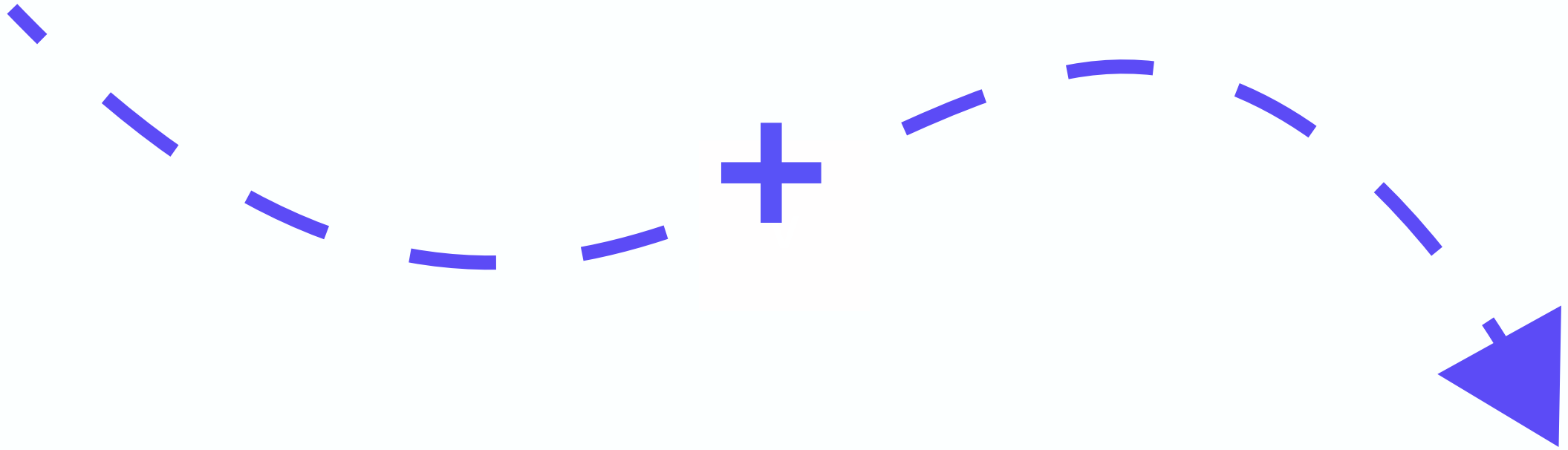


TRANSPORTATION



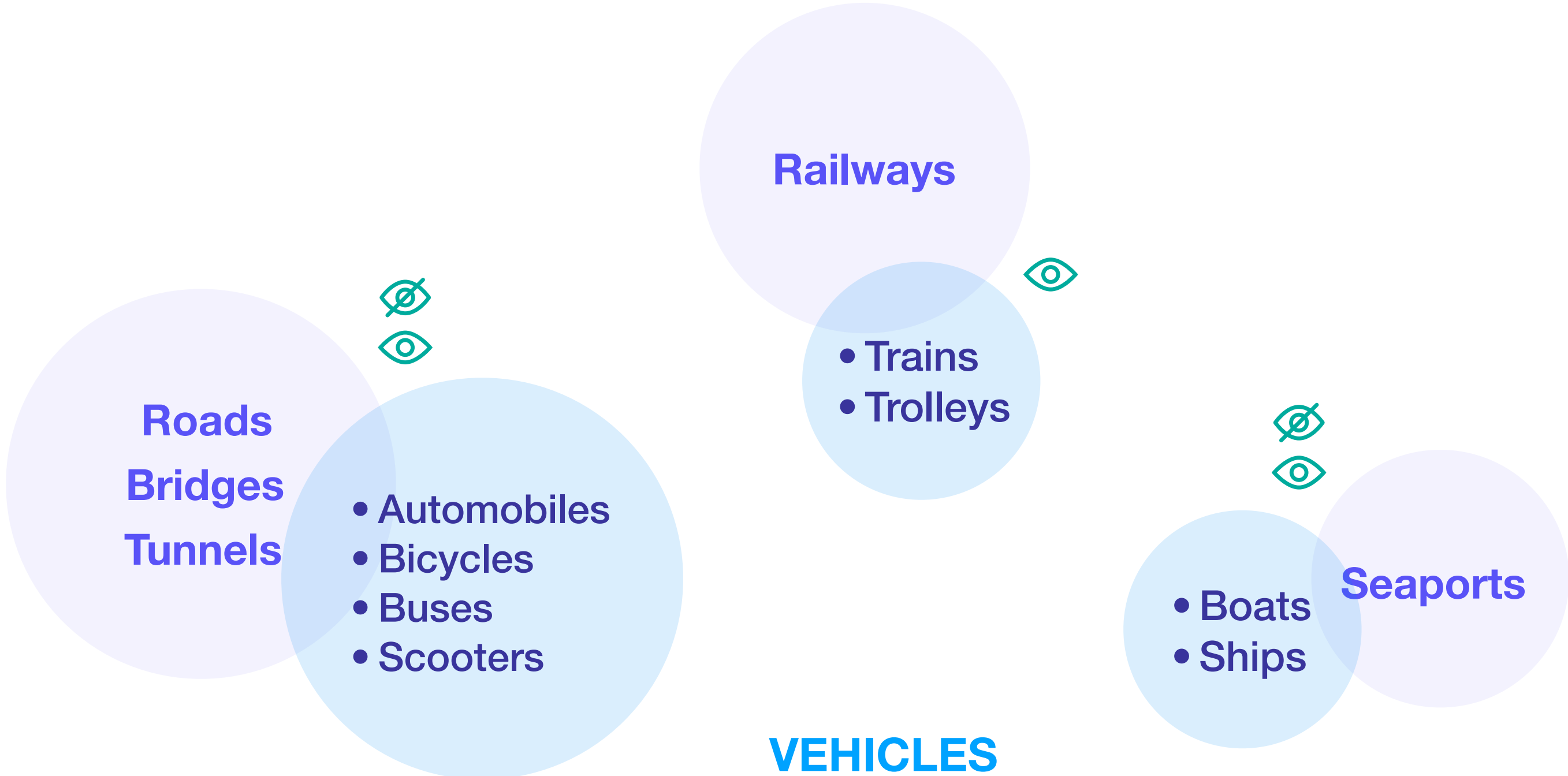
WAYFINDING



WHAT IS TRANSPORTATION?

The movement of people or goods from one place to another.

INFRASTRUCTURE



OPERATIONS

- Private
- Public





WAYFINDING

Spatial problem solving.

The cognitive, social and physical process and experience of locating, following or discovering a route through and to a given space.

1. **Orientation** - determining one's location in relation to objects that may be nearby and the desired destination.
2. **Route decision** - selecting a course of direction to the destination.
3. **Route monitoring** - checking to make sure that the selected route is heading towards the destination.
4. **Destination recognition** - recognize that the destination is reached.



WAYFINDING PRINCIPLES

- Create **points of reference**.
- Provide an **appropriate amount** of information.
- Uses **consistent language**.
- Help develop **mental models** of the space.
- Contribute to a sense of **well-being, safety,** and **security**.

