

Methodology Validation Report for CityRyde, LLC



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Project Title	Methodology for Determining GHG Emission Reductions Through Bicycle Sharing Projects
Version	4.4

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Summary:

First Environment, Inc. (First Environment) was retained to provide the first assessment in the VCS Double Approval Process for the proposed Methodology Element entitled, "Methodology for Determining GHG Emission Reductions Through Bicycle Sharing Projects." The Methodology Element provides procedures for monitoring and emission reductions associated with modal shifts in transportation as a result of the implementation of a bike-sharing program in urban or sub-urban environments.

The proposed Methodology Element belongs to sectoral scope 07 (transport).

The validation is an independent third-party assessment of the new Methodology Element. In particular, the validation has to confirm that the baseline, the monitoring plan, and the entire Methodology Element are in compliance with relevant VCS rules and procedures. The validation of the new Methodology Element is done through a double approval process, according to the VCS standard, and is necessary to provide assurance to stakeholders of the quality of the new Methodology Element.

The validation assessment was conducted using the VCS Version 3 Standard; the VCS Methodology Approval Process, Version 3.0; and the VCS Program Guide Version 3.0 as the criteria. Additionally, First Environment applied its professional judgment as informed by ISO 14064-2 and 14064-3 in assessing the proposed methodology.

During the validation process, First Environment issued several clarification and corrective action requests – all of which were addressed sufficiently by CityRyde. First Environment is of the opinion that the methodology element "Methodology for Determining GHG Emission Reductions Through Bicycle Sharing Projects," as described in the methodology element document of version 4.4 of June 30, 2011, meets all relevant VCS requirements for VCS Methodology Element.

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1 INTRODUCTION

This report is provided to CityRyde LLC (CityRyde) as a deliverable of the Verified Carbon Standard (VCS) methodology element (ME) validation assessment process for the proposed VCS ME entitled “*Methodology for Determining GHG Emission Reductions Through Bicycle Sharing Projects.*” This report provides a description of the steps involved in conducting the first validation assessment and summarizes the findings of the first validation assessment performed on the basis of the VCS Standard: VCS Version 3 (VCS)

The Audit Team was provided the original version methodology dated November 26, 2010. Based on this documentation, a document review and desktop audit took place which resulted in Corrective Action Requests (discussed later in this report) and revisions to the proposed methodology. The final version, dated June 30, 2011, serves as the basis of the final conclusions presented herewith.

1.1 Objective

The purpose of the methodology validation assessment is to have an independent third party assess the proposed methodology’s conformance with VCS requirements.

1.2 Scope and Criteria

The validation assessment scope is defined as an independent and objective review of the proposed methodology. The validation assessment is conducted using the VCS Version 3 Standard; the VCS Methodology Approval Process, Version 3.0; and the VCS Program Guide Version 3.0 as the criteria. Additionally, First Environment applied its professional judgment as informed by ISO 14064-2 and 14064-3 in assessing the proposed methodology.

1.3 Level of assurance

First Environment, Inc. (First Environment) and CityRyde have agreed that a reasonable level of assurance be applied to this assessment.

2 VALIDATION PROCESS

2.1 Method and Criteria

The following validation process was used:

- conflict of interest review;
- selection of validation team;
- kick-off meeting with CityRyde;
- development of the validation plan;
- desktop review of the methodology and other relevant documentation;
- follow-up discussions with CityRyde for supplemental information as needed;
- corrective action cycle; and
- validation report development.

The validation process was utilized to evaluate whether the methodology's approach is consistent with the stated criteria. A validation conformance checklist was developed for the methodology which summarizes the criteria used to evaluate the methodology, the methodology's conformance with each criterion, and the Audit Team's validation findings.

Conflict of Interest Review

Prior to beginning any validation project, First Environment conducts an evaluation to identify any potential conflicts of interest associated with the project. No potential conflicts were found for this project.

Audit Team

First Environment's audit team consisted of the following individuals who were selected based on their validation experience.

Lead Auditor – Michael Carim
Auditor – Iris Caldwell, Heather Moore, Ross MacWhinney
Internal Reviewer – James Wintergreen

Audit Kick-off

The validation process was initiated with a kick-off conference call on January 10, 2011 between First Environment and the primary CityRyde contacts, Jason Meinzer and Timothy Ericson. The communication focused on confirming the validation scope, objectives, criteria, schedule, and the information required for the validation assessment.

