



# MICHIGAN LAUNCH INITIATIVE

## Frequently Asked Questions

### **Q: What is the Michigan Launch Initiative?**

A: The MLI is a public/private non-profit entity that provides a collaborative platform for academia, industry, and governmental agencies to provide low earth orbit (LEO) and hypersonic launch technology for commercial and defense applications. The MLI's priority is to organize industry partners to establish and operate satellite launch facilities and a command center in Michigan. The MLI seeks to support the entirety of the space mission by encouraging future customers to be located near the launch facilities and providing a command center that can be utilized by future customers.

### **Q: What is the market potential in the space industry?**

A: In 2005, global revenues from the space industry were \$175 billion; by 2017, they grew to nearly \$385 billion. Private investment in the industry has grown nearly ten-fold in the same timeframe – from \$1.1 billion in 2000-2005 to more than \$10 billion in 2012-2017. While the sector suffered one down year in 2009, its growth was largely unaffected by the recession. The industry's growth is expected to continue. Major financial firms are bullish on the industry's prospects: both Morgan Stanley and Goldman Sachs estimate that the industry will be worth approximately \$1 trillion by 2040, while Merrill Lynch projects it to grow to \$2.7 trillion. Regardless of which estimate is correct, the industry trend is for significantly more investment and revenue in the next two decades.

### **Q: What is being proposed by the MLI?**

A: MLI proposes to construct new infrastructure and facilities to operate both vertical and horizontal commercial space launch sites in Michigan. Through a state-funded site selection process, Marquette County was been identified as the proposed location for the development of a vertical launch site and Oscoda-Wurtsmith Airport (OSC) as the proposed location for the horizontal launch site. MLI is proposing approximately 12 launches per year from each site. The actual launch rate will likely begin much lower and slowly increase over several years.

### **Q: What are commercial space launch sites?**

A: Commercial space launch sites are facilities that support the processing, integration and launch of vertical or horizontal launch vehicles. Traditional vertical launch vehicles typically take off under rocket power from a fixed launch pad. Additional vertical launch infrastructure such as a flame trench, ignition overpressure and sound suppression systems, service structures, lightning protection, propellant loading systems, vehicle processing facilities, etc. are often provided to support launch activities. Horizontal reusable launch vehicles are launch systems that can take off and land on conventional runways. Commercial space launch sites also provide necessary support services for launch operations, including utilities, security, and firefighting capabilities.

Both the horizontal and vertical launch sites proposed by MLI will encompass a minimal footprint. Existing structures will be repurposed to the extent possible, and additional structures will be constructed in accordance with existing zoning laws. As currently envisioned, renewable energy, solar, and wind generated technologies will be used for electrical power. As MLI is only proposing the launch of small lift class vehicles, the vertical launch site footprint will be much smaller than those that are currently utilized at other launch site facilities.

### **Q: What are vertical and horizontal launch vehicles?**

A: Traditional vertical launch vehicles typically take off under rocket power from a fixed launch pad. Traditional vertical launch vehicles are defined based on their payload weight that the vehicle can deliver to LEO. This ranges from small launch vehicles that can carry payloads of up to 3,300 pounds through large launch vehicles that can carry payloads larger than 15,000 pounds. MLI is proposing to limit the site development to only support small launch vehicles.

Horizontal reusable launch vehicles are launch systems that can take off and land on conventional runways. The horizontal reusable launch vehicles can takeoff under either jet power, like a conventional aircraft, or under rocket power. Horizontal reusable launch vehicles can land by means of jet power or a controlled glide. MLI is proposing to initially focus on horizontal launch systems the depart the airport under jet power.



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## **Q: Where are we in the project development process?**

A: The MLI effort to construct and operate horizontal and vertical launch sites, and a command and control center, is currently in the site selection and feasibility stage of the project development process. In an effort that was funded by the State of Michigan under Section 501(2) of Public Act 28 of 2019, and the associated grant agreement with the Michigan Economic Development Corporation, a series of studies are being conducted to evaluate the technical feasibility of launch operations at potential sites around Michigan. Upon completion of the feasibility studies, a Federal Aviation Administration (FAA) Office of Commercial Space Transportation (AST) launch site operator licenses will be pursued for both the vertical and horizontal sites.

## **Q: What is the process for obtaining an FAA launch site operator license?**

A: To obtain a launch site operator license, applicants must follow the process described in 14 Code of Federal Regulations (CFR) Part 420, License to Operate a Launch Site. Before making a license determination, the FAA will conduct environmental, policy, location, and safety reviews. The **environmental review** portion of the license application analyzes the potential environmental impacts that could result from the construction and operation of a launch site. The **policy review** determines whether potential exists to affect U.S. national security, foreign policy interests, or international obligations. For the **launch site location review**, the applicant must demonstrate that at least one type of the proposed expendable or reusable launch vehicles can be safely flown from the launch site. In the **safety review**, the applicant must demonstrate an understanding of potential launch site hazards and provide operational plans to safely support launch site operations.

## **Q: Will these projects impact the environment?**

A: A preliminary environmental screening is being conducted as part of the ongoing site selection and feasibility studies. A comprehensive environmental review for each proposed site will be prepared by the FAA pursuant to the National Environmental Policy Act (NEPA). NEPA, which requires Federal agencies to evaluate potential environmental impacts, applies to a Federal agency's decisions and actions, including the approval of the projects proposed by the MLI. The FAA's environmental review will evaluate the potential environmental impacts and measures to avoid, minimize, or mitigate them.

## **Q: What do rocket launches sound like to the surrounding community?**

A: Noise generated from rocket launches varies greatly for different launch systems. For horizontal launch systems that take off under jet power, the initial noise is like other aircraft operations. It is unlikely that members of surrounding communities would hear rocket noise from horizontal launch operations, as rocket ignition would occur over open water at significant distances from land. Noise from vertical launch operations would be audible; however, it would be temporary, infrequent, and only loud enough to result in minor impacts like disruption of conversations.

## **Q: What types of jobs will be created?**

A: Aerospace companies bring with them high paying jobs. The median salary for an R&D senior systems engineer is approximately \$103,900 per year. A senior mechanical system engineer makes approximately \$97,800 per year. Other construction, manufacturing, and trade jobs are also anticipated to be created.

## **Q: Michigan's Upper Peninsula attracts visitors who enjoy the natural beauty and serenity. How will the commercial space launch sites impact tourism?**

A: Visitors will still be able to enjoy the natural beauty and serenity of Michigan's Upper Peninsula. Additionally, as demonstrated in Brevard County, Florida, economic revenue spikes are directly tied to launch events. Hospitality, dining establishments, and other tourist destinations stand to benefit from the increase in visitors.

## **Q: How will the launch sites be funded?**

A: MLI envisions the launch sites will be funded through a public/private partnership.

## **Q: Forest fires are a constant threat during the summer and fall; how can this risk be mitigated?**

A: Firefighting contingencies are launch specific and are coordinated as part of the comprehensive launch planning process. As part of this process, a fire mitigation plan will be developed to address risks associated with launch failures. For both vertical and horizontal launches, the flight path will carry the rocket immediately over water, minimizing risk of forest fires near the launch site.