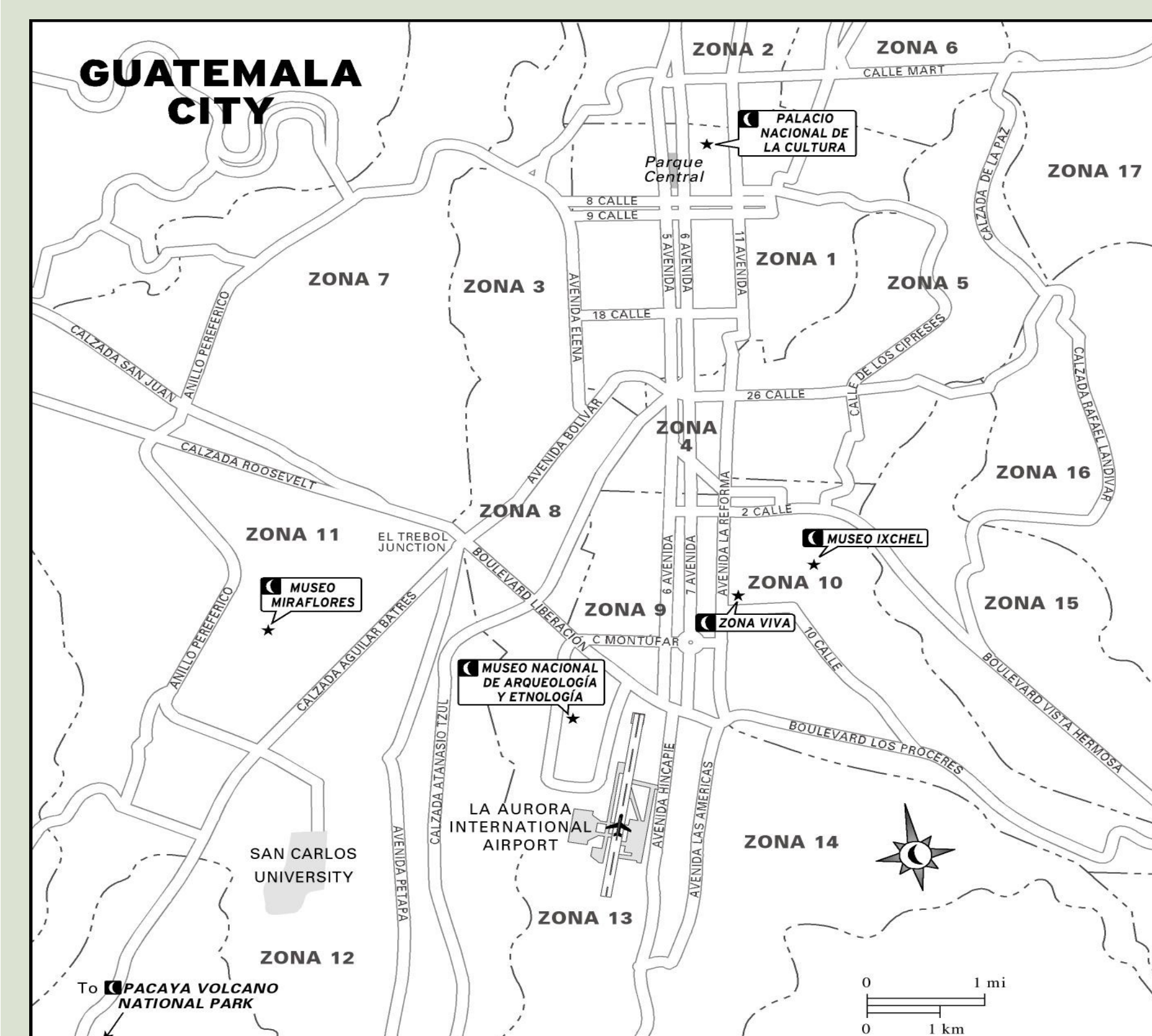


