Operation 3SL

Slow Speed Saves Lives

Phase 3
System Design
Prototype

CIS 9590
Section QMWA

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Phase 3. System Design Prototype

1. Summary

The Vision Zero mission is to reduce traffic injuries and get traffic fatalities down to zero. The O3SL project aims to support this mission with an interactive dashboard as well as a report generation feature for the NYPD. The O3SL version 1 prototype (O3SL.V1) for the O3SL project takes into account strict stakeholder requirements as well as user experience, culminating in an easy-to-use decision making tool.

O3SL is currently on schedule and is closely following it's scheduled development timeline. In order to get a working copy of our prototype ready for user testing, we have prioritized the most important features based on stakeholder requirements. As such, not all features will be available for testing with this version of the working prototype.

At the current position of our development timeline, O3SL.V1 will include the following:
- Online Data warehouse and scheduled data extraction into Tableau
- Online access to Dashboard accessible 24/7 globally
- Top 10 geolocation searches for high accident areas and hours using:
  - Filtered data by time range (Quarter)
  - Filtered data by time range (Year)
- Output reports which can be downloaded and saved locally in Image or PDF format

At the current position of our development timeline, O3SL.V1 will NOT include the following as they are currently in development:
- Street level mapping
- Additional filter options such as by Zip code and borough, and time range sliders
- Live ETL process from NYPD DB to Google Cloud Data warehouse (Due to time constraints, demo available offsite with developers)
- Remote User login using google authorization

Through the release of this prototype, our stakeholders can gain first hand experience of the usability, response, and overall value of the system we are developing. Through active user involvement in our prototype phase, we can gain immediate and invaluable feedback from those parties which are most invested. This will allow us to detect errors and identify missing, difficult, or confusing functionalities much earlier. Altogether, this phase will allow us to deliver a better quality product at a more rapid pace.

2. Project Analysis

    a. Sequence diagrams

In below charts, the diagrams represent how the system usage is changing based on the user type. First, we will look at the sequence diagram for NYPD or DOT users:
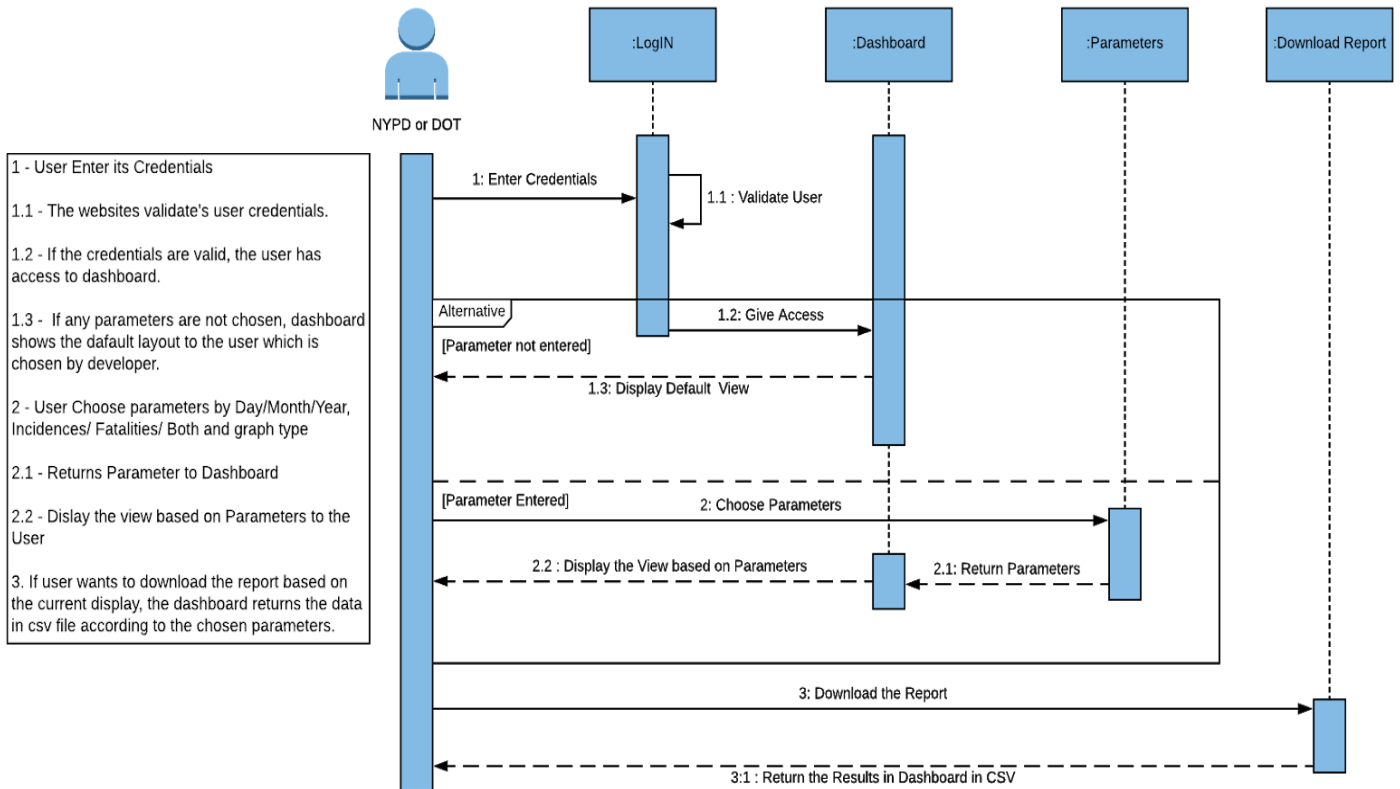
1 -   User enters their credentials and Log In

