

Terminal system and transport system domestically

- Rail • Slow mode of transport compared to road transport • Low price of transport • Goods with low commodity value • Long distances • Large volumes • Inflexible
- Small environmental impact



Transport modes environmental impact

1 tonne of goods 1 kg CO₂



Air transport 1 km



Road transport 2 miles



Sea transport 20 miles



Railway Diesel 50 miles



Railway electricity 900 miles

Terminal system and transport system domestically

- Wagon load
 - Door to door
 - Requires knitting tracks
- Several goods owners' wagons in the train set
- System transport
 - A complete train set
 - A goods owner



Terminal system and transport system domestically

- Multimodal transport • The transport unit changes the mode of transport • Pallet, carton • Eg from container to trailer
- Intermodal transport • The carrier changes the mode of transport • Rail transport • Combined terminal
- Ports
 - Sea container
 - Trailers

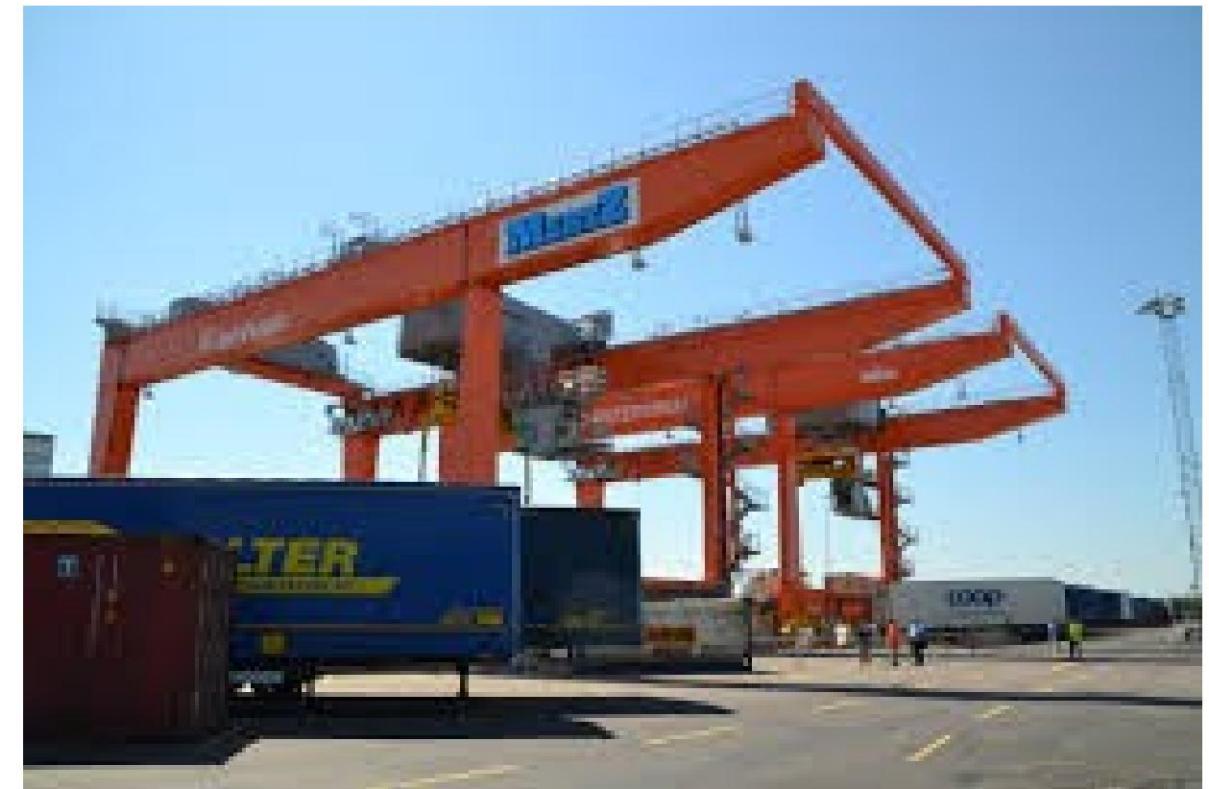


Terminal system and transport system domestically



Terminal system and transport system domestically

- Combined traffic
 - Port of Gothenburg
 - 70% of unloaded containers •
 - Further by train
 - 70 departures per day
 - Malmö – Stockholm
 - Daily departure
 - Gothenburg – Stockholm •
 - 4 departures per day



