Taking the rush out of the **BART rush hour**

Knowing which car will be best to board

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Problem- Random Boarding

Solution- Distributed Boarding

Platform Indicators

Lights above platform indicate best standing position for boarding.
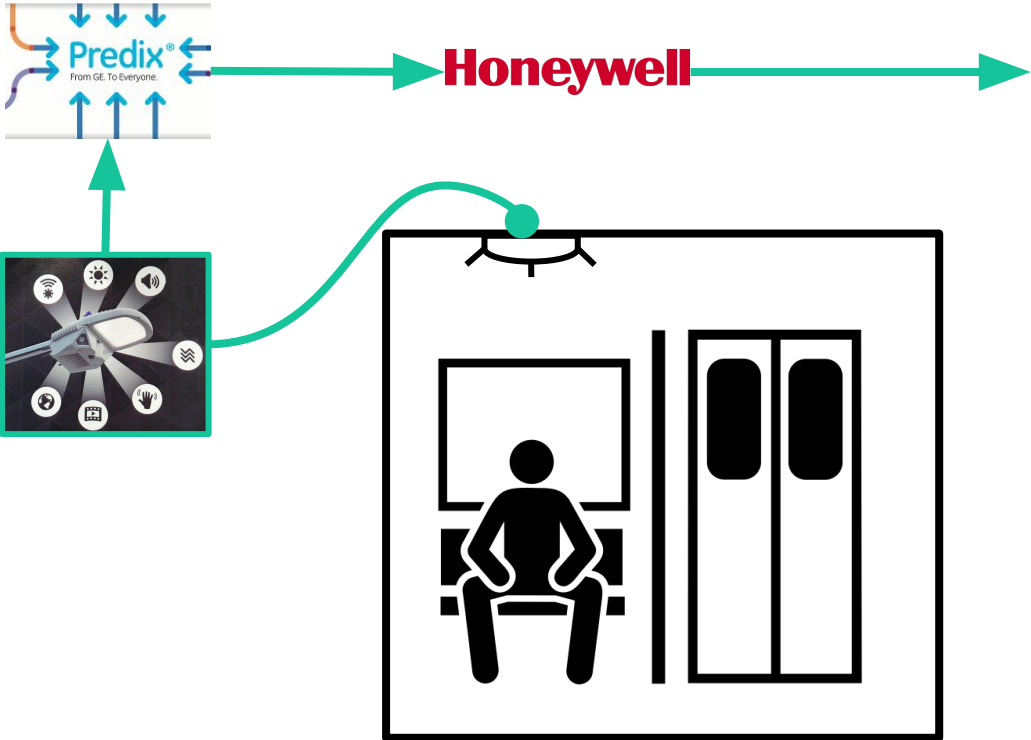
Full | Kinda busy | Maybe a seat | Lots of seats

Platform- GE Predix core

Occupancy Sensing

Use a GE smart lamp in a
train car to collect video, and
Honeywell software on
Predix to gauge occupancy

BART Dashboard

Montgomery Station

Next Train: Headed to Daly City, will be arriving in 10

Car 1	Car 2	Car 3
50% Space Available	72% Space Available	49% Space Available

Embarcadero Station

Next Train: Headed to Daly City, will be arriving in 8

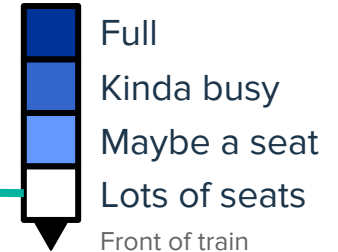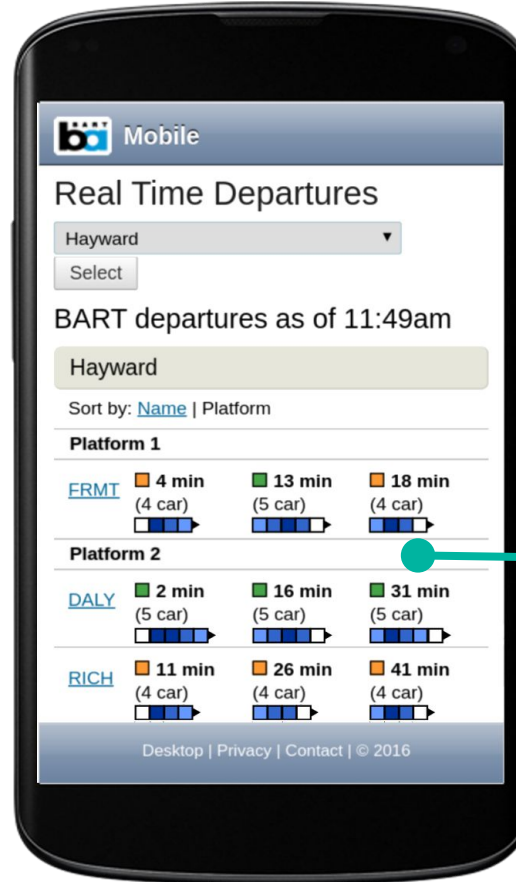| Car 1	Car 2	Car 3
60% Space Available	60% Space Available	60% Space Available