1.1 -   The website validates the user's credentials

1.2 -   If the credentials are correct, user access to dashboard

1.3 -   If the user does not choose any parameter, the dashboard will show user the default layout decided by the developer

2 -   If User choose parameters by Day/Month/ Year , or Incidences/Fatalities/Both and graph type

2.1 -   The Dashboard is updated by the chosen parameters

2.2 -   The Dashboard displays the results to the user

3 -   User Requests to download the report

3.1 -   Returns the results in CSV file
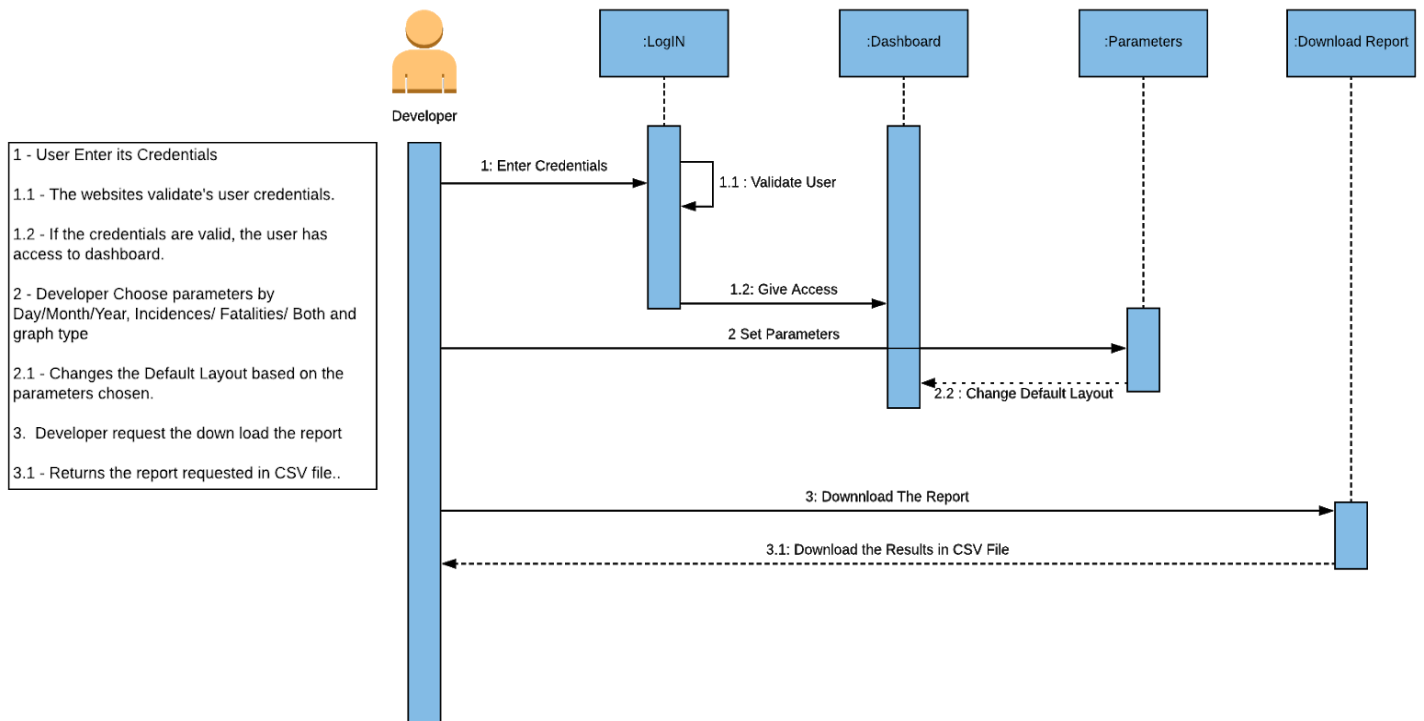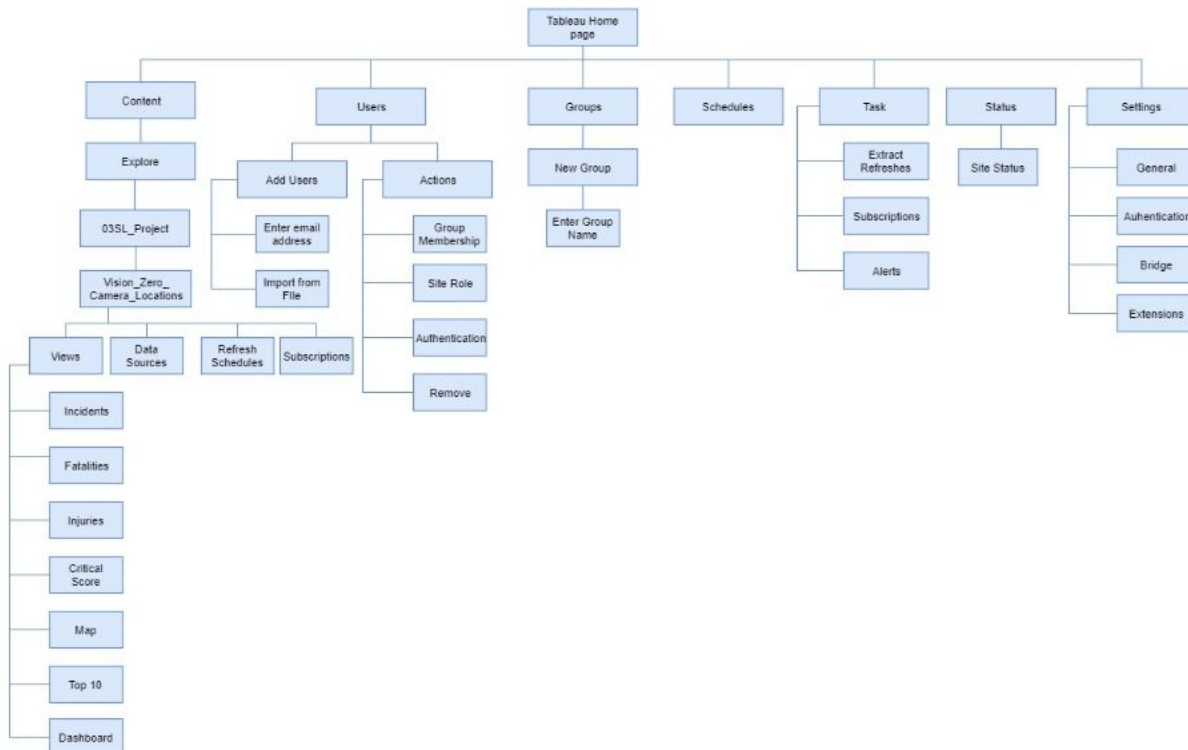
b. State chart diagrams
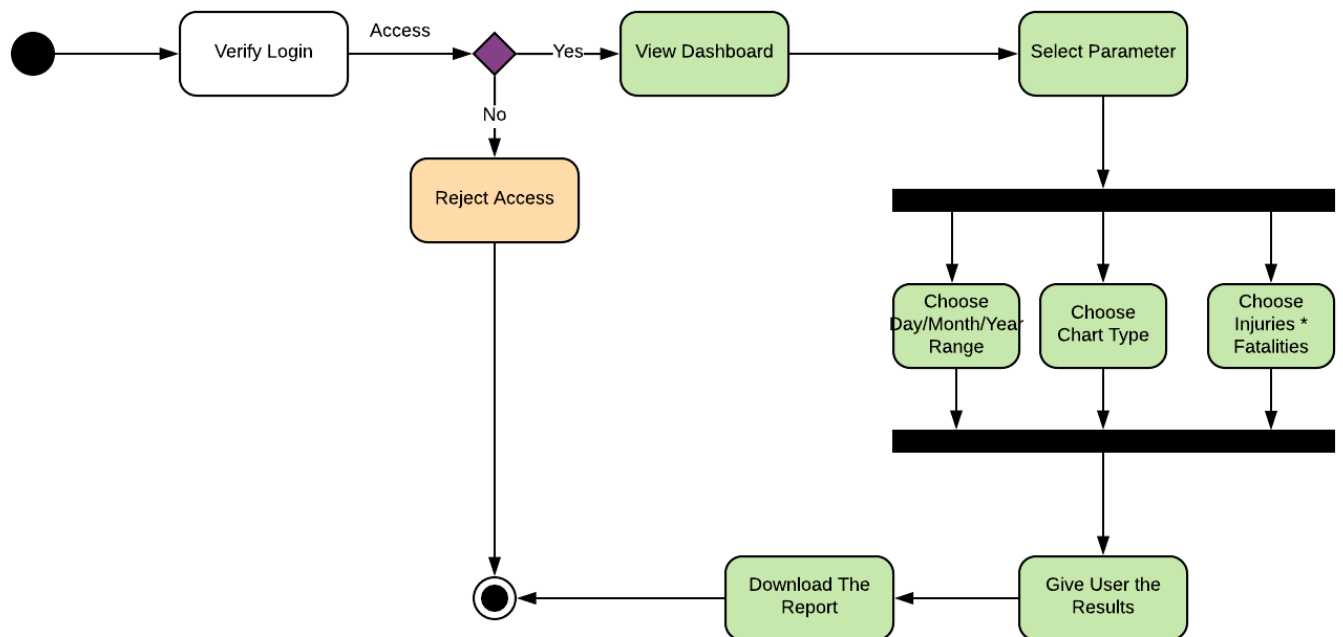
3. Menu Hierarchies

    a. Show menu options and menu flow

       The below menu hierarchy shows the navigation from Tableau's home page after login.

