

ETHICAL SMART CITY (ESC) TOOLKIT

ESC DEFINITION TOOL

Using prompt questions and a fill in the blank template the ESC Definition tool starts the thinking around ethics in Smart City planning.

WHY USE THIS TOOL?

This tool helps develop a shared understanding of what is valuable to the individual and group. With this understanding, the community is able to have a starting point in defining what is ethical to them.

HOW TO USE IT

1. With the relevant stakeholders, answer the seven questions in the ESC Definition Tool.
2. Generate your Ethical Baseline by filling in the blanks for the template to identify what your Ethical Smart City supports and ensures.

ESC DEFINITION TOOL

Objective: To create the Ethical Smart City definition for your community.

STEP 1 - KNOW YOUR ETHICAL BASELINE: GENERATIVE

What does your community want to achieve?

What is economic success for your community?

What practices is your community willing to adopt?

What is social success for your community?

What does your community want to avoid?

What does environmental success look like for your community?

FILL IN THE BLANKS

An Ethical Smart City (What does your community want to achieve?)

that supports (What practices is your community willing to adopt and avoid?)

and ensures (What are the social, economic and environmental successes?)

Based on your definition, what does your community want to learn from others?

VALUE MAPPING TOOL

Value Mapping is a tool that helps describe personal and organizational values.

WHY USE THIS TOOL?

The Value Mapping tool helps align the values of the individual with that of the community. This is useful to generate a shared understanding of what should be prioritized by the community.

WHERE CAN YOU FIND THIS TOOL?

You can find more information on this and other tools from Development Impact & You Toolkit: An initiative of Nesta at diytoolkit.org

HOW TO USE IT

1. List or describe your personal values, and those embodied by your organization.
2. Map the identified values to the level of perceived importance (always, sometimes, rarely, or never important) by filling in the relevant fields provided, for both your individual and organization's values.

VALUE MAPPING TOOL

Objective: To align the community on the basis of shared values.

STEP 1 - KNOW YOUR ETHICAL BASELINE: GENERATIVE

INDIVIDUAL VALUES

Always Important

Sometimes Important

Rarely Important

Never Important

COMMUNITY VALUES

Always Important

Sometimes Important

Rarely Important

Never Important

ESC BENCHMARKING TOOL

This tool evaluates the existing city systems to create a benchmarking criteria for identifying ESC solutions.

WHY USE THIS TOOL?

The benchmark criteria filters out solutions that do not match what is ethical for your community.

HOW TO USE IT

1. List the Why, What, Who, How and Where questions to understand the various facets of your community.
2. Based on the answers to the questions, list the criteria for your city to reinforce your ethical baseline under “Benchmark Criteria”.
3. List other cities whose solutions meet these criteria under “Benchmark Cities”.

ESC BENCHMARKING TOOL

STEP 1 - KNOW WHAT YOU CAN BENCHMARK AGAINST: EVALUATIVE

Objective: To create your benchmark criteria.

List WHY questions to understand your community's challenges

List WHAT questions to understand your city systems and potential solutions

List WHO questions to understand your stakeholders

List HOW questions to understand the experience of your stakeholders

List WHERE questions to understand the scope of your city systems

Benchmark Criteria

Benchmark Solutions

COMPARATIVE ANALYSIS TOOL

WHY USE THIS TOOL?

The tool helps you analyze the consolidated findings from similar projects to set benchmarks for your proposed solution.

WHERE CAN YOU FIND THIS TOOL?

You can find more information on this and other tools from Development Impact & You Toolkit: An initiative of Nesta at diytoolkit.org

HOW TO USE IT

1. Select three smart city projects that are similar to what you are proposing for your own city.
2. Identify the values, challenges, technologies and lessons learned from each of the chosen smart city projects.
3. List your city's values, challenges, technologies. Include any lessons learned that you can take to your own project from the three projects you have analyzed.

COMPARATIVE ANALYSIS TOOL

Objective: To learn from Smart City projects implemented by other cities.

STEP 1 - KNOW WHAT YOU CAN BENCHMARK AGAINST: EVALUATIVE

	What values did the city uphold?	What challenges did the city address?	What technologies did the city implement?
CASE STUDY OF CITY 1			
CASE STUDY OF CITY 2			
CASE STUDY OF CITY 3			
LESSONS FOR YOUR CITY			

List the lessons learned from Smart City projects implemented by other cities.