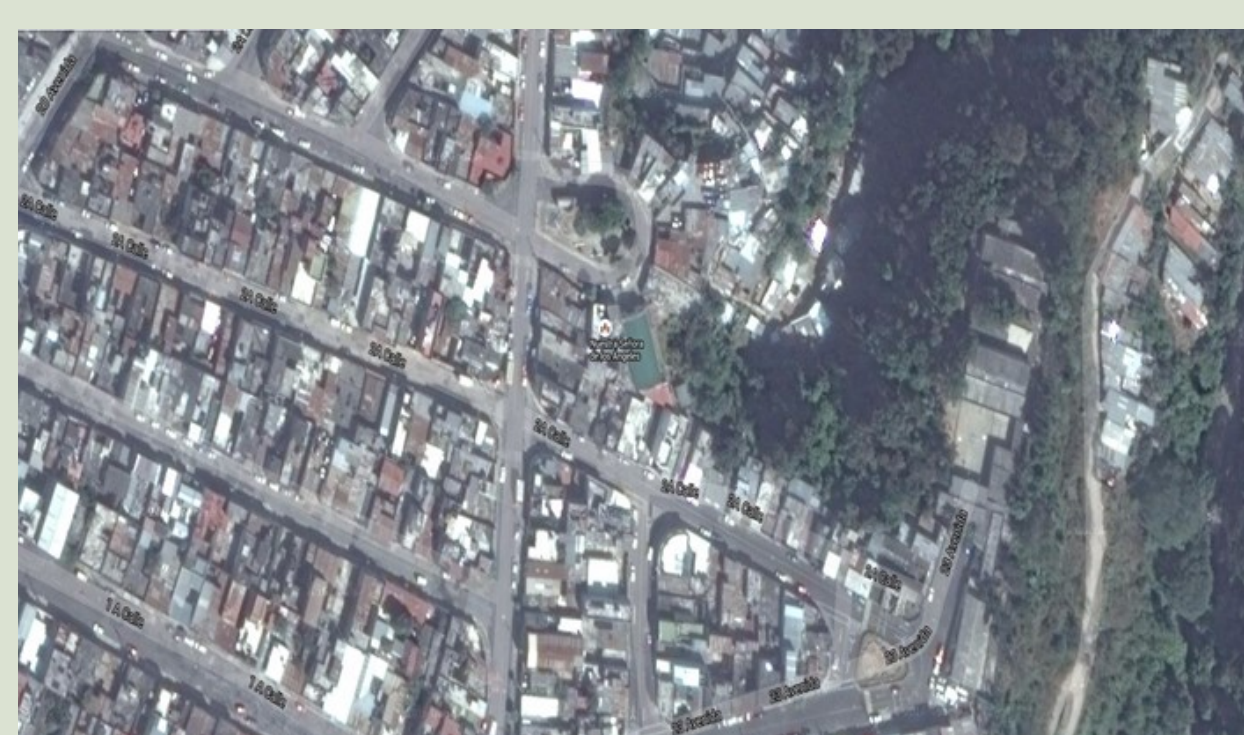