### 4. Report Designs

    a. Layouts with sample data

The users can interact with dashboard and generate a report by choosing selection criteria based on the requirement at the time.

The various selection criterias available are:
- Year - Select the year for which you need the output.
- Quarter - Select the quarter for selected year for which you need the output.

Depending on the selection, the user would be able to view
- Top 10 Location with highest Critical Score
- Top hours of Incidents
- Top hours of Fatalities
- Top hours of Injuries
- Top hours by critical score
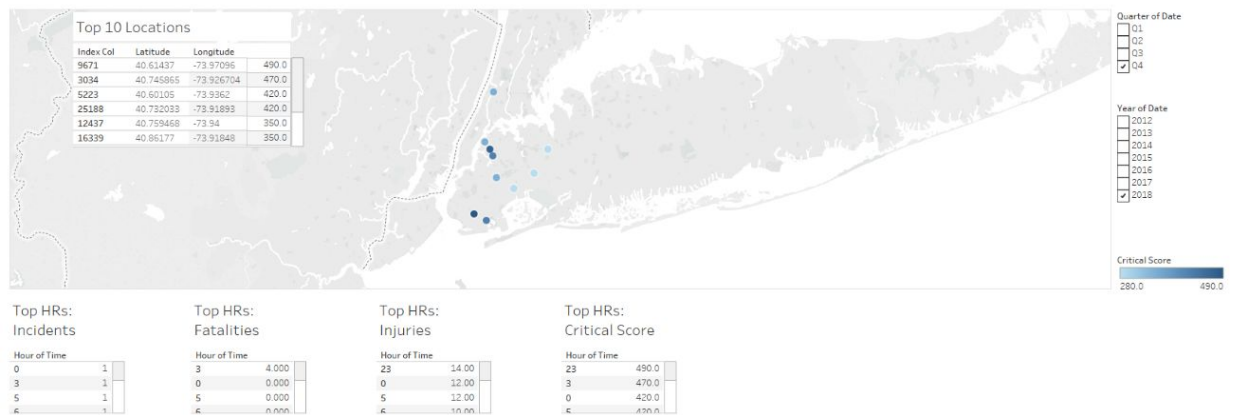
b. Rationale for each report and its content

The report would provide the users with the information of top 10 locations of high incidents by the critical score.
- Critical score is calculated as below:
  C.R = (Fatalities* 100) + (Injuries*35)
The weights to fatalities and injuries are assigned as per the inputs by NYP and DoT.
The top locations can be viewed two formats i.e as a table and a map.

Top 10 Locations

Index... F	Latitude	Longitude	
267710	40.762978	-73.65198	1,720
308057	40.722095	-73.77772	960
245908	40.654533	-73.860916	840
425069	40.7575928	-73.7810721	770
250565	40.653656	-73.86239	760
144831	40.673985	-73.90697	700
368359	40.712116	-73.73118	700
794421	40.6763431	-73.910927	700

Critical Score
630 ▭▭▭▭▭▭▭▭▭▭▭▭▭▭▭▭▭▭▭▭▭▭▭▭▭▭ 1,720
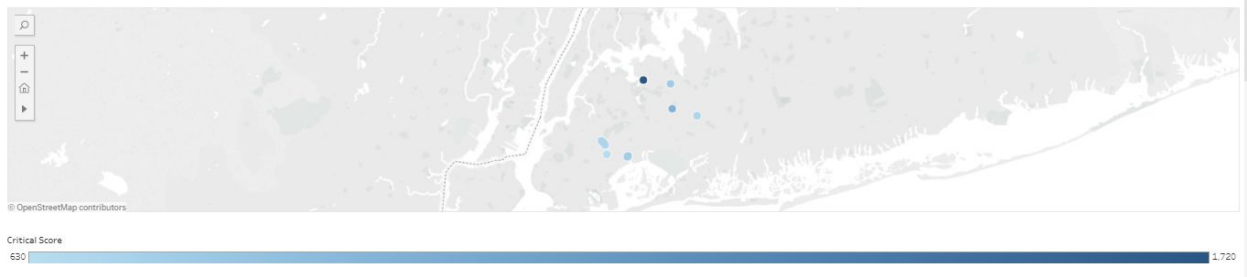
The report will also provide top hours of incidents, fatalities, injuries to help NYPD and DoT identify top accidental spots and hours so that they can take preventative measures to reduce the number of accidents at that location.