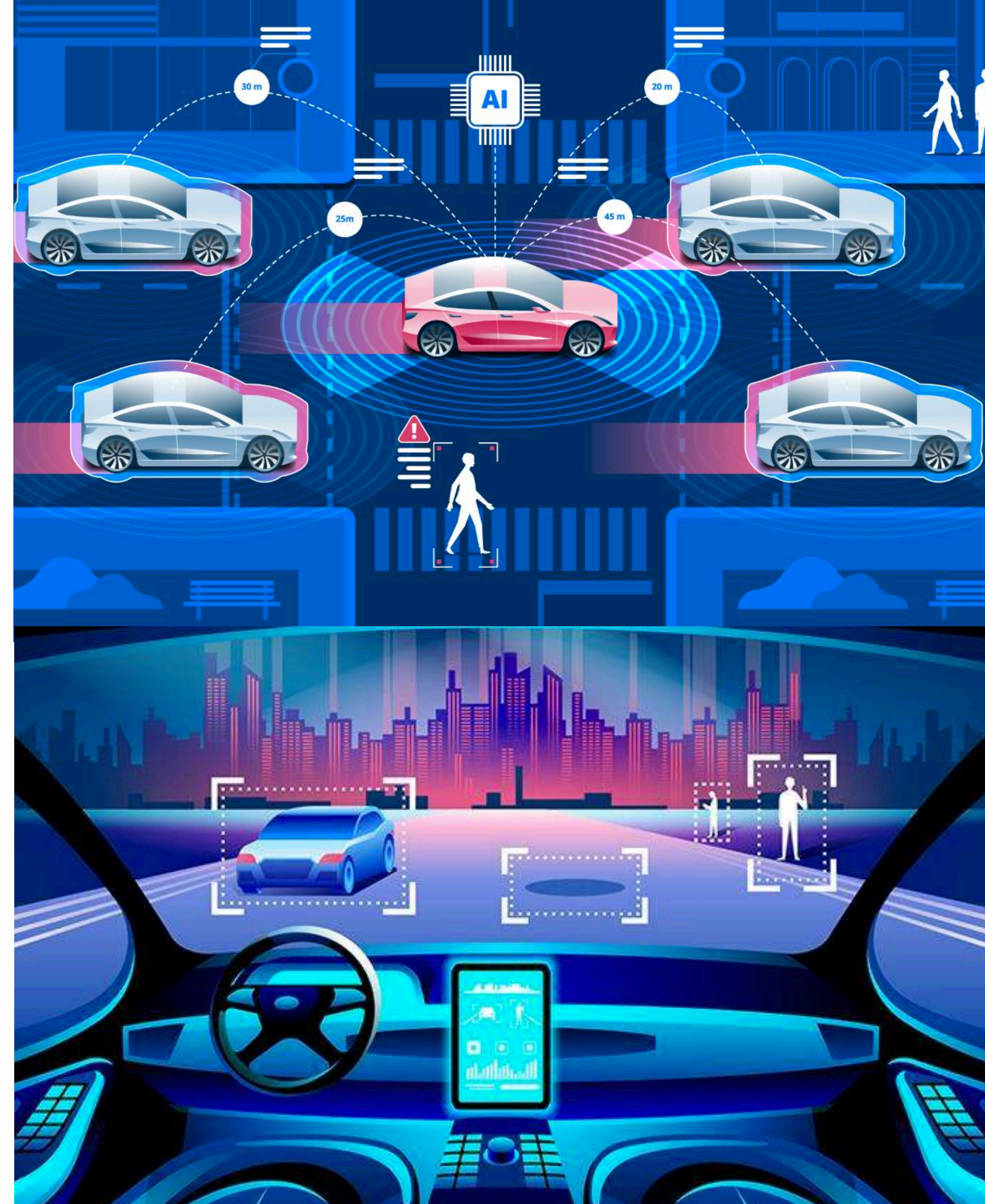
FUTURE OF TRANSPORTATION

Autonomous Vehicles

- Autonomous vehicles use a combination of sensors and software to control, navigate, and drive the vehicle
- Self-driving systems create and maintain an internal map of their surroundings

Impact

- Safety
- Equity & Accessibility
- Environment



FUTURE OF TRANSPORTATION

Alternative Modes & Fuels

- Electric vehicles (EV) may be more prominent in the near future
- High speed trains with maglev technology already exist and may get more popular
- Advanced biofuels are those fuels made from materials that are considered “renewable biomass”

Impact

- Cost
- Sustainability





CURRENT PROBLEMS

- Traffic congestion
- Automobile dependency
- Parking
- Long commute hours
- Environmental impacts



Intro to Universal Design



What is universal design?

“Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.”

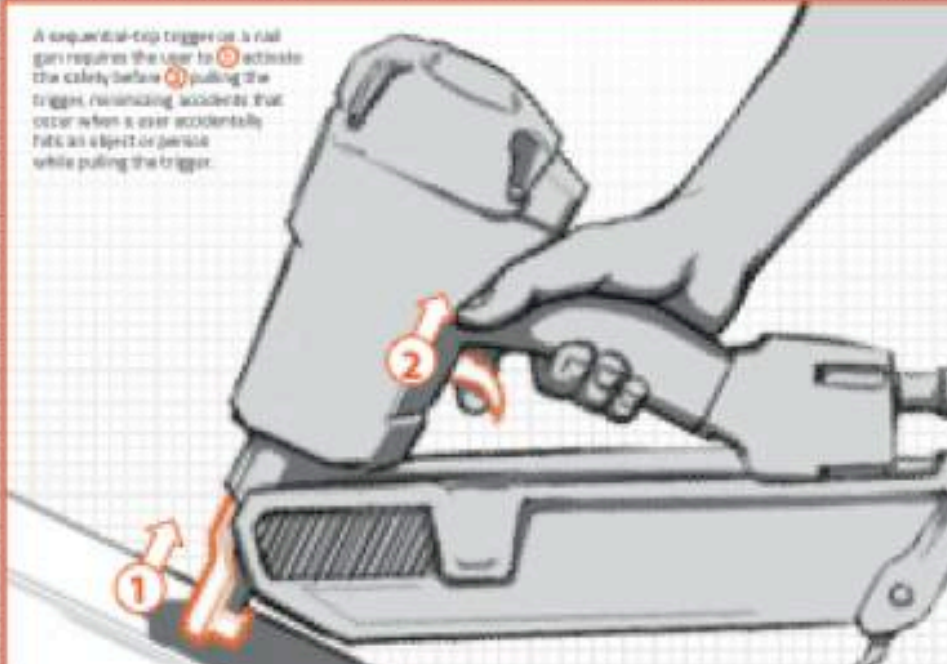
– Ron Mace

The Principles of Universal Design



1 Equitable Use
The design is useful and marketable to people with diverse abilities.

Powered door with sensors is convenient for all shoppers, regardless of health and fit.