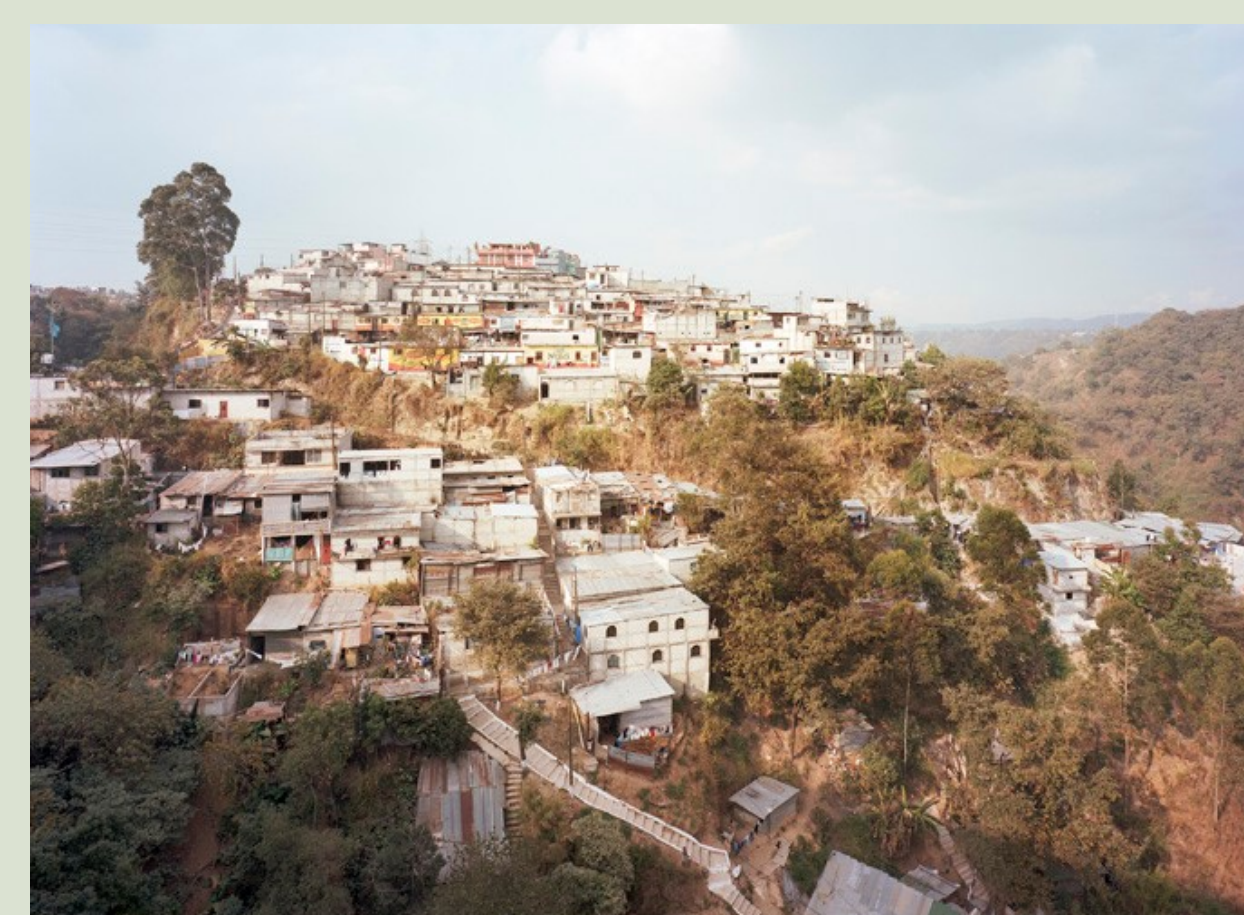
The Purpose