Top HRs: Incidents		Top HRs: Fatalities		Top HRs: Injuries		Top HRs: Critical Score	
Hour of Time		Hour of Time		Hour of Time		Hour of Time	
0	1	3	4.000	23	14.00	23	490.0
3	1	0	0.000	0	12.00	3	470.0
5	1	5	0.000	5	12.00	0	420.0
6	1	6	0.000	6	10.00	5	420.0

5. The Prototype

HOMEPAGE VIEW
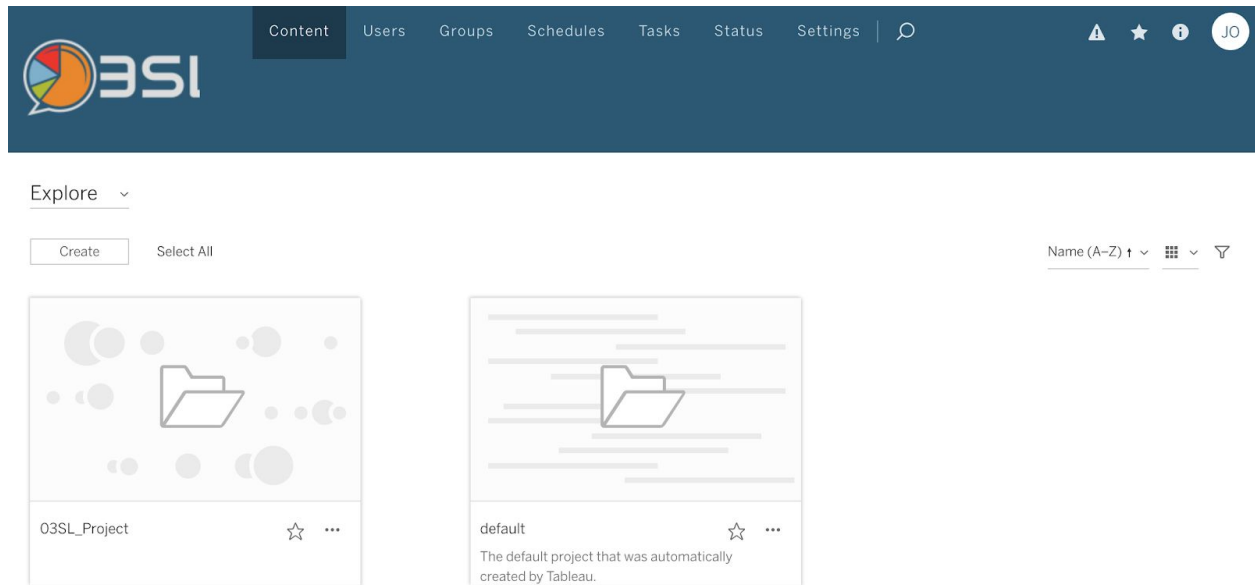
USERS PERMISSIONS VIEW

Under Users page, the users/groups and permissions can be managed. New users can be added by clicking on 'Add Users' wherein site admin can select either of the below given options for user to access Tableau dashboard

- Users will receive an invite email that contains a link to the site.
- Users will receive an invite email that contains a link to the site and instructions to set up their Tableau ID.

Depending upon the authorization required, site admin can assign roles to the users as per their user group

Group Membership	Permission
Data Administrators	View / Interact / Edit (Full Permission)
Data Analyst	View / Interact / Edit (Limited)
Field Users	View Only

Permissions

Edit permissions for the view "Dashboard".

User / Group	Permissions	View					Interact/Edit				Edit	
	Managed by the owner	👁										
All Users (5) •••	None											
Data Administrators... •••	Editor	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Data Analyst (0) •••	Custom	✓	✓	✓	✓	✓	✓	✗	✓	✓	✗	✗
Field Users (1) •••	Custom	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

+ Add a user or group rule

User Permissions   All Users (5)

