INTEGRATING GHG INTO LRP	DESCRIPTION OF KEY DECISION POINT WITH RESPECT TO GHG CONSIDERATION	INFORMATION TRANSFER BETWEEN KEY DECISION POINTS	QUESTIONS TO BE ADDRESSED	TECHNICAL INFORMATION NEEDED TO RESPOND TO QUESTIONS
LRP-1: Approve LRTP Scope	Integration of GHG considerations into the scoping key decision point involves confirming whether or not climate change, or more specifically, GHG emissions will be considered as part of long range plan development; and, if considered, to what extent.	The decisions made at this point are transferred to LRP-2 to support integration of GHG considerations into long range plan vision/goal statements. The vision/goal statements are critical in that they serve as the foundation for how potential transportation investment strategies will be evaluated (in the context of how well they support attaining long term goals) at subsequent point LRP-3 and how investments will be prioritized for funding in the final approved plan scenario, at point LRP-8. Decisions made at LRP-1 can also be transferred to Cor-1 and Env-1 to maintain consistency between the scope of the long range plan and the scope reflected in subsequent project development activities.	• Will climate change/GHG emissions be considered as part of the long range plan? • Are there external factors that will influence how GHG will be considered, e.g., state climate action plan, federal inventory requirements? • What is the mechanism for integrating GHG into the long range plan, e.g., qualitative policy-level consideration, quantitative GHG emissions analysis for projects/plan? • If a GHG emissions analysis will be conducted, what is the scope of the analysis? • Are existing tools and data resources sufficient to support the method of GHG integration? • What additional coordination efforts (data/resources) will be needed to support integration of GHG considerations into long range plan?	Technical information needed at this key decision point involves a review of existing or readily available tools and data resources available to the agency to support the preferred mechanism and scope for integrating GHG into the long range plan. • Emissions source(s) to include in analysis • Transportation mode(s) to include in analysis • Analysis years • Tools to estimate travel activity and network performance: Macro (travel model), micro (simulation model), sketch analysis • Tools to estimate emissions rates • Data availability by emissions source, by travel mode • Data format

INTEGRATING GHG INTO LRP	DESCRIPTION OF KEY DECISION POINT WITH RESPECT TO GHG CONSIDERATION	INFORMATION TRANSFER BETWEEN KEY DECISION POINTS	QUESTIONS TO BE ADDRESSED	TECHNICAL INFORMATION NEEDED TO RESPOND TO QUESTIONS
LRP-2: Approve Vision and Goals	Integration of GHG considerations into the vision/goals key decision point involves defining, through high-level statements of purpose, what the agency's GHG goals are for the long range plan. Inclusion of GHG considerations at this point signals that it is a priority planning consideration and will impact, on some level, resource allocation decisions.	The goal statements defined at this point are directly transferred to LRP-3 in that they provide the context for how proposed transportation investment strategies will be evaluated, i.e., goal statements define the primary planning emphasis areas to be considered as part of project evaluation and plan development. Inclusion of GHG considerations at this point also signals that GHG will be a factor in identifying transportation deficiencies that should be addressed with the long range plan (LRP-4); selecting types of investment strategies for the plan (LRP-6); and approving and adopting the final plan scenario (LRP-8, LRP-9). Goal statements defined at LRP-1 can also be transferred to Cor-3 and Env-3/Per-1 to maintain consistency between the goals of the long range plan and the goals of subsequent project development activities.	• How should GHG consideration be reflected in long range plan vision/goal statements? • How specific should GHG goal statements be, e.g., integrated into a broader environmental goal? Emphasized in its own GHG reduction statement?	No technical information is needed to respond to the policy questions identified at this point, but goal statements should not conflict with the (technical) scope of GHG consideration defined in LRP-1.

