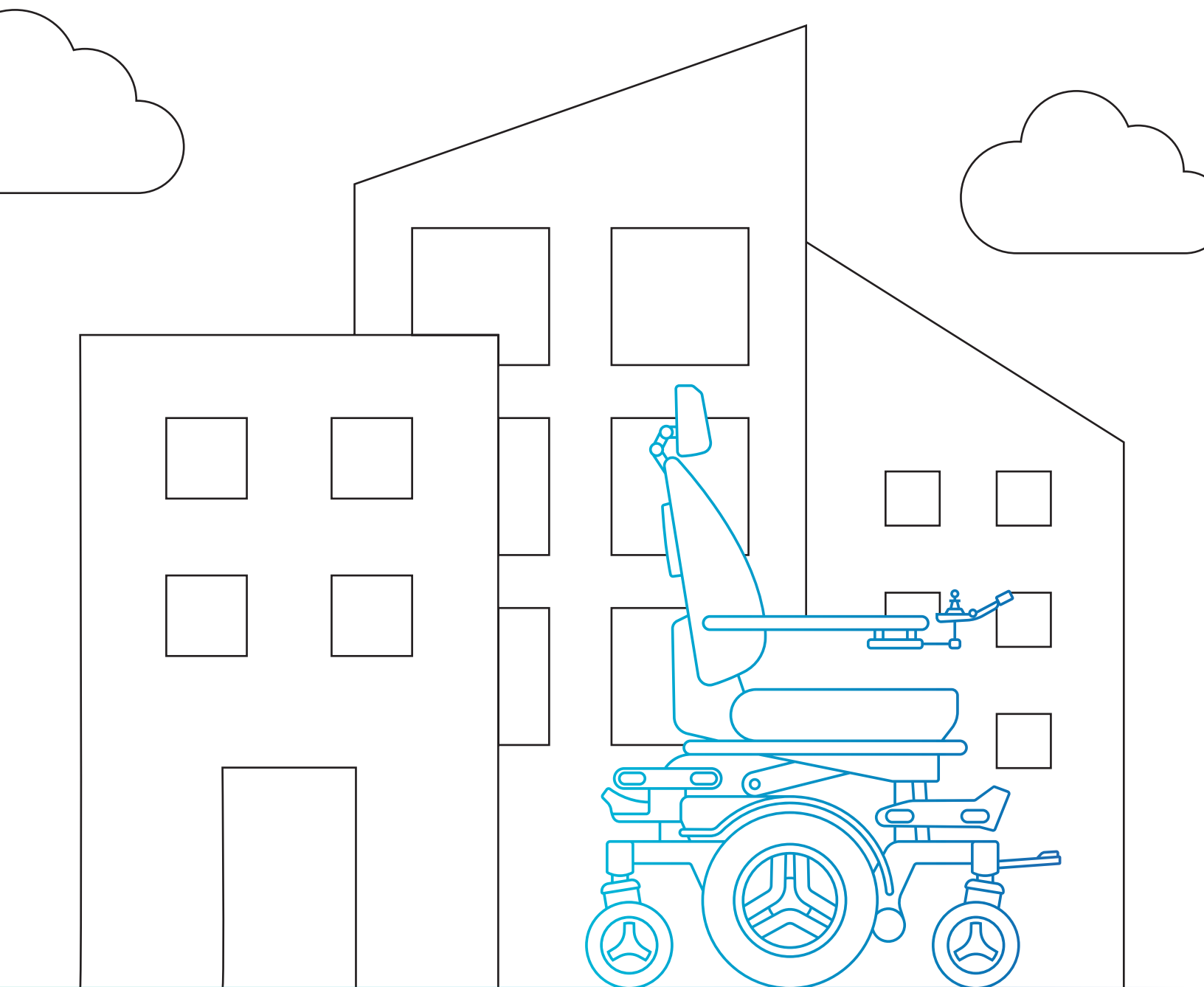