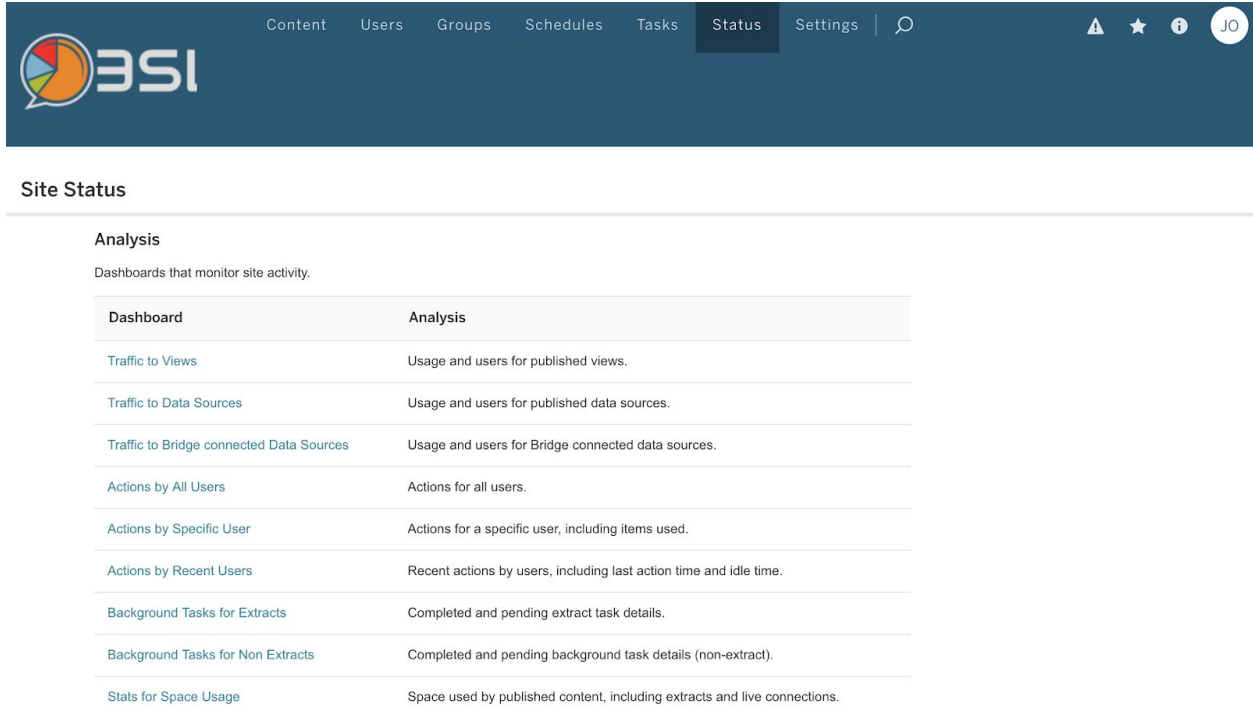| John Ortiz | Administrator | | | | | | | | | | | |
John Ortiz	Custom											
Paridhi Sharma	Administrator											
s.alsahybi@gmail.com	Administrator											
Sage Ashique	Administrator											

SCHEDULED TASKS VIEW

The dashboard is interfaced with NYPD Motor Vehicle Open data source. The data from the source is fed to the target system (Tableau) through API. The job is scheduled to run hourly in order get fresh extracts of data from source system.

Schedules 99

▾ 0 items selected

↑ Name		Frequency	Task type	Tasks	Execution	Next run at	
☐ Refresh daily [00:00 - 02:00, UTC] - Daily at 7:00 PM	•••	Daily	Extract Refresh	0	Parallel	Nov 29, 2018, 7:00 PM	
☐ Refresh daily [01:00 - 03:00, UTC] - Daily at 8:00 PM	•••	Daily	Extract Refresh	0	Parallel	Nov 29, 2018, 8:00 PM	
☐ Refresh daily [02:00 - 04:00, UTC] - Daily at 9:00 PM	•••	Daily	Extract Refresh	0	Parallel	Nov 29, 2018, 9:00 PM	
☐ Refresh daily [03:00 - 05:00, UTC] - Daily at 10:00 PM	•••	Daily	Extract Refresh	0	Parallel	Nov 29, 2018, 10:00 PM	
☐ Refresh daily [04:00 - 06:00, UTC] - Daily at 11:00 PM	•••	Daily	Extract Refresh	0	Parallel	Nov 29, 2018, 11:00 PM	

STATUS VIEW

Under "Site Status", various performance and monitoring analysis dashboard for site and server activity can be viewed. This helps site administrator to monitor the usage and performance of the system. Based on which, the admin can perform fine tuning for site/server optimization.

DASHBOARD VIEW

The dashboard is a collection of various views which can help compare different data simultaneously.
For 03SL project dashboard, the views consist of:
- Top 10 incidents by hours
- Top 10 fatalities by hours
- Top 10 injuries by hours
- Critical score
- Map
- Top 10 accident Locations

Vision_Zero_Camera_Locations ✎ 💭 …

WORKBOOK • By John Ortiz • 27 views • ☆ 0 • Extract: Nov 28, 2018, 2:06 PM

Views 7   Data sources 1   Refresh Schedules 0   Subscriptions 0   Details

▾ 0 items selected   Sort by Sheet (First–Last)

Incidents	Fatalities	Injuries	Critical Score	Map
3 views ☆ 0	1 view ☆ 0	0 views ☆ 0	0 views ☆ 0	1 view ☆ 0

Top 10	Dashboard

6. Decision Log

| ID	Decision	Description of decision and impact	Source	Owner	Priority	Date Added	Status	Decision Date	Record of decision made
Unique identifier	Brief 3-5 word description of decision needed	Description of the decision and the impact of making or not making the decision	Meeting/conversation/person from which this need for a decision came	Person who is responsible for ensuring this decision is made	Relative priority: 1-High, 2-Medium, 3-Low	Date this decision was added to this list	Status of item: 1-Not started, 2-In progress, 3-Complete	Date this item was complete.	Notes or results on the completion of this item, such as final decision document
3A	Which Data Storage for Prototype	Deciding between using Tableau Servers or Google storage. While the decision has been made to use Google Storage in production, for the purposes of the prototype we decided to use Tableau Servers as it would be quicker to implement and just as full-featured. Also, it would save us (real) money.	Group Meeting 1	John / Sage	High	18-Nov	Complete	18-Nov	Tableau Demo
3B	Decide Document and Presentation Responsibilities	Distribute report and presentation duties. This was needed in order to proceed with the project. At this point, each of our individual strengths have settled us into certain roles in the project team.	Group Meeting 1	Team	Medium	18-Nov	Complete	18-Nov	Prototype phase meeting log
3C	What will we demo during Prototype Presentation	We have a working prototype and we had to decide which parts of it we would show during the Phase III and the Phase IV. Since the second presentation will be much longer in length, we saved a lot for the final presentation. We will just show the dashboard and a report during Phase III.	Group Meeting 2	John	Low	25-Nov	Complete	25-Nov	Prototype Presentation

7. Risk Register and Probability vs. Severity Chart
a. Risk Register

Id	Date Raised	Risk Description	Probability	Severity	Owner	Mitigating Action
1	11/18/18	Risk of Cloud connection services not being available during prototype presentation	Low / 0.1	Med / 0.7	John Ortiz / Eren Yuceer	Local copy of Data Warehouse has been established to use as backup
2	11/18/18	Risk of tableau services not being available during prototype presentation	Low / 0.1	High / 1	John Ortiz / Eren Yuceer	Will revert to using locally stored tableau copy for prototype until connection is reestablished
3	11/18/18	Risk of NYPD db connection failure during ETL processing in Prototype phase	Low / 0.3	Med / 0.5	John Ortiz / Eren Yuceer	Contact NYPD Tech department immediately and work to re-establish connection
4	11/18/18	Risk of Mapbox services not being available during prototype presentation	Low / 0.25	Low / 0.3	John Ortiz / Eren Yuceer	Email Mapbox services to get a timeframe on when mapping services will be back online
5	11/18/18	Risk of technical team not being available for any live issues during prototype presentation	Low / 0.05	High / 0.8	Paridhi Sharma	Cover Out of Office schedule with entire team. Assign back ups for each position and require weekly knowledge transfer between team members.
6	11/18/18	Risk of user logins not working for all stakeholders to demo product	Low / 0.15	Med / 0.85	Suhaib Alsahybi / Sage Ashique	User test each user ID and temporary password and confirm users have correct roles within 24 hours of prototype presentation.
7	11/18/18	Risk of stakeholders requiring modifications and updates not included in prototype	Med / 0.8	Med / 0.7	Paridhi Sharma	Speak to Project Stakeholder regarding change in requirements. Document all changes and communicate with project team.
8	11/18/18	Risk of Prototype documentation (User manual) requiring further detail	Med / 0.7	Low / 0.3	Suhaib Alsahybi / Sage Ashique	Receive questions with higher level of detail from users. Update web version of documentation and alert all stakeholders/users once update is available.
9	11/18/18	Risk of High Level prototype failure during presentation (i.e. Prototype will not start up)	Low / 0.3	High / 1	Suhaib Alsahybi / Sage Ashique	Daily smoke test of prototype by testing team, up to and including the morning of prototype presentation and release.
10	11/19/18	Risk of system integration being more complex than estimated on client environment	Low / 0.1	Low / 0.1	Paridhi Sharma	Buffer time added for client side setup.
11	11/20/18	Risk that full product may not be delivered by deadline	Med / 0.5	Low / 0.2	John Ortiz / Eren Yuceer	Developer overtime schedule has been established in case catch up is required
12	11/21/18	Risk of any issues due to unforeseen circumstances	Low / 0.3	Low / 0.3	Paridhi Sharma	Team meeting will be immediately held to analyze situation and brainstorm action plan
13	11/22/18	Risk of customer not completing UAT testing in time delaying schedule	Low / 0.2	Med / 0.05	Suhaib Alsahybi / Sage Ashique	QA will rerun high priority tests as substitute. Stakeholder has option to move up deployment date.
14	11/23/18	Risk of Scope creep inflating scope	Low / 0.1	Low / 0.2	Paridhi Sharma	Project manager will consistently monitor any and all requirement changes

