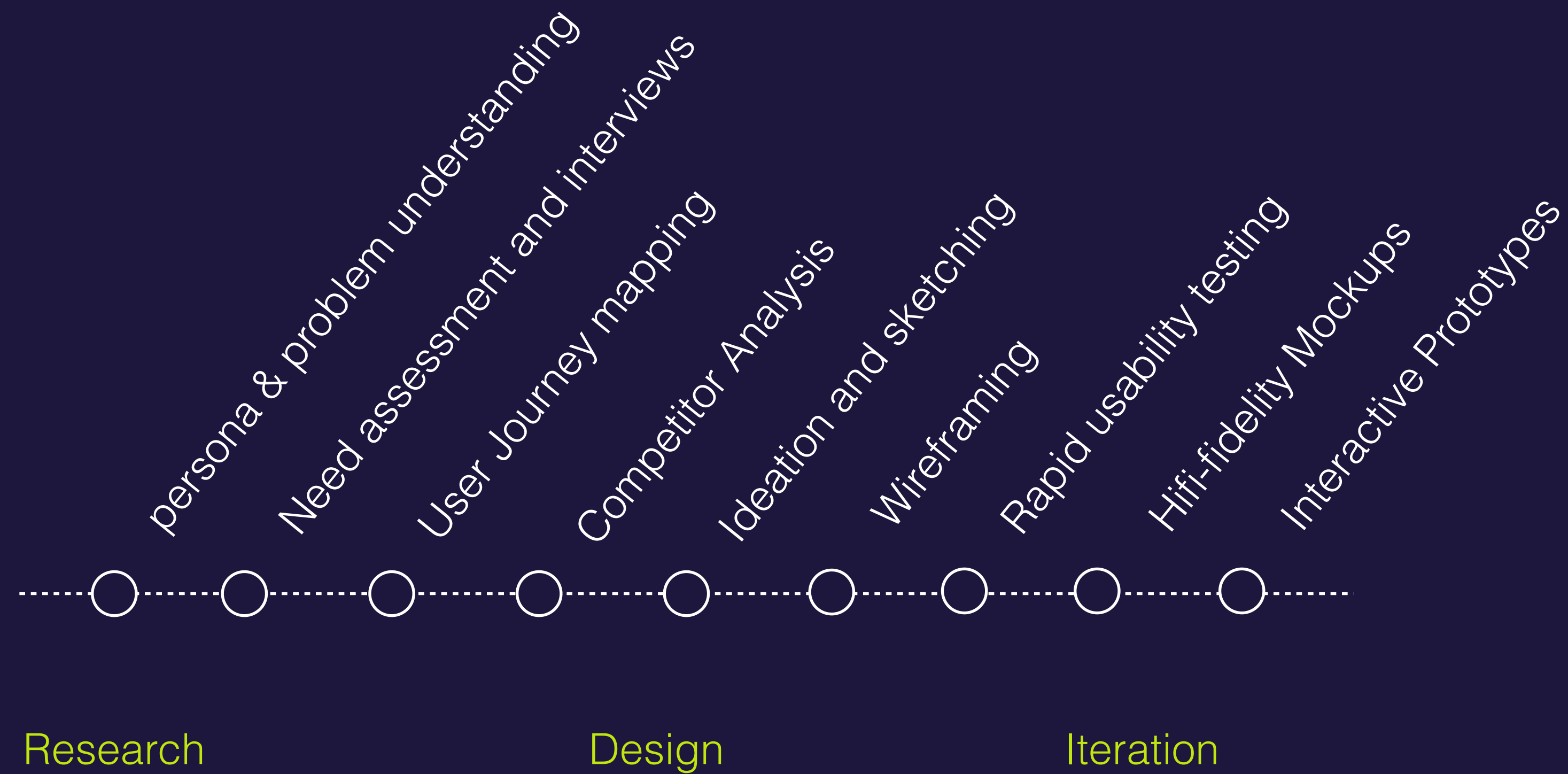




Daily transport assistant, great and small, one and for all

Statement of Works



Understanding the persona

Who are the AJs

- Highly frequent city traveller
- Using multi-agent public transport primarily
- Time-sensitive travels
- Changing destinations
- Busy daily schedule

PROCORE DESIGN CHALLENGE



AJ Smith

AJ is a 26 year old travelling salesman working for Bloom industries. His life revolves around his meeting schedule. He lives in NYC and commutes to multiple sales opportunities on a daily basis primarily using public transport. Given the nature of public transport, he frequently misses trains and buses due to a number of factors. These including overcrowding, weather conditions, road/rail congestion and other general delays.