ESC NEEDS ANALYSIS TOOL

The interview guide is a tool to ensure that relevant information is collected from stakeholders.

WHY USE THIS TOOL?

The interview guide can inform your strategy for selecting and asking the right questions to your stakeholders. An interview is a direct interface with the community and can be structurally optimized to understand their values and challenges.

HOW TO USE IT

Using data gathering such as interviews or focus groups with the relevant stakeholders,

1. Compile a list of the most important values, challenges and available technologies for your community.
2. Identify the pain points and desires from the lived experiences of the community.
3. Deduce the prioritized values, the relevant challenge and appropriate technologies that will allow you to explore your community's needs.

ESC NEEDS ANALYSIS TOOL

Objective: To identify prioritized values, the right challenge and appropriate technology.

STEP 2 - PERSONALIZE YOUR UNDERSTANDING OF NEEDS: GENERATIVE

CHALLENGES	VALUES	TECHNOLOGY
What are the most pressing issues in your community?	What values are most important to your community?	What are the technologies that are available to you right now?
How do these issues manifest in your daily life and long-term plans?	What are the pain points you encounter when trying to live by these values?	What technologies have caused harm or created challenges within your community?
What are some barriers you want to get rid of?	What values do you want your community to focus on?	What other technology do you want to be implemented that can support your daily activities?

Based on the answers above, identify the relevant challenge, prioritized values, and appropriate technology.

RELEVANT CHALLENGE What is the right challenge to address at this time?	PRIORITIZED VALUES Which value is most important to uphold while solving this challenge?	APPROPRIATE TECHNOLOGY Which technologies will be best suited to help solve the challenge?
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INTERVIEW GUIDE TOOL

An interview guide is a tool to ensure that relevant information is collected from stakeholders.

WHY USE THIS TOOL?

The interview guide can inform your strategy for selecting and asking the right questions to your stakeholders. An interview is a direct interface with the community and can be structurally optimized to understand their values and challenges.

WHERE CAN YOU FIND THIS TOOL?

You can find more information on this and other tools from Development Impact & You Toolkit: An initiative of Nesta at diytoolkit.org

HOW TO USE IT

1. Before conducting an interview, prepare questions you may ask the stakeholder using the prompts show me, draw it, think aloud and be specific.
2. Once you have identified questions to ask, review and prioritize those that will help you to understand the behaviours, attitudes and motivations of your stakeholders.

INTERVIEW GUIDE TOOL

Objective: To guide you through the interview process with stakeholders.

STEP 2 - PERSONALIZE YOUR UNDERSTANDING OF NEEDS: GENERATIVE

SHOW ME

Have the interviewee walk you through the process of using services or products. This is a way to understand the users' needs and motivations.

DRAW IT

Ask participants to map out their activities and experiences through sketches and diagrams. This is a good way to debunk assumptions and reveal how people perceive and order their activities.

THINK ALOUD

As they perform a process or task, ask participants to describe aloud what they are thinking. This helps uncover their motivations, concerns, perceptions and reasoning.

BE SPECIFIC

Ask people to talk about a specific period of time. This is ensure the responses are not general but rich in important details.

ESC SYSTEMS MAPPING TOOL

ESC Systems Mapping is a tool to help you explore the impact of your challenge on different stakeholders in the community through the context of policies, technology, infrastructure and environment.

WHY USE THIS TOOL?

By mapping the systems contributing to and affected by a challenge, you will be able to understand the community's context. This will also enable you to consider the dependencies and limitations of the problem and solution space.

HOW TO USE IT

1. Write down the relevant challenge identified for your community.
2. List the impacts of the policy, technological, environmental and infrastructural systems on this challenge, by answering the prompts listed under each section.

ESC SYSTEMS MAPPING TOOL

Objective: To identify the systemic forces that positively and negatively impact the challenge

STEP 2 - PERSONALIZE YOUR CONSIDERATIONS: EVALUATIVE

What is the challenge you are trying to tackle?

POLICY
What economic and social policies affect the challenge? How do these policies impact or get impacted by the existing system? Who are the decision makers that can make or block changes to the existing policies?