INTEGRATING GHG INTO LRP	DESCRIPTION OF KEY DECISION POINT WITH RESPECT TO GHG CONSIDERATION	INFORMATION TRANSFER BETWEEN KEY DECISION POINTS	QUESTIONS TO BE ADDRESSED	TECHNICAL INFORMATION NEEDED TO RESPOND TO QUESTIONS
LRP-3: Approve Evaluation Criteria, Methods, and Measures	Integration of GHG considerations at this point involves defining evaluation criteria and methods used to measure the impact of potential transportation investment in relation to GHG goals.	Evaluation criteria and methods defined at this point are transferred to LRP-4, in which transportation deficiencies are defined and evaluated (e.g., congestion issues, safety needs, environmental impacts). The criteria also transfer to LRP-6, where strategies are defined to address deficiencies; LRP-7, where investment scenarios ("packages" of strategies) are evaluated in terms of how well they address deficiencies; and at points LRP-8 and LRP-9 where preferred investment scenarios are adopted using this information. Evaluation criteria and methods defined at LRP-3 can be transferred to Pro-4, Cor-5, and Env-5 *if LRP-3 methods involve GHG analysis at project/corridor level*. If methods defined at LRP-3 are defined as appropriate for systems-level analysis only, than they should not be directly transferred to a project or corridor level analysis.	• What is the appropriate scale to conduct GHG emissions analysis, e.g., systems-level, corridor-level, project-level? • What GHG evaluation criteria/measures will be used to evaluate transportation investment strategies and scenarios, e.g., CO2, CO2e, VMT (as proxy)? • How will GHG impacts be evaluated? *Note: Preliminary scoping of evaluation methods to be done in LRP-3, but specific methods are likely to depend on strategies identified in LRP-6.* • How will GHG measures be weighted against other evaluation criteria to be considered?	• Output of model or sketch analysis tools, e.g., travel data only (speeds and VMT), emissions data, other activity data • Ability to convert model or sketch analysis output to GHG measure of interest • Ability to forecast measure

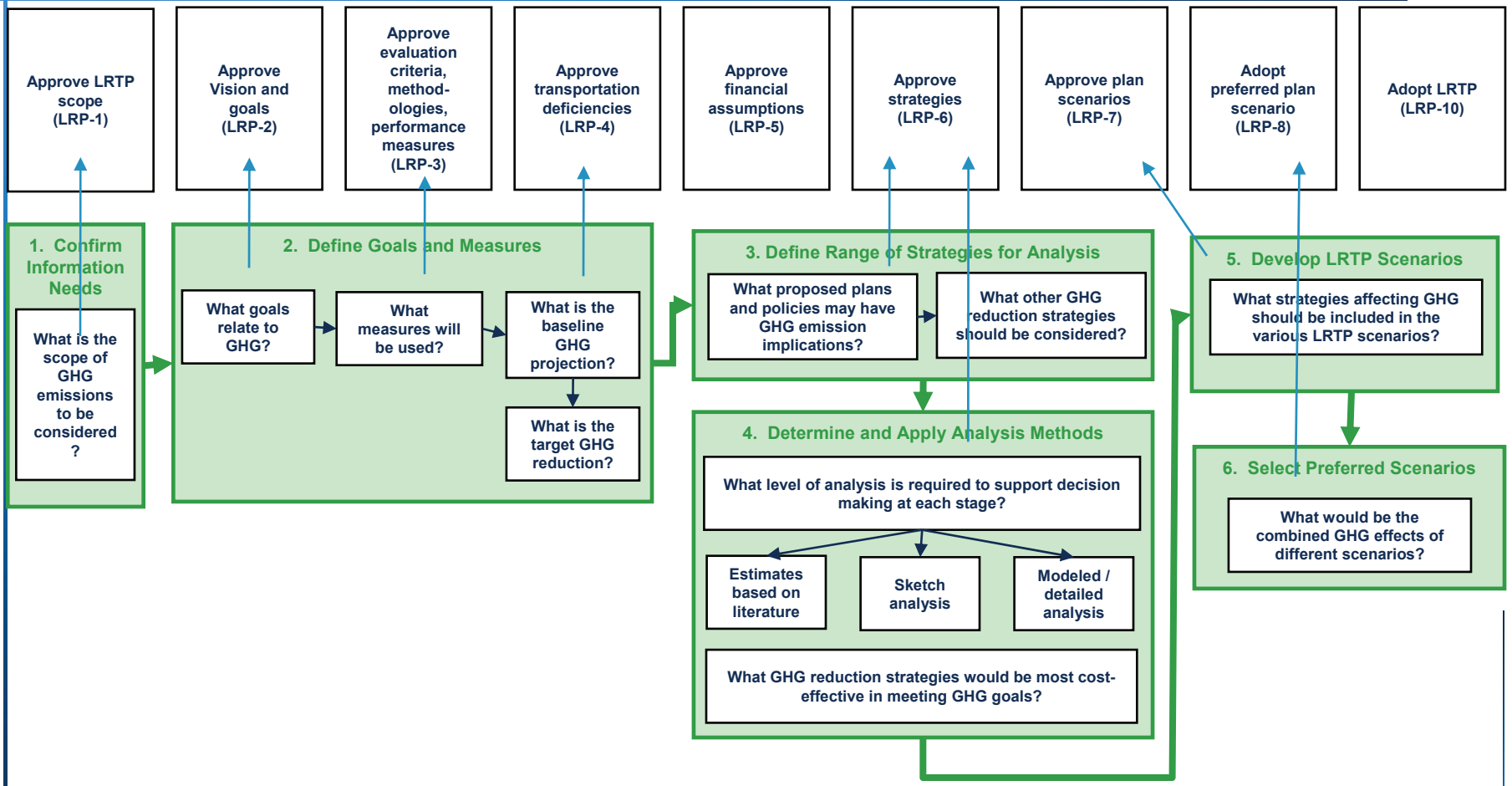
INTEGRATING GHG INTO LRP	DESCRIPTION OF KEY DECISION POINT WITH RESPECT TO GHG CONSIDERATION	INFORMATION TRANSFER BETWEEN KEY DECISION POINTS	QUESTIONS TO BE ADDRESSED	TECHNICAL INFORMATION NEEDED TO RESPOND TO QUESTIONS
LRP-4: Approve Transportation Deficiencies	Integration of GHG considerations at this point requires including GHG emissions as a deficiency (negative impact) of transportation performance. By including GHG impacts as a deficiency, potential investments for the long range plan can be evaluated in terms of how well they address the deficiency (along with other deficiencies identified – e.g., congestion, safety, air quality).	Transportation-related GHG deficiencies identified at this point link directly to LRP-6, where strategies are defined to address deficiencies; LRP-7, where investment scenarios ("packages" of strategies) are evaluated in terms of how well they address deficiencies; and at points LRP-8 and LRP-9 where preferred investment scenarios are adopted using this info. Deficiencies defined at LRP-4 can be transferred to Pro-3, Cor-2/4, and Env-3/Per-1 *if LRP-3 methods involve GHG analysis at project/corridor level.* If LRP-3 methods are appropriate for systems-level analysis only, than the GHG-related transportation deficiency identified in LRP-4 should be at systems level only, and should not be directly transferred to a project or corridor level analysis.	• What is the appropriate scale to define GHG-related transportation deficiencies, e.g., systems-level, corridor-level, project-level? • What is the baseline GHG inventory for base year and planning horizon year(s) corresponding to "existing plus committed (E+C)" transportation network? • What is the gap between baseline emissions and target-GHG emission levels (if applicable)?	• Inventory method (from LRP-3) • E+C project list for baseline and planning horizon year(s) • Estimates of travel activity and transportation network performance for baseline and planning horizon year(s) • GHG emission rates that reflect state and federal policies impacting GHG emissions, current and future • Target GHG reductions (if applicable)
LRP-5: Approve Financial Assumptions	NA	NA	NA	NA