Terminal system and transport system domestically



Combined terminal - Torrhamn – Dryport

- Inland port
- Train shuttles
- Customs handling
- Container depot
- Benefits
 - Less congestion
 - Economies of scale
 - Time saving
 - Environmental effect

Terminal system and transport system domestically

- Harbor line
- Railport Scandinavia



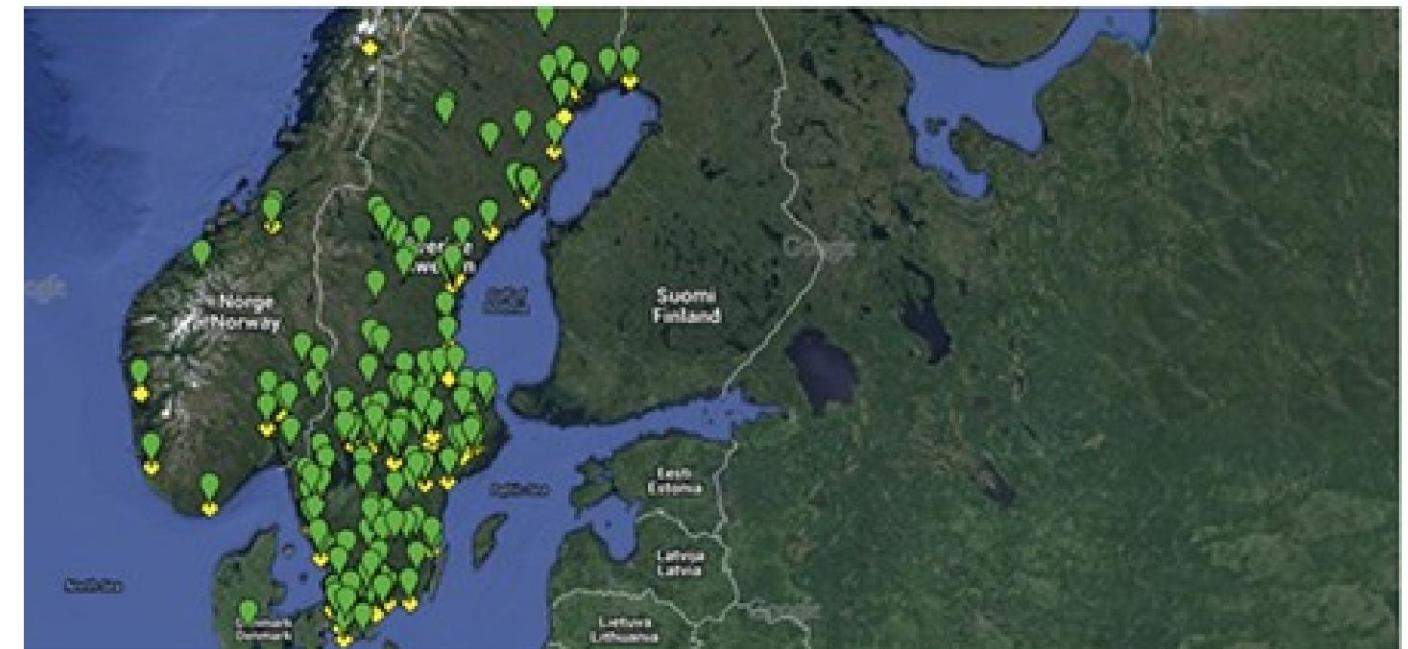
Terminal system and transport system domestically

- Train shuttle
 - From the Port of Gothenburg
 - Railport of Scandinavia
 - 8 train operators
 - Greencargo
 - Real Rail,
the Väner Express,
GDL, SCT, Schenker,
CFL , Ancotrans