TECHNOLOGY
What technologies affect the challenge? How do these technologies impact or get impacted by the existing system? Who are the decision makers that can make or block changes to the existing technologies?

ENVIRONMENT
What changes in the environment affect the challenge? How do these changes to the natural environment impact or get impacted by the existing system? Who are the decision makers that can make or block changes to the existing environment?

INFRASTRUCTURE
What city infrastructures affect the challenge? How do these infrastructural changes impact or get impacted by the existing system? Who are the decision makers that can make or block changes to the existing infrastructure?

SYSTEMS MAPPING TOOL

A tool for mapping the interactions between stakeholders, institutions and external factors.

WHY USE THIS TOOL?

By mapping the systems contributing to and affected by a challenge, you will be able to understand the community's context. This will also enable you to consider the dependencies and limitations of the problem and solution-space.

WHERE CAN YOU FIND THIS TOOL?

You can find more information on this and other tools from Institute without Boundaries at institutewithoutboundaries.ca

HOW TO USE IT

1. List the interactions between stakeholders and institutions within your city systems.
2. Analyze the external factors affecting these stakeholders and institutions that you've previously identified.
3. Once completed, use a separate sheet of paper to map the interdependencies, connections and gaps between all the elements.

SYSTEMS MAPPING TOOL

Objective: To map the interactions within the systems in your city.

STEP 2 - PERSONALIZE YOUR CONSIDERATIONS: EVALUATIVE

STAKEHOLDERS
List the stakeholders impacted by the system.

INSTITUTIONS
List the institutions within the system.

EXTERNAL FACTORS
List the external factors affecting the people and institutions of the system.

In a separate sheet, map how the listed items interact with one another to identify interdependencies and gaps.

ESC GOAL- SETTING TOOL

ESC Goal-Setting tool enables you and your community to set goals based on their prioritized values, relevant challenges and appropriate technologies.

WHY USE THIS TOOL?

By mapping out factors internal and external to the community, you can set ESC goals that champion their needs.

HOW TO USE IT

1. Identify the internal factors that impact community needs, such as the stakeholders themselves.
2. Analyze the current status of the situation and the desired outcome.
3. Map out partners and funding available to assess support structures for your goals.
4. Write down your ESC goals on the basis of this understanding.

ESC GOAL-SETTING TOOL

Objective: To set goals based for community needs.

STEP 3 - STRATEGIZE WITH INTENT: GENERATIVE

INTERNAL FACTORS

RELEVANT STAKEHOLDERS
Which communities are relevant to be included in this solution?

COMMUNITY NEEDS
What are the needs of the community?

CURRENT STATUS
What is the impact of the current condition?

DESIRED CHANGE
What changes would benefit the relevant stakeholders?

EXTERNAL FACTORS

PARTNERS
Which partnerships can serve these goals?

FUNDING
What kind of funding is available?

ETHICAL SMART CITY GOALS

SCOPING CANVAS TOOL

The Scoping Canvas is a tool that ensures scoping and alignment while setting goals for the project

WHY USE THIS TOOL?

The Scoping Canvas highlights potential problems and indicates what needs to be included.

WHERE CAN YOU FIND THIS TOOL?

You can find more information on this and other tools from Board of Innovation at www.boardofinnovation.com

HOW TO USE IT

1. Using the challenge you're trying to solve, answer and fill the first 6 boxes on the worksheet.
2. Using your previous answers, re-frame the challenge to a "how might we question" that aligns to the goals you have set.
3. In the last box, include any related initiatives or projects that have explored challenges similar to what you have defined.

SCOPING CANVAS TOOL

Objective: To create alignment by goal setting.

STEP 3 - STRATEGIZE WITH INTENT: GENERATIVE

<p>WHY THIS CHALLENGE? How did the team come up with this challenge? Why is it important for the team?</p>	<p>CUSTOMER SEGMENT Who do you want to create value for?</p>
<p>FIRST SOLUTION IDEAS What are your first ideas on how to solve the challenge? Why did you decide on these solutions? What is the competition doing?</p>	<p>CURRENT SITUATIONS What is the current user journey?</p>
<p>SOLUTION ASSUMPTION What do you think users want to see changed?</p>	<p>GOAL/SUCCESS What kind of decision do you want to make at the end of the project?</p>
<p>THE CHALLENGE: HOW MIGHT WE... Frame the challenge in the "how might we..." format, which frames the context clearly, but leaves options for solutions open!</p>	<p>RELATED INITIATIVES & RESOURCES Are there any projects which recently explored similar business areas/challenges?</p>

ESC FORESIGHT TOOL

The ESC Foresight Tool helps you and your community hypothesize how future trends and risks might impact your goals.