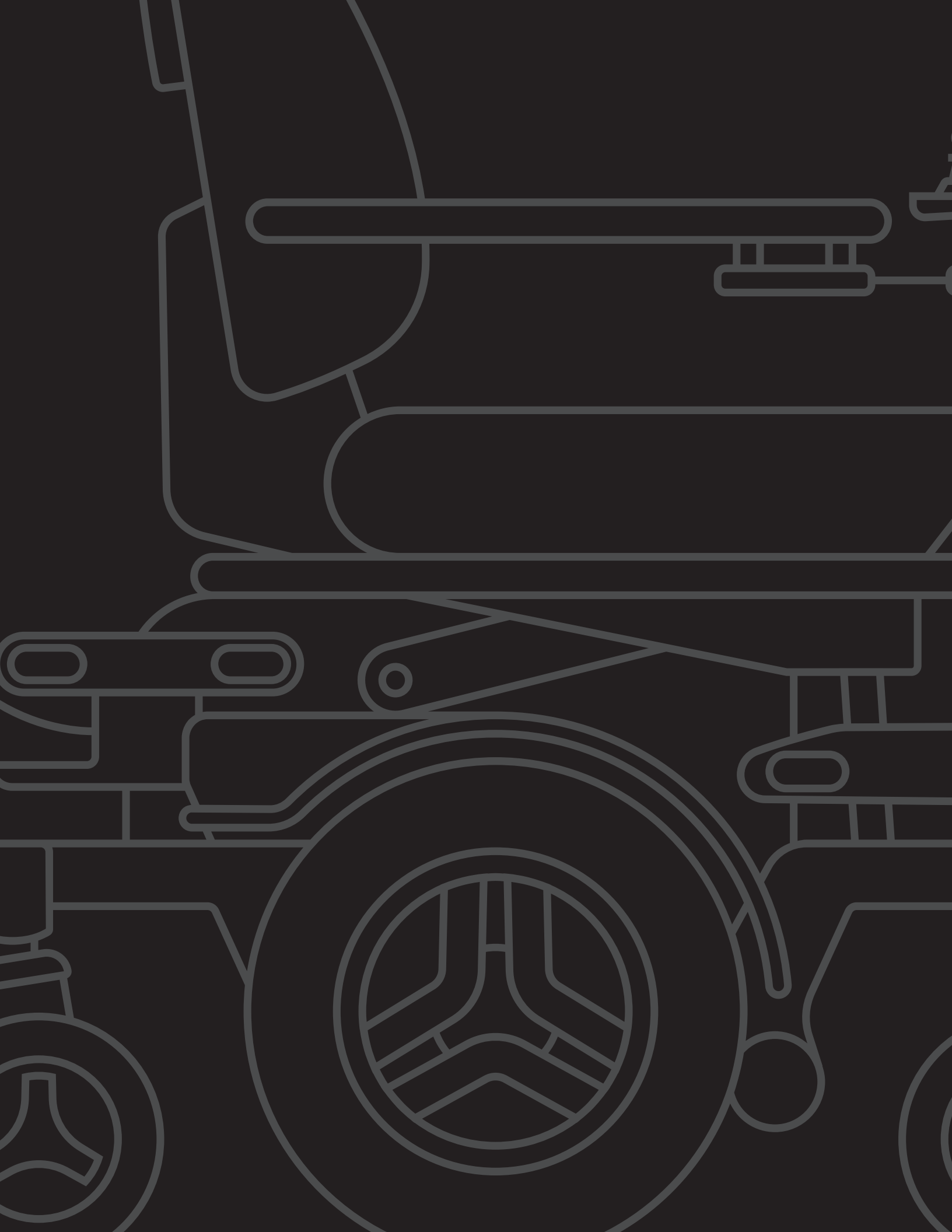# LUCI

