

# POLIS

CITIES AND REGIONS FOR TRANSPORT INNOVATION

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KARLSRUHE (DE)



Baden-Württemberg  
Ministry of Transport



Karlsruhe

# The Secret to Filling an On-Demand Bus



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# Getting DRT right is not just about tech

**Holistic  
Service Design**

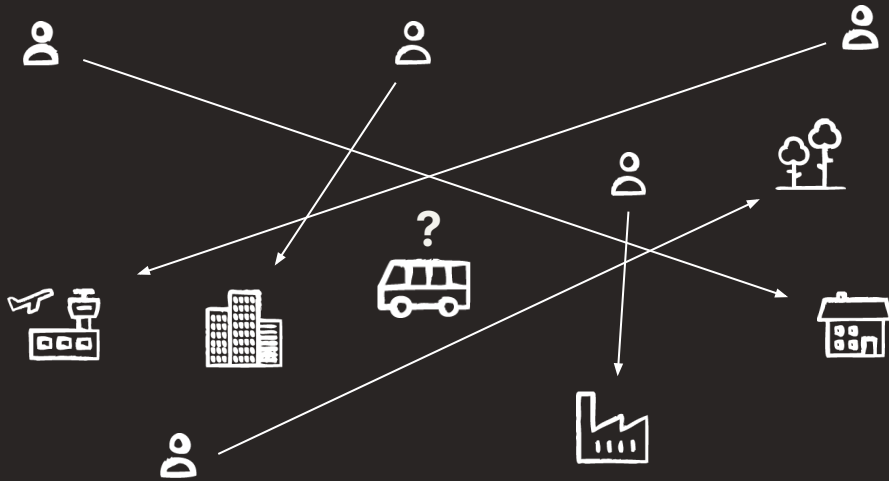
**Effective  
Technology**

*Focus for Today*

**User-Centric  
Program Management**

# Technology makes it possible to dynamically pool various trips together

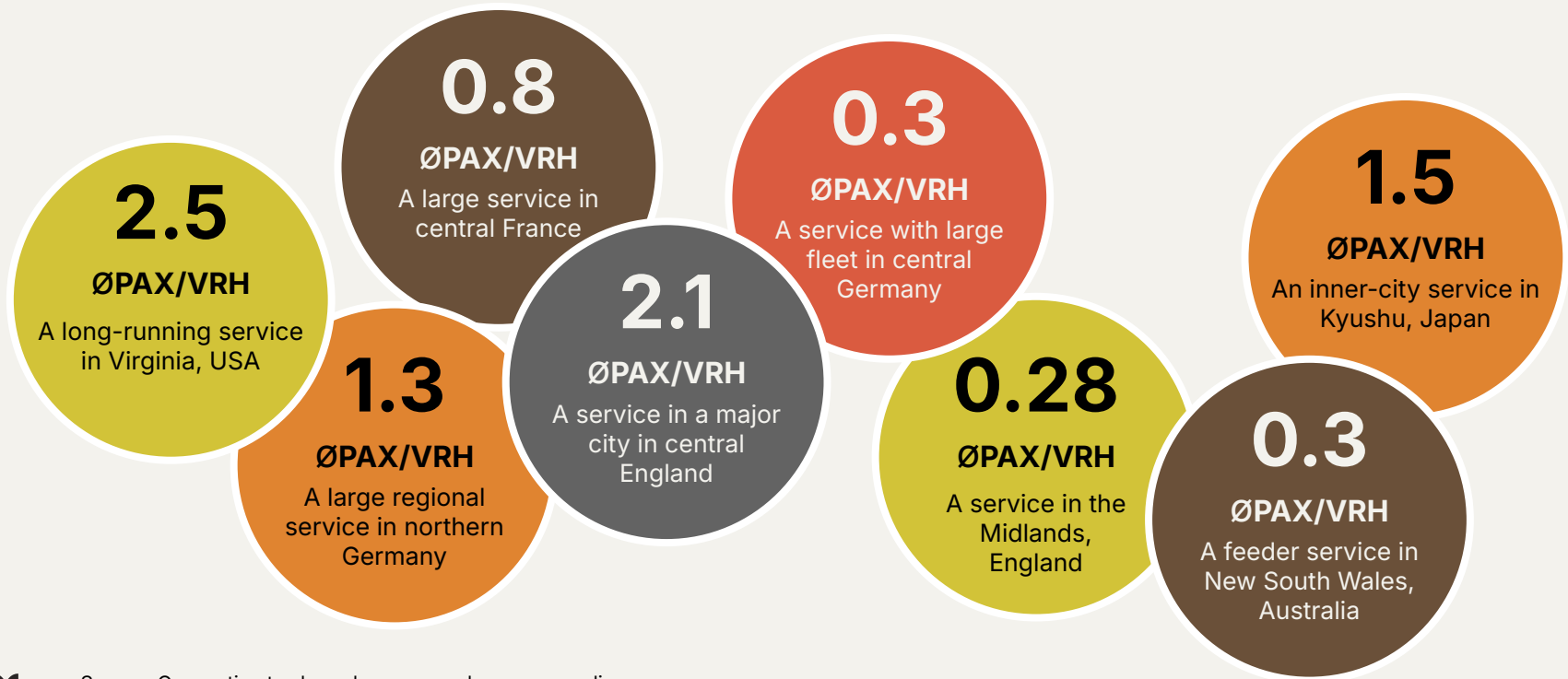
## The Task



## The Solution

1. Passengers can request a trip through an app or a call centre
2. Algorithm calculates how to pool trips together based on wait & detour times
3. Driver(s) automatically receive sequence & route through app to serve passengers