This inability to confidently predict public transport has resulted in lost sales for AJ. NYC is an expensive place to live and the resulting loss of income has often affected his quality of life.

Assuming you have access to a repository of public transport and systems data, design an app that will aid AJ's and those in a similar scenario efficiently coordinate their use of public transport.



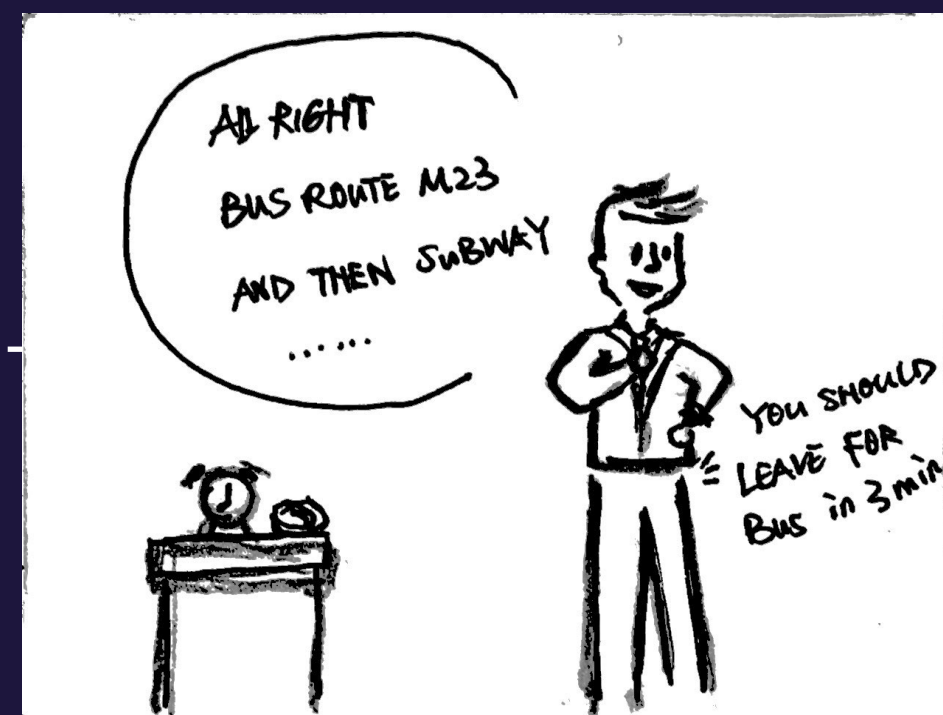
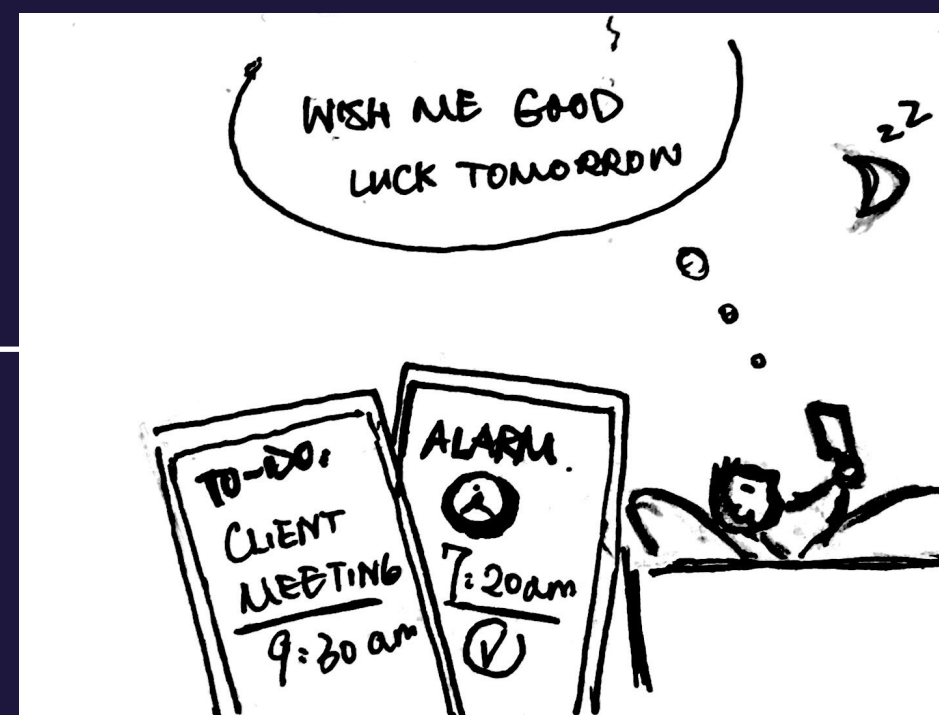
Additionally can also assume you have access to public transportation APIs, embedded mapping software, the user's calendar and machine learning technology to aid you in designing your solution.