Privacy & Security

For a wheelchair to be considered "smart," it needs to connect to other technologies and make data accessible to you and your team. So...

At LUCI®, data is our business, and yours.

Sometimes it can feel like companies don't want you to know how your information is being collected, shared, or used. We don't like that feeling and we don't think you do either, so we created this document for two important reasons:

1. It's your right to know.

2. As the pioneer in smart wheelchair technology, LUCI can set an example of transparency and communication on this topic that sets the standard for how data and privacy are handled in the industry.

LUCI is committed to building the future of smart technology[1] for wheelchair users, while improving safety[2], and giving users control of their data as we connect wheelchairs to the modern world.

Review this document to learn how LUCI is designed to give you control over your data and protect your privacy.

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[1]https://luci.com/smart/
[2]https://luci.com/safe/

MYLUCI® DATA AND SECURITY OVERVIEW

When we built LUCI, we took the privacy and data security of our users and their caregivers seriously. We also took the data collection and secure communication capabilities of LUCI seriously, so that we could offer the best customer experience to users. LUCI's connectivity allows the product to keep improving over time with over-the-air software updates and gives users access to information to better manage their mobility and health. It also provides deidentified and anonymized data so the internal team at LUCI and external researchers can better serve the community. We believe our customers deserve access to the connected, world class features and future opportunities that connectivity, done right, provides.

LUCI's operating system on the wheelchair generates data about the wheelchair and LUCI's functions including collision avoidance, drop-off protection and tip protection. This data is made available to users through the MyLUCI app (available on iOS, Android and as a web app at MyLUCI.com) and users are in control of who has access to their identified data.
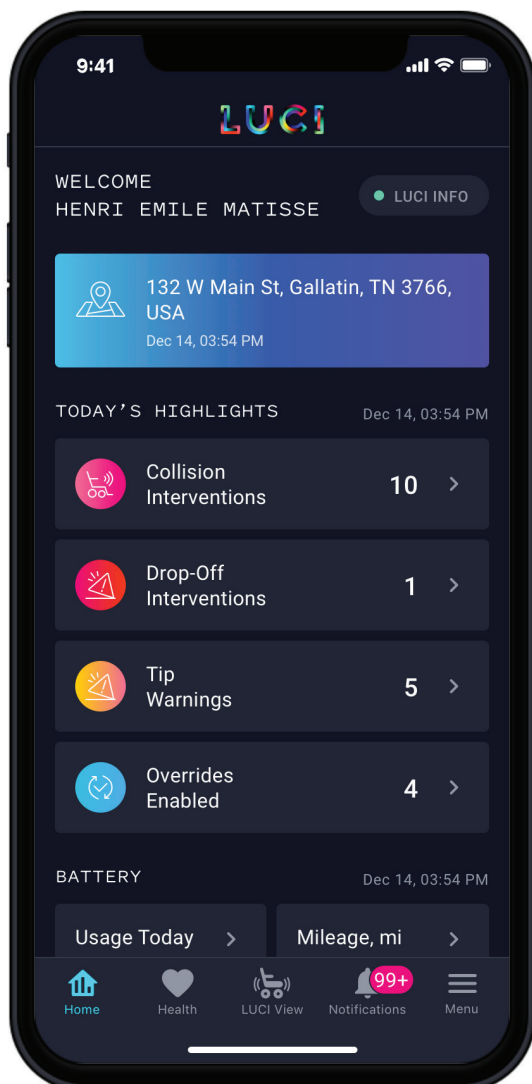
MyLUCI is a voluntary, opt-in app designed to emphasize driver rights, security, and dignity.

TERMS TO KNOW

Identified Data is data that includes a user's personally identifying information such as name, email address, phone numbers or other contact information.

Deidentified Data is data where all personally identifying information such as name, email address, phone numbers or other personal contact information has been removed to protect personal privacy.

Anonymous Data is deidentified data that has been further processed or aggregated (combined with other user's data) so that it cannot be re-associated with an individual.

Privacy and Data

At LUCI, we take three user-centered stances around privacy and data in our development and we think others should to:

1

LUCI's collision avoidance, drop-off protection, tip protection and other core safety features work whether or not a user opts-in to use the MyLUCI app.

2

MyLUCI users control the use of their personally identified data created through the product. This means users are in control of whether or not anyone else sees their identified data and they must explicitly invite others to see their identified data.

3

If a user opts not to use the MyLUCI app, they still have access to the latest over-the-air software and security updates.

These guiding principles mean that LUCI users can choose the level of connectivity and privacy they desire. For today's LUCI users that means:

LUCI features that don't require any connectivity:

- Collision avoidance,
- Drop-off protection,
- Tip protection,
- Driver assist features, and,
- The ability to update your LUCI drive settings using the Setup Tool.

Once you connect your LUCI unit to Wi-Fi you gain:

- The ability to receive **over-the-air updates** to keep your LUCI software up to date,
- Improved, remote customer support if you need it, and,
- You help LUCI improve by sending deidentified engineering data to the LUCI team.

When you choose to opt-in to MyLUCI you can also:

- Use LuciView to get a birds-eye view of your wheelchair's surroundings.
- Share data, if you'd like, with members of your team,
- Connect and share your Google Fit or Apple Health data with your team if you choose,
- Interact with LUCI via Alexa or Google Assistant, and,
- Contribute anonymous usage data to help the LUCI team and researchers move the industry forward.