# But pooling rates are not always high

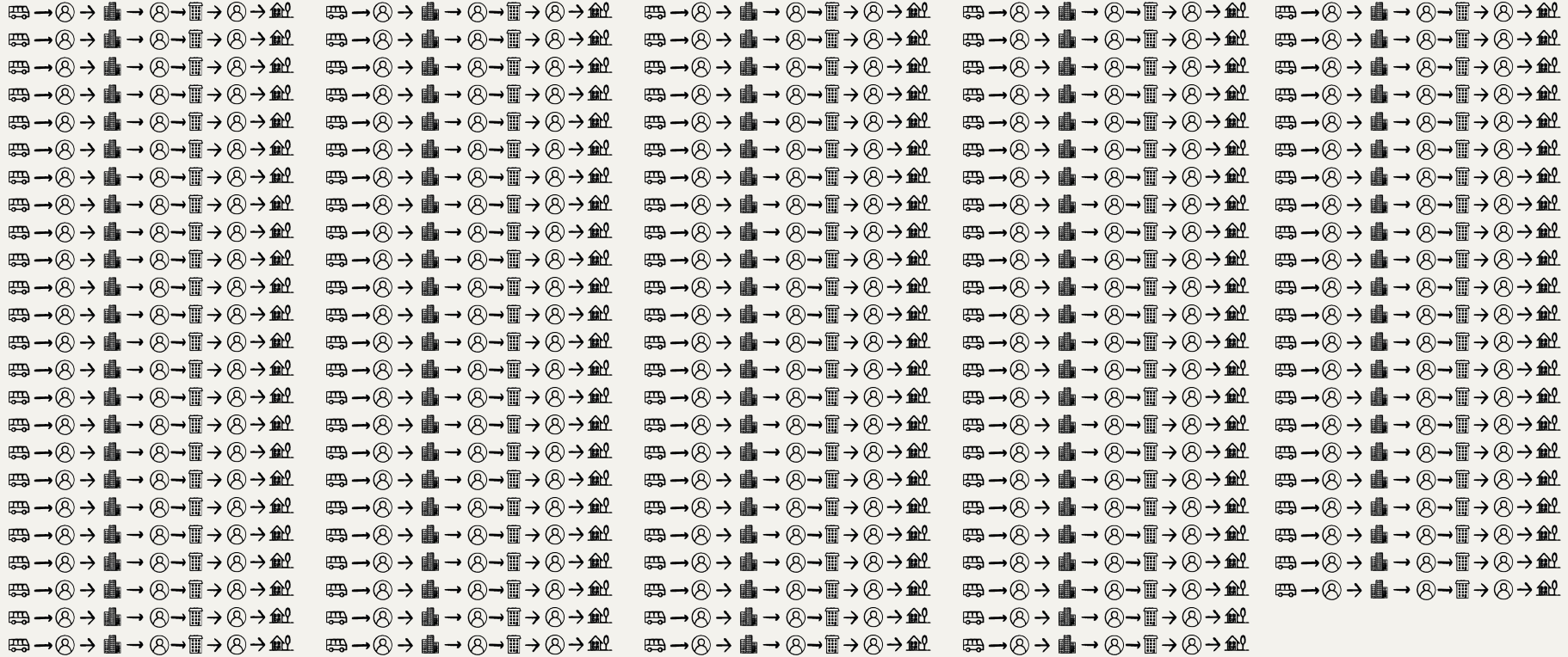


But WHY is it  
so hard to fill  
on-demand  
buses?

# OF PASSENGERS	POSSIBLE PICKUP / DROPOFF SEQUENCES
01	01
05	113,400
10	2,375,880,867,360,000
15	8,094,874,872,198,210,000,000,000,000
20	778,117,449,996,851,000,000,000,000,000,000,000,000



# All 112 possible routes for 1 vehicle to serve just 3 passengers



# Complex problems need performant solutions

*Question to ask*