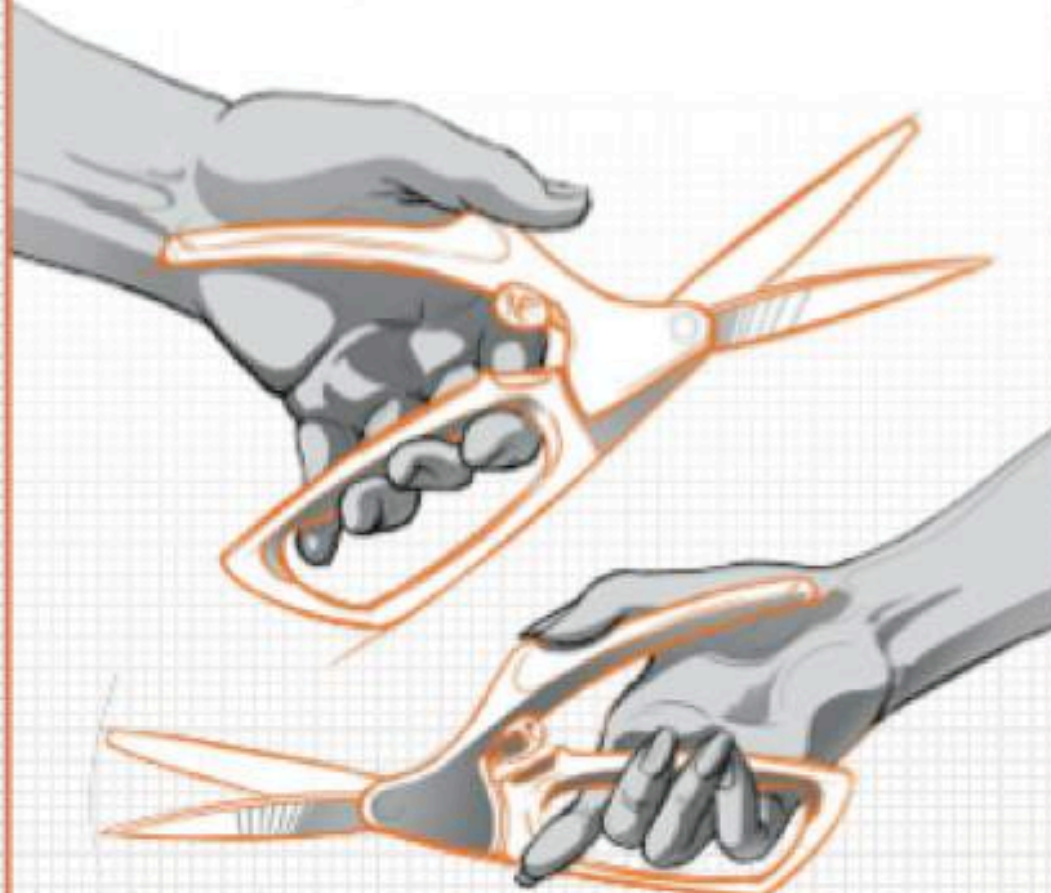


A sequential-step trigger on a rail gun requires the user to activate the safety before pulling the trigger, minimizing accidents that occur when a user accidentally pulls an object or device while pulling the trigger.

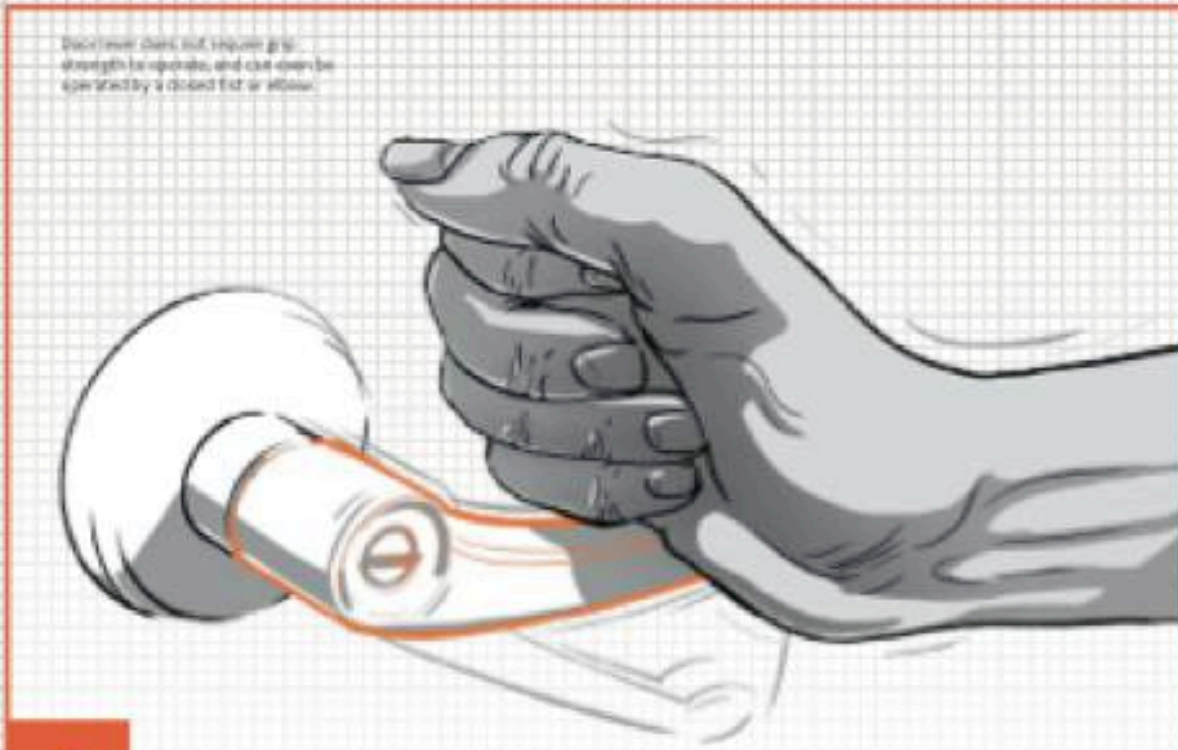
5 Tolerance for Error
The design minimizes hazards and the adverse consequences of accidental or unintended actions.