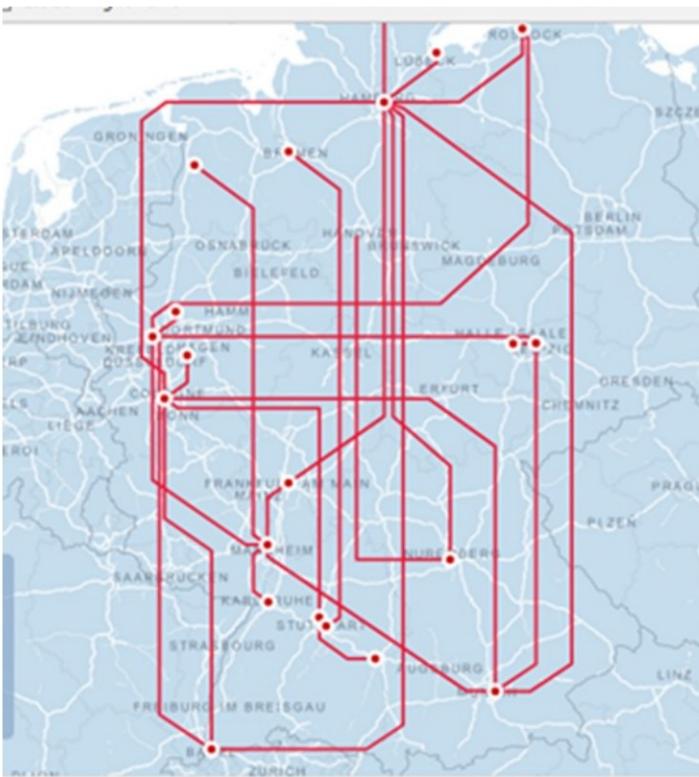
Terminal system and transport system domestically

- Green Cargo •
 - Train operator
 - Owner: Swedish State
 - 360 locomotives
 - 5000 wagons
 - Wagon load
 - Wagon types
 - Tank
 - Open •
 - "Goods finka"
 - System transports •
 - Complete
 - train sets • Intermodal transports





*kombi
verkehr*



Terminal system and transport system domestically

- The national plan •
 - Expansion of capacity •
 - Signaling system
 - ERTMS
 - Improved connections
 - Ports
 - Combi terminals
 - Double track
 - Four track



National freight transport strategy

- Government decision 2018
- National freight transport council •
 - Implementation of the strategy
- The purpose of the
 - strategy • Efficient, high-capacity and sustainable freight transport
- National plan for the transport system 2018–2029 • Trafikverket
 - Business freight transport • Priority area
 - Demand for freight transport • Increase by 2% per year until 2040



National freight transport strategy

- Competitive and sustainable freight transport •
- Transition to fossil-free transport •
- Innovation, competence and knowledge • National plan for the transport system 2018–2029