INTEGRATING GHG INTO LRP	DESCRIPTION OF KEY DECISION POINT WITH RESPECT TO GHG CONSIDERATION	INFORMATION TRANSFER BETWEEN KEY DECISION POINTS	QUESTIONS TO BE ADDRESSED	TECHNICAL INFORMATION NEEDED TO RESPOND TO QUESTIONS
LRP-6: Approve Strategies	Integration of GHG considerations at this point involves defining and evaluating possible transportation solutions for GHG reduction.	Transportation strategies that contribute to GHG reduction identified at this point link directly to LRP-7, where investment scenarios ("packages" of strategies) are evaluated in terms of how well they address deficiencies; and at points LRP-8 and LRP-9 where preferred investment scenarios are adopted using this information.	• What potential transportation strategies have GHG implications, e.g., system management and operations, demand management, construction and maintenance practices, land use integration? • What type of analysis is required to support evaluation of particular strategies (in line with general methods defined in LRP-3)? • Which strategies provide the most benefit and are the most cost-effective from a GHG standpoint?	• List of potential strategies that can provide GHG reduction benefits, refined based on agency review of those potentially applicable in region • Will vary by level of analysis needed to support effective review of transportation strategies, e.g., screening-level assessment based on research applied in other areas, sketch level analysis, modeled analysis • Available tools and data to support strategy evaluation
LRP-7: Approve Plan Scenarios	Integration of GHG considerations at this point requires inclusion of transportation strategies that contribute to GHG reduction into one or more transportation scenarios ("packages" of strategies) that will be evaluated as part of plan development.	Scenarios approved at this step, inclusive of strategies that contribute to GHG reduction, directly transfer to points LRP-8 and LRP-9 where preferred investment scenarios are adopted using this information.	• What transportation strategies that contribute to GHG-reduction should be included as part of scenario analysis? • How cost-feasible are the strategies? • Are there interactive effects that should be considered –	• Level of GHG-reduction and cost-effectiveness for each strategy evaluated at LRP-6 • Relative importance (weight) of GHG-reduction benefits compared to other planning factors • Sketch-level planning cost

INTEGRATING GHG INTO LRP	DESCRIPTION OF KEY DECISION POINT WITH RESPECT TO GHG CONSIDERATION	INFORMATION TRANSFER BETWEEN KEY DECISION POINTS	QUESTIONS TO BE ADDRESSED	TECHNICAL INFORMATION NEEDED TO RESPOND TO QUESTIONS
			strategies that work better in combination, or alternatively, that work against each other? • What are the other (non-GHG) benefits or disbenefits of the strategies being considered? • Is there a likely project sponsor for the strategies?	for strategies potentially included in scenarios
LRP-8: Adopt Preferred Scenario	Integration of GHG considerations at this point involves estimating the impact of various plan scenarios on GHG emissions levels, and using this information to help select and adopt the preferred long range plan investment scenario.	The preferred investment scenario adopted at this point is directly linked to LRP-9, in which the preferred scenario is finalized to become the adopted long range transportation plan.	• What are the GHG impacts of various scenarios compared to baseline and target (if applicable)? • How important are GHG-reduction benefits compared to other transportation benefits, i.e., what is the trade-off if scenarios improve some planning factor areas, but not others? • What is public and stakeholder response to results of scenario analysis? • What is the cost of	• Will vary by level of analysis needed to support review of transportation scenarios, e.g., modeled analysis, supplemented with off-model enhancements as needed • Level of GHG reduction for each scenario, compared to baseline and target (if applicable) • Non-GHG related transportation benefits of each scenario (in line with other evaluation criteria defined in LRP-3)