Development of the Validation Plan

Based on the information discussed during the kick-off conference call, the Audit Team formally documented its validation plan and provided the validation plan to CityRyde.

Corrective Actions and Supplemental Information

The Audit Team issued requests for corrective action and clarification during the validation assessment process. The corrective action and clarification requests and the responses provided are summarized in Section 2.5.

Validation Reporting

Validation reporting, represented by this report for CityRyde, documents the validation assessment process and identifies its findings and results.

2.2 Document Review

Eligibility requirements, baseline approach, additionality, project boundary, emissions, leakage, monitoring, data and parameters, and other pertinent criteria were assessed to evaluate the proposed methodology against VCS program requirements. Discrepancies between the proposed methodology and the validation criteria were considered material and identified for corrective action.

2.3 Interviews

The Audit Team held teleconferences with the following individuals throughout the course of the methodology assessment:

- Jason Meinzer – CityRyde LLC
- Timothy Ericson – CityRyde LLC
- Dr. Juerg Grütter – Grütter Consulting

2.4 Resolution of Any Material Discrepancy

As described above, the Audit Team requested corrective actions, clarification, and supplemental information during the validation process. The corrective action and clarification requests and the responses are summarized in the tables below.

ID	Corrective Action Request	Summary of Methodology Developer Response	Validation Conclusion
1	Please justify the equivalency of transportation via bike compared to baseline modes of transport, in particular with respect to Equation 2 in the methodology for electricity-based vehicle categories.	CityRyde provided evidence that the approach used in Equation 2 is consistent with other VCS-approved transportation methodologies.	Response is acceptable.
2	Please provide a more precise definition of 'electric bike' in Section 3 of the methodology.	The definition in Section 3 was revised to provide additional clarification. CityRyde also provided examples from motor vehicle regulations that supported the definition used in the methodology.	Response is acceptable.
3	The definition of the project boundary provided in Section 5 of the methodology is inadequate. Please provide a more concise description of the project boundary and clarify what is meant by the "geographic bounds" in which the project operates.	The geographic boundaries defined in Section 5 were elaborated. The geographic bounds of the project were identified as the geographic zone of influence of the bike sharing stations that comprise the project system. A condition restricting the project boundary to a 20km radius around bike stations in the project system was removed in the final revision to the ME.	Response is acceptable.
4	Sections 6 and 7 of the methodology do not provide sufficient guidance on the applications of the CDM "Tool for the demonstration and assessment of additionality" and the baseline methodology in the context of bike sharing projects.	Section 6 and 7 were revised to adequately address the corrective action request. The revised ME provides additional guidance on barriers and investment analysis as well as the application of common practice test at the project level.	Response is acceptable.

ID	Corrective Action Request	Summary of Methodology Developer Response	Validation Conclusion
5	Please justify the conservativeness of defining AD _{i,y} as the actual distance driven by the bike user instead of the displaced baseline distance, i.e. demonstrate that AD _{i,y} is equal to or less than that distance travelled using the baseline mode of transportation.	The definition of AD _{i,y} was revised to the straight line distance between the origin and destination bike stations in the project trip. The ME also provides the option of determining AD _{i,y} from the distance between public transit stations where this is the baseline mode of transport. This is conservative as it eliminates any incremental travel that the user may undertake between the origin and destination bike stations.	Response is acceptable.
6	Please provide further justification for exclusion of changes in load factors or a rebound effect as project emissions and/or leakage.	CityRyde provided evidence from other transportation projects that demonstrated that these emission sources had a negligible effect on overall reported emission reductions at the project level. Additionally, references were provided from the methodology development process for the CDM methodology AMS.III.U that showed these emissions sources were excluded as leakage sources because of their immaterial magnitude.	Response is acceptable.
7	Please provide justification for the exclusion of indirect project emissions caused by passengers from their trip origin to the point of entry into the bike sharing network and from their exit from the network to their final destination.	Additional requirements for the surveying users of the project system were added to the ME. Users will be asked if they took a significant detour (defined as 20% longer than normal) from their trip origin to the point of entry into the bike sharing network and from their exit from the network to their final destination. Trips corresponding to an affirmative response are excluded from consideration in emission reduction calculations via an adjustment factor that is applied to P _{i,y} in Equation 1 of the methodology.	Response is acceptable.