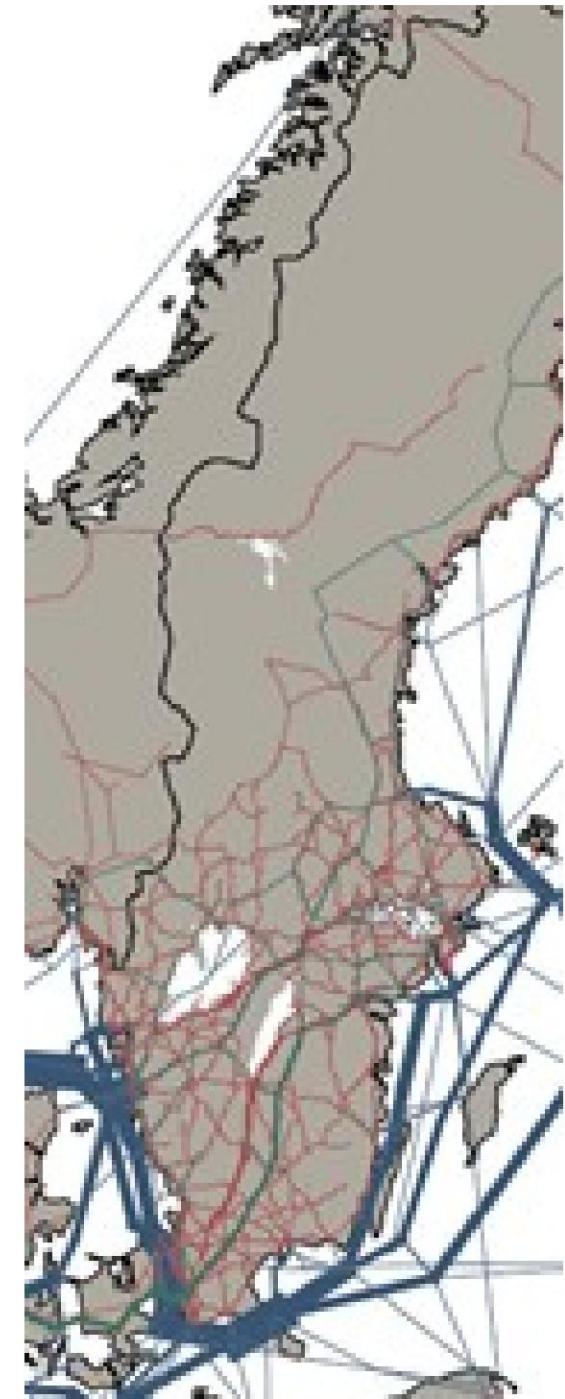
National freight transport strategy

- Competitive and sustainable freight transport •
- Coordination and cooperation for increased intermodality • Industry organizations • Trafikverket
 - Transshipment costs
 - Location of combi terminals •
 - Innovative solutions
 -
- Knowledge • Jernhusen and Green Cargo • Transport efficiency • Longer and heavier vehicles
 - Occupancy rate • Open data



National freight transport strategy

- Competitive and sustainable freight transport
 - Investments along freight lines •
Freight lines in the EU's Tent-T network
 - Maintenance of the railway •
The grant is increased • Port of Gothenburg
 - Improved port infrastructure
 - The Arlanda Council
 - Hub airport •
Airspace and infrastructure for connecting transport



REVIEW EXERCISE ROUTE PLANNING

Transport units

Unit that goods can be loaded into, e.g

- Stool
- Box
- Hedge
- Cardboard
- Barrel
- Function •
 - Hold the goods together • Be load-bearing
 - Protective • Load securing
- Parcel
 - Collective name for all types of package



Transport units

Pallets

EUR pallet 1.2m x 0.8m

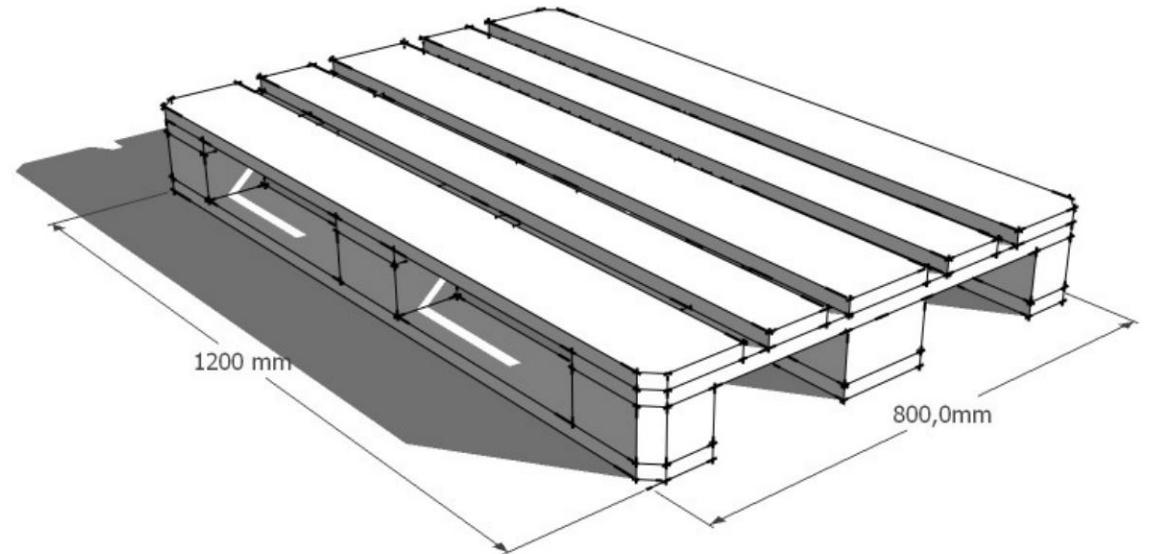
Sea pallet 1.2m x 1m

The European podium

- Pool system •
- Stool replacement
- Half pallet
- Weight of the pallet
 - About 25kg •