WHY USE THIS TOOL?

This tool is a stress test for evaluating the systemic impact of the implementation of your goal and the factors that impact it.

HOW TO USE IT

1. Identify the possible, probable and preferred scenarios for your Smart City goals.
2. Identify the internal and external factors that will influence the outcome of each of the scenarios.
3. Identify your municipality's responses to each of the scenarios on the basis of the goals.

ESC FORESIGHT TOOL

STEP 3 - STRATEGIZE CONSIDERING POTENTIAL IMPACT : EVALUATIVE

Objective: To hypothesize the impact of future trends and risks on ESC goals.

Undertake trend research related to your city challenges and identify the possible, probable and preferred futures. Once done, make sure you revisit your ESC goals to prepare them for these future scenarios.

POSSIBLE FUTURE
What could happen within the context of the social, economic and environmental systems? What internal/external forces will influence the outcomes of the future scenario? How do we address the impact of these factors on ESC goals?

PROBABLE FUTURE
What is likely to happen within the context of social, economic and environmental systems? What internal/external forces will influence the outcomes of the future scenario? How do we address the impact of these factors on ESC goals?

PREFERRED FUTURE
What do we want to happen within the context of social, economic and environmental systems? What internal/external forces will influence the outcomes of the future scenario? How do we address the impact of these factors on ESC goals?

ENVIRONMENTAL SCAN (STEEPV) TOOL

This tool breaks down the Social, Technological, Economic, Environmental, Political and Value (STEEPV) factors for strategic discussions.

WHY USE THIS TOOL?

This environmental scan coupled with the analysis on present and future trends, tests the adequacy of ESC goals. This ensures that the strategies and goals align with community needs.

WHERE CAN YOU FIND THIS TOOL?

You can find more information on this and other tools from Institute without Boundaries at institutewithoutboundaries.ca

HOW TO USE IT

1. Conduct research to identify signals from social, technological, economic, environmental, political and value factors that impact your city systems.
2. Map the trends and interconnections between these factors.

ENVIRONMENTAL SCAN (STEEP)

STEP 3 - STRATEGIZE CONSIDERING POTENTIAL IMPACT : EVALUATIVE

Objective: To identify the impact of these factors to your ESC goals and strategies.

How are your goals and strategies affected by the current and future manifestations of the factors below?

Social

Technological

Economic

Ecologic

Political

Values

ESC SOLUTION TOOL

The ESC Solution tool combines the prioritized value, appropriate technology and the relevant challenge to provide context for generating ideas for ethical solutions.

WHY USE THIS TOOL?

The proposed ethical solution will allow you to champion community needs.

HOW TO USE IT

1. List the most pressing challenge, important values and impactful technologies for your community.
2. In the space provided, write or sketch your solution that prioritizes your chosen ethical value using smart technology to address your community challenges.
3. Using the template, create a statement about your ESC solution that upholds prioritized values, the relevant challenges and appropriate technologies to share with your community.

ESC SOLUTION TOOL

Objective: To generate ideas for ethical solutions.

STEP 4 - DESIGN FOR YOUR CURRENT AND FUTURE STAKEHOLDERS: GENERATIVE

What is the most pressing challenge in your community?

What ethical value(s) is (are) most important to you and your community? E.g. privacy, safety, sustainability

What smart technology(ies) can be most impactful in solving your community's challenge? E.g. Artificial Intelligence (AI), Internet of Things (IoT), Blockchain

Write or sketch your solution that prioritizes your chosen ethical value using smart technology to address your community challenges.

FILL IN THE BLANKS

We are creating an Ethical Smart City solution that is (prioritized value)

which addresses (relevant challenge)

using (appropriate technology)

OPPOSITE THINKING TOOL

Opposite Thinking is a brainstorming tool that leverages limitations to generate ideas.

WHY USE THIS TOOL?

Opposite Thinking will help you examine the assumptions about the challenge and possible solutions.