Security

LUCI's software has been designed using security best practices for our onboard, app, and cloud software. We've built in the ability to push security updates over-the-air to LUCI via a cryptographically verified process if we find security issues that need to be patched in the future.

Security starts by making sure the driver is safe regardless of connectivity. LUCI's core functions of collision avoidance, drop-off protection and tip protection work entirely onboard LUCI and require no connection to the cloud. This means LUCI isn't affected by MyLUCI updates, random network outages, or other loss of connectivity. LUCI drive settings can only be changed while in the LUCI Setup Mode. To get into this mode the user must press a button on the LUCI Dashboard locally, chair motion is locked out, and the chair must be restarted for changes to take effect. For your safety and security, drive settings can't be tweaked or modified while the system is moving.

We take your data security seriously. To this end, we've taken many steps to ensure security including:

- No personally identifiable information is stored on LUCI units locally after initial setup is complete. All local information is deidentified.

- MyLUCI is HIPAA-secure and kept up-to-date by our team.

- Even though day-to-day communications between LUCI and the cloud don't include personally identifiable information, we transmit deidentified and encrypted data via a secure connection to MyLUCI.
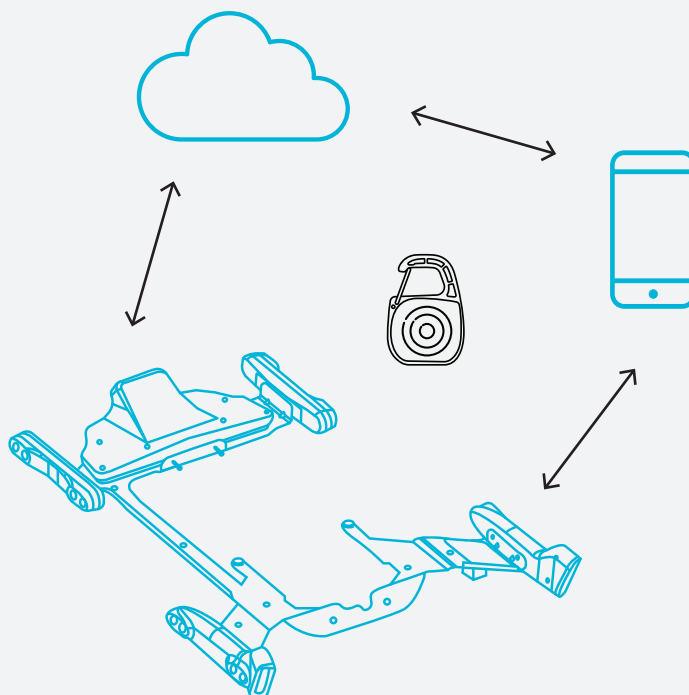
Going further, LUCI's communication of your data to the cloud requires **multi-factor authentication**. Your individual Wheelchair Key serves as an extra layer of protection. Your LUCI unit will not send data to the MyLUCI app or allow settings to be changed unless your personal Wheelchair Key is present.

Adding this extra layer of hardware security wasn't something we were required to do...it was just the right thing to do.

Control

LUCI is designed to let you know when and how data is being communicated and to give you control over what information is shared and with who.

When you're using LUCI you can always know if and how LUCI is connected and if your Wheelchair Key is present, by looking at the Dashboard

PERSONALIZED STATUS	When this light is green, your Wheelchair Key has been detected and LUCI has permission to send your data to MyLUCI. Don't worry, if you haven't signed up for MyLUCI, then data that gets sent up is rejected by the cloud.
WI-FI CONNECTION STATUS	When this light is green your LUCI unit is connected to a Wi-Fi network.
CELLULAR CONNECTION STATUS	When this light is green your LUCI unit is connected to a cellular network.[3]

When using MyLUCI, you have complete control over who can see your identified data. To invite someone to see your data, navigate to My Team in the Menu of the MyLUCI app and select who you would like to share data with. You can also control which specific types of data you would like to share with each individual person.

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[3] LUCI has an onboard cellular modem and a cellular data plan that comes included in the cost of LUCI. It is only used to send high-priority messages (like tip-over alerts) to MyLUCI if Wi-Fi isn't available. If you aren't using MyLUCI then all cell messages will be rejected by the cloud.