The pallet's maximum weight

- About 1200kg



Transport units

Goods on pallet

- Fixed
- Bands
- Plastering •

Edge protection



Transport units

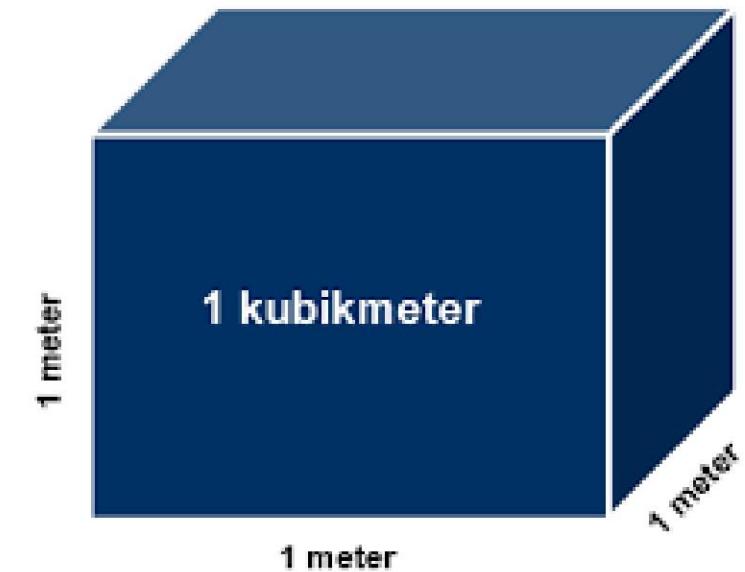
Stools with collars

- Unpackaged goods
- Benefits
 - Irregular goods •
 - Protect the goods
 - Reduced handling work



Number of parcels, weight and volume

- The importance of weight and volume
 - Planning of the load in vehicles
 - Weight limitation •
 - Volume limitation •
 - Distribution of weight in vehicles •
- When the carrier should price • Weight
 - Volume
 - Or both
- The goods owner's wishes •
 - Weight
 - Volume



Number of parcels, weight and volume

Goods facts

1. Type of parcel • Eg

cartons, pallets, boxes 2. Number of
parcels • How many?

3. The weight of the goods

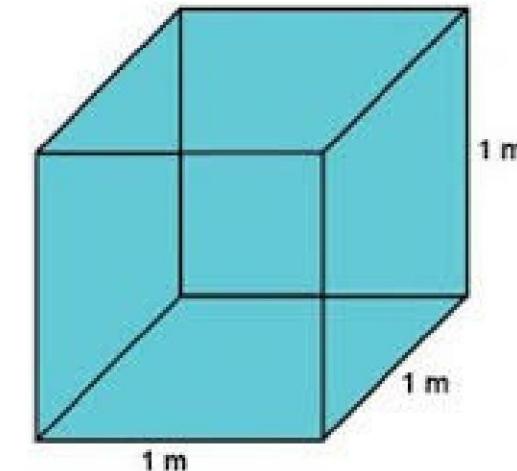
- What does the goods weigh?

4. Goods volume • The

space for the goods in the load carrier

- For example in a trailer or container

5. Structure of the goods and packaging • Where should the
goods be placed in the load carrier? • How should the
goods be placed in the cargo carrier?



Number of parcels, weight and volume

- Carrier weight and volume calculation units
- Weight
- Volume
- Flat meter
- Platform space



Number of parcels, weight and volume

- Heavy goods, its goods
- Small volume
- High weight in relation to volume
- Calculated in kg
- Real weight, gross weight, the weight the scale registers
- To take into account
- Can the pallets be placed on top of each other?
- The pressure on the pallet at the bottom
- Position in the vehicle
- Weight distribution in the vehicle



Heavy goods



Weight and volume

- Bulk goods •

Large volume

- Low weight, in relation to volume •

Calculated in cubic meters (m³)

- Length x width x height
- Can be overloaded •

The goods can be loaded on top of other goods



Bulk goods



Weight and volume

- Flat meter goods

- Goods that require floor space •

The goods cannot be loaded on top of other goods

- Goods that cannot be stacked
 - Goods that do not have standard dimensions
 - The cargo owner pays for the entire cargo area
 - Length meters of the flatbed with the full width and height of the cargo area



Flat meter goods FLM



Podium place PPL

- The customer pays for
 - Floor area for the pallet 1.20 x 0.8
 - The entire space from floor to ceiling



Podium place PPL

- The customer pays for
 - Floor area for the pallet 1.20×0.8
 - The entire space from floor to ceiling



