SOAR Oregon Testimony to the Joint Ways and Means Committee on Transportation and Development

The advent of the manned aviation industry in the 1920's created hundreds of industries and countless jobs for those states that were willing to make the necessary investments to support a new technology. Today those states have an industry worth billions in revenues and hundreds of thousands of jobs.

Oregon has just such an opportunity right now. The commercial UAS or commercial drone, industry today is where manned aviation was then or the PC industry was in the mid-1980's and it represents similar economic potential. But this opportunity is fleeting as other States, and even other countries, compete for UAS jobs.

There are only six FAA authorized test sites with ranges in 10 states. Oregon has three of those test ranges in the rural communities of: Pendleton, Tillamook and Warm Springs. These ranges represent tangible assets of the State, and an opportunity for Oregon to establish an industry that goes well beyond aviation, and will spawn many ancillary and supporting businesses around robotic systems – many of which will revolutionize our lives.

SOAR, funded last biennium by the state to help create this industry, has been the leading advocate and the driving force behind civilian uses of drones in Oregon. Our goal is to develop the Oregon test ranges to meet the standards required by the FAA and advocate for businesses to use these ranges to commercialize their UAS products. We seek to create the same types of self-sustaining technology clusters surrounding these Ranges as have occurred throughout decades of manned aviation economic growth.

This is an entirely new category of systems that are designed from the outset to function autonomously and allow us to do things in ways that are either impossible or extremely costly today.

Even more exciting are the dozens of businesses that are developing in support of the UAS industry. Many of these businesses will address sectors of the market completely unrelated to aviation: everything from ground and sea vehicles to new approaches to smart/lean manufacturing.

In more practical terms, the expectation for jobs creation in Oregon is 1510 new jobs of which 690 are directly related to developing UAS and 820 indirectly related. These jobs represent $405MM in economic value by the end of the third year with the three ranges fully functional.

SOAR has advocated tirelessly within the state and at the federal level with our lawmakers and the FAA. We have worked side by side with our ranges to resolve operational and regulatory issues related to flight and we are closing in on making the Oregon test ranges an operational reality.

Last month, Governor Brown announced an investment of $1.6MM for upgrading the infrastructure at the Pendleton to meet the FAA requirements. Similar infrastructure investments are currently working their way through the system for Tillamook and Warm Springs.

The $3.5MM that we are requesting this biennium is to provide the essential personnel necessary to take advantage of that infrastructure investment and make the Pendleton range the first of our ranges to fully comply with the FAA requirements. These people are needed to meet industry and FAA requirