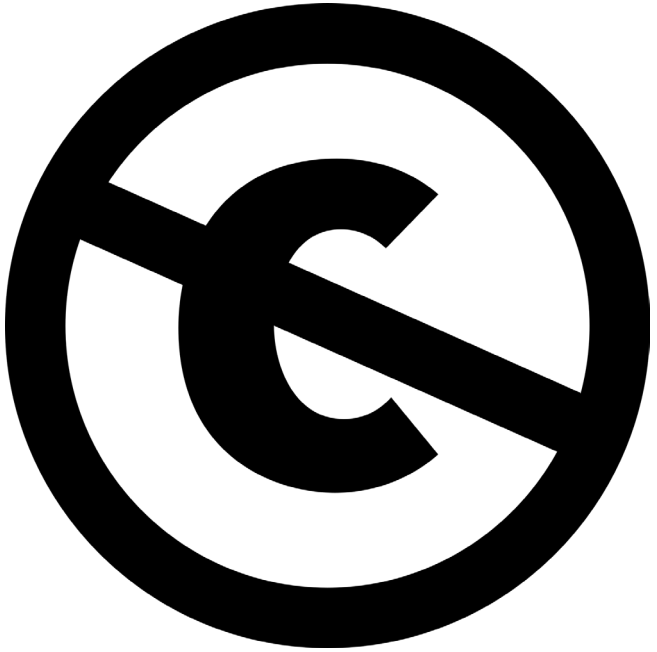
ISO0/EUR6 Hand Truck

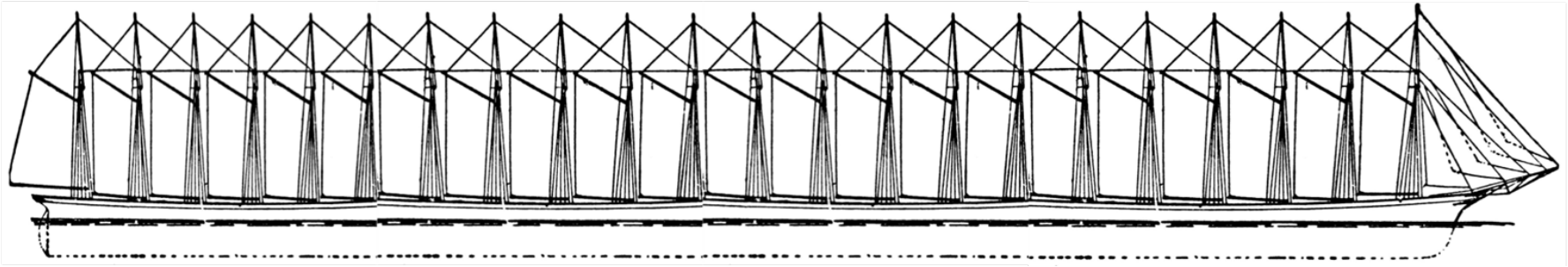
Ultralight Pallet Jack

No specialized tools are strictly needed to work with this system.

Actual Use Case: Time's Up Danube Sail Freight Project

open source
hardware





Questions?

Steven@PostCarbonLogistics.org