Challenge Statement

- ▶ Designing an app that will aid “AJs” scenario in **efficiently coordinating their use of public transport.**

Need Assessment

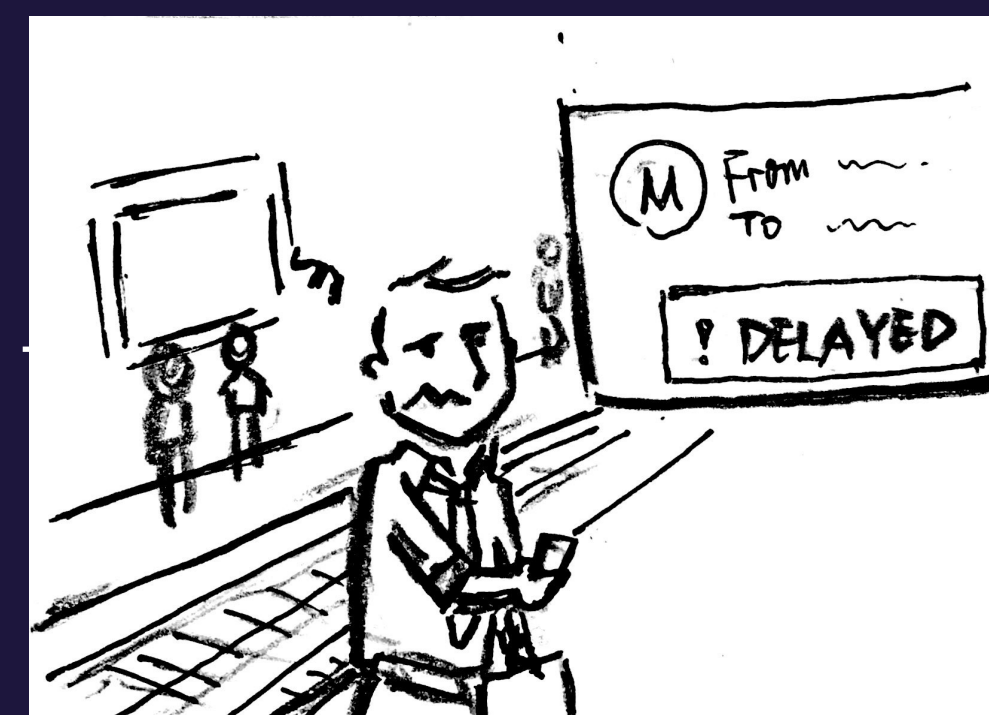
Pain Points



► transit comes a bit early



► temporarily delayed



► overcrowding channels



highlights from

Interview

▶ View [Interview Guideline](#)

