



# Why Next-Generation Fare Systems are Missing the Mark

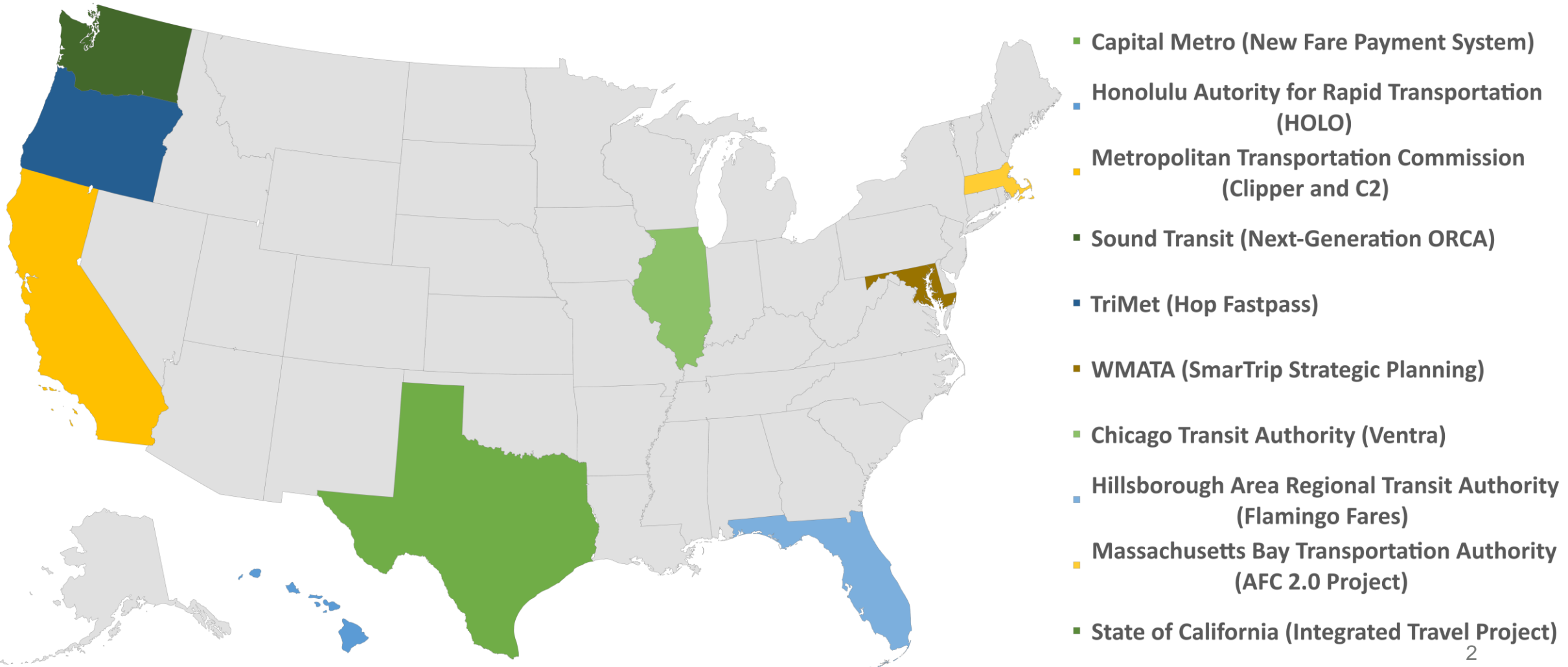
Transport Ticketing Global 2020

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Transportation Technology Solutions

# Clevor Group is leading successful account-based ticketing implementations across the U.S.



# We've found a key feature missing from most of today's account-based ticket systems

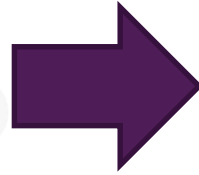
A feature so important that...

- If you are looking to procure a next-generation ticketing system, **you are crazy not to require it**
- If you have already rolled out a system that doesn't have it, **you are behind the curve**

