**Aegis**

Keeping you safe

Team C: Kevin Shank, Victor Li, Peter Pham, Jason Meng and Lou Dignam

**Table of Contents**

**Introduction3**

**Glossary4**

**Functional Requirements5-11**

**User Manual12-13**

**Special Requirements14**

**Index15**

**Introduction**

Aegis is an android application that puts the safety of our users first. Using the Google Maps API, the Philadelphia Crime Rate API and an incremental database, Aegis pinpoints the safest route for our users to travel from Point A to Point B. In the application, the user will be able to see each reported crime displayed on the map by different color pins. Aegis will be able to determine the safest route for our users based on the amount of pins displayed on the route as well as what the user rates a specific crime on a scale of one to ten. The user will also have the ability to filter out crimes based on past history as well as more recent crimes. Along with these features, Aegis will include a feature that allows the user to create a special code to alert a contact in an emergency situation. Safety is ongoing issue regarding anyone whom may be travelling. At times, when in an unknown area, people tend to feel on edge, well that can stop there. Our application, Aegis is designed for anyone who may be concerned with their safety. Aegis truly puts the safety of our users first.

**Glossary**

**A**

**Aegis**: Our application name

**APK**: Android Application Package

**C**

**Core Framework**: Our key technology we will use

**Color Code**: Different colors used to indicate different level of risk, generally, red means dangerous, green means safe, yellow means warning.

**G**

**Google Play**: Google online application store

**H**

**Hardkey**: Define your own buttons combination

**HardKey Trigger**: Once you press predefined buttons combination, application will activate function

**K**

**KitKat**: Android Version 4.4 - 4.4.4

**M**

**Mainstream Market**: Most popular product in the market

**P**

**Pulling data**: Users can choose what kind of crime information they want to avoid

**Pulling intervals**: Users can choose how frequently the crime information will update in their application

**R**

**Route Computation**: After calculating the user’s threshold and the crime that happened between the “to and from” destinations, our app will pick the “Safest route”.

**S**

**Satellite View**: Over view base on the real world

**T**

**Timestamp**:  is a sequence of characters of encoded information identifying when a certain event occurred, usually giving date and time of day, sometimes accurate to small fraction of a second

**Threshold**: For example, if a user wants to avoid at most 5 crimes, then the application will pick a route that less than 5 crimes happened before. Also our application will have default data.

**Terrain View**: Only show the terrain on the map

**Functional Requirements**

[Feature 1 - Platform & System](#_q58cghwuunlx)

[Feature 2 - Core Framework](#_i6c4bqq8shtz)

[Feature 3 - Default Page (Main Interface)](#_hwqg9ekpkqd1)

[Feature 4 - Disable Google Map’s Satellite and Terrain View](#_3kcuxj3ead0)

[Feature 5 - Searching](#_s9kkv3gsddsz)

[Area Searching](#_f9tcwrl7s933)

[Crime Data Searching - Estimated Arrival Time Range](#_uxg0gfahbdor)

[Feature 6 - Search History](#_k9yqcmwuavog)

[Feature 7 - My Addresses](#_wey1bksnk0hf)

[Feature 8 - Pulling Data](#_18pz4clhsneb)

[Manual Pulling](#_r5afdundipk9)

[Background Automatic Pulling](#_h57u116e3yf)

[Data](#_o2vk71z3lcpj)

[Feature 9 - On Map Crime Incidence Display](#_wvqv8ls0nsqo)

[Feature 10 - Destination Crime Report and Risk Evaluation](#_csl0n42nc5eb)

[Crime Incidences Report](#_ok1m19z0v46x)

[Risk Evaluation](#_siz0yfldroxp)

[Color Codes](#_mz1zoxoqpfd6)

[Warning Messages](#_5ditcyyvh8kf)

[Feature 11 - Route Computation](#_j6v8km5a4usw)

[Feature 12 - Navigation](#_km61iycw57ua)

[Feature 13 - Police Districts and Stations](#_ef9zvxg7g3g1)

[Feature 14 - Emergency Call](#_xmzuyj8niixg)

[Feature 15 - Emergency Messaging](#_2ztmquhlcuw7)

[Feature 16 - Hardkey Triggered Quiet Emergency Call/Messaging](#_frdessw339g3)

# Feature 1 - Platform & System

Aegis is an App which is designed and optimized for Android devices.

