

Project MAXIMUM BOOST: Executive Summary

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The proposal. X1 Racing proposes an \$11.0 billion federal strategic investment under the United States Investment Accelerator (Executive Order 14255): a \$2.2 billion direct tranche deployed at closing, plus \$8.8 billion released dollar-for-dollar against verified private sponsorship. With up to \$8.8 billion in matched private capital, total program impact reaches \$19.8 billion. Federal exposure is capped at \$2.2 billion if sponsorship fails to validate the program.

The deliverable. Type certification of an integrated package (airframe, SI co-pilot, and opposed free-piston linear generator powertrain) under a new FAA aircraft and operator certification category for SI-augmented private-use Advanced Air Mobility. The target is January 20, 2029, the last date the Investment Accelerator's executive-order authority can be relied upon.

The mechanism. The X1 Cup is a fully unmanned flying-car racing championship. Up to fifty instrumented aircraft flying in parallel generate general operational data at the rate the 2029 deadline requires, while designated Danger Zones allow full contact between machines and reduce SI authority, keeping only what is needed to prevent collateral damage, to capture failure modes no civil certification campaign can. The X1Racing Game, the same interface that pilots the live aircraft, runs a digital twin calibrated against race telemetry, letting players generate multi-aircraft interaction data at a scale and complexity no flight program can reach. Racing operates under existing FAA authorities, and MOSAIC, the Department of War Acquisition Transformation Strategy, and EO 14255 together form a complete regulatory on-ramp requiring no new statute.

Two phases. Phase 1 runs until certification, with all IP and operational data shared among teams, government, and the FAA to compress the timeline. Phase 2 begins on certification: teams privatize their IP and commercialize, while operational data sharing continues for safety oversight.

The safety case. An SI co-pilot certified as second crew member eliminates the dominant causes of general aviation fatalities. The paper derives a projected rate of 30 to 70 fatalities per billion miles, below walking, driving, and current general aviation, even after penalizing for a vastly expanded operator population.

The powertrain case. The Formula 1 hybrid power unit and the large two-stroke marine diesel both reach roughly 50% brake thermal efficiency, each capped by mechanical losses: valvetrain, piston side load, crankshaft friction, and cylinder head heat rejection. The opposed free-piston linear generator eliminates all four. The program sets 60% as an initial target, with no cap,

against a first-principles design point in the high 60s. Certified in Phase 2 as a standalone engine, the powertrain serves freight, grid generation, and defense.

Equity structure. Federal: 10% non-voting, with a senior liquidation preference (first claim on assets in any dissolution) and no voting or operational control. Teams: 25% voting stock, earned at 0.5% per car (four cars maximum per team, 50-car aggregate cap) and vested by starting races and completing laps. Treasury: 14% non-voting reserve. Leadership: 51% super-voting.

The return. Morgan Stanley's 2021 revision, which lowered its own prior estimate, projects a \$1 trillion global AAM market by 2040 and \$9 trillion by 2050. The program unlocks that market for American industry through six returns: federal equity, a new certified industrial sector, aviation capability transferred into American automotive OEMs, dual-use defense capability, energy sovereignty, and trickle-down employment and supplier growth.

The precedent. The Interstate Highway System used matched federal capital to catalyze continental-scale automotive industry. Apollo used public spectacle to accelerate civilian technology by decades. Project MAXIMUM BOOST applies both models to personal air mobility.

Full paper: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6621460