The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

2 Flexibility in Use
The design accommodates a wide range of individual preferences and abilities.

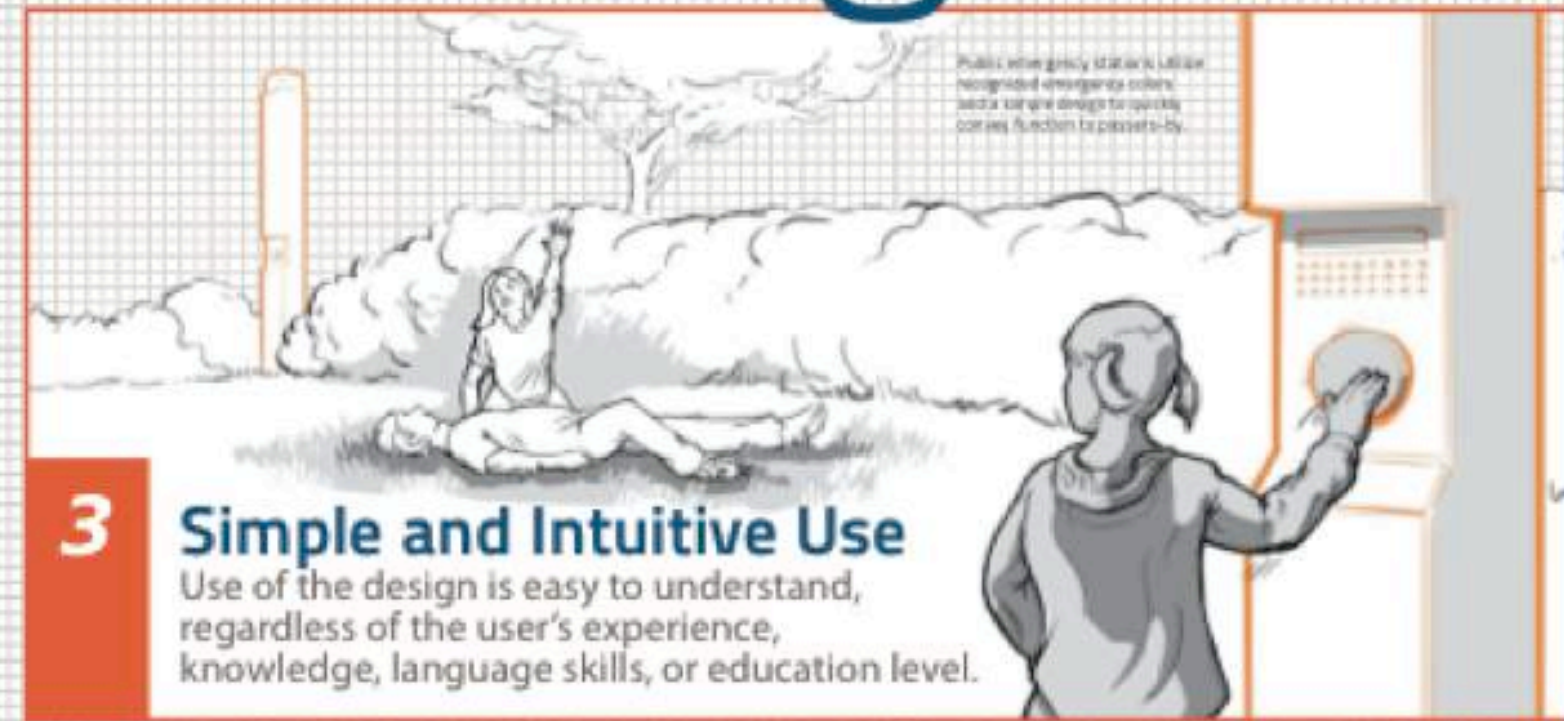


Large grip extends reach/visibility and with wider hand and allows alternation between the two in highly repetitive tasks.



6 Low Physical Effort
The design can be used efficiently and comfortably and with a minimum of fatigue.

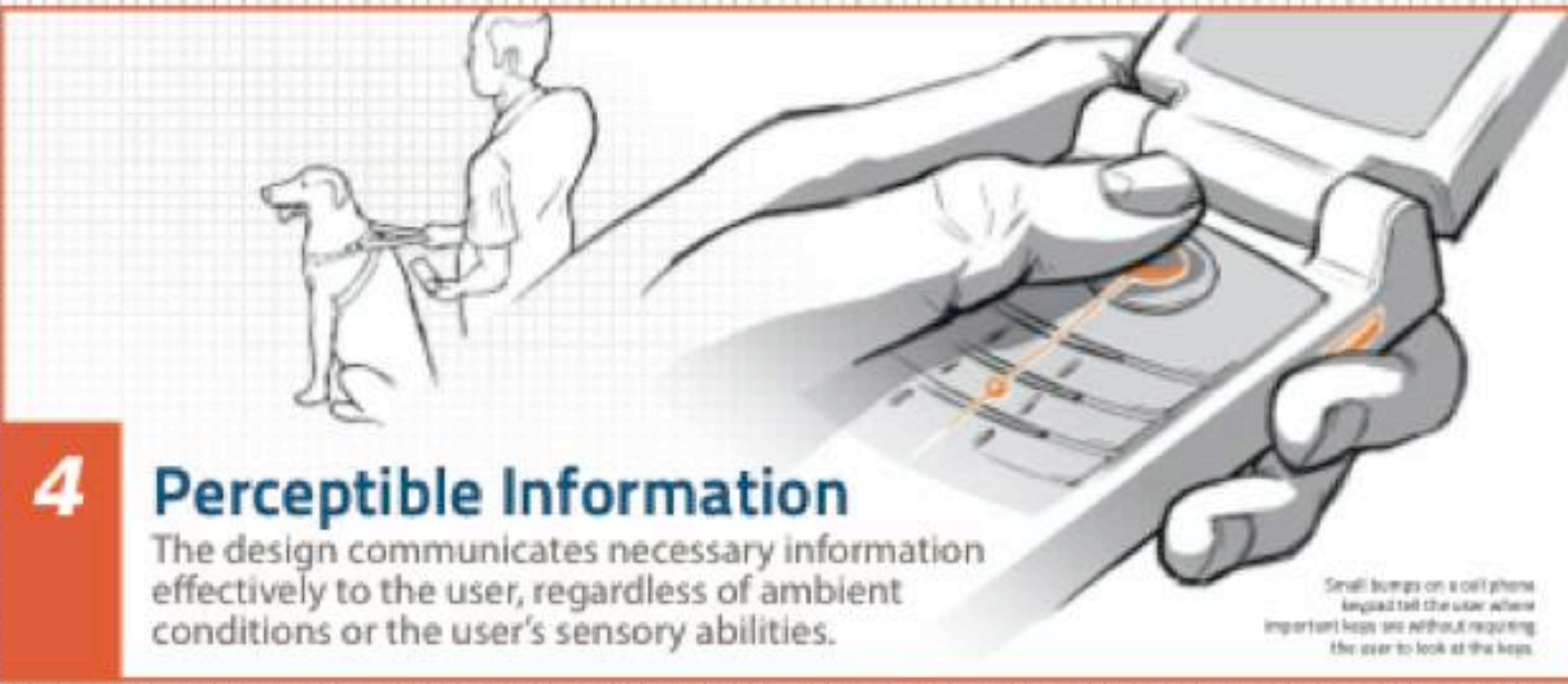
Door turn does not require grip strength to operate and can operate open/closed by a closed fist or elbow.



