

# How to Navigate the Believe in Ohio STEM Commercialization Plan and STEM Business Plan Instructional Roadmap

Your Innovation Will Reach 12 Mileposts Along the Way.

## MILEPOST “0” - GET READY FOR YOUR JOURNEY

**STEP 1** – Determine if you will develop a STEM Commercialization Plan or a STEM Business Plan. The answer depends mainly on the subjects taught by your sponsoring teacher. Generally, complete a STEM Commercialization Plan if your supervising teacher teaches science, technology, engineering, mathematics or career technical subjects. Complete a STEM Business Plan if your teacher teaches business, economics, marketing or entrepreneurship.

**STEP 2** – Read all the program materials and thoroughly explore the Believe in Ohio website to get a big picture understanding of what you are being asked to do.

[www.believeinohio.org](http://www.believeinohio.org)

**STEP 3** – Use the “Roadmap to Ohio’s Future Jobs & Prosperity” as a brainstorming tool to help develop your plan. The Milepost 1-8 poster can be found on page 8 & 9 of the STEM Plan Instruction Booklet.

- Use your Milepost 1-8 poster as a brainstorming tool by using a 1 ½ x 2 inch Post-it® Note (or a trimmed down 3” x 3” Post-it® Note) to post your thoughts and findings to the Roadmap. Consider taping or hanging it on a wall so that you can reference it frequently. As you research and discuss your plan ideas with others, you will find that your ideas will evolve and you will likely make many course corrections, often called pivots.
- Continually keep revising your Post-it® notes until you are satisfied that your Plan idea is a commercializable idea.
- Throughout your Innovation Journey if you come upon a term that you don’t know or understand, stop for a minute to determine the meaning and determine how it may relate to your journey.

**NOTE:** Believe in Ohio’s “Road Map” is based loosely on the “Lean Canvas Business Model” developed by Ash Maurya (<https://bmttoolbox.net/tools/lean-canvas/>) that was adapted from the “Business Model Canvas” (<http://www.businessmodelgeneration.com/canvas/bmc>) by Alexander Osterwalder & Yves Pigneur, and is licensed under the Creative Commons Attribution-Share Alike 3.0 Un-ported License.

## NOW, SET OUT ON YOUR JOURNEY



### Milepost 1 – Problem Statement – Pain Point – Market Opportunity

Whether developing a STEM Commercialization Plan or a STEM Business Plan, often the hardest part about getting started is coming up with an idea for a Plan. The first step is to put your imagination to work. In brainstorming an idea, remember that innovation and entrepreneurship are about challenging the status quo and transforming or developing new products, services, and solutions to meet the changing needs, wants, and problems of society. Start by looking around you at needs that are not being fulfilled, problems that remain unsolved, and things that do not work. Then think about how technology developments have made possible or could make possible products, services, and solutions that simply were not possible before.

If you are a STEM student doing a STEM Commercialization Plan, think about how a new and/or an existing STEM technology concept (or a combination of multiple new or existing STEM technology concepts) may be applied, or further developed to create a commercializable technology concept that might be applied to fill a marketplace need or solve a societal problem.

If you are business student doing a STEM Business Plan, think about how a new or existing technology can be applied to create a new product or service or enhance an existing product or service with new features or capabilities that can be successfully developed into a real world business opportunity and be “taken to market.”

In a few words note on one or more Post-it notes, the Problem(s), “Pain Points” or Market Opportunities that the plan will address. At all Mileposts you should focus generally on three or fewer problems, needs or opportunities.



### Milepost 2 – What is Your Proposed Solution?

At Milepost 2, use Post-it notes to describe briefly your proposed solutions to the problem(s) and need(s) identified at Milepost 1.



### Milestone 3 – What STEM Concepts and Principles Underlie Your Proposed Solution?

The accelerating pace of technological change is the catalyst behind most of the innovation that will cause virtually every product, service, and aspect of life to be continuously transformed and reinvented during your lifetime. In that context, use your Post-it® notes at Milepost 3 to indicate the key science and technology concept(s) and advances that you plan to apply to address the problems and solutions you previously identified at Mileposts 1 and 2.



### Milestone 4 – Who Are Your Target Customers and Intended Users?

You can't have a useful and economically sustainable product, service and market opportunity unless someone other than you actually will buy and use what you are planning to develop. At Milepost 4, note who you believe to be your target customer(s). While you are thinking about your targeted customers, consider the size of the market opportunity they represent. Would millions likely see value in or purchase your idea, or only a small group of people? Keep in mind the difference between who your customer might be and who the ultimate user will be. For example, if your idea is intended to be used by young children, the children will be the intended user while their parents will be the intended customer. At Milepost 4 note both your expected target customer(s) and intended user(s).



### Milestone 5 – Who Are Your Competitors?

At Milepost 5, note who you expect your competitors will be. When considering the potential feasibility of a new idea, product, or service, you must know and understand your competitors. Both are important because you need to know what your idea, product, or service will be competing against and because we learn from competitors.



### Milestone 6 – What is the Customer Value Proposition and Competitive Advantage?

At Milepost 6, describe what you believe is the customer value proposition and competitive advantage your plan offers. Stated another way, unless your target customer perceives value in your idea, it won't go far. In the real world you would do research to try to answer this question. Describe what you see as the "competitive advantage" your proposed solution has over other potential solutions to the problem/pain point/market opportunity that your plan addresses. Generally, some form of cost advantage or differentiated features or benefits gives your problem solution a competitive advantage.