- ▶ Subway is the preferred means of fast transportation, followed by Uber/Lyft, but not taxi as budget is a constraint.
- ▶ Current app's time predicting does not include the time to go up/downstairs which result in underestimation.
- ▶ If late for the meeting, people want to (gracefully) notify the meeting attendees and provide them an estimation of arriving time.
- ▶ When time is tight, hard to balance between stop and find alternative faster routes and ...run.
- ▶ Tips: If you happen to arrive at the wrong side of the platform, at times it could be very hard to get to the other.
- ▶ Tips: During peak hours, walking/bicycling can be even faster than bus in Manhattan.
- ▶ Even though transit time can be accurately predicted, it does not always help some users to be on time (see a more specific scenario on next page)

A more niche Use Case

- ▶ Even though with machine learning and big data, it could provide people with more accurate time estimation, however, not all things can be anticipated. Some people rely too much on the predicted time that they overlook other factor, e.g. themselves.



It's raining/
snowing like
CRAZY



Don't want to
wait for extra
time outside



Check the
schedule, yet still
have 5 more mins

turns out...



▶ **Procrastination!**

Understanding the background

Infrastructure

► **Complexity - why NYC?**

“if you could coordinate public transport in NYC, where else would be hard?” - someone

Being the most populous city in the US, NYC has a transportation system which includes one of the largest subway systems in the world; home to an extensive bus system in each of the 5 boroughs; and 3 commuter rail network

► **Popularity - how extendable to other cities**

NYC has, by far, the highest rate of public transportation use of any American city, with 54.2% of workers commuting to work by this means (*U.S. Census Bureau, American Community Survey, 2006*).

► **Ubiquitous Connectivity**

Beginning January 2017, New York subway has provided cellular services and wifi, which enables us to design with real-time network data.