FREQUENTLY ASKED DATA AND SECURITY QUESTIONS

Q: Why does the user need to enter an email address during luci setup?

When a new LUCI user completes device setup with the Setup Tool, there is a one-time transfer of personally identifiable information from LUCI to the MyLUCI cloud via an encrypted connection. This transfer happens as soon as LUCI gets a WiFi or cellular connection after completing initial setup and includes three key things:

- user's name,
- user's email, and,
- user's acceptance of the terms of use of LUCI.

The drivers name and email is not stored on the LUCI hardware after this one-time transfer is complete.

We need the rider's name and email with the acceptance of terms to be compliant. We need a record that the user has reviewed and accepted the risks of using LUCI. At the highest level, the terms and conditions say:

- The rider is old enough to consent to the terms and conditions.
- LUCI won't prevent all collisions or tips. LUCI helps but it isn't magic.
- LUCI reserves the right to use deidentified and/or anonymous data for product improvement and as an input to research studies that might help move the seating and mobility industry forward.

If, and only if, the rider follows the link received in the MyLUCI invitation email received after setup and completes registration, will the rider be signed up for the MyLUCI app. As part of that process there is another set of terms and conditions focused on app and data use.

Q: What can a user do with MyLUCI that a user can't do without MyLUCI?

MyLUCI is an app that gives the rider access to his/her data and allows him/her to securely share data with their team. To setup a MyLUCI profile, simply follow the emailed instructions you receive after LUCI is first installed and set up on the wheelchair. The user can access the MyLUCI app by downloading the MyLUCI app on the Apple App Store or Google Play Store.

In the MyLUCI app, the rider will be able to:

- Use the LuciView 360-degree visualizer.
- Access the information that LUCI is tracking.
- Share data and information with contacts and caregivers.
- Access the information from LUCI-compatible devices.
- Connect to Alexa and Google voice assistants.
- Personalize LUCI notifications.

In order to take full advantage of MyLUCI's features, you will want to connect LUCI to Wi-Fi. LUCI can be connected to any private Wi-Fi network through the LUCI Setup Tool or the MyLUCI App.

Q: What if the user already setup a MyLUCI account but does not want LUCI to share his/her data with the MyLUCI app?

Each LUCI user gets a unique Wheelchair Key that is tied to their account. If the Wheelchair Key is present, then LUCI will send data to their MyLUCI account when connected to a network. If the Wheelchair Key isn't present, then no personal data gets transmitted.

If you do not want LUCI to share data with the app, then keep the Wheelchair Key away from the chair. You will know that LUCI doesn't sense the Wheelchair Key if the Personalized Status light on the LUCI Dashboard is off.

## Q: What if the user does not want his/her information and location shared with caregivers?

Users can use MyLUCI to share data, or not. They are in control. The MyLUCI app allows each user to control access to their data and to customize alert and data preferences. Users have the choice of whether or not they want to add a team of caregivers. If they do, they can then choose what information is shared with each individual on their team. Users have the right to revoke data privileges from a person after they have been added whenever they choose.

Q: What about the deidentified data created by LUCI?

LUCI reserves the right to use deidentified data for product improvement and as an input to research studies that might help move the seating and mobility industry forward.

Deidentified engineering data (data not attached to personal identifiers such as name, email address, etc.) is sent to be used by engineering when LUCI is connected to Wi-Fi based on the LUCI terms and conditions. Examples of the deidentified engineering data being shared from a LUCI unit can be seen below for reference:

```
arn:aws:s3:::luci-logs | s3
2021-06-22 17:52:32.980, I, 0, Timing for; processCombinedDropoff; Ran; 4500; Avg; 29; Med; 16; 90 percentile; 38; 99 percentile; 310; min;
13; max; 1350
arn:aws:s3:::luci-logs | s3
2021-06-22 17:08:07.957, I, 0, Ultrasonic MPU (addr: 1, spiID: 0) tested and responded.
arn:aws:s3:::luci-logs | s3
2021-06-22 17:08:07.957, I, 0, IMU Bootload register is: 1
arn:aws:s3:::luci-logs | s3
2021-06-22 17:08:07.945, I, 0, Start mode initialized with: Auto
```
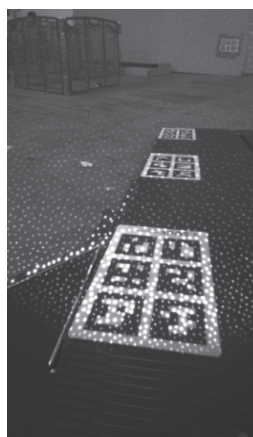
(above) Machine logs are uploaded by LUCI units to help gather statistics and look for areas of future improvement.