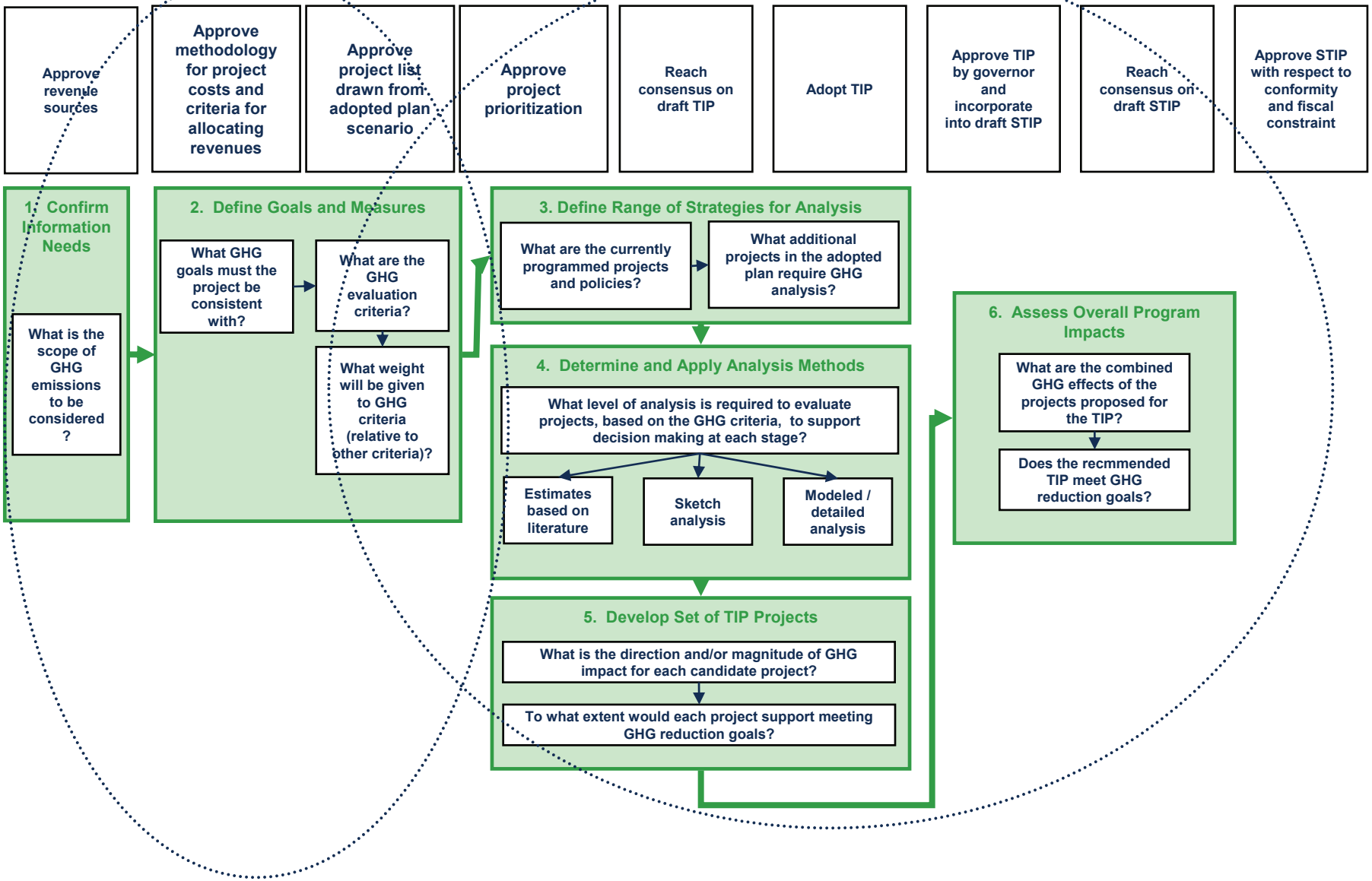
INTEGRATING GHG INTO LRP	DESCRIPTION OF KEY DECISION POINT WITH RESPECT TO GHG CONSIDERATION	INFORMATION TRANSFER BETWEEN KEY DECISION POINTS	QUESTIONS TO BE ADDRESSED	TECHNICAL INFORMATION NEEDED TO RESPOND TO QUESTIONS
			implementing various scenarios?	• Relative importance (weight) of GHG-reduction benefits compared other transportation benefits • Cost to implement scenarios
LRP-10: Adopt LRTP	Specific GHG considerations are not necessarily critical at this point in time, unless plan approval hinges on a GHG inventory or reduction assessment. GHG integration at this point involves less of policy or technical discussion around GHG-related planning efforts, and instead focuses on what should be communicated to various planning partners and stakeholder groups about the GHG implications of the plan that is proposed for adoption.	The decision to adopt a long range plan transfers directly to Pro-1/2/3 with the adopted plan providing the framework for the types of projects to be programmed in the TIP, the revenue available for programming, and the methods and criteria to be used for project evaluation.	• Who is responsible for reviewing and approving the plan? • What needs to be communicated to support plan adoption?	• Impact of long range plan on all evaluation criteria/planning areas in line with long-term transportation goals, including GHG goals • Cost of plan

Task 6 – Incorporation of GHG Decisions into the CDMP
Figure 1: Long Range Transportation Planning Process