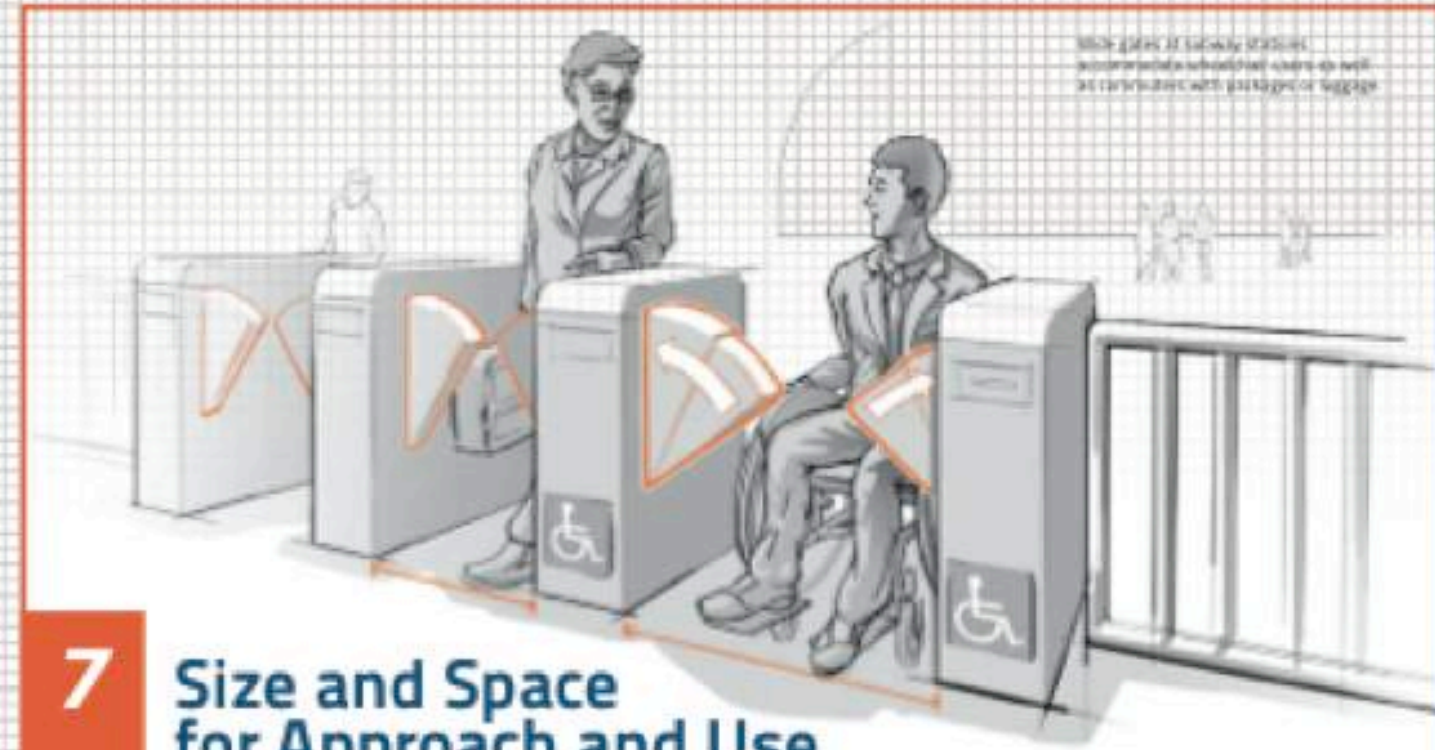
3 Simple and Intuitive Use
Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or education level.

Public emergency station with recognized emergency colors and a large design to quickly convey function to passers-by.

4 Perceptible Information
The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.



Small bumps on a cell phone keypad tell the user where important keys are without requiring the user to look at the keys.



7 Size and Space for Approach and Use
Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Wide gaps at transit station accommodate wheelchair users as well as commuters with packages or luggage.

EQUITABLE USE

The design is useful and marketable to people with diverse abilities.

FLEXIBILITY IN USE

The design accommodates a wide range of individual preferences and abilities.

SIMPLE AND INTUITIVE USE

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

PERCEPTIBLE INFORMATION

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

TOLERANCE FOR ERROR

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

LOW PHYSICAL EFFORT

The design can be used efficiently and comfortably and with a minimum of fatigue.

SIZE AND SPACE FOR APPROACH AND USE

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility

**How can universal design
support transportation?**

Design Sprint!

Congratulations! You have been hired as designers for the SFMTA Olympics Committee!



Congratulations! You have been hired as designers for the SFMTA Olympics Committee!

Your role as a designer in this department is to use the generous funds given to you by the committee to redesign the transportation system using the principles of universal design.

There are five groups of designers, each working in a different area. We will review your proposals at the end.

A family of five from Japan is traveling to San Francisco for the 2030 Olympics.

They are used to the excellent public transportation system in Tokyo. They have heard horror stories about the terrible American public transportation system.



THE YAMASAKI FAMILY

Kento, 50 - Dad

Kento does photography in his spare time, and loves to take pictures while he is traveling.

Matsumi, 42 - Mom

The planner of the family. Always does research about what to do and where to go.

Naruto, 4 - Son

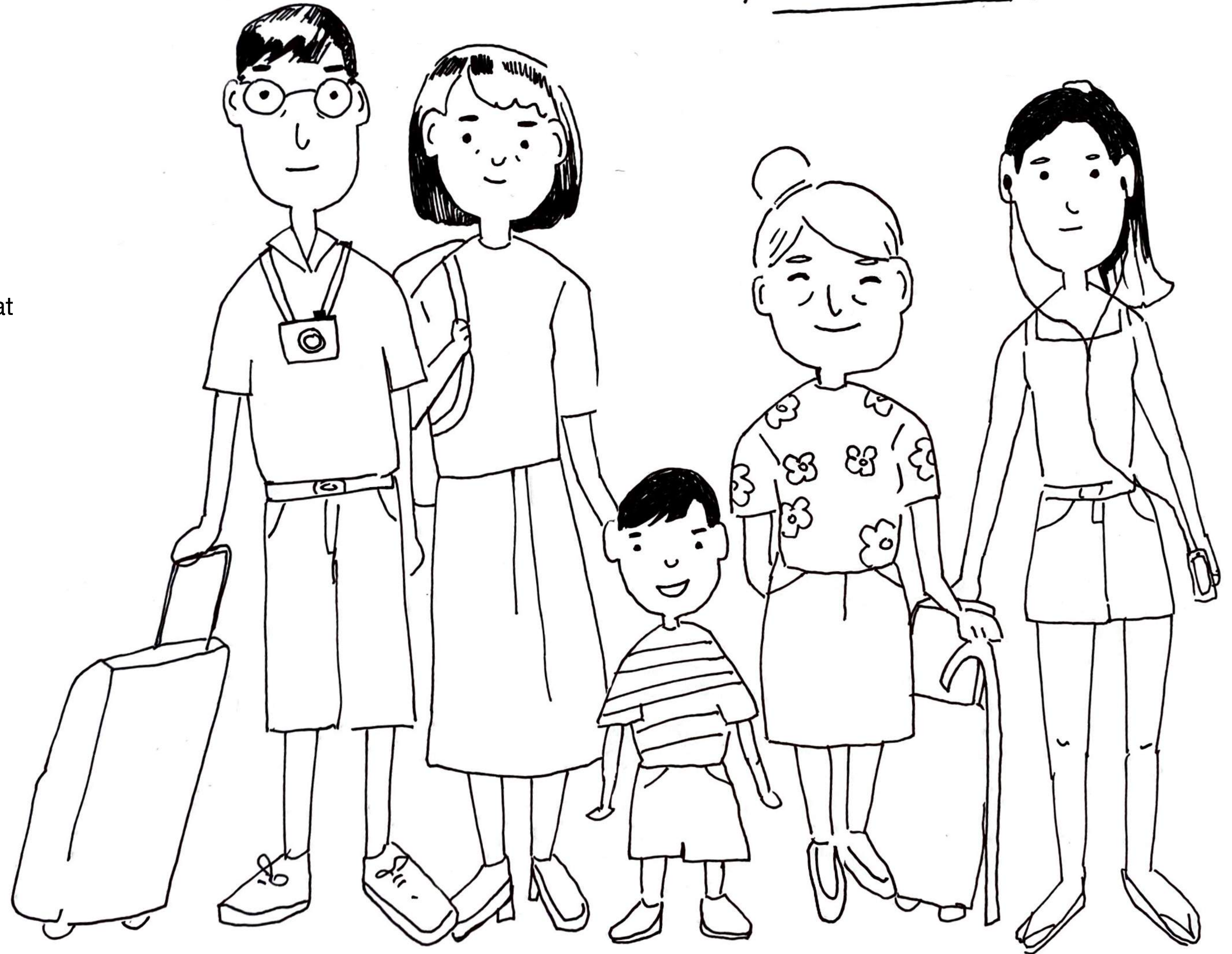
The toddler. Cries a lot but is just having a good time.

