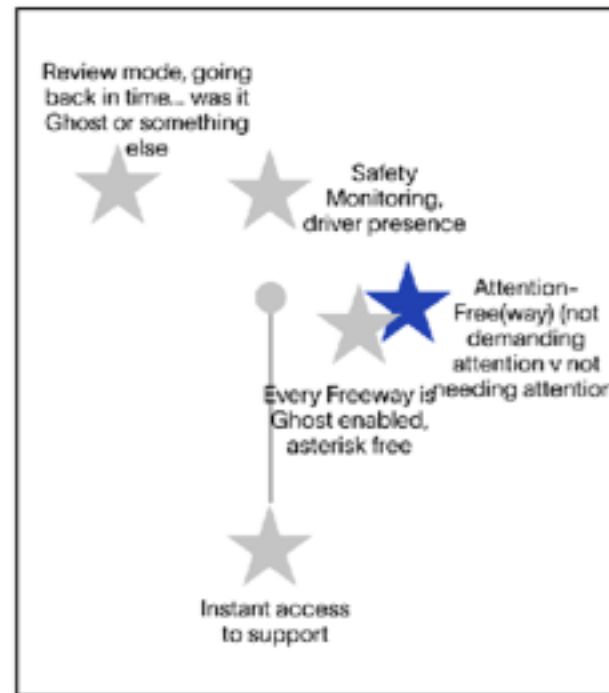


Design Goals



1 / Away

- Ignition is off, the user is somewhere else
- Security should be obviously present and reactive to the environment both people and objects (e.g. thieves/people, shopping carts)



2 / Walkup

- Ignition is off, the user is outside the vehicle
- Create confidence around presence of the driver & responding to it
- Recognition and authentication
- **Passive authentication**



3 / Parked

- Ignition is on, the user is inside the vehicle
- Ghost comes to life and greets the driver, introducing sonic branding
- Pre-driving setup often happens now for navigation, music, etc.
- Potential system 'check' feedback
- **Evaluator authentication, e.g. software key name/code/ password**
- **Seatbelt check**



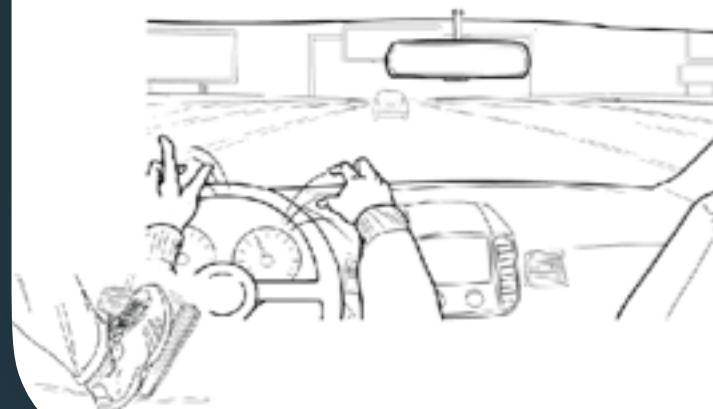
4 / Pre-Highway

- The user is manually driving the vehicle, mostly on surface streets
- Likely utilizing some navigation and/or music
- **Ghost perception is working and provides assistance (e.g. pothole detection, ADAS capabilities)**



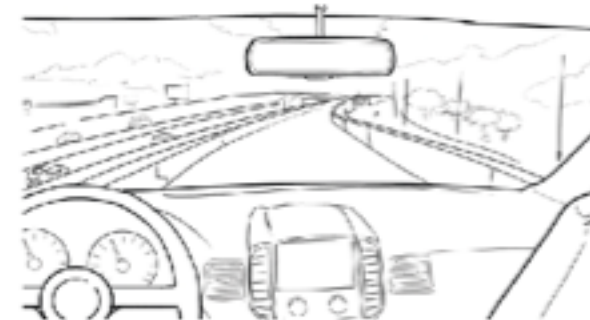
5 / Ready

- User is on the highway and has satisfied all conditions for Ghost to be active
- This is our second most primary hero moment ux-wise that we can celebrate
- Introduction of sonic branding indicating Ghost is ready.



6 / Hand-off

- Control has been ceded and the driver is looking for confirmation
- Likely for new users to be uncertainty and the variety of the situations this may occur in is massive



7 / Autonomous

- Ghost is fully in control
- This is our most celebratory moment
- User can relax now and focus on other parts of the experience without multitasking with driving
- **Ghost provides entertainment while not driving**



8 / Event

- Ghost sees a potential hazard
- User is calmly informed of Ghost's actions and returns to their activity
- Hazard is visualized on display to coincide with what you see IRL



10 / Boundary

- **Ghost provides a 'heads up' that a boundary is ahead**
- Ghost needs the user to take back over
- User's attention may be elsewhere and is not guaranteed
- Opportunity for a 'need your attention' sound



Ghost Proprietary and Confidential

In order to get buy in across teams, we used various methods of quick visualization, from whiteboarding to storyboard creation.

Nix the Handoff Button

- 1. Reduced Ambiguity**
Ghost will start driving whenever the driver isn't in active control
- 2. Every car model has different driver controls**
Identifying, testing, and training for manufacturer buttons is incremental work for each additional vehicle and there is no guarantee of a suitable option
- 3. Adding a Ghost button**
Additional hardware to include in the kit with associated complexity
- 4. Button is no panacea**
Buttons provide a signal of intent and is instantaneous, but "leaps of faith" exists during corners and braking.
- 5. Improve usage**
Only [one third of drivers regularly use adaptive cruise control on their cars](#);
Ghost will be safer and more comfortable than manual driving, so reducing friction to usage will improve overall driving experience for our customers.



We believed in making a truly fluid experience, one that felt like the experience avoided adding any new interfaces for drivers to think about.
I took the charge to encode this into product requirements.