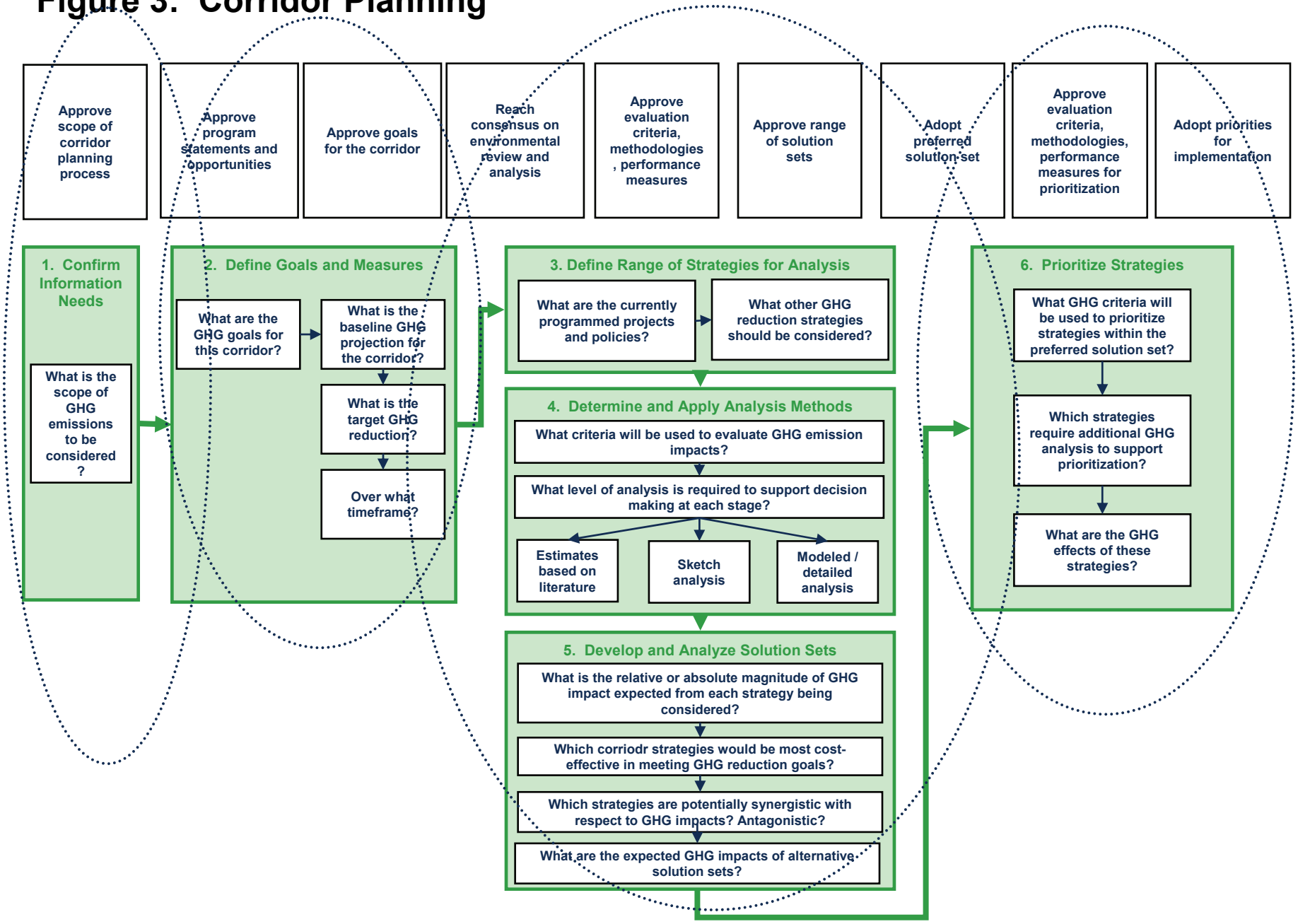
CAMBRIDGE SYSTEMATICS

Task 6 – Incorporation of GHG Decisions into the CDMP
Figure 2: Programming



Task 6 – Incorporation of GHG Decisions into the CDMP

Figure 3: Corridor Planning



Task 6 – Incorporation of GHG Decisions into the CDMP

Figure 4: Environmental Review / NEPA (Project or Plan)