Tsunade, 85 - Grandmother

Kento's mom. She doesn't understand English, and has a bad hip so she walks with a cane.

Sakura, 15 - Daughter

Secretly loves family vacations but won't admit it. She's got hundreds of followers on instagram.



Design Briefs

Design Proposal #1

Navigating the Airport

The family of five has just landed in SFO!

Design the optimal flow to help them get from the terminal, baggage carousel, customs, and transportation. Another way to think of this is to help them leave the airport.

How might we reduce the confusion of leaving an airport for foreign travelers?

Design Proposal #2

Traveling from the Airport to the Hotel

The family has gotten their bags and exited the airport.

They now want to connect to transportation to get from the airport to the hotel. The hotel is located at Union Square.

How might we help foreign travelers understand and access various transportation options?

Design Proposal #3

Navigating San Francisco

The family loves baseball. They're at their hotel and Matsumi, Kento, and Sakura are headed to the Olympics where Japan is playing in three hours. Naruto and Tsunade are staying behind because they're not feeling well.

The event is located at Oracle Park, 2 miles from their hotel. They want to enjoy the waterfront on the way there.

How might we encourage the use of different transportation methods to Olympic events?

Design Proposal #4

Public Parking

The Olympics have ended, and the family has 3 days left in San Francisco. They've rented a car so they can go visit the UC Berkeley campus.

Choose one:

1. Park on the street: Design a parking sign and/or payment kiosk/parking meter
2. Park in a lot: Improve the experience of parking in a garage (i.e. payment kiosk, signage)

How might we improve the experience of parking?

Design Proposal #5

Payment

The City wants to reduce the complexity of payment between multiple apps and public transportation agencies.

How might we streamline payment for transportation?

Groups

15 minutes to design & 5 minutes to present

Design Proposal #1

Navigating the Airport

Nathalia | Will | Alvin | Jamie | Ruitao | Jackie

Design Proposal #2

Traveling from the Airport to the Hotel

Tiger | Heather | Tia | Sherrie | Rita

Design Proposal #3

Navigating San Francisco

Eugina | Jimmy | Tara | Claire | Elijah

Design Proposal #4

Public Parking

Hridae | Tai | Yuan | Asher | Jieying

Design Proposal #5

Payment

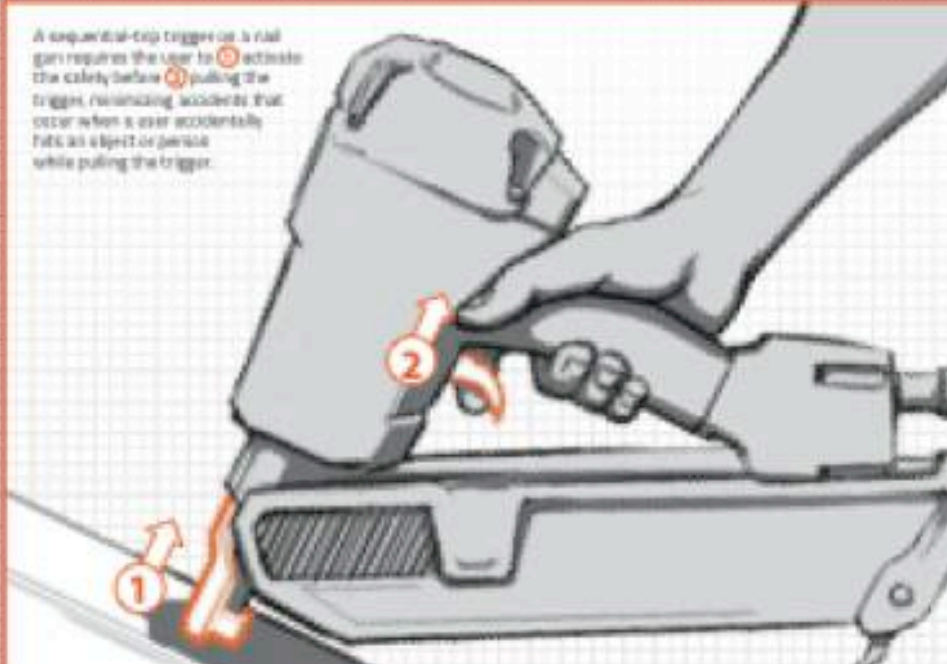
Anchi | Kendra | Natasha | Jay | Grace

The Principles of Universal Design



1 Equitable Use
The design is useful and marketable to people with diverse abilities.

Powered chair with controls is convenient for all shoppers, regardless of health and fit.

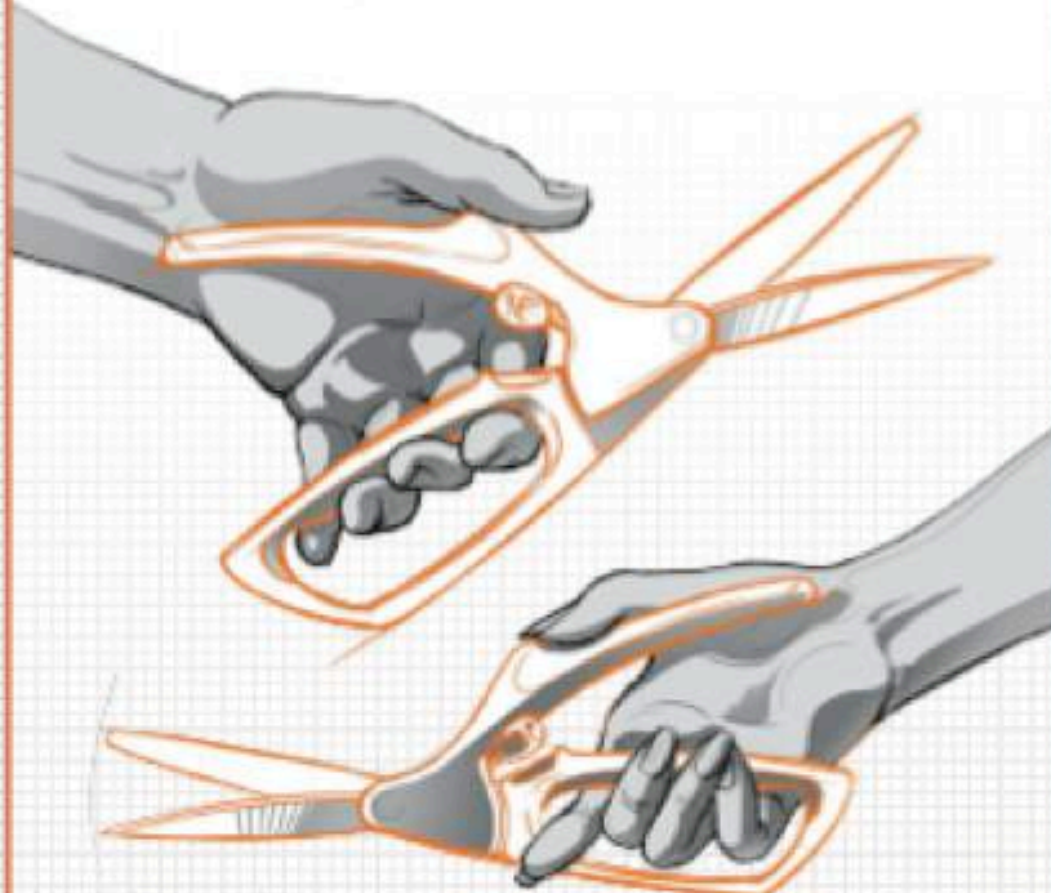


A sequential-step trigger on a rail gun requires the user to activate the safety before pulling the trigger, minimizing accidents that occur when a user accidentally pulls an object or device while pulling the trigger.