The inhabitants of Zone 5 of Guatemala City comprise a developing, low-income community whose limited resources result in the construction of dwellings in landslide-prone regions along steep unstable land. Partnering with the NGO Esfra, Red Rocks Community College students have developed a fully-autonomous UAV designed to analyze these regions to provide more comprehensive topographical data, where environmental disasters might then be more mitigatable.



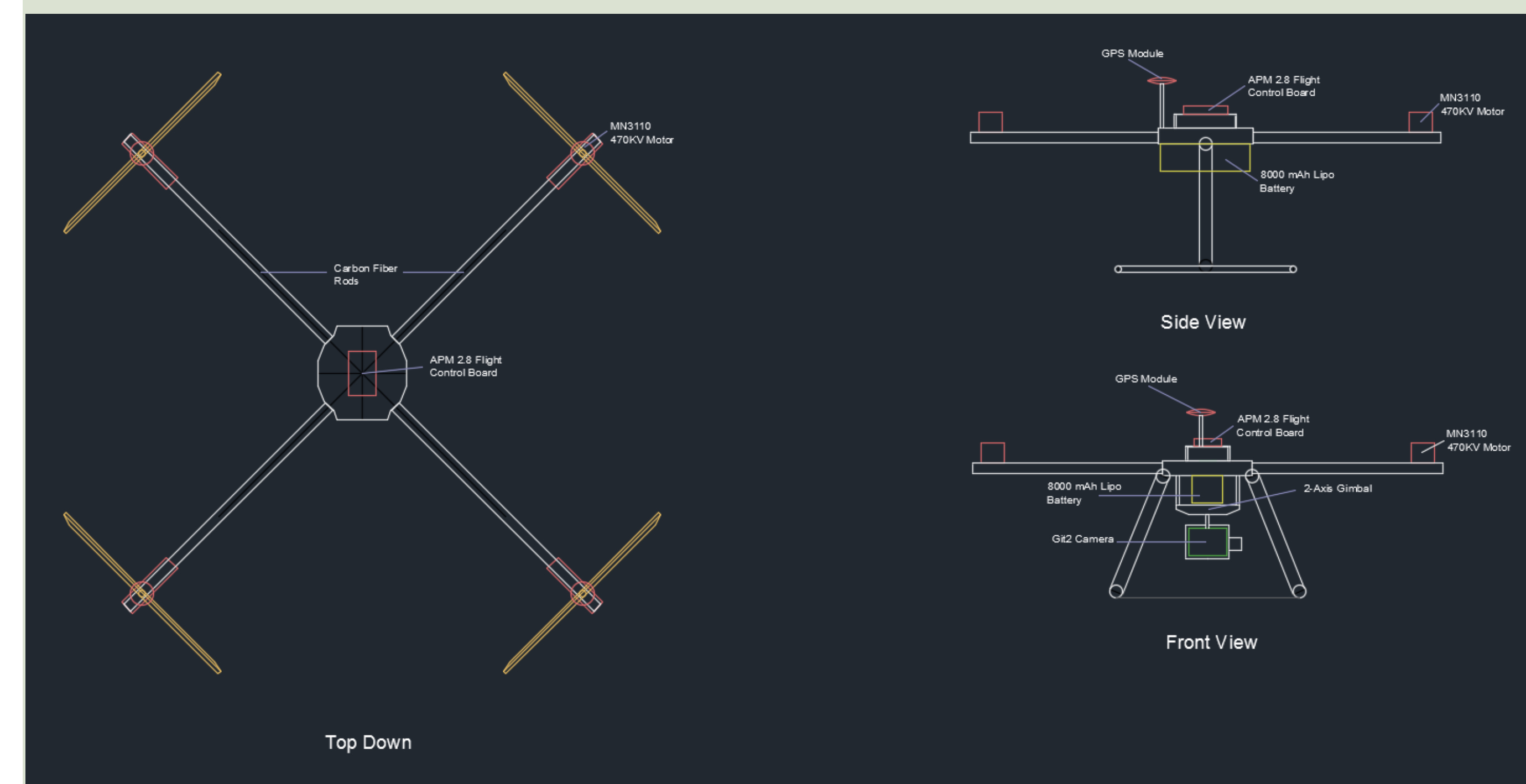
In October 2015, nearly 300 lives were lost after heavy rains destabilized the slopes around El Cambray Dos, a lower-income area similar to Zone 5

Resources are scarce, and usable land more so, as such the inhabitants of developing regions of Guatemala City build homes from recycled materials, often in dangerous locations.