Data Aggregation

Transmit data in real time to BART dashboard for occupancy and capacity optimization

github.com/Czechh/bartApp

Customer Centric

Mobile Web Application

Inform passengers of optimal boarding car on a train in addition to normal schedule information

Passenger Rail Market- Volume

10.2 billion

passengers transported
All passenger rail services, excludes urban transport

2.0 billion

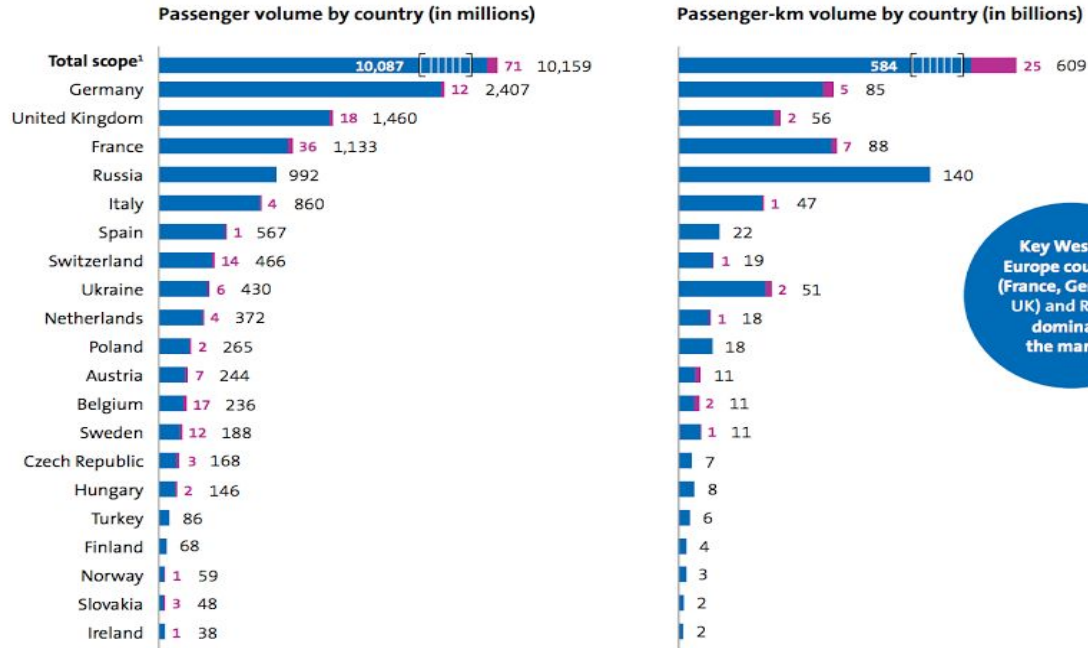Long distance passengers
>100 km

635.4 billion

passenger kilometers

368 million

High speed rail passengers
> 250 km/h new high speed tracks
> 200 km/h on upgraded tracks

AMADEUS

Passenger Rail Market Per Country

Passenger volume by country (in millions)

Country	Cross-border	Domestic (total)
Total scope[1]	71	10,087 / 10,159
Germany	12	2,407
United Kingdom	18	1,460
France	36	1,133
Russia		992
Italy	4	860
Spain	1	567
Switzerland	14	466
Ukraine	6	430
Netherlands	4	372
Poland	2	265
Austria	7	244
Belgium	17	236
Sweden	12	188
Czech Republic	3	168
Hungary	2	146
Turkey		86
Finland		68
Norway	1	59
Slovakia	3	48
Ireland	1	38

Passenger-km volume by country (in billions)