Aegis must satisfy the following:

1. H/W compatibility: Android phones and Android tablets on the mainstream market. Goal: Phones with 4.7”, 5.5” screen size, Tablets with 7” - 11”. See: [10 Best Android phones 2016](http://www.techradar.com/news/phone-and-communications/mobile-phones/best-android-phone-which-should-you-buy-1135314).
2. S/W compatibility: Google Android OS multiple versions from KitKat to the latest. See: [Android Version History](https://en.wikipedia.org/wiki/Android_version_history).
3. Aegis must be packaged as a whole, entire APK and be delivered to user; Aegis must be capable to be identified and executed by Android App Installer without error.
4. [Optional] Aegis should be available on Google Play for user to download and install.

# Feature 2 - Core Framework

Aegis shall use Google Map and Google Map extensions as its core functional kernel. Aegis is fundamentally a map/geographical Android App.

# Feature 3 - Default Page (Main Interface)

A default page is what user see when he or she launches the App.

The default page of Aegis shall be Google Map’s default page:



Such page must include the following controls/functions:

1. An input for user to search a location/address
2. A graphic map which is displayed full-screen
3. A button for user to locate his/her current location
4. A button for user to launch tools side menu which contains:
   1. Login/Signup
   2. My Addresses
   3. Settings
   4. Pull Data
   5. Way of Travel: Public Transit, Biking, Drive (default)

# Feature 4 - Disable Google Map’s Satellite and Terrain View

Aegis should stay and keep staying on Google Map’s default map view type. User should not be able to switch to Satellite and Terrain view.

# Feature 5 - Searching

## Area Searching

When user taps the address input, Aegis should direct user into a search view page which sits on top of the graphic map and covers the map. On the search view page, user can easily cancel searching and return to the map view page.

Aegis should not support voice input.

When user tap on “Search” button, Aegis should perform an address search, return to the map view page and mark the results on the map.

If the search results a remote address, the map view should be able to automatically move to the region around the destination.

## Crime Data Searching - Estimated Arrival Time Range

Aegis should enable user to pick an hourly time range to perform a crime data searching The searching should be on the destination address and the time range.

The search result will be used by [Feature 10](#_csl0n42nc5eb).

# Feature 6 - Search History

Aegis should save and keep the search history as a list sorted by the search frequency in descending order.

Each time when user launches the search view page, the search history list should be displayed under the search input.

# Feature 7 - My Addresses

Aegis should enable user to input and keep his/her frequently used addresses as his/her favorite address book.

When user select one address from the address book, Aegis should be able to automatically perform a search, return to the map view, move and mark the address’ location on the map view.

# Feature 8 - Pulling Data

## Manual Pulling

Aegis should allow user to perform manual data pulling from the defined data sources. The data sources are defined in “Settings”.

Aegis should save the downloaded data into its database and replace the records with old version or timestamps.

## Background Automatic Pulling

In “Settings”, user can set his/her preference on the pulling intervals - default: Once per week.

Background data pulling should pull data from the built-in (predefined) data source. Crime data should be pulled and added into local database incrementally.

## Data

Aegis downloads two type of data:

1. Crime Incidence Database: <https://data.phila.gov/view/ter3-xxzp> (The source is not up-to-date at <https://www.opendataphilly.org/dataset/crime-incidents/resource/d6369e07-da6d-401b-bf6e-93fdfacdf24d>)
2. Police Districts (HQs)
   1. Police Service Areas: <http://metadata.phila.gov/#home/datasetdetails/5543866f20583086178c4f24/representationdetails/55438ab79b989a05172d0d5b/>.
   2. Police Stations: <https://www.opendataphilly.org/dataset/police-stations>.

# Feature 9 - On Map Crime Incidence Display

Aegis user should be able to see crime incidences marked on Map by location markers, when:

1. On the default page (main page) around the current location.
2. One the search result page around the destination location.

Crime incidences are fetched from local database which is pulled from the data sources defined in “Settings”.

The date range of the incidences can be customized in “Settings” by user. The default, if not customized by user, is 18 days.

User can chose to display one type or a combination of types of crime. If not set, Aegis should display all.

# Feature 10 - Destination Crime Report and Risk Evaluation

* This feature is an enhancement to [Feature 9](#_wvqv8ls0nsqo).
* This feature uses the result from [Feature 5](#_s9kkv3gsddsz).

## Crime Incidences Report

The crime data in the date range (defined by user or default) should be displayed in the region of the map where current screen focuses. The displayed incidences should be a filtered-by-type result according to user’s preference. If not set, None filter should be applied upon the search result.