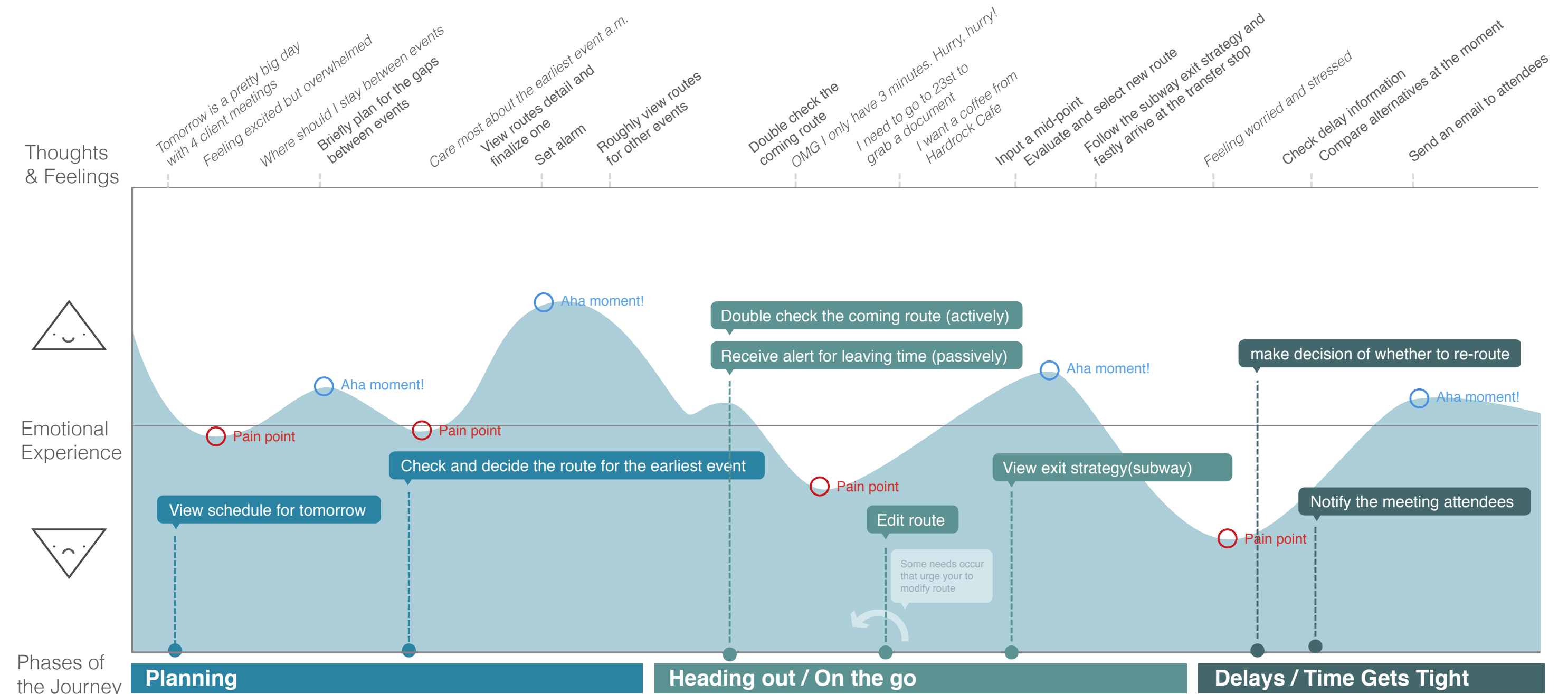
Redefined Challenge

Help people **efficiently** and **confidently** plan public transport
and **support along the way** so that they destination **timely**.

User gap & design insights

Journey Mapping

► View original pdf file: [User Journey Map](#)



the **Planning** phase begin with users checking the calendar schedule. Before this user has already input their frequent address (e.g. Home, Work). Through this stage, depending on individual habits, users want to finalize the routes to next few events or just focus on the coming one. The system automatically provide the optimal route that meets users preference (e.g. public transport, fastest). Users could view step-by-step detail or change the settings.

Pain points:
Overwhelming amount of information
Inability to confidently set alarm clock for the morning event

Aha Moments:
Having a calendar view highlighting and helping manage travel time for events
The first event in the morning is set as starting from Home, and the later ones are set as from Company as default
Including the "vertical travel" time
Providing route details with machine learning prediction of latent delays
Automatically adjust the alarm clock if there is delays on users selected route of the coming event

When the **Travel** approaches, users would be reminded of the coming event based on their setting (push notifications or alarms). For procrastinator, there is an option for a "countdown" mode where the app will make a sound when approaching the deadline. If they need to modify the existing route, user can either add from the route detail page or search the location on the map and add from there. For subways, the app provide a very useful feature suggesting the most convenient subway cars that allow them to transfer faster without running into the congestion at the transfer channel.

Pain points:
Failed to correctly estimate enough time before head out, or some other things occurred at the last minute, e.g. cannot find cell phone before rushing out.
As travel plan change, hard to modify the route
Procrastination
The peak time at the subway can be overcrowded

Aha Moments:
Use machine learning technologies to optimize the initial self-reported buffer time before heading out
Countdowns of time to head out of the door, especially for procrastinators
Easy steps to add a stop onto a current route

If the app detected that users are behind the schedule and are not likely to arrive on time, they will get an alert with smart suggestions on hurry up or seek faster route. If needed, users can send an email to notify other meeting attendees.

Pain points:
Road congestion, bad weather conditions, overcrowded channels, temporal subway delays or any other unanticipated factors