b. Probability vs. Severity Chart

Probability vs. Severity
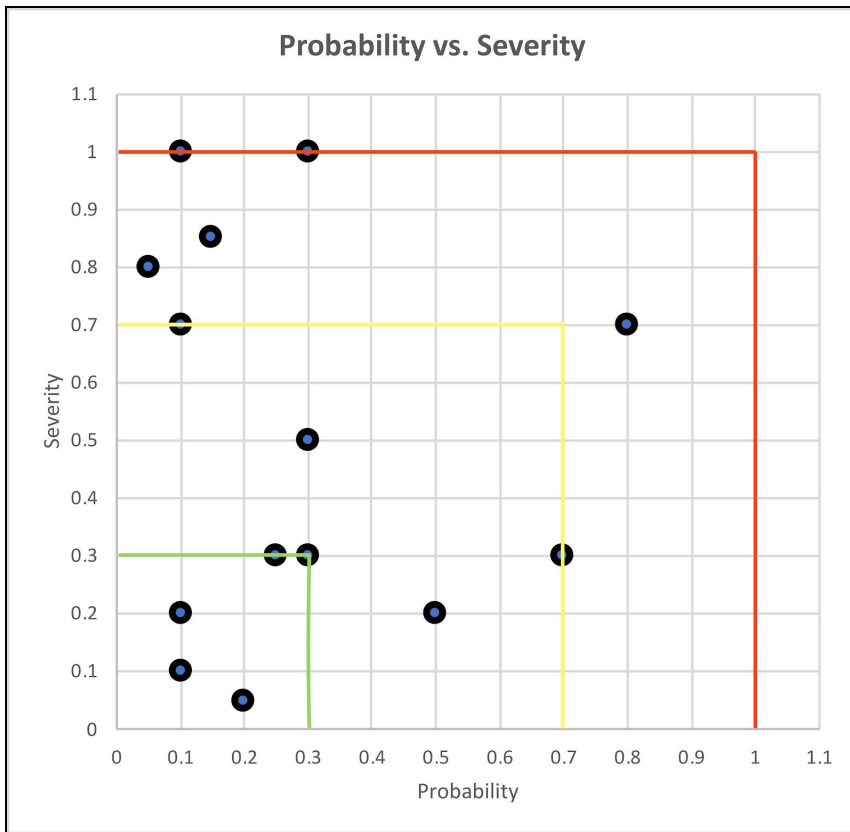
O3SL has risk mitigation plans for each risk scenario in order to protect the project. The green, yellow, and red boundaries in the above chart represent low, medium, and high measures of risk. This is based on probability vs. severity. The chart displays that our risk is spread evenly between all three categories. The chart also shows that most of the project risks have a low probability of occurrence. Among all of our risks however, some are classified as high impact. As such, It is even more necessary to have back up plans ready.

8. Meeting Minutes

Group Meeting Log Sheet 1

Date of Meeting: 11/18/2018   **Time of Meeting:** 8:00PM

Group: Make It Better   **Recorder:** Sage Ashique

Attending:	- Sage Ashique	- John Ortiz
	- Eren Yuceer	- Suhaib Alsahybi
	- Paridhi Sharma	

| **Absent:** | - None | Excused? |

Meeting Minutes

- Discuss entire process of Prototype
- Split up work and assign teams to different parts of Prototype Report
- Review and test current prototype version
- Discuss top User Scenarios for prototype

Tasks Assigned	Team Member	Delivery Date
Report Designs / Prototype	John Ortiz	11/23/2018
Risk Register / Menu Hierarchies / Meeting Minutes	Sage Ashique	11/23/2018
Project Analysis	Eren Yuceer	11/23/2018
Report Designs / Prototype	Paridhi Sharma	11/23/2018
Decision Log / Menu Hierarchies	Suhaib Alsahybi	11/23/2018

Performance Appraisal & Sign-off   **Meeting Ending Time:** 9:00 PM

Team member name	Signature	Contribution
John Ortiz		20%
Sage Ashique		20%
Eren Yuceer		20%
Paridhi Sharma		20%
Suhaib Alsahybi		20%

Group Meeting Log Sheet 2

Date of Meeting: 11/25/2018   **Time of Meeting:** 8:00PM

Group: Make It Better   **Recorder:** Sage Ashique

Attending:
- Sage Ashique
- Eren Yuceer
- Paridhi Sharma
- John Ortiz
- Suhaib Alsahybi

Absent: -   None   Excused?

Meeting Minutes

- Discuss remaining work
- Decide which part of project to demo in Phase III and which will be in the Phase IV
- Create multiple logins to Tableau
- Discuss which work is remaining for the final Phase

Tasks Assigned	Team Member	Delivery Date
Report Designs / Prototype	John Ortiz	11/30/2018
Risk Register / Meeting Minutes	Sage Ashique	11/30/2018
Project Analysis	Eren Yuceer	11/30/2018
Report Designs / Prototype / Powerpoint	Paridhi Sharma	11/30/2018
Decision Log / Powerpoint	Suhaib Alsahybi	11/30/2018

Performance Appraisal & Sign-off   **Meeting Ending Time:** 9:00 PM

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