# It solves an issue created through the evolution of contactless payments in public transport

## Card-Based Systems

**Fare value on the media**  
**Fare intelligence in devices**



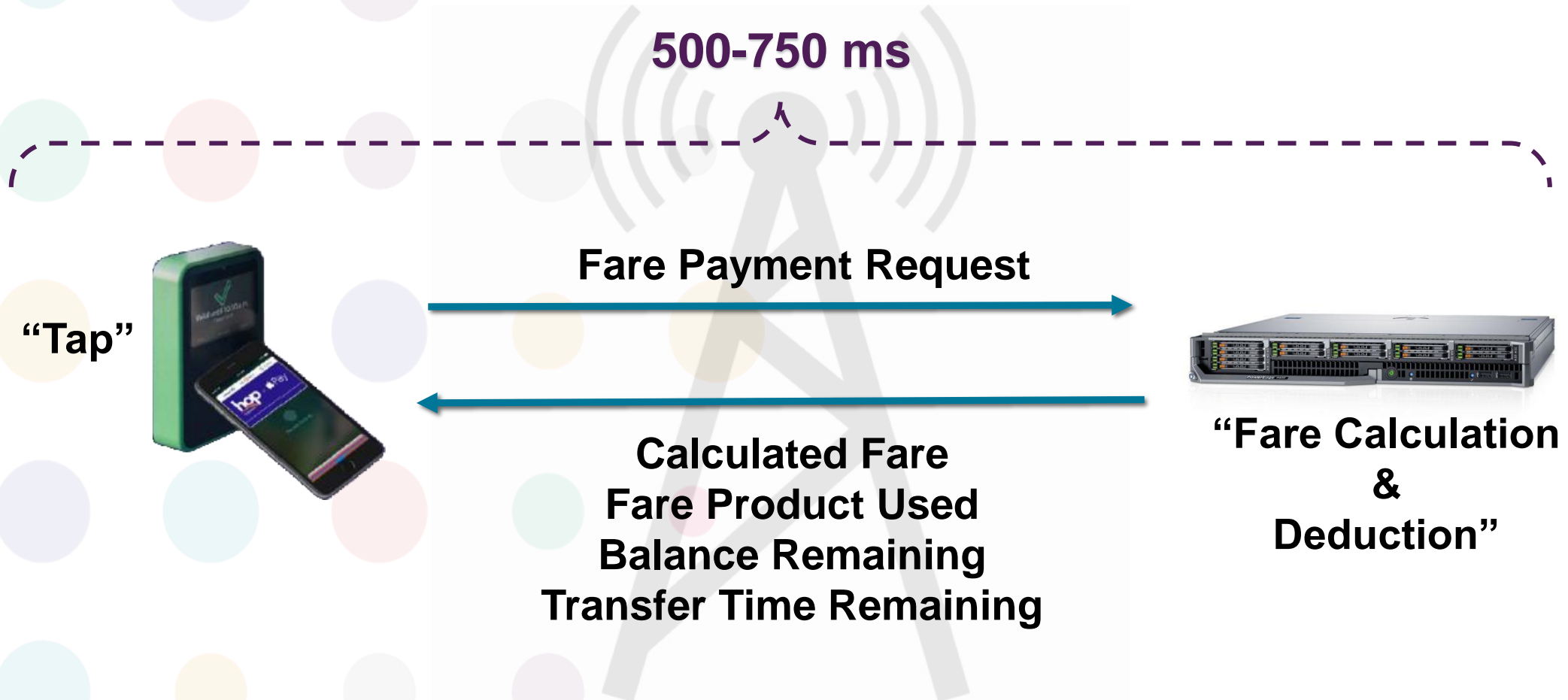
## Account-Based Systems

**Fare value and intelligence in the back office**

- ✓ Offline Operation
- ✓ Instantaneous Payment  
Feedback for Customers & Operators
- ✓ Near 100% Revenue Assurance

- ✓ On-Demand Loading via Web & Mobile
- ✓ Online Access to Transaction Data
- ✓ Easier Tariff Management
- ✓ Open/EMV Payment Acceptance

# “Real-Time Fare Calculation”



# Enable next-generation features without sacrificing customer experience and financial controls

- ✓ On-Demand Loading via Web & Mobile
- ✓ Online Access to Transaction Data
- ✓ Easier Tariff Management
- ✓ Open/EMV Payment Acceptance
- ✓ Offline Operation (when necessary)
- ✓ Instantaneous Payment Feedback for Customers & Operators
- ✓ Near 100% Revenue Assurance

**But...**

## ... Aren't risk lists good enough?

- No matter how sophisticated, there will always be gaps in accommodating your fare policy
- You're already paying for a system that calculates fares precisely, use it!
- A “good enough” financial system looks to collect revenue, completely and accurately, not make best guesses
- Risk lists still provide a fallback for offline operation

# ... Do customers really need all that information?

- Do you want to take it away and find out?
- Just because you can display it, doesn't mean you have to
- Real-time fare payment data isn't just a benefit for the customer



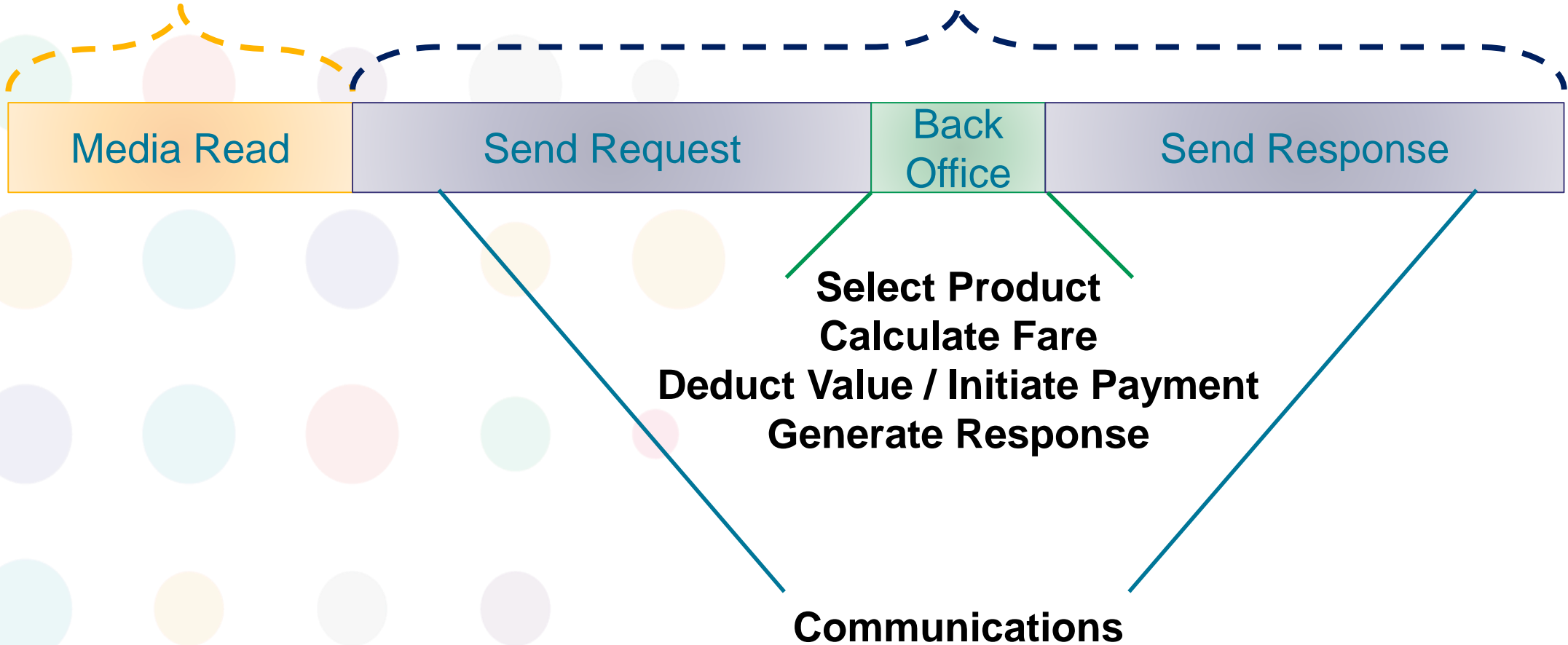
... Isn't it impossible?!?!

**NOPE!**

# Let's break it down...

~ 20-120 ms

~ 400-700 ms



# The fare calculation is NOT a bottleneck



**500,000% Increase in Processing Power**

# Communications have undergone a similar evolution

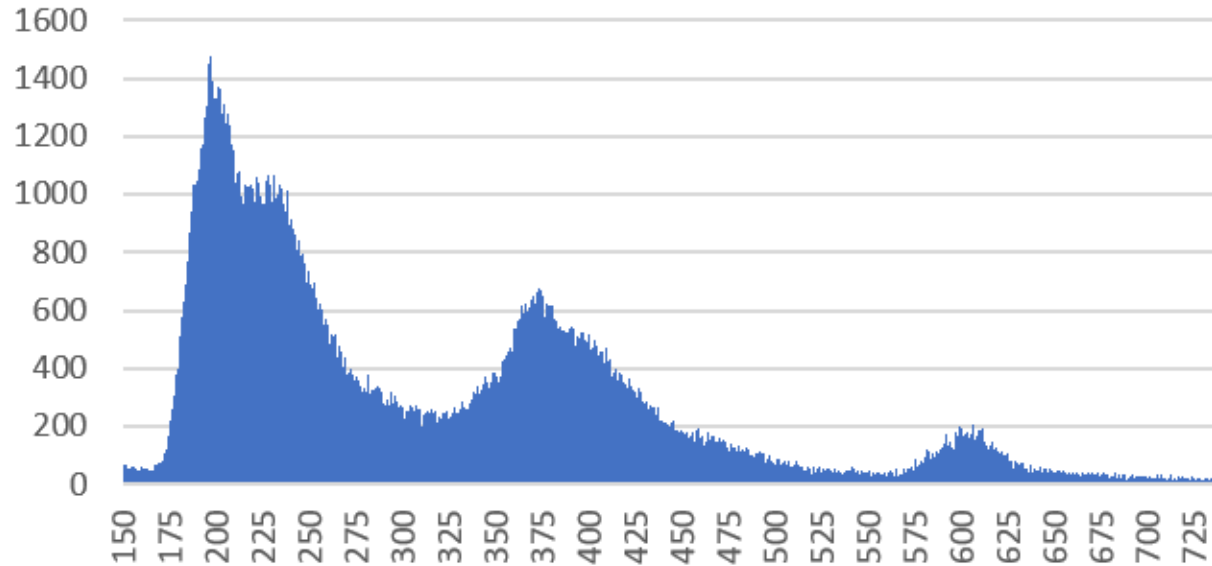
Technology	Latency	Bandwidth
2G	300-1000 ms	up to 400 Kbps
3G	100-500 ms	up to 40 Mbit/s
4G	50-100 ms	up to 1 Gbps
5G	10-30 ms	up to 100 Gbps (expected)

