

Table of Contents

Executive Summary	2
List of Tables	8
List of Figures	8
Introduction	9
Definitions	10
Level 1 EVSE	10
Level 2 EVSE	10
Level 3 EVSE	10
Section 1: Literature Review	11
Variables that optimize EVSE locational choices: A global review of variables identified as critical in the assessment of EVSE siting locations	13
Distance considerations in EVSE placement in local communities: Voronoi diagram methodology and outputs	14
Grid partition considerations in EVSE placement in local communities	15
Household activity data considerations in EVSE placement in local communities	15
EVSE usage in small communities: Key outcomes to consider in making EVSE placement choices	16
Tompkins County: An example of installation cost considerations in EVSE siting choices	16
San Joaquin Valley: An example of ad hoc EV driver needs in EVSE siting criteria and considerations	17
Uppsala: An application of GIS modelling in predicting optimal EVSE siting locations	18
Other U.S. examples of optimal EVSE location selection criteria	18
Optimal location considerations	19
Installation costs assessment	19
Charging patterns assessments	19
Summary	20
Section 2: Assessment of EVSE Usage and EVSE Network Gaps in Oxford County	21
Data collection opportunities and challenges	21
Descriptive analysis considerations based on literature	25
Predictive analysis: Assessing future EV adoption impacts on EVSE needs in Oxford County	26
Driver typologies: Type A – Type D EV Owners and Drivers	26
Vehicle make and model technical specifications and assumptions	27
Current and future EV ownership for Type A1	28
Current and future EV ownership for Type C	28
Current and future EV ownership for Type A3 & D	29
Usable battery range assumptions	30
Summary	38
Section 3: GIS Mapping Methodology – Geographical Distribution Drivers for EVSE Upgrades and Extended Installations	39
Recommendations for new EVSE locations	43
Summary: Recommended Locations and Quantity of EVSEs	47

Concluding Remarks -----	50
General recommendations -----	51
Charging Systems dedicated to condominium and high-rise buildings -----	51
Workplace charging systems -----	51
Innovative solutions -----	51
Ownership models-----	51
Tariff models -----	52
Works Cited -----	54
Appendix I: A Literature Review of Factors Determining Siting of Hydrogen Fueling Stations -----	57
Works Cited -----	59
Appendix II: Individual Voronoi maps for Existing Level 1, Level 2, Level 3, and Tesla chargers in Oxford County -----	60

List of Tables

TABLE 1: DATA COLLECTION OUTLINE	22
TABLE 2: TECHNICAL AND BATTERY PACK INFO.....	28
TABLE 3: NUMBER OF TYPE A1 EVS	28
TABLE 4: NUMBER OF TYPE C EVS.....	29
TABLE 5: NUMBER OF TYPE A3 EVS	29
TABLE 6: NUMBER OF TYPE D EVS.....	30
TABLE 7: PREDICTIVE ANALYSIS FOR NISSAN LEAF 2017 APPLICABILITY: LEVEL 1, 2, & 3 CHARGER REQUIREMENTS	31
TABLE 8: PREDICTIVE ANALYSIS FOR CHEVY BOLT 2017 APPLICABILITY: LEVEL 1, 2, & 3 CHARGER REQUIREMENTS	35
TABLE 9: CANDIDATE (NUMBERED), UPGRADE (LETTERED), AND GENERAL ("G") LOCATIONS MAPPED IN FIGURE 4.....	47

List of Figures

FIGURE 1: LOCATION OF EXISTING EVSES WITH CHARGING LEVEL.....	40
FIGURE 2: EXPLANATORY FIGURE OF VORONOI POLYGONS.....	41
FIGURE 3: REPRESENTATION OF EXISTING EVSE SPATIAL COVERAGE.....	42
FIGURE 4: CANDIDATE LOCATION MAP FOR NEW AND UPGRADED EVSES.....	44
FIGURE 5: OXFORD COUNTY EMPLOYERS.. ..	46