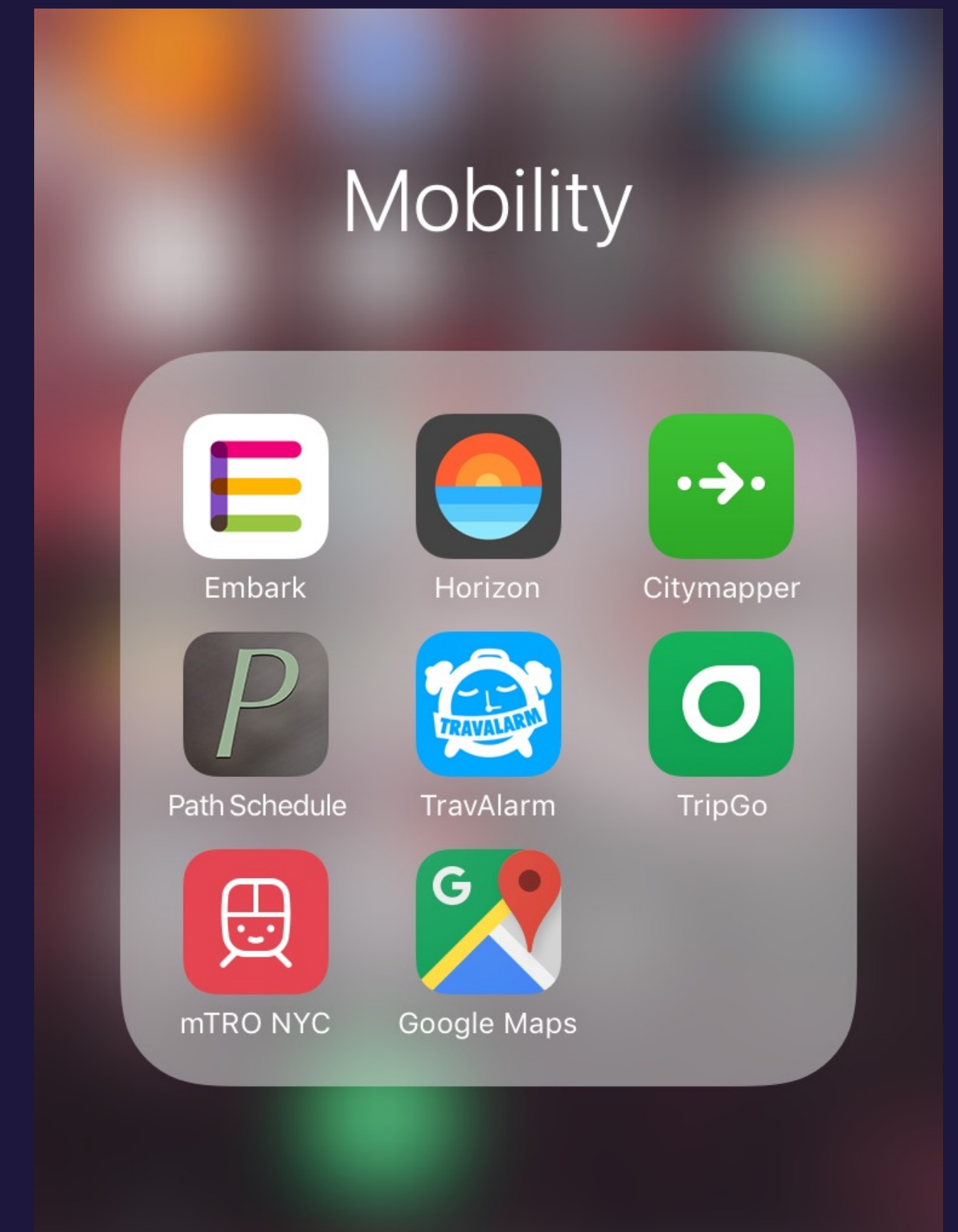
Aha Moments:
Provide the fastest alternative route at the moment
Provide an fast entry to request a uber/lyft/other riding services
Can quickly notify the meeting attendees without stopping the steps (template email, voice input)