(left) RampAssist logs are pictures of the ground, only triggered by TAGs for your privacy, that help our team improve image processing on LUCI.

(right) Black box sensor logs are used for customer support to help with remote troubleshooting.
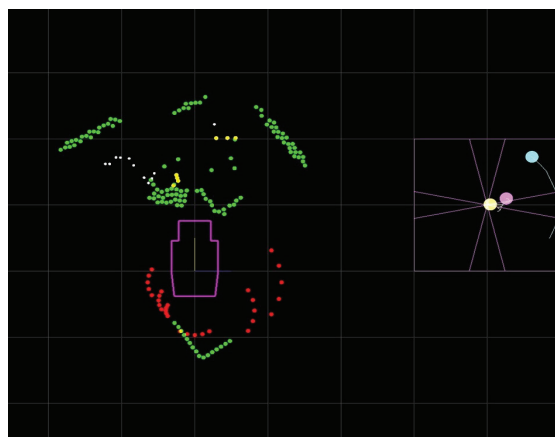
If a user wishes to opt-out of sharing machine logs they may do so in the Setup Tool when their LUCI unit is first set up. If a user does not want TAG images captured then they should not enable driver assist features like RampAssist. Opting-out makes it harder for LUCI to continue to improve the product so please help us out by sharing this data.

Q: What if the user does not want to receive over-the-air updates to LUCI software?

The ability to receive over-the-air software updates helps make sure the user has the best drive experience and most secure software available. Software updates are scheduled to occur while your wheelchair is off to minimize disruptions to your personal use.

We've set LUCI up to allow over-the-air updates anytime your chair is connected to Wi-Fi whether you've opted in to the MyLUCI app or not for your safety and security. Said plainly, even if you don't intend to use the MyLUCI app, we urge you to receive over-the-air updates. This feature allows you to benefit from continuous improvements even AFTER your purchase. Phones, GPS units, cars, and TV's provide this benefit to their users and we believe our clients benefit from it, too.

That said, LUCI does not currently allow over-the-air software updates over its cellular service so, if you do not want to receive over-the-air software updates, simply do not connect your LUCI unit to Wi-Fi. If you have already connected LUCI to Wi-Fi then use the Setup Tool and the "forget all Wi-Fi networks" function in the Wi-Fi menu to remove them. See the LUCI User Guide for detailed instructions.

Q: Can wheelchair users be hacked or followed?

Keeping LUCI users safe from malicious attacks is extremely important. We've taken many steps to ensure users' security, including:

- No personally identifiable information is stored on LUCI locally. All local information is de-identified.

- The MyLUCI portal is HIPAA secure and kept up to date by our team.

- Even though day-to-day communications between LUCI and the cloud don't include personally identifiable information, we transmit de-identified data encrypted, via a secure connection to MyLUCI.

- LUCI drive settings can only be changed locally, on the device, using the LUCI Setup Mode. To get into this mode the user must press a button on the LUCI system, motion is locked out, and the chair must be restarted for changes to take effect. This means drive settings can't be modified while the system is driving.

While we have used security best practices to develop our onboard and cloud software, in the event we've missed something we have built in secure over-the-air update capability so that we can push security patches to LUCI if needed.

Q: Are you tracking people?

Every LUCI has GPS onboard and its GPS loc communicated to the individual's MyLUCI ac rider can view his/her current location on the app. This is just like a cellphone, any modern some existing wheelchair brands.

This data is collected so that you can share location with others if you choose to do so. F example, you can set up LUCI to send a mess family member or caregiver with your locatio wheelchair tips over. Before any identified us like your location, is shared with another pers user must give that person permission in the app. You can use MyLUCI to share data, or ne in full control.