ID	Clarification Request	Summary of Methodology Developer Response	Validation Conclusion
1	Please clarify whether expansions to existing bike sharing programs are eligible under the methodology.	CityRyde confirmed that expansion projects are eligible and the ME was revised to define the applicability conditions and minimum size thresholds that expansion projects must meet.	Response is acceptable.
2	Please clarify whether the methodology's applicability is limited to urban zones.	An applicability condition was added to the ME that states eligible projects must occur in urban or sub-urban zones.	Response is acceptable.

ID	Clarification Request	Summary of Methodology Developer Response	Validation Conclusion
3	Please provide clarification on what constitutes “several modal options”, as described in the first applicability condition in Section 4 of the methodology.	Examples of modal options, such as cars, taxis, and other public transit systems, were added to the application condition in the ME for clarity.	Response is acceptable.
4	Please clarify why the ‘Combined tool to identify the baseline scenario and demonstrate additionality’ is listed as a reference in Section 1 of the methodology as it is not referred to elsewhere in the methodology.	The reference to the Combined Tool was removed from the ME.	Response is acceptable.
5	Please clarify whether baseline emissions are quantified ex-ante or ex-post.	The ME was revised to state that emission factors used in baseline emission calculations are determined ex-ante, but that overall baseline emissions are calculated ex-post.	Response is acceptable.
6	In the definitions in Section 3 of the methodology, Public Bicycle Systems and Community Bicycle Programs are identified but not fully described. Please clarify whether one of the requirements for the methodology is that the project be implemented by a public entity.	Definitions were revised to clarify that the project bike sharing system can be implemented by public, private, or mixed entities.	Response is acceptable.
7	Please clarify why HFCs are included in the table in Section 5 of the methodology.	HFCs were removed from the project boundary in Section 5 of the ME.	Response is acceptable.
8	Section 10 of the methodology states that “emissions from the trips of passengers who would not have travelled in the absence of the project” are accounted for as project emissions. Please clarify where in the methodology this occurs.	CityRyde clarified that this statement refers to project emissions from users of e-bikes. Even where these users are determined via survey to make ineligible trips, emissions from the e-bike are counted as project emissions.	Response is acceptable.
9	Please clarify how the methodology accounts for trips taken where the origin and return are the same bike rental station.	The description for the parameter $AD_{i,y}$ in Section 14 of the ME was revised to clarify that such trips are assigned a distance of zero.	Response is acceptable.
10	Please identify all potential facilities and supporting equipment associated with bike sharing projects, specifically: <ul style="list-style-type: none"> • how bikes are transported between stations (when not ridden by passengers) or transported for maintenance; and • whether kiosks or other rental facilities are anticipated. 	Additional clarification was added in an annex providing detailed explanation of all upstream and downstream emissions sources affected by potential project activities. An applicability condition was also added to the methodology describing conditions under which such emissions sources would have to be accounted for by the project proponent.	Information provided was sufficient to demonstrate that all relevant GHG SSRs are accounted for within project boundaries. Response is acceptable.

ID	Clarification Request	Summary of Methodology Developer Response	Validation Conclusion
11	Please clarify whether projects are eligible for second or third crediting periods and if so, specify any renewal requirements.	Clarification was added to Section 4 of the ME to state that projects are twice eligible for renewal of the crediting period. Additional requirements for renewal of the crediting period were also added to the applicability conditions in the ME.	Response is acceptable.
12	Please describe the minimum requirements for the electronic/mechanical controls and survey methods in the methodology. If survey methods are used, provide guidance on how the survey data should be interpreted for use in baseline and project emissions equations.	Surveys conducted will follow CDM guidance published for surveys relative to small scale methodologies. Further clarification was also added to Annex 4, including a flow chart that indicates the information to be collected from each user and how this information is used in emission reduction calculations.	Response is acceptable.
13	Please clarify why a maximum data vintage of five years is specified for monitoring parameters referenced from AM0031 and ACM0016.	CityRyde referenced difficulties in obtaining similar data in other transport projects therefore has extended the maximum data vintage to provide flexibility to project developers.	Response is acceptable.
14	Please clarify how pre-existing bike stations and baseline bike trips are accounted for in the quantification of baseline emissions for expansion projects, i.e. whether any adjustments to the baseline quantification model are necessary for expansion projects	No adjustments are necessary. The project only quantifies emissions between project bike stations therefore any trips between pre-existing stations in the bike sharing network are excluded from the project boundary.	Response is acceptable.
15	Please clarify why the responses provided to the following findings are applicable to projects in rural zones: <ul style="list-style-type: none"> Clarification request No. 2 Corrective action request No. 5 Corrective action request No. 7 	The ME was revised in response to this and another finding to limit eligible project activities to those occurring in urban or sub-urban zones therefore the request is moot.	Response is acceptable. See response to Clarification ID No. 2 above.