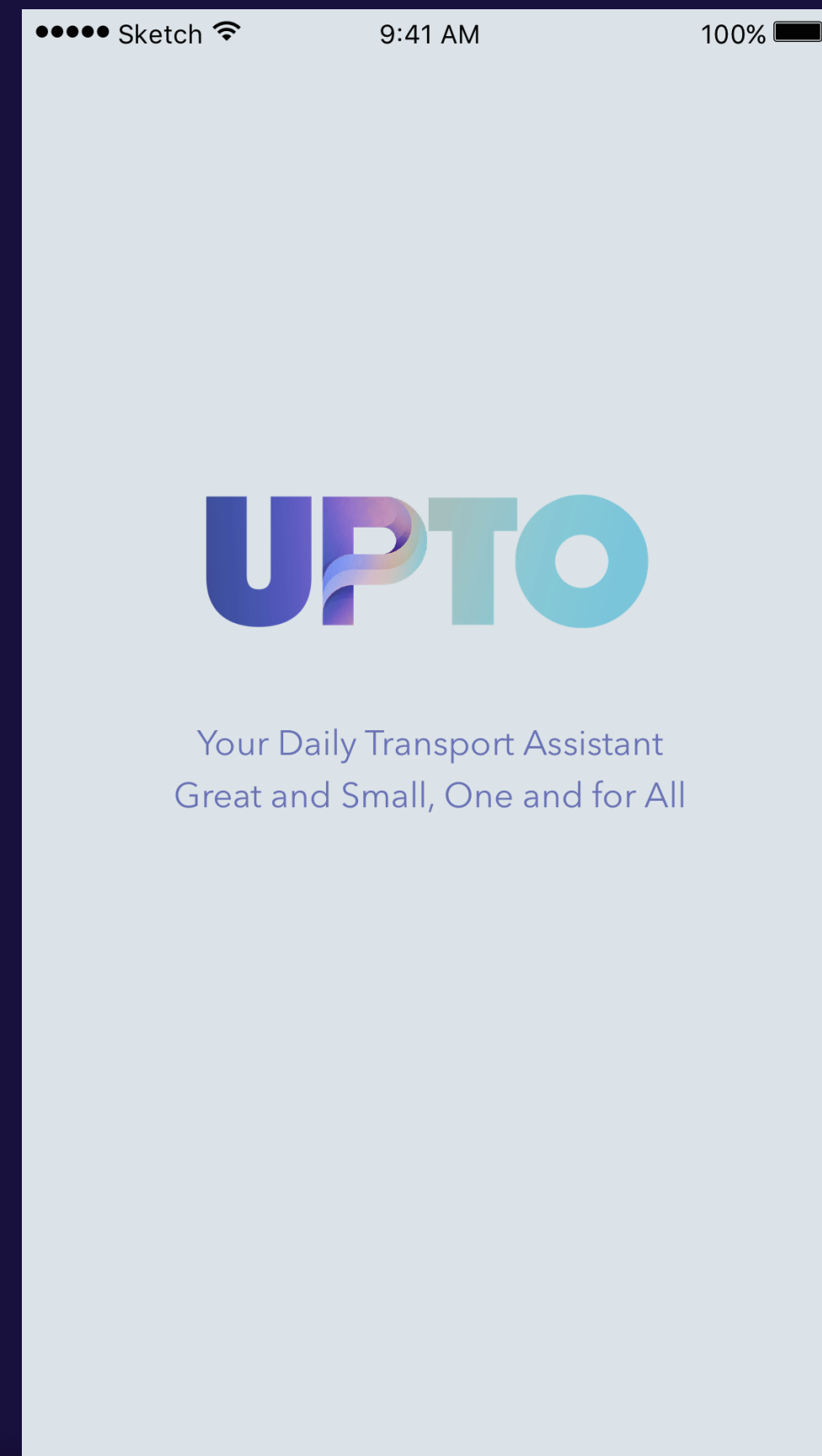
Findings of

Comparative Analysis

► View [Comparative Analysis](#)

- **Not Streamline:** Though a lot of app partially help plan the public transport experience, the usability is poor with outdated design.
- **Not really personalized:** A number of apps integrate personal calendar, but do not use the data effectively, e.g. just for notification of leaving time.
- **Unmet need to modify a travel:** it is very difficult to change an existing travel for instance choose a different route or add one mid-stop





Introduce **UPTO** App

- ▶ Intelligent Public Transportation Assistant
- ▶ Route Planing that taps into your meeting schedule
- ▶ Learning your travel habits
- ▶ Integrate multi-agent public transport system

Design **Philosophy**

- ▶ **Efficiency**
- ▶ **Personalization**
- ▶ **Real-time**
- ▶ **Adaptability**

Final Design

solution for AJ

► Please View: [\[UPTO\] App Final Design](#)

(slides or pdf are not friendly to animated media)