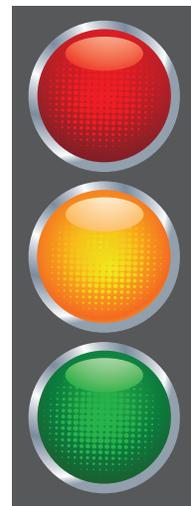
### Milestone 7 – What Revenue Streams Do You Expect?

At Milepost 7 note what revenue sources and potential size of those revenue streams that your venture would anticipate receiving. Now that you have noted the customers and competitors and what customer value proposition or competitive advantages your solution offers, identify what revenue streams you expect such as: product sales through middleman wholesalers or direct to customers, fees for services performed, subscription fees, usage fees, advertising revenues, lease income, license fees, franchise fees, etc.



### Milestone 8 – What Startup and Operating Costs Do You Expect to Incur?

At Milepost 8, consider what kind of startup and operating costs you would expect to incur. These costs will be determined in part based on all the matters you considered at Mileposts 1 -7. To what extent will you incur costs for ongoing research and development or for the development of potential prototypes and testing? Will you manufacture a product yourself, or outsource production? What staff will be needed to bring your plan idea(s) to fruition? You will find that all of the issues discussed earlier at Mileposts 1 -7 and at this Milepost 8 trade off against one another.



### Stop! – Traffic Light – In Your Opinion Does Your Solution and Plan Make Commercial Sense?

- **If NOT** - Then start again at Milepost 1 and repeat until you are satisfied that your solution makes commercial sense
- **If YES** – Write your Plan by following through on Mileposts 9 -12.

Challenge your plan to determine if it makes commercial sense. Why? It makes no sense to invest time, energy and resources to pursue an idea that a pragmatic assessment concludes won't fly. Better to go in another direction.

Talk to any business incubator or accelerator and they will tell you that it is rare, if ever, that someone's first idea is the one that they move forward with. Instead, what happens is that the entrepreneur or innovator takes to heart what they learned from their research and discussions with others and decides to make course corrections, or pivots. It is not uncommon for a new idea to pivot 5-6 or more times before it is ready to advance.



## Milestone 9 – Summarize The STEM Concepts and Principles Underlying Your Solutions

(500 words or fewer based on Milepost 3)

If your idea is based largely on existing or developed science that has not previously been applied in the way you propose, discuss how that science provides a feasible basis for your product, service or other concept idea. Also discuss what additional scientific research or development may be required to bring your concept or idea to completion.



## Milestone 10 – Summarize in Writing Your Commercialization Assessment of Your Plan

(Based on your findings at Mileposts 1-2 and 4-8)

Summarize your conclusions as to the commercial feasibility of your Plan. Include a discussion of the following:

- The problem, pain point or market opportunity you seek to address.
- Your proposed solution.
- Who your target customer(s) are?
- Who your intended users are, and how they may be different from your customers?
- Who your competitors are and on what basis you expect to compete with them?
- What your customer value proposition is and what competitive advantage your solution offers.
- What principal revenue streams you foresee generating?
- What significant startup and operating costs you expect the development of your venture will require.
- Your overall assessment of the commercial feasibility of your Plan.



## Milestone 11A – If a STEM Commercialization Plan, Develop a Science and Technology Proof of Concept

This section provides an assessment of the science and technology concepts and principles underlying your proposed idea and provides a proof of concept for the feasibility of the idea. Your discussion should include:

- Your review and assessment of the scientific literature related to your idea. What does the scientific community already know that is relevant to your idea? You do not need to summarize every paper in the field.
- Your statement of a single, clear and compelling (1) testable hypothesis or (2) engineering design.

- An inquiry or design-based discussion rather than simply a summary of knowledge. Your writing should include a discussion of prototypes and models that you create (including computer and mathematical models) with strong data analyses. Discuss additional research, design or analyses that should be done.
- Data tables, graphs, charts, sketches, engineering drawings or photos of prototypes or models, and cited references.
- A description of your findings with relevant, references cited within the text that you will include in a list of cited references at the end of your Plan. There must be a 1:1 concordance between in-text citations and references



## Milestone 11B – If yours is a STEM Business Plan, Develop a Business and Financial Proof of Concept

The purpose of this section is to provide an assessment of the business and financial feasibility of your proposed business venture, which effectively provides a proof of concept for your idea. Your discussion should include:

- Your proposed marketing, sales and pricing strategies to bring your new product, service or concept idea to market.
- How you will operationally develop and make your product, service or other concept idea into a tangible commercial venture.
- The most significant risks and uncertainties you expect to face in bringing your new product, service or other concept idea to market.
- A discussion about the amount and type of investment you believe will be required to bring your new product, service or concept idea to market.
- A three-year financial projection that confirms the financial feasibility of bringing your new product, service or concept idea to market on a sustainable basis. Access the financial template at: <http://believeinohio.org/resources/>
- A description of your findings with relevant, references cited within the text that you will include in a list of cited references at the end of your Plan. There must be a 1:1 concordance between in-text citations and references.



## Milestone 12 – Prepare an Executive Summary and Elevator Pitch of Your Entire Plan

An Executive Summary 250 words or fewer provides a concise summary of your plan. The Executive Summary must be written in a manner that a person, who may not be familiar with the topic, can understand your plan's important points. An Elevator Pitch is a three or fewer sentence summary of the entire plan.