WHERE CAN YOU FIND THIS TOOL?

You can find more information on this and other tools from Board of Innovation at www.boardofinnovation.com

HOW TO USE IT

1. Describe your assumptions related to the challenge you are trying to solve.
2. Write down the opposite of your assumption.
3. Use a scenario to describe a new or improved solution that challenges your assumption.

OPPOSITE THINKING TOOL

Objective: To generate ideas from an opposite point of view.

STEP 4 - DESIGN FOR YOUR CURRENT AND FUTURE STAKEHOLDERS: GENERATIVE

ASSUMPTION

Describe the assumption you have about your concept or domain.

OPPOSITE

Describe the opposite of this assumption.

SOLUTION

Describe a new service, offering or improvement out of the opposite.

ESC TESTING TOOL

ESC Testing is a tool that uses the three lenses of innovation - desirability, viability and feasibility - to evaluate solutions.

WHY USE THIS TOOL?

The tool ensures that the benefits of implementing the solution outweigh the potential costs.

HOW TO USE IT

1. Write down the proposed ESC solution for your city.
2. Evaluate the desirability, feasibility and viability of the proposed ESC solution by answering the questions in this tool.

ESC TESTING TOOL

Objective: To test the desirability, viability and feasibility of Ethical Smart City solutions.

STEP 4 - DESIGN THE PERCEIVED VALUE, PROTOTYPE AND TEST: EVALUATIVE

What is your Ethical Smart City solution?

DESIRABILITY

How does the solution uphold community values? What is the unique value proposition? Does it address the community's needs? Do people want this product or service?

VIABILITY

How will it be funded? What are the costs? Does this solution create new problems?

FEASIBILITY

How does the solution address the challenge? Is it functionally possible in the foreseeable future?

PROTOTYPING TESTING TOOL

The Prototyping Testing Tool ensures that the design and concepts of solutions are efficiently tested before resources are invested into creating the final solution.

WHY USE THIS TOOL?

The tool provides information on what part of the solution should be invested in further.

WHERE CAN YOU FIND THIS TOOL?

You can find more information on this and other tools from Development Impact & You Toolkit: An initiative of Nesta at diytoolkit.org

HOW TO USE IT

1. Write down the main idea/hypothesis that you want to test.
2. Using words, sketches or models, rapidly test your idea.
3. Examine your prototypes, refine and re-test to see where you can develop it further.
4. List the things that will take your idea from prototype to fully realized.

PROTOTYPING TESTING TOOL

Objective: To plan the process of prototyping and testing the solutions.

STEP 4 - DESIGN THE PERCEIVED VALUE, PROTOTYPE AND TEST: EVALUATIVE

What is the Smart City solution you want to test?

Quickly try out your idea to determine whether it can work in real life.

Test your idea again after having developed it further, to examine details before launching it.

Make a list of all the things that you need to bring the idea to life.

ESC PLANNING TOOL

The ESC Planning tool creates a backbone for the ESC project plan.

WHY USE THIS TOOL?

The tool will guide your planning by highlighting the features critical to your project implementation.

HOW TO USE IT

1. Write down the ESC solution for your city generated in the previous step of the framework.
2. Write down the community needs and project information by answering the questions in this tool.
3. Generate your ESC project plans using the community needs and project information as a foundation.

ESC PLANNING TOOL

Objective: To summarize the important features of the project plan.

STEP 5 - ADAPT YOUR ETHICAL BASELINE : GENERATIVE

What is your Ethical Smart City solution?

COMMUNITY NEEDS

PROJECT INFORMATION

PRIORITIZED VALUES
How are the community values reflected in the Smart City Project?

GOALS
How do the project objectives align with the goals of the city?

RELEVANT CHALLENGE
Who was consulted when identifying the problem to be solved? Were they included in the prototype or testing of the solution?

SUCCESS CRITERIA
How does this align with your community's Ethical Benchmark Criteria?

APPROPRIATE TECHNOLOGY
How was the technology chosen? Who was consulted?

RISKS
What are the risks around the limitations of your community's context?

COMMUNITY FEEDBACK
What are the insights gathered from knowing the community? How are these insights applied to the project planning?

FUTURE SCENARIO
What are the potential change drivers and disruptors that can influence this Smart City Project Plan? How does this impact economic, social and environmental sustainability?