Podium place PPL



Concept

- PLL
- PPL
- PLC
- M3, KBM, CBM •
FLM, LDM •
KRT, CRT
- RLE
- RLS
- DRM
- IBC Container
- HCK, CTE
- KLI, CLI
- Pallet •
Pallet space •
Pallets, pallets • Cubic meter,
Cubikmeter • FLM, LDM = Flakmeter,
Loadingmeter •
Karton,
Carton • Roll •
Rolls, *Reels*
• Drum, barrel • *Intermediate bulk container* •
Hedge, *Crate*
• Kolli, *Colli* • Used when a booking from
customer contains several package types

Degree of filling

- Degree of filling
 - Measures how efficiently the load carrier/vehicle is loaded
- High degree of filling •
 - Efficient loading •
 - Combination of goods •

Degree of filling in cargo carriers

- The transporter measures profitability/efficiency •
 - Common denominator
 - Converts volume to weight



Volume conversion

- The shipping
 - The cost that the goods owner must pay for the transport
- The carrier may charge • Actual weight •
 - Volumetric weight
 - Actual weight/
 - physical weight
 - The weight of the goods when placing the goods on the scale
 - Volume weight •
 - When volume is converted to weight
- **Shipping weight**
 - The weight for which the goods owner must pay shipping
 - Always the highest •
 - The weight
 - The volume



Example of conversion of volume to weight domestic road transport

Volume calculation	Weight by volume
1 cubic meter m ³	280kg
1 Flak meter etc	1950kg
Length x Width/width of the bed (2.4)	
1 platform ppl	780kg
1.2m x 0.8m /2.4 = 0.4flm	

Weight, volume and shipping weight

- Ex 1 Weight or cubic meters

- 1 pll weight 150kg volume 1m³ •

Volume weight 1m³ = 280kg • The highest weight of actual weight and volume weight • Shipping weight = 280kg

- The weight the customer must pay shipping for

- Ex 2 Weight or cubic meter • 1

pll weight 500kg volume 1m³

- Volume weight 1 m³ = 280kg • The highest weight of real weight and volume weight

- The real weight 500kg • The shipping weight = 500kg

- The weight the customer must pay shipping for

- Ex 3 Weight or cubic meters

- 1 pll weight 175kg volume 1.2m³ •

1.2m³ x 280kg = 336kg • Volume weight = 336kg • The highest weight of actual weight and volume weight • Shipping weight = 336kg

- The weight the customer must pay shipping for

- Ex 4 Weight or cubic meters

- 3 plts weight 726kg volume 1.8m³ • 1.8

m³ x 280kg = 504kg • Volume weight 504kg • The highest weight of real weight and volume weight • The real weight 726kg

- Shipping weight = 726kg

- The weight the customer must pay shipping for

Weight, volume and shipping weight

- Formula for calculating flat meter
 - Goods set
 - **Length x Width / width of flatbed 2.4m**

- Ex 5 Weight or flat meter etc

- 1 package with the dimensions

- Length 1.3m •

- Width 0.9m •

- Weight 500kg

- $1.3 \times 0.9 / 2.4 = 0.488 \text{ flm}$ •

- Volume weight = $0.488 \times 1950 = 952\text{kg}$ •

- Volume weight is higher than the actual weight of the goods • Shipping weight = 952kg

- The weight the customer must pay shipping for

Weight, volume and shipping weight

- Platform space
 - Eur pallet dimensions
 - 1.2m length
 - 0.8mm wide
 - Starting point, the vehicle's number of pallet spaces
- Example 6
 - The vehicle has 33 ppl.
 - Customer 1
 - 13 ppl
 - Customer 2
 - 20 ppl
 - $13 \text{ ppl} + 20 \text{ ppl} = 33 \text{ ppl}$
 - The vehicle is full

Weight, volume and shipping weight

- PPL and flat meter are related • What does the vehicle's number of ppl mean in flat meter?
 - How many flakes are a eurpl? • 1.2m length • 0.8m wide
 - The formula for flat meter
 - Length x width / width of the flap,
 $2.4m \cdot 1.2 \times 0.8 / 2.4 =$
0.4 flm • Each ppl corresponds to 0.4 flm

Weight, volume and shipping weight

- Example 7
- The vehicle 13.6 m trailer
 - Customer 1
 - 13 ppl •

How many flat meters? • $13 \times 0.4 =$

5.2 flm • Customer 2

• 20 ppl •

How many flat meters? • $20 \times 0.4 =$

8 sc • $5.2 \text{ sc} + 8 \text{ sc} =$

13.2 sc