5 Tolerance for Error
The design minimizes hazards and the adverse consequences of accidental or unintended actions.

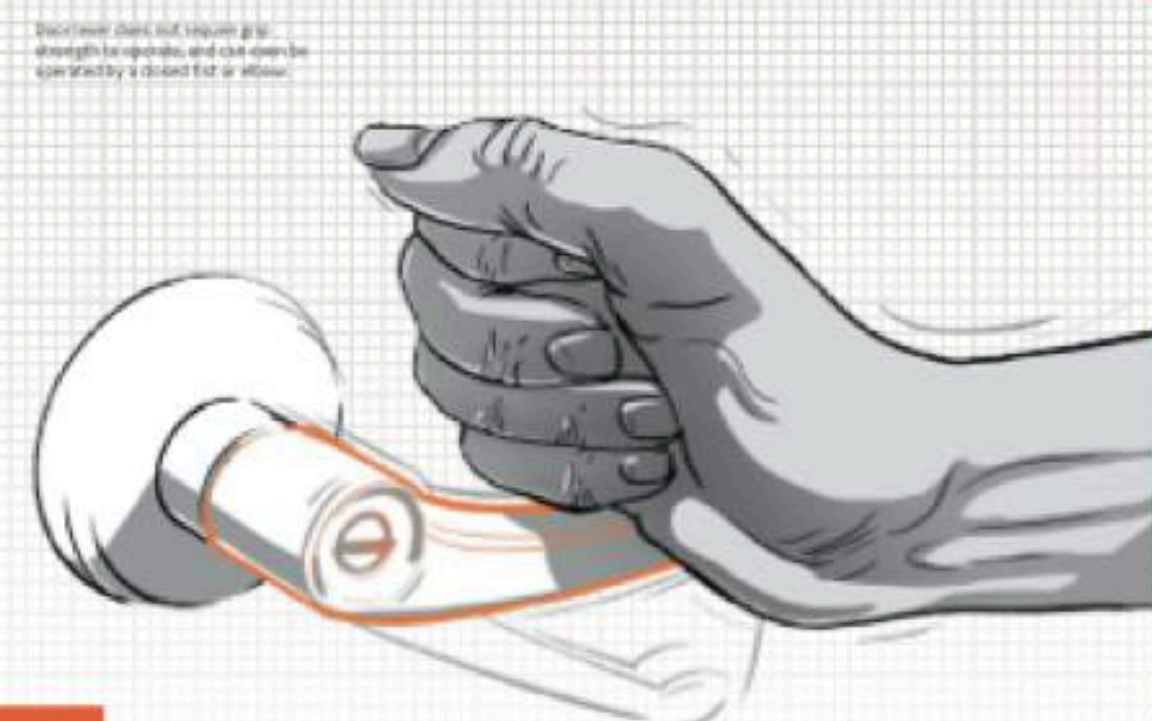
The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

2 Flexibility in Use
The design accommodates a wide range of individual preferences and abilities.

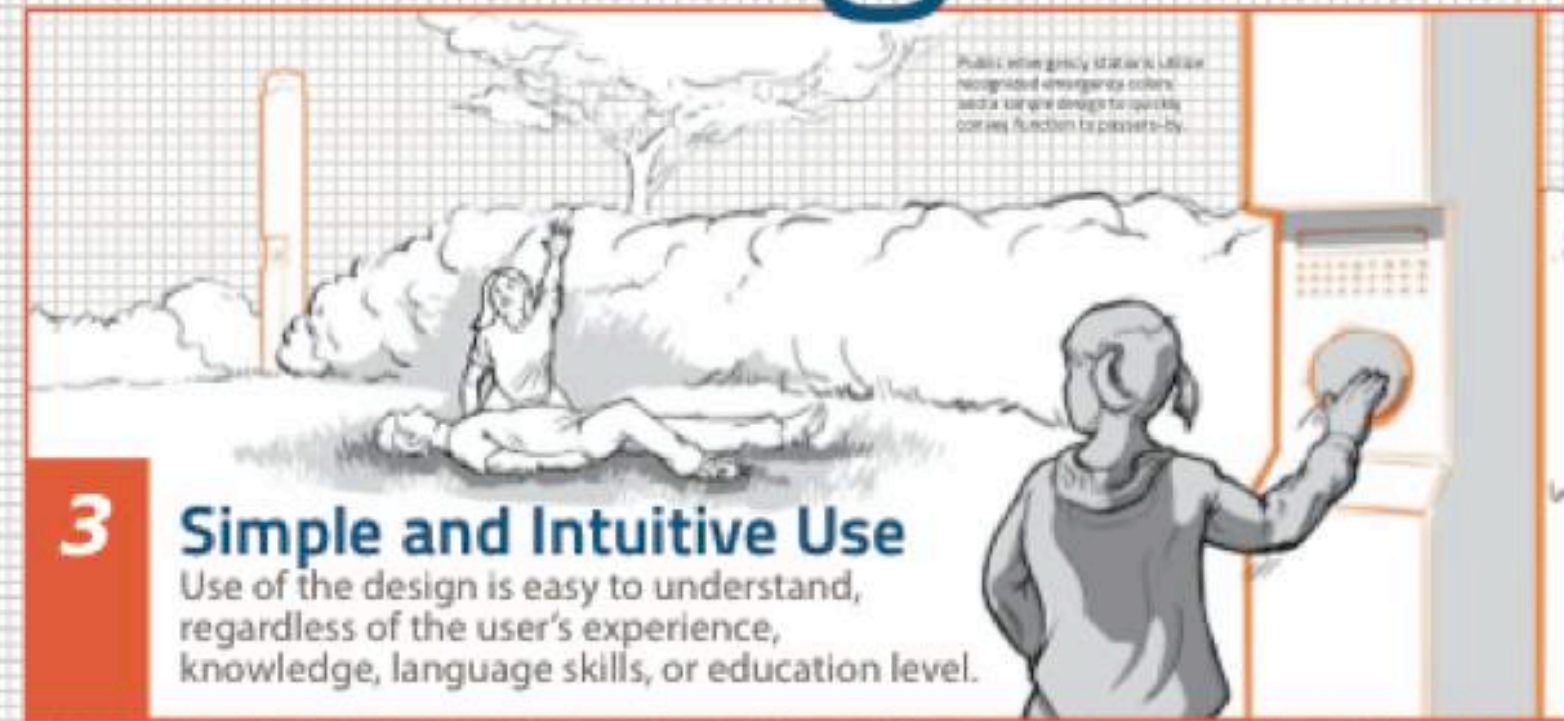


Large grip options accommodate the user with either hand and allows alternation between the two in highly repetitive tasks.