## Risk Evaluation

Aegis sums up the crime incidence occurrence within the time range (set by user) and within the date range (set by user or default), and calculate the average number in a day within the time range.

Aegis calculates the risk level by comparing the average number of crime incidence with the thresholds set by user (or default) in “Settings”.

The risk levels are:

* Fatal
* Dangerous
* Risky
* Safe

## Color Codes

Aegis should employ a set of color codes to depict the evaluated risk values. User can have an intuitive impression about the danger.

|  |  |
| --- | --- |
| **DON’T GO** | Fatal > 20 (default), user can set it in “Settings” |
| **If you insist, GET A GUN** | Dangerous > 10 (default), user can set it in “Settings” |
| **GO THERE IN DAYTIME** | Risky > 5 (default), user can set it in “Settings” |
| **Low Risk** | Safe < 2 (default), user can set it in “Settings” |

For instance: When user do searching on address XXXX Abcdef St at Wxyz Street with time range “8pm - 10pm”, Aegis will respond with a [warning message](#_5ditcyyvh8kf) with a color code:

|  |
| --- |
| **GO THERE IN DAYTIME** |

## Warning Messages

Warning messages are displayed after a risk evaluation. The messages are paired with the risk thresholds.

User can customize the warning messages in “Settings”.

# Feature 11 - Route Computation

Aegis utilizes Google Map’s route calculation. Google Map can return multiple routes. Aegis adds crime data, according to user’s settings, along the routes, weighs the crime density, and pick a least risky route out of the options.

# Feature 12 - Navigation

Aegis can do navigation on top of the route that user picks. This feature simply utilizes Google Map’s built-in navigation feature.

# Feature 13 - Police Districts and Stations

Aegis downloads police districts (or PSA: Police Service Areas) and stations data from the data source built-in (predefined). Such information will be automatically marked on the map view, before/after searching with the crime incidences.

# Feature 14 - Emergency Call

Aegis should enable user to make an emergency call in a simplest way(one click) whenever it’s running actively (Aegis runs in the frontend on user’s device) or running background as a service daemon. According to user’s settings, Aegis should be able to make 911 call or to make calls to designate persons who are the emergency contacts.

In the meantime, Aegis also automatically send text messages to his emergency contacts with his current location, in the following pattern:

* EMERGENCY! CALL 911 - I am at <Current Location>.

# Feature 15 - Emergency Messaging

Aegis should enable user to make an emergency message in a simplest way whenever it’s running actively (Aegis runs in the frontend on user’s device) or running background as a service daemon. According to user’s settings, Aegis should be able to send text messages to designate persons who are the emergency contacts.

Aegis provides user a set of patterns of the emergency text. But user can also make his/her own pattern or not use a pattern but a fixed message instead.

# Feature 16 - Hardkey Triggered Quiet Emergency Call/Messaging

Aegis must be capable to trigger silent/quiet emergency calls/messages when it detects a combination of hard keys are clicked. In some highly possible scenarios, Aegis’ users can be involved in circumstances that they are not able to make calls with phones in hand in front of other people who are supposed to endanger them. With this feature, user can reach the device in pocket, and make an emergency call/message quietly and invisibly.

The hard keys and the combination should be configurable in “Settings”. Aegis also needs to employ a method to ensure the user-set combination cannot be easily triggered unexpectedly by accident.

**User Manual**

How to use Aegis

Use Aegis on your android to search, explore, and find your way around Philadelphia

Here's a guide to get you started using Aegis.

Get directions and start navigation

You can get directions for driving, public transit, walking, biking, or flying on Aegis. Whenever you see multiple routes, the best route to your destination is blue and is the first result shown. Other routes are in gray on the map.

Open the Aegis app.

1. Search for your destination or tap it on the map.
2. In the bottom right, tap the blue circle. It'll show a car, bus, bike, taxi, or person walking.
3. To see the list of driving, walking, or biking directions, tap the white bar at the bottom. It's the one that shows the travel time and distance.

**Notes**:

* To choose another route, tap it on the map. Each route shows the estimated travel time on the map.

Use navigation in the Aegis app

You can use navigation in the Aegis app to get turn-by-turn directions to places easily. Maps will show you directions and uses real-time traffic information to find the best route to your destination.

With voice navigation, you’ll hear traffic alerts, where to turn, which lane to use, and if there's a better route.

**Note**: Navigation and info about which lane to use aren't available in all regions and languages.

Start or stop navigation

1. Open the Aegis app.
2. Search for a place or tap it on the map.
3. In the bottom right, tap the blue circle. It'll show a person walking. If you touch and hold the blue circle instead, you’ll start navigation and can skip steps 4-6.
4. If alternate routes are available, they will be shown in gray on the map. To follow an alternate route, tap the gray line.
5. To start navigation, tap Navigate . If you see “Searching for GPS,” your phone is trying to get a GPS signal. For example, you might be in or near a tunnel, parking garage, or other location where there’s no GPS signal.
6. To stop or cancel navigation, go to the bottom left and tap Cancel **X**.

**Tips**:

* To see a step-by-step list of directions, tap the white bar at the bottom.
* To see the map from your point of view, tap the compass.
* To switch between miles and kilometers, open the Aegis app Menu **Settings** **Distance units** **Miles** or **Kilometers**.

Set your home and work

Type less by setting your home and work addresses. And then protect your commute by getting the safest route.

Set or change your home and work address

Type less and get directions faster by setting your home and work addresses. On your android, you can also choose an icon for your home and work.

Set your home or work address

1. Open the Aegis app.
2. Tap Menu **Your places**  **Labeled**.
3. Choose **Home** or **Work**.
4. Enter the address.

Change your home or work address

1. Open the Aegis app.
2. Tap Menu **Your places**  **Labeled**.
3. Next to "Home" or "Work," tap More **Edit home** or **Edit work**.
4. Clear the current address, then add a new address.

Delete your home or work address

1. Open the Aegis app.
2. Tap Menu **Your places**  **Labeled**.
3. Next to "Home" or "Work," tap More  **Remove home** or **Remove work**.

Get directions to home or work

1. Open the Aegis app. Set your home and work addresses, if you haven't already.
2. Tap Directions .
3. Tap **Home** or **Work**.

Pick your favorite icon for home or work

1. Open the Aegis app.
2. Tap Menu **Your places**  **Labeled**.
3. Next to "Home" or "Work," tap More **Change icon**.
4. Tap a new icon for your home or work from the list.
5. Tap **Save**.

**Notes**:

* You can only add icons for home or work.
* Your labeled places are private so only you can see them.

Get info about a place

Find a place on the map and get directions. Or get info like business hours and menus, and see Street View imagery.

Hear voice directions

When you navigate to a place, you can hear voice directions.

**Change the volume level**

1. Open the Aegis app Menu **Settings** **Navigation settings** **Voice level**.
2. Choose **Louder**, **Normal**, or **Softer**.

**Mute, unmute, or hear alerts**

1. Open the Aegis app.
2. Start navigation.
3. In the top right, tap Sound . Then, choose one of the following:
   * **Mute/Unmute**: Tap Mute/Unmute.
   * **Hear alerts**: Tap Alerts . You’ll hear alerts like traffic, construction, and accidents. You won’t hear turn-by-turn directions.

**Special Requirements**

1. Refresh Rate

2. Crime Level Measuring

3. API Limitation

4. Emergency Input

## 1. Refresh Rate

* As a real time crime monitoring app, we expect to run into issues involving the gathering of data from the crime api in real time or in at a reasonable rate.

## 2. Crime Level Measuring

* To help the user decide on which path to take we plan on making a color code of danger. We’d need to measure how dangerous one route is compared to another and why one route would be more dangerous than the other.

## 3. API limitation

* The API we are working with is only in the Philadelphia area. Testing wise, we’d be able to work with this but if someone were to select an area outside of the API’s covered range then we’d need to prevent that.

## 4. Emergency Input

* We plan on adding a feature that allows for the individual to silently send an emergency notification through button input. We’d need to limit it to a certain code that the user would put in and make sure they don’t send in by accident.

**Index**

* Table of Contents - 2
* Introduction - 3
* Glossary - 4
* Functional Requirements – 5, 6, 7, 8, 9, 10, 11
  + Platform & System - 5
  + Core Framework - 6
  + Default Page - 6
  + Satellite and Terrain View - 7
  + Searching - 7
  + Search History - 7
  + My Addresses - 8
  + Pulling Data – 8
  + Crime Display - 9
  + Report and Risk Evaluation
  + Route Computation - 10
  + Navigation - 10
  + Police - 10
  + Emergency Call/Messaging - 11
* User Manual
* Special Requirements - 14
  + Refresh Rate - 14
  + Crime Level Measuring - 14
  + API Limitation - 14
  + Emergency Input - 14