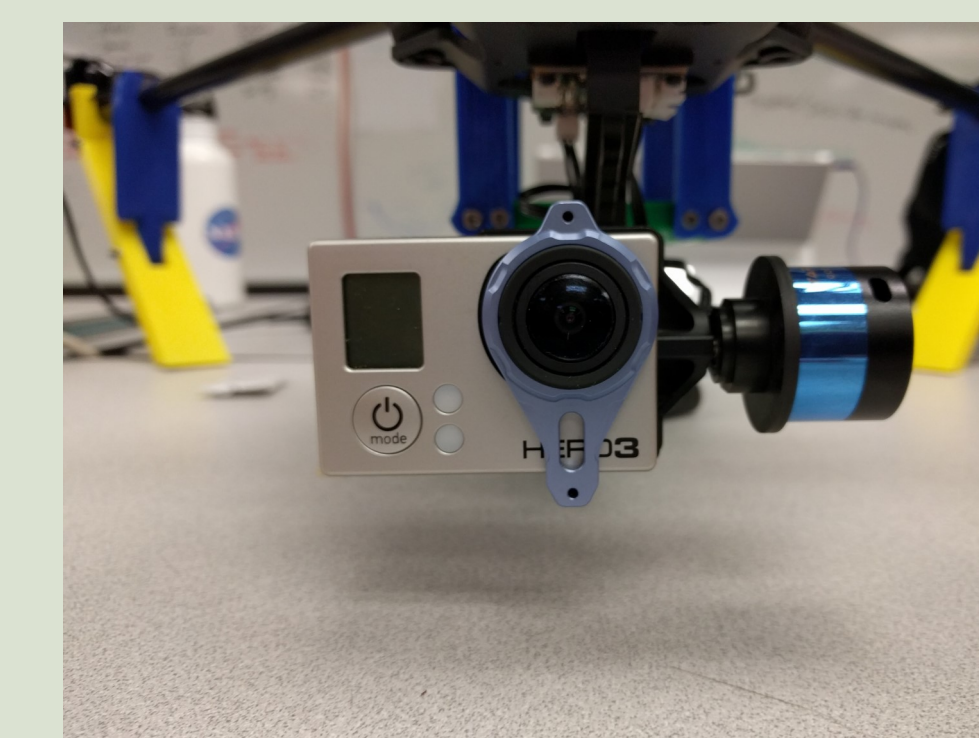
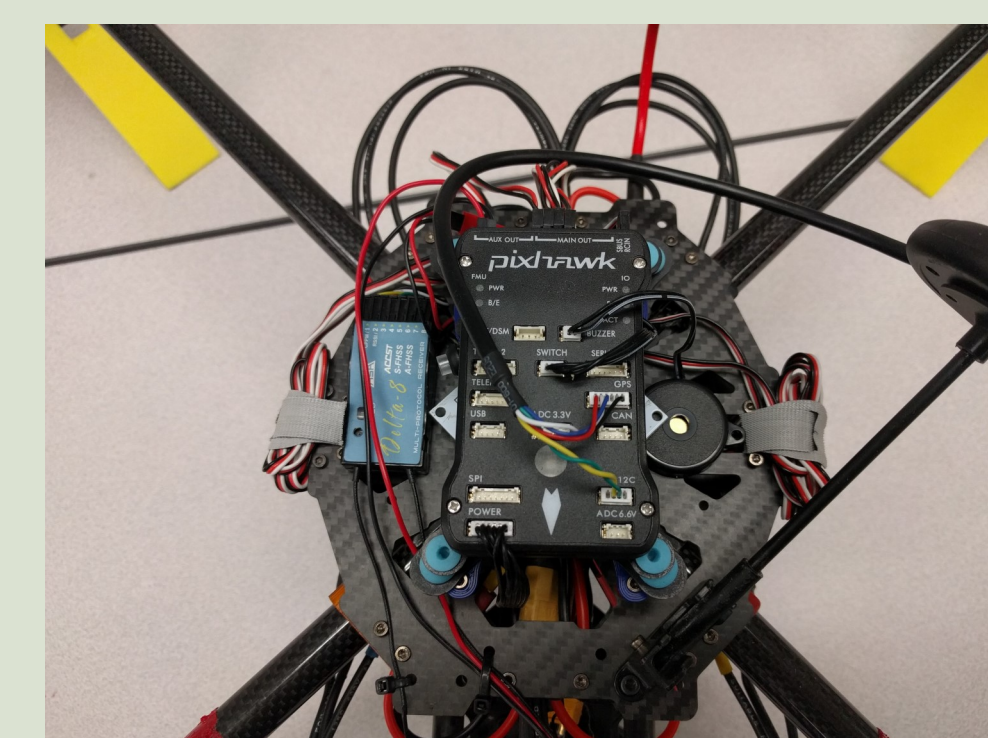


Despite the growth of comprehensive 3D topographic data from survey satellites, coverage of developing communities is still lackluster.

The Design



The modular quadrotor design utilizes mainstream consumer components, with the goal of an easy end-user experience.