6 Low Physical Effort
The design can be used efficiently and comfortably and with a minimum of fatigue.



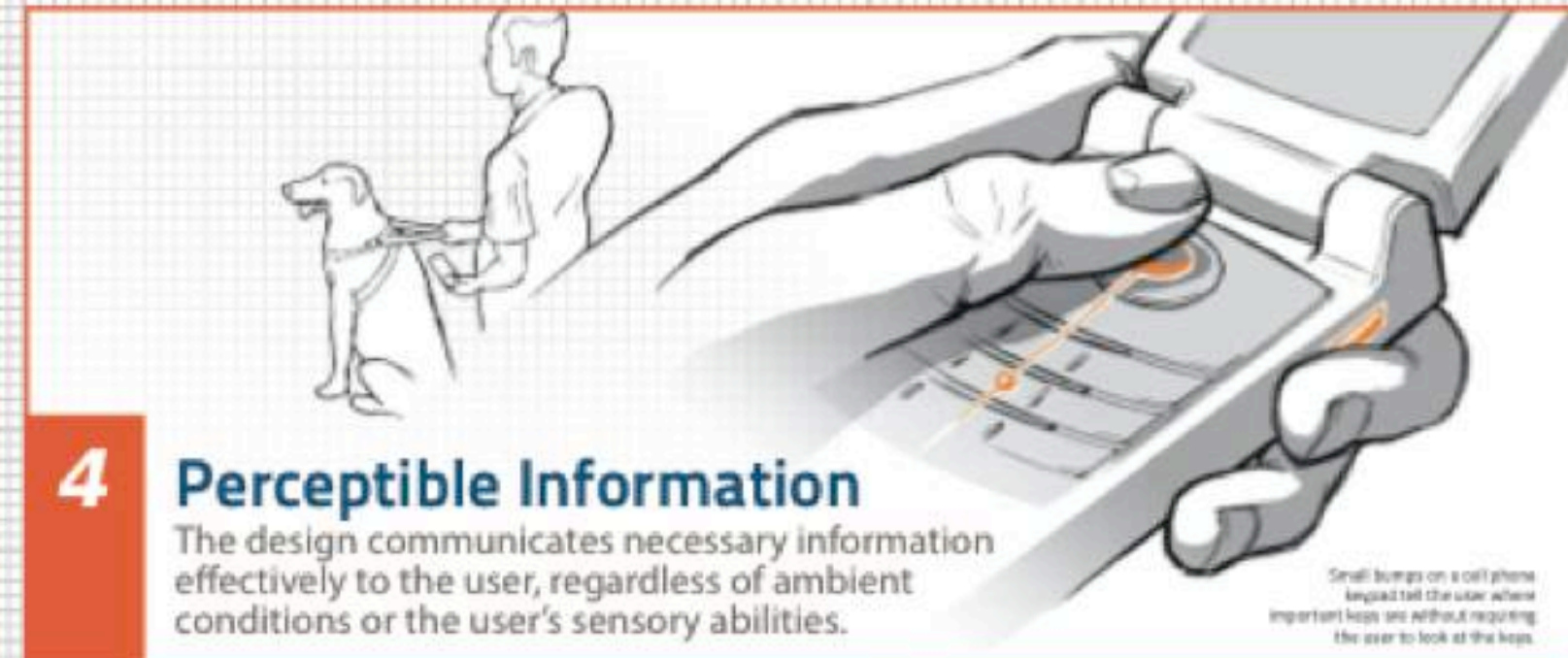
Door turn does not require grip strength to operate and can be operated by a closed fist or elbow.



Public emergency station with recognized emergency colors and a large design to quickly convey function to passively.

3 Simple and Intuitive Use
Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or education level.

4 Perceptible Information
The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.



Small bumps on a cell phone keypad tell the user where important keys are without requiring the user to look at the keys.



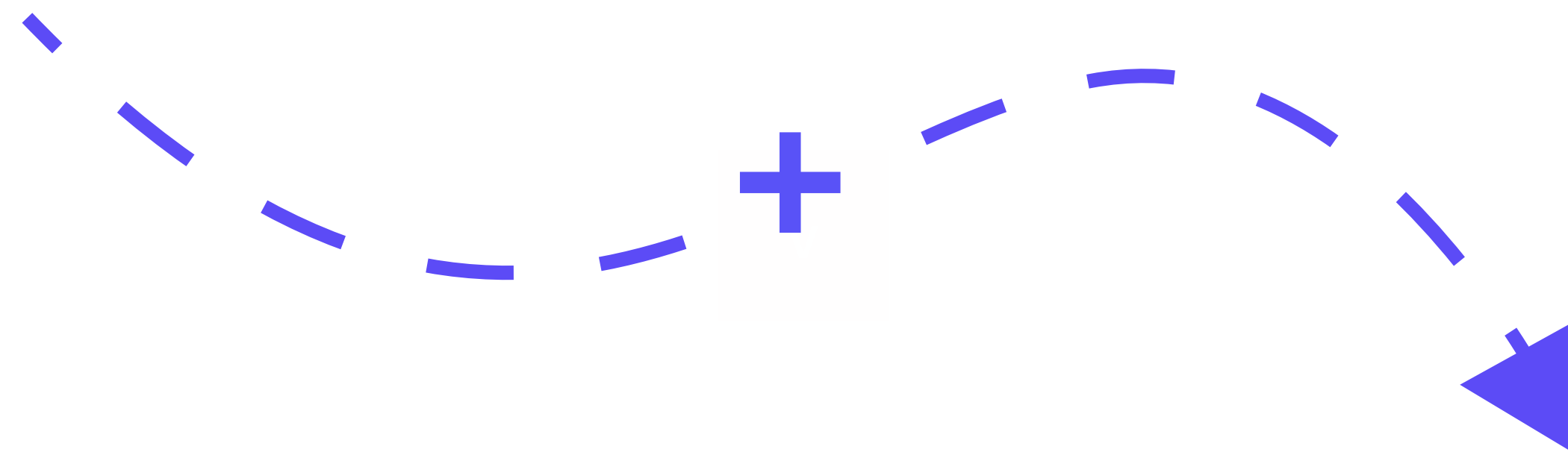
Wide gaps at subway station accommodate wheelchair users as well as commuters with packages or luggage.

7 Size and Space for Approach and Use
Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

jessica.yang@cca.edu

Closing

THANK



YOU!

REFERENCES

<https://en.wikipedia.org/wiki/Wayfinding>

<https://segd.org/what-wayfinding>

<http://www.ai.mit.edu/projects/infoarch/publications/mfoltz-thesis/node8.html>

<https://www.gnugroup.com/resources-top-wayfinding-design-principles-that-cant-be-ignored/>

https://transportgeography.org/?page_id=1579

<https://thefutureishere.economist.com/transportation/blogs-future-transportation.html>

<https://www.disruptordaily.com/future-of-transportation/>

<https://www.fi.edu/science-of-selfdriving-cars>

Slides

1 intro: everyone

2-5 transportation: jessica

6-8 future & problems: gina

9-12 intro universal design: omar

13-14 principles: jessica

15-16 principles: gina

17-19 principles: omar

20 question: omar

21-25 design sprint & personas: jessica

26-31 briefs: gina

32-34 groups: omar