Country	Cross-border	Domestic (total)
Total scope[1]	25	584 / 609
Germany	5	85
United Kingdom	2	56
France	7	88
Russia		140
Italy	1	47
Spain		22
Switzerland	1	19
Ukraine	2	51
Netherlands	1	18
Poland		18
Austria		11
Belgium	2	11
Sweden	1	11
Czech Republic		7
Hungary		8
Turkey		6
Finland		4
Norway		3
Slovakia		2
Ireland		2

Key Western Europe countries (France, Germany, UK) and Russia dominate the market

■ Cross-border ■ Domestic

1 Scope is limited to 20 countries (AT, BE, CH, CZ, DE, ES, FI, FR, GB, HU, IE, IT, NL, NO, PL, RU, SE, SK, TR, UA)
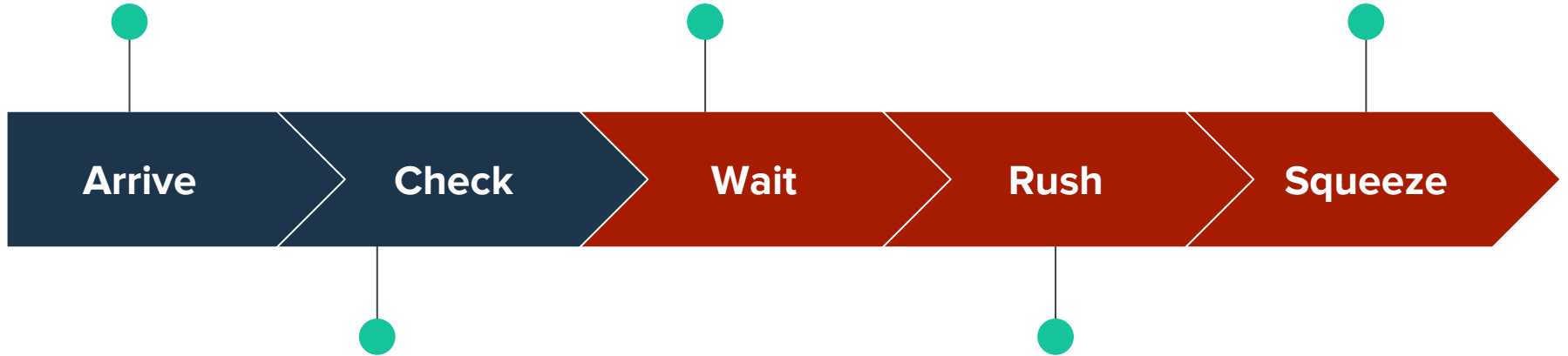
Passenger Rail Purgatory

Get to the station, and arrive at the platform

Wait around for the train to arrive, maybe walk around

Everyone else had the same idea, and now they're all squeezing in

Arrive → **Check** → **Wait** → **Rush** → **Squeeze**

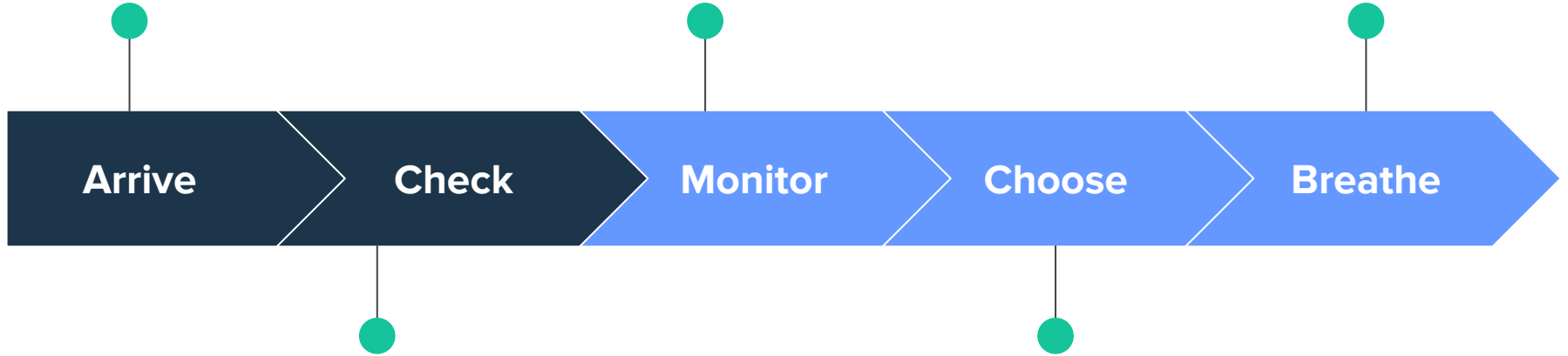Check app and boards for time until the next train arrival

When the train arrives, rush to a car that looks empty

Passenger Rail Heaven

Get to the station, and arrive at the platform

Keep an eye on the occupancy status or wait for the next train

Have some space to breathe and move in the least crowded car

Arrive → **Check** → **Monitor** → **Choose** → **Breathe**

Check app and boards for time until the next train arrival

Right before the train arrives, stand at the right platform position

Questions?