**A system that supports real-time fare calculation will naturally improve over time**

# This is real, and it's happening today...



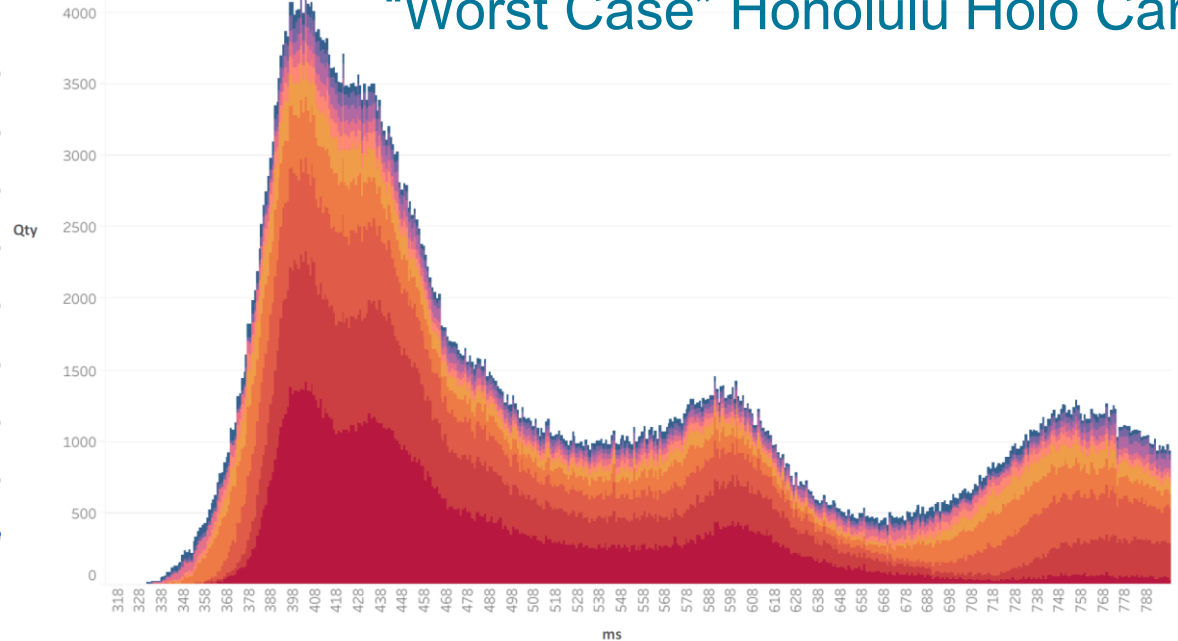
“Best Case” TriMet Hop FastPass



Average Media Read = 110 ms  
Average Server Response = 46 ms  
Average Total Transaction = 304 ms  
Online Transactions = **96%**



“Worst Case” Honolulu Holo Card



Average Media Read = 19 ms  
Average Server Response = 46 ms  
Average Total Transaction = 525 ms  
Online Transactions = **73%**

# In summary

- Real-time fare calculation is possible, and it's here today
- A system with real-time fare collection still has the benefit of risk lists (offline fallback), but will naturally evolve to not rely on them
- A system built solely on risk lists will ALWAYS be relying on a “best guess”
- **If you want it... you have to ask for it!**

“The electronic fare system **shall support real-time fare calculation**, such that all back office-approved fare payment requests (i.e., with response received within established timeout) include the fully calculated fare, fare product used, balance remaining, transfer time remaining, and other pertinent information, as applicable to the fare being paid.”