3 VALIDATION FINDINGS

The methodology validation assessment includes evaluation of elements of the proposed methodology against specific VCS program requirements. A summary of the proposed methodology's approach and First Environment's assessment is provided below.

3.1 Applicability Conditions

The proposed ME element clearly identifies criteria by which to assess the eligibility of bicycle sharing programs. Specifically, the ME requires that eligible projects must meet the following applicability conditions:

- several different modal options for transport must exist in the baseline scenario;
- air- and water-based transport systems are excluded;
- projects that expand existing bike-sharing programmes must increase the total number of bicycles in use relative to the baseline scenario according to the thresholds established in the ME;
- projects must be located in urban or sub-urban zones; and
- projects must have at least 60 percent of their bike share stations powered by solar energy and must incorporate emission-free mechanisms by which to abate any emissions that may be associated with redistributing bicycles throughout the program.

The proposed ME is applicable for a 10-year crediting period and may be renewed twice. The ME also specifies several items that shall be assessed during the renewal of the VCS crediting period.

The criteria identified provide a clear basis for determining the ME's applicability to potential project activities. First Environment concluded that eligibility requirements are appropriate and adequate.

3.2 Project Boundary

The spatial extent of the project boundary is determined by the origin and destination of users of the bike-sharing network. The ME requires that a map of all bike-sharing facilities be included in the PD. Grid-connected and/or captive power plants are also included for projects that consuming electricity.

The proposed methodology summarizes the relevant emissions sources in a table and indicates whether each is included or excluded from the project boundary. First Environment determined that the proposed methodology provided sufficient criteria to establish the project boundary and that all relevant emission sources and GHGs are included.

3.3 Procedure for Determining the Baseline Scenario

The proposed ME uses a two-step approach that relies on the CDM "*Tool for the demonstration and assessment of additionality*" (Additionality Tool) to assess and determine the baseline scenario. Baseline alternatives are identified and evaluated in accordance with the Additionality Tool, and must consider at a minimum:

- the proposed project activity not being registered as a VCS project activity;
- the continuation of the current public and individual transport systems.

First Environment determined that this approach is appropriate and adequate.

3.4 Additionality

The proposed ME has adopted the most recent version of the *Tool for the demonstration and assessment of additionality* as published by the Clean Development Mechanism (CDM) Executive Board in order to evaluate project additionality. First Environment determined that this approach is appropriate and adequate.

3.5 Emissions

Baseline Emissions Quantification

Baseline emissions sources consist of emissions from the transportation of project passengers, using the baseline modes of transport that are displaced by the bike-sharing system. The baseline distance displaced for each trip on the project system is conservatively defined as the shortest distance between origin and destination bike stations used in the trip.

An emission factor is calculated ex-ante by the project proponent for each baseline transport category identified. Guidance is provided for determining the emission factor for both electric and fossil fuel powered vehicle categories. Emissions in each category are determined by multiplying the total number of project passengers using that vehicle category in the baseline by the appropriate emission factor. Total emissions are quantified as the sum of displaced emissions from vehicle category each trip on the project system.

Information about the baseline mode of transport used by project passengers is gathered via survey. The annex to ME provides guidance on assembling and conducting the survey needed to gather data for baseline emissions quantification.

All formulae and quantification methods were reviewed for accuracy and appropriateness. First Environment concluded that the approach to calculate baseline emissions is appropriate and adequate.

Project Emissions Quantification

Project emissions are only applicable to project systems that use e-bikes. In this instance, project emissions of CO₂ are determined by multiplying activity data by an emission factor.

