

## GREEN ANALYTICS



# Sierra Leone nLine Site Selection Delivery

Prepared for: nLine Corporation

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# EXECUTIVE SUMMARY

### Objective

Optimize site selection for PowerWatch sensor deployment within Freetown, Sierra Leone. Optimization is based on capturing representative samples of 1k grid cells across demographic variables 1) Population density, 2) income and 3) proximity to transmission lines.

### Goals

Determine where to target non residential deployment of limited PowerWatch sensors to capture an even distribution between income, population density and presence of transmission line.

### Project Outline

Multiple data sources were acquired, compiled and aggregated to create the analysis environment used to perform a sampling design.

- Aquire finest resolution conductor shape file
- Aquire income spatial distribution
- Aquire population density spatial distribution
- Create 1k grid
- Aggregate data sources to 1k grid
- Rank grid cells
- Perform filtration sampling to isolate grids with

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# BUDGET & MILESTONES

### Contract Milestones

Contract milestones and delivery dates are described in table below

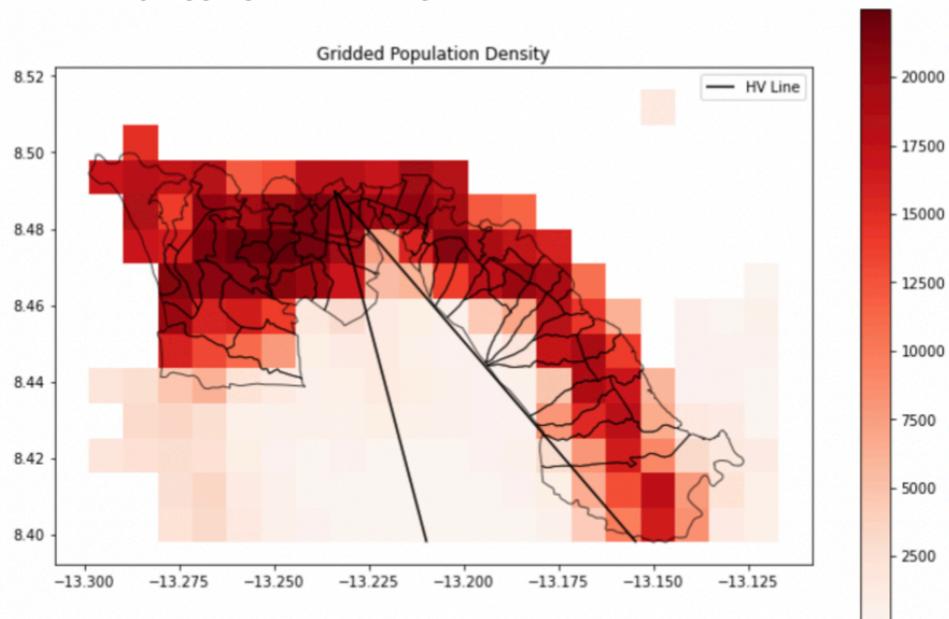
Milestone Description	Milestone Date	Date Delivered	Cost
<b>Project Kickoff</b> Produce project outline and provide sample of raw acquired data sources	Sept. 12, 2022	Sept. 10, 2022	\$0
<b>Data Compilation</b> All data compiled to 1k Grids	Sept. 26, 2022	Sept. 26, 2022	\$200
<b>Data Exploration</b> Explore singular and joint spatial distributions population, connectivity and income.	Oct. 3, 2022	Oct. 3, 2022	\$200
<b>Sample Design and Project Delivery</b> Produce optimal sample of 1k grids for sensor deployment, Deliver grids in form of .gpkg file attributed with aggregated population density, number of buildings intersecting, amount of transmission line and income.	Oct. 14, 2022	Oct. 14, 2022	\$400
<b>Total</b>			<b>\$800</b>

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## PROJECT DELIVERY EXECUTIVE SUMMARY

Displayed below are visualizations of the population density aggregated to the 1km grids overlaid with the regions of West Sierra Leone. We can see the population epicenters highlighted by a dark crimson red. The 1km grids that intersect the HV conductor line will be selected to be apart of the study group, as these regions have direct exposure to transmission lines. High population grids not intersection the HV line are likely served indirectly by distribution lines.

**Population Density Aggregated to 1km grid**



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As there are 200 censors funded for deployment and 37 grids that intersect the transmission lines, we will distribute the censors evenly across the results grids.

[19]:		geometry	id	X	Y	Z	index_right	COUNTRY	CNTRY_NAME	VOLTAGE_KV	FROM_NM	TO_NM	STATUS	SOURCES
420	POLYGON ((-13.23413 8.48445, -13.23413 8.48877...,	420	-13.230417	8.487084	20538.738281		3	SLE	SIERRA LEONE	161	FREETOWN	HASTINGS	Existing	Bumbuna Hydroelectric Project Assessment EIA, ...
420	POLYGON ((-13.23413 8.48445, -13.23413 8.48877...,	420	-13.230417	8.487084	20538.738281		2	SLE	SIERRA LEONE	161	FREETOWN	GOMA	Existing	WB map archive IBRD #22273, March 1991
418	POLYGON ((-13.23413 8.47581, -13.23413 8.48013...,	418	-13.230417	8.478750	19708.361328		2	SLE	SIERRA LEONE	161	FREETOWN	GOMA	Existing	WB map archive IBRD #22273, March 1991
468	POLYGON ((-13.22549 8.47581, -13.22549 8.48013...,	468	-13.222083	8.478750	7369.352539		3	SLE	SIERRA LEONE	161	FREETOWN	HASTINGS	Existing	Bumbuna Hydroelectric Project Assessment EIA, ...
516	POLYGON ((-13.21685 8.46717, -13.21685 8.47149...,	516	-13.213750	8.470417	6064.865723		3	SLE	SIERRA LEONE	161	FREETOWN	HASTINGS	Existing	Bumbuna Hydroelectric Project Assessment EIA, ...