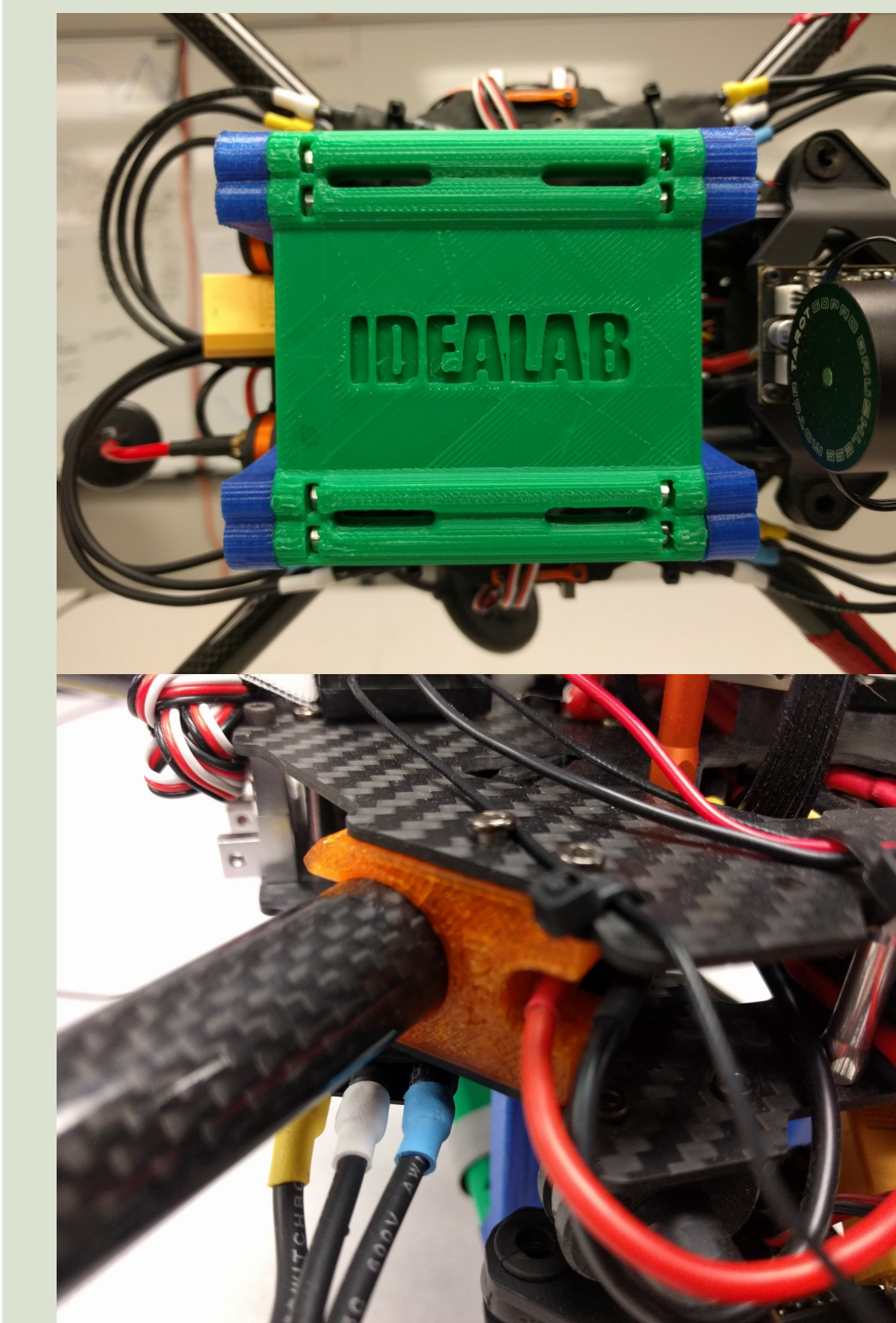


Automation is provided by the Pix-Hawk flight controller, utilizing the open-source, waypoint-based flight software Mission Planner.