*Solution to look for*

Within the given time budget, how many possible combinations can the algorithm evaluate?

**Holistic evaluation of all potential pick-up/drop-off sequences**

How often does the algorithm optimize a booking?

**Continuous re-optimization across entire fleet after booking**



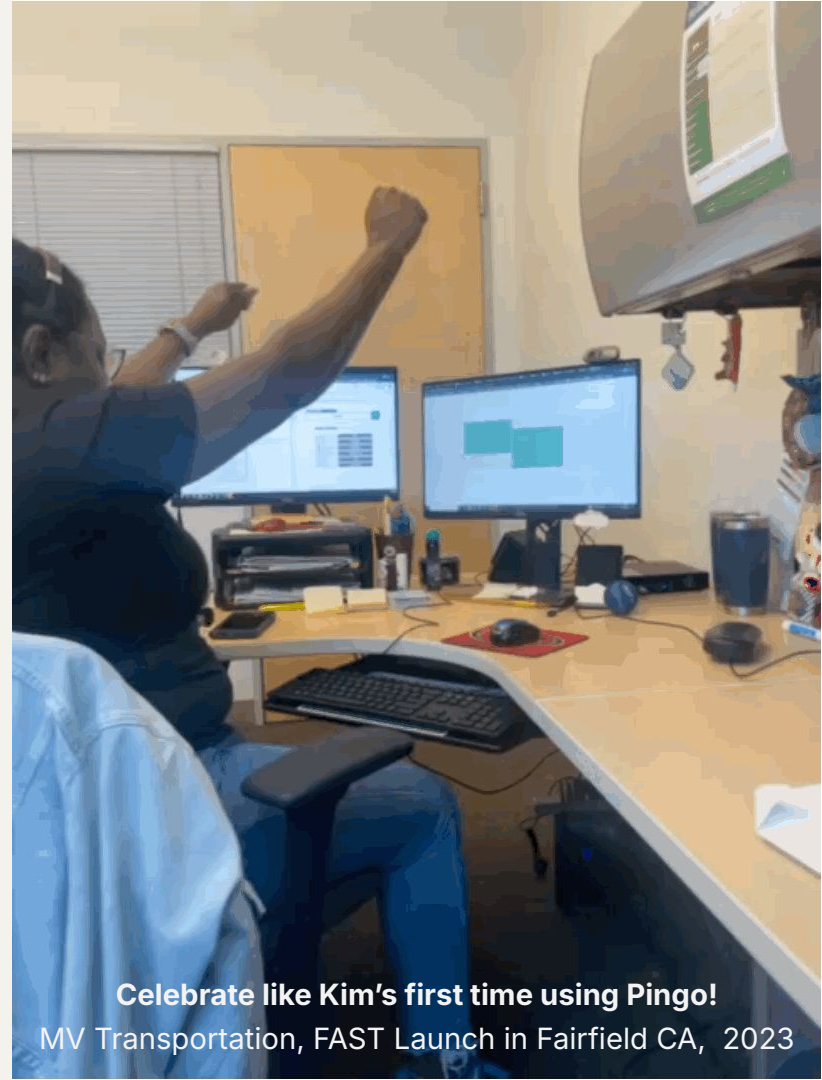
**4-5 separate trips on-board at a time**