All formulae and quantification methods were reviewed for accuracy and appropriateness. First Environment concluded that the methodology's approach to calculate project emissions is appropriate and adequate.

Emission Reductions Quantification

Emission reductions are calculated as the difference between baseline and project emissions and leakage emissions. Baseline and project emissions per trip are aggregated across all used. First Environment determined that this approach to calculate emission reductions is appropriate and adequate.

3.6 Leakage

The proposed ME identifies emissions associated with travel by passengers from their origin to project transport system, and from the system to their destination as a potential source of leakage emissions. The ME specifies that the survey conducted by project proponents must ask whether users took a significant detour prior to entry or upon exit from the project bike-sharing network. Trips where a significant detour occurred are monitored separately during the first year after project implementation to compute the percentage of total project trips involving a significant detour. The term representing the number of project trips in baseline emissions ($P_{i,y}$) is discounted by this percentage in Equation 1 of the ME.

Evidence was provided to exclude leakage emissions associated with a changes in load factors and a rebound effect experienced after project implementation.

First Environment determined that this approach to calculate leakage emissions is appropriate and adequate.

3.7 Monitoring

All data and parameters required for emissions quantification are described and appropriately defined in the proposed ME. Additionally, the proposed ME specifies records retention for two years after the end of the last crediting period, consistent with VCS requirements. Guidance is also provided in an annex to the ME on the survey that must be conducted at the project level to collect relevant project data..

First Environment determined that the monitoring approach is appropriate and adequate to obtain the necessary data for emission reductions quantification.

3.8 Data and Parameters

The proposed ME describes all data and parameters required for emission reductions quantification and classifies them as either monitored or not monitored.

The descriptions include source of data, measurement procedures, monitoring frequencies, default values where appropriate, and other comments necessary for project implementation or validation/verification. First Environment concluded that the data and parameters included in the proposed methodology and the associated requirements for measurement and monitoring are appropriate and sufficient to reduce uncertainty in emission reduction calculations.

3.9 Adherence to the Project-Level Principles of the VCS Program

The proposed ME was developed in accordance with the requirements of VCS and adequately addresses the principles of relevance, completeness, consistency, accuracy, transparency, and conservativeness.

3.10 Comments by Stakeholders

In accordance with VCS requirements, a 30-day public stakeholder consultation was conducted. No stakeholder comments were received for the proposed ME.

3.11 Relationship to approved or pending methodologies

The proposed ME draws upon elements of the approved CDM-methodologies ACM0016, "*Baseline Methodology for Mass Rapid Transit Projects*" and AM0031, "*Baseline Methodology for Bus Rapid Transit Projects*." However, the degree to which these methodologies would have to be revised to incorporate bicycle sharing programs is substantial enough to warrant a new methodology.

4 VALIDATION CONCLUSION

First Environment performed the methodology validation assessment of the proposed ME as part of the VCS double-approval process. First Environment used the VCS Standard: VCS Version 3; the VCS Methodology Approval Process, Version 3.0; and the VCS Program Guide, Version 3.0 as the assessment criteria and to guide the methodology validation assessment process.

The review of the proposed ME and the satisfaction of corrective action and clarification requests have provided First Environment with sufficient evidence to determine the fulfillment of stated criteria.

The proposed ME was prepared in accordance with the VCS Standard: VCS Version 3; the VCS Procedural Document Methodology Approval Process, Version 3.0; and the VCS Program Guide, Version 3.0. The proposed methodology belongs to Sectoral Scope 7 – Transport.

In summary, it is First Environment’s opinion that the proposed ME entitled *Methodology for determining GHG emission reductions through bicycle sharing projects*, dated June 30, 2011, meets all relevant VCS requirements.

The validation of the Project is based on the information made available to us and the engagement conditions detailed in this report. First Environment cannot guarantee the accuracy or correctness of this information. Hence, First Environment cannot be held liable by any party for decisions made or not made based on this report or opinion.

5 ELIGIBILITY CRITERIA FOR VALIDATOR

First Environment has not completed ten validations in the VCS Sectoral Scope 7 – Transport and therefore cannot independently fulfill the requirements specified in Table 1 of the VCS Methodology Approval Process Procedural Document.

6 LEAD VALIDATOR SIGNATURE



Michael M. Carim
Associate

7 INTERNAL REVIEWER SIGNATURE



James Wintergreen
Senior Associate