Q: Do I have the right to be forgotte

Of course! If you are an active MyLUCI user a like your account and data to be completely just contact customer support for assistance

MORE INFORMATION

For more information on LUCI's connectivity, its purpose, capabilities and more see LUCI's answers to Judging Smart (luci.com/smart). You can also review our full end user license agreement and terms of use on our website here at: luci.com/legal.
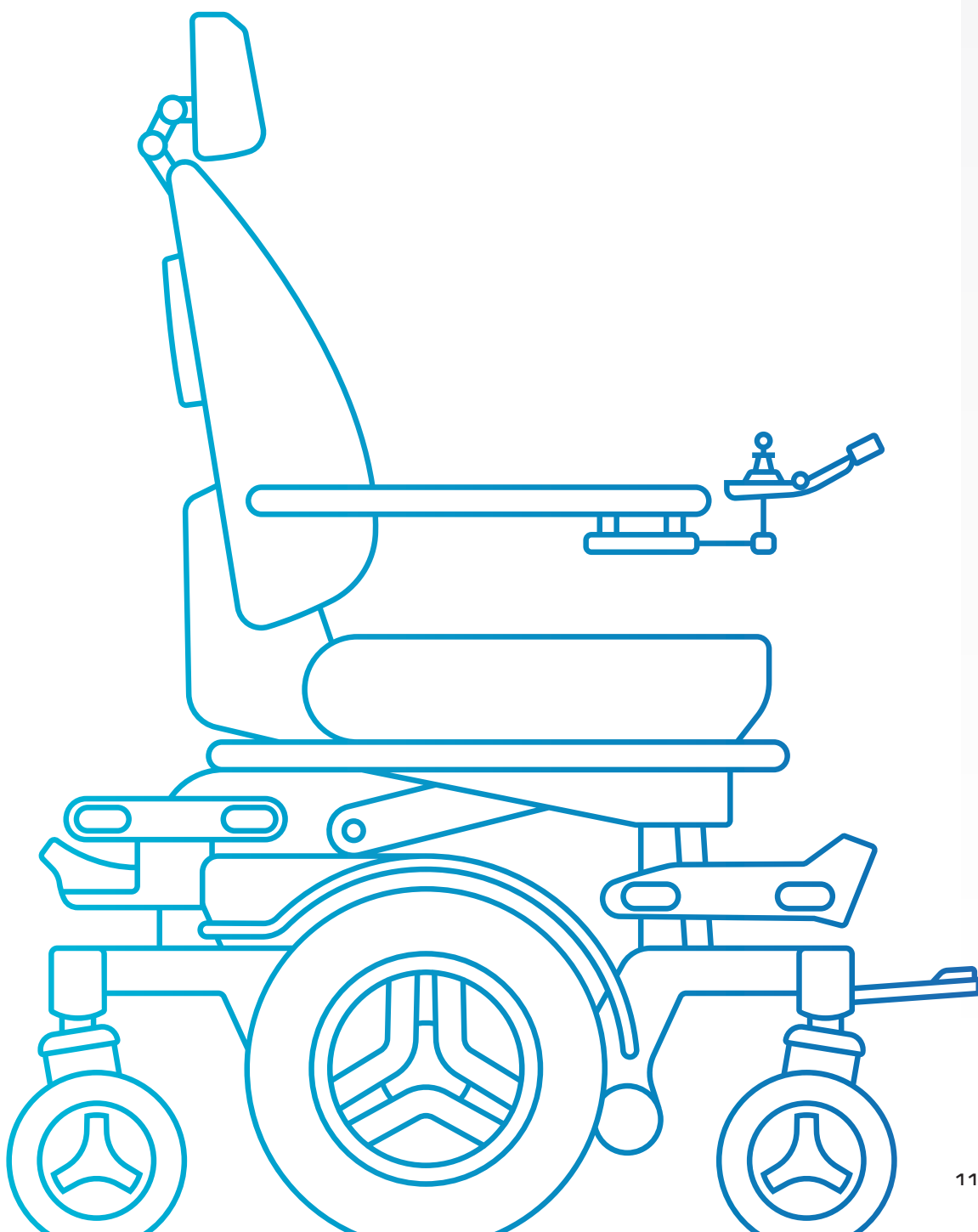
THIS DOCUMENT WILL ADDRESS:

What is the purpose of the connectivity?

How is long-term security handled?

How is driver data used?

LUCI is committed to providing this information. It's your right to know! We always recommend asking for this information from ALL the companies you work with.

LUCI®

LUCI.COM