**Each numbered block is a trip, held within a shift. When trips are stacked, they are shared.**

And *this* is what it  
means to operators



Information in this document is confidential



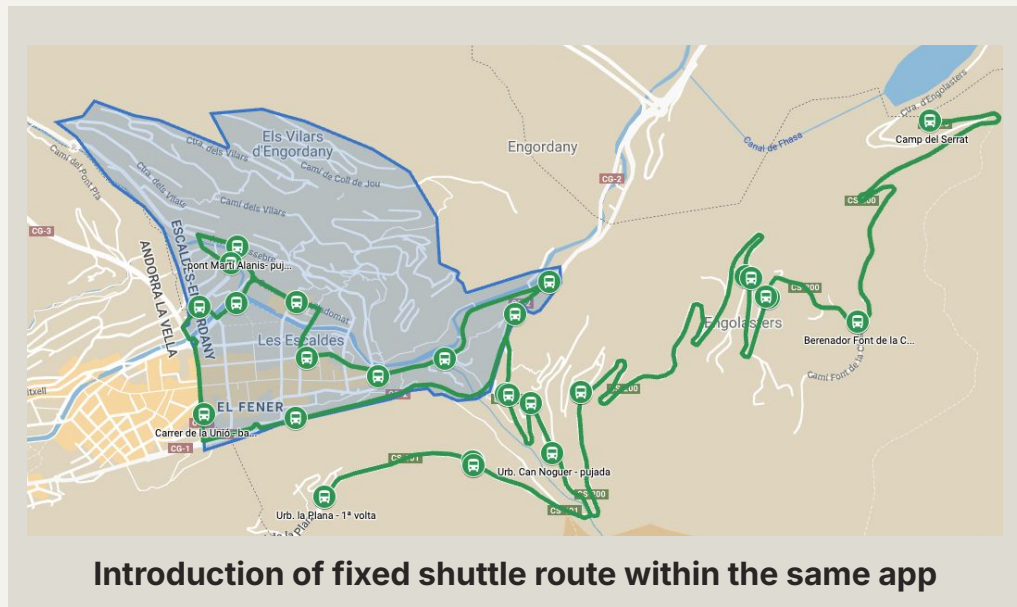
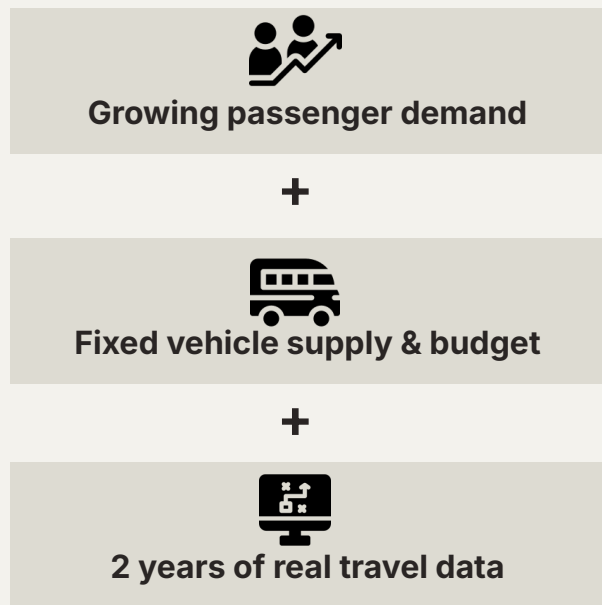
**Celebrate like Kim's first time using Pingo!**  
MV Transportation, FAST Launch in Fairfield CA, 2023