BUSINESS MODEL CANVAS TOOL

The Business Model Canvas is a tool that identifies the key considerations for the implementation of ESC project plans.

WHY USE THIS TOOL?

The Business Model Canvas provides a comprehensive picture of components required to implement the ESC project plan.

WHERE CAN YOU FIND THIS TOOL?

You can find more information on this and other tools from Development Impact & You Toolkit: An initiative of Nesta at diytoolkit.org

HOW TO USE IT

1. Using your ESC project plan, fill out the sections of the worksheet. Start with identifying your key partners, activities and resources.
2. Define your audience segments, relationships and channels.
3. Create a value proposition that describes your ESC Project.
4. Determine the cost structures and revenue stream that will make your project sustainable.

BUSINESS MODEL CANVAS TOOL

Objective: To generate a comprehensive view of the ESC project.

STEP 5 - ADAPT YOUR ETHICAL BASELINE : GENERATIVE

KEY PARTNERS Who will help you?	KEY ACTIVITIES How do you do it?	VALUE PROPOSITION What do you do that is unique to you?
	KEY RESOURCES What do you need?	
	AUDIENCE SEGMENTS How do you help?	
AUDIENCE RELATIONSHIPS How do you interact?		
DISTRIBUTION CHANNELS How do you reach them?		
COST STRUCTURE What would be the cost?		
REVENUE STREAM How much will you make?		

ESC REPORT CARD TOOL

The ESC Report Card is a tool that helps track progress and lessons learned across all steps of the Framework.

WHY USE THIS TOOL?

The tool ensures that progress on each step is recorded in one place and can be easily referred to or carried over into the next step of the Framework.

HOW TO USE IT

1. Write down the following for each step of the Framework:

outputs

lessons learned

insights

questions

2. Check the boxes next to the outputs accomplished in each step.

ESC REPORT CARD TOOL

Objective: To document the progress through the steps of the ESC Framework.

STEP 5 - ADAPT TO CHANGES: EVALUATIVE

ESC FRAMEWORK STEPS

KNOW
What is your definition of an Ethical Smart City?

PERSONALIZE
What are the needs of your community?

STRATEGIZE
What are your ESC goals?

DESIGN
What is (are) your ethical Smart City solution(s)?

ADAPT
What are the key features in the implementation plan/RFP?

OUTPUT

-  ESC Definition
-  ESC Benchmark Criteria
-  Benchmark Solutions
-  ESC Needs Analysis
-  Policies
-  Funding Opportunities
-  Smart City Goals
-  Risks/ Trends
-  Scenarios Analysis
-  Ethical Smart City Solutions
-  Prototype and Test Approach
-  Test Results
-  Implementation Plan
-  Project Plans
-  Lessons Learned

ECOLOGY OF INNOVATION TOOL

The Ecology of Innovation is an IwB tool which analyzes the innovation and gaps across five essential systems: social, technical, business, political and design innovation.

WHY USE THIS TOOL?

The Ecology of Innovation ensures that the solutions are holistic and consider five critical systems that impact cities.

WHERE CAN YOU FIND THIS TOOL?

You can find more information on this and other tools from Institute without Boundaries at institutewithoutboundaries.ca

HOW TO USE IT

1. Describe the social, design, political, technology and business innovations for your ESC Project.
2. Use the prompt questions to identify gaps to achieve innovation in all five areas. List changes that will be needed and barriers to its implementation.
3. Identify what barriers you need to overcome to create desired innovations.

ECOLOGY OF INNOVATION TOOL

Objective: To map out the gaps and innovation across all systems in your city.

STEP 5 - ADAPT TO CHANGES: EVALUATIVE

SOCIAL INNOVATION
How do we want to live? What are the barriers to its implementation? How do we overcome the barriers?

DESIGN INNOVATION
What is the impact of the design that is needed for change? What are the barriers to its implementation? How do we overcome the barriers?

POLITICAL INNOVATION
What governance/policy change is needed? What are the barriers to its implementation? How do we overcome the barriers?

TECHNOLOGY INNOVATION
What is the technology that is needed for change? What are the barriers to its implementation? How do we overcome the barriers?

BUSINESS INNOVATION
How do we create a business to make this change? What are the barriers to its implementation? How do we overcome the barriers?