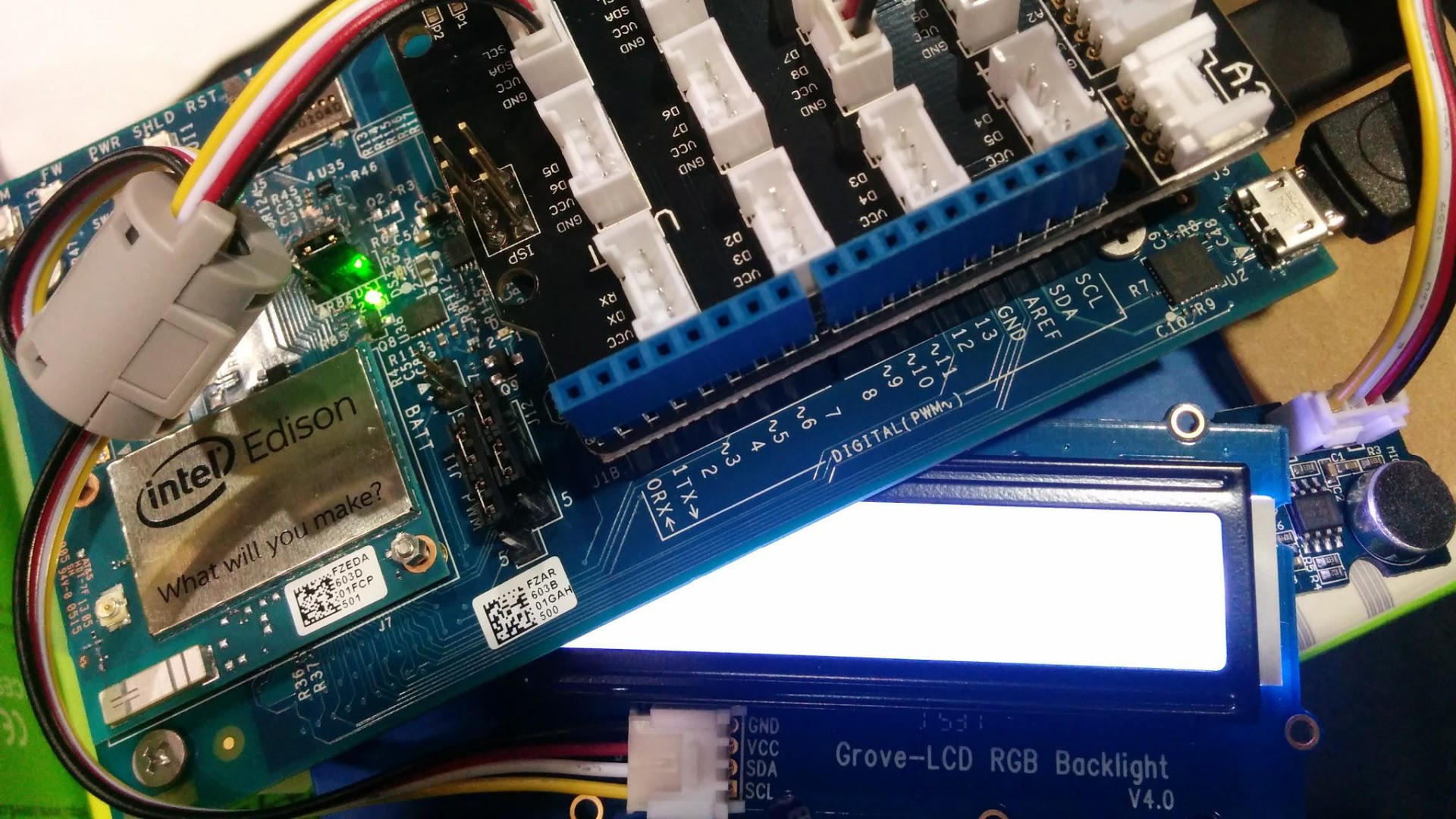**People to hire:**

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