# Because Efficiency Matters: Bus a la Demanda, Andorra



All numbers as of August 2023 | \*) VRH = Vehicle Revenue Hour | \*\*) post-trip in-App survey, 1-5 scale





# Efficiency in any use-case

## Suburban



Dial-A-Ride, Big Rapids, MI  
6.1 PAX/VRH

## Rural



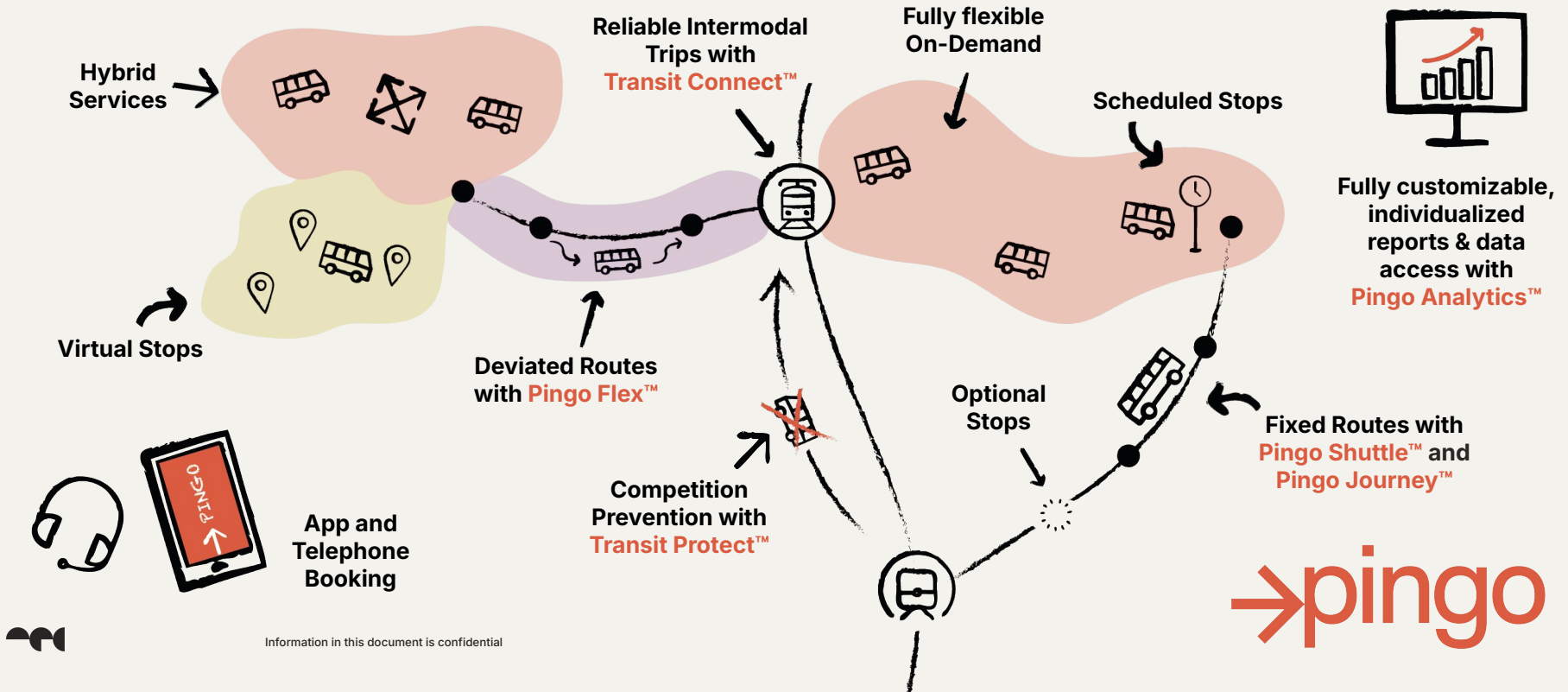
Pingo Dunoon, Scotland  
4.5 PAX/VRH

## Campus



VCU RamSafe, VA  
5.9 PAX/VRH

# Is it only about efficiency, though? No – Flexibility is Key!





Reach out if you'd  
like a product demo  
or to explore a pilot



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