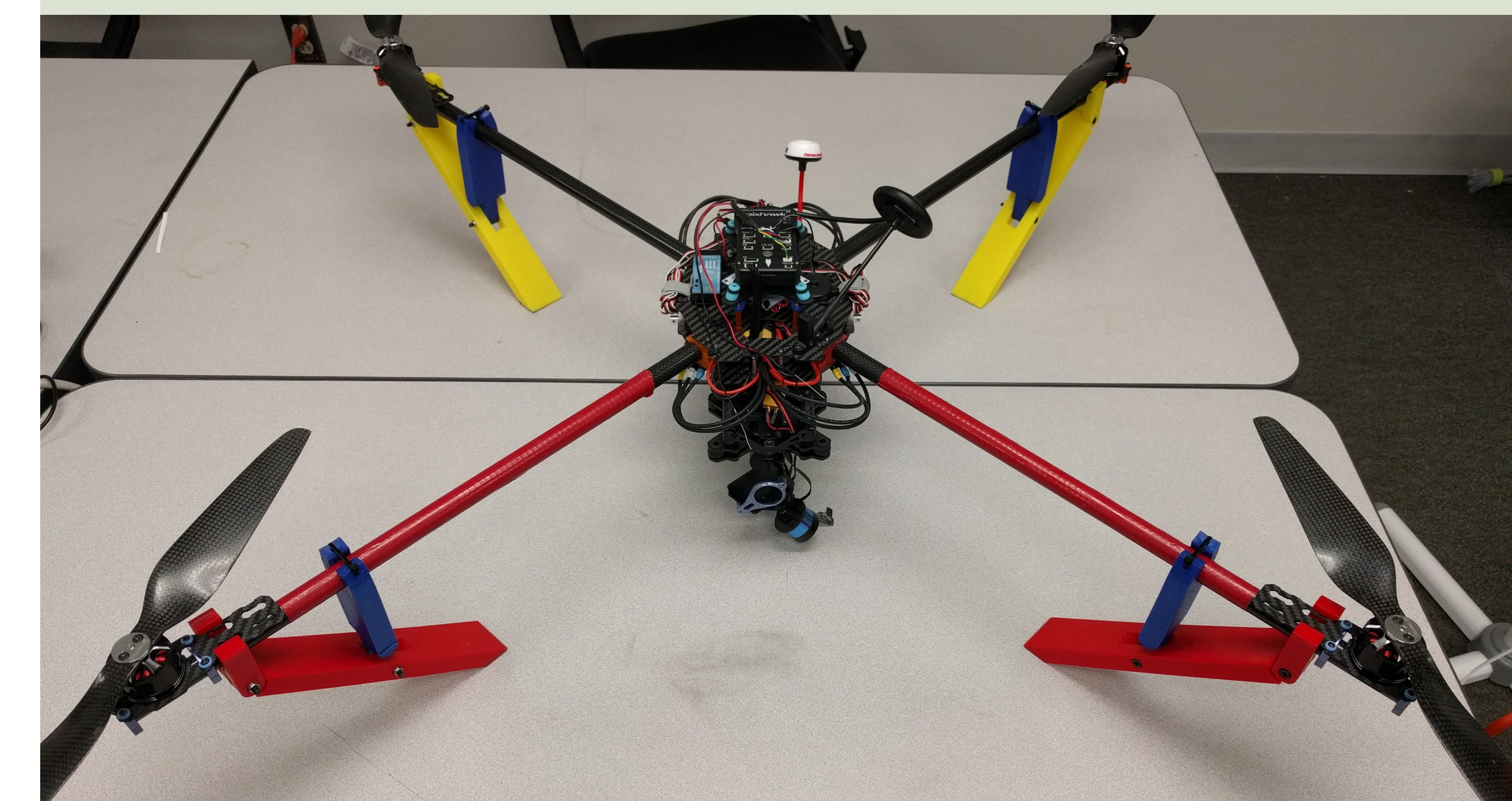
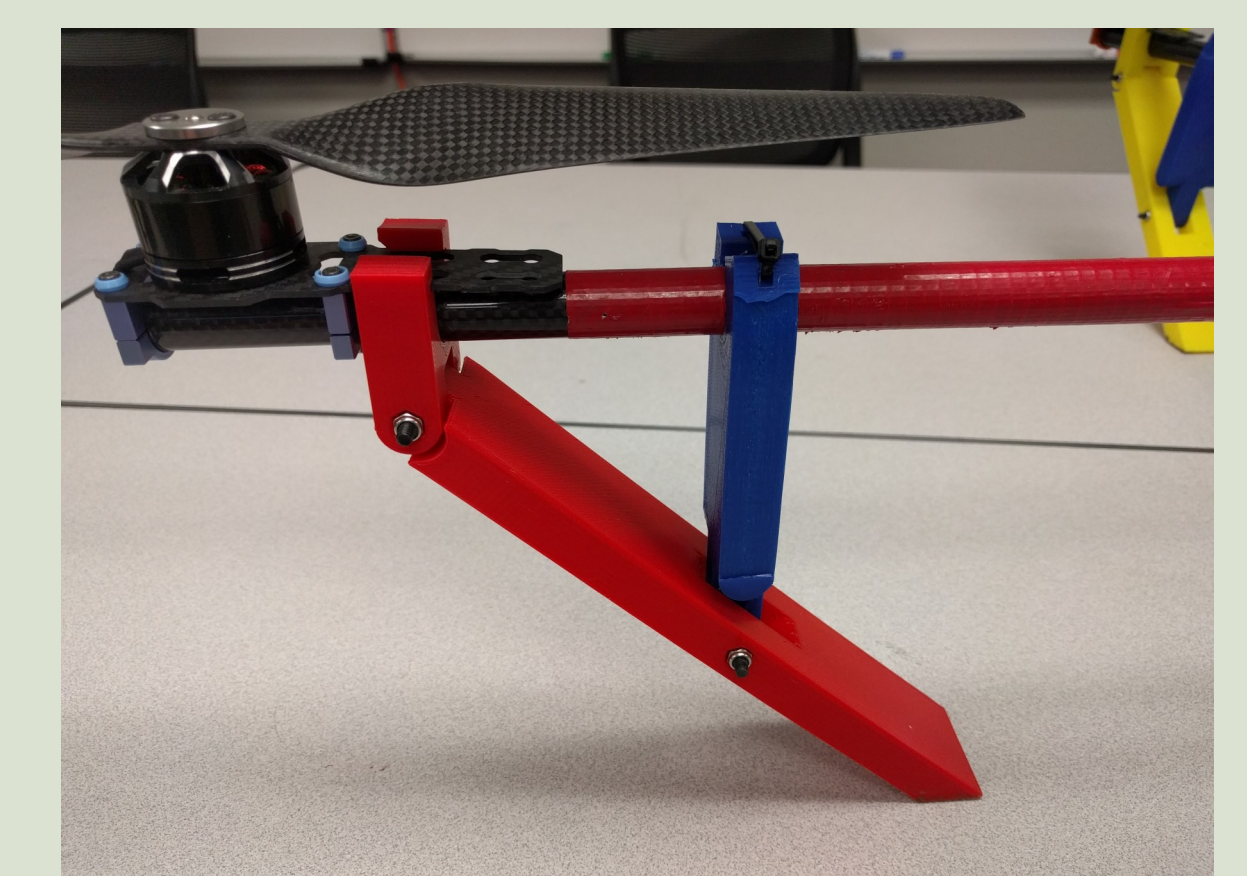


Images captured during automated flight will be sent to BGC Engineering, where survey software will create updated 3D topographical data.

The Innovation



Several components required redesign to fit the needs of the project, thus 3D-printing was utilized.



The Future

- Implementation of the survey UAV is estimated to begin in early 2017, as final flight performance calibration and tuning is nearly complete.
- End-user training and operations manual is in development to allow for seamless integration into Esfra and the community of Guatemala City.

References

Guatemala Mudslide Area Declared Uninhabitable. Retrieved from <http://www.bbc.com/news/world-latin-america-34453407>

Primary references and citations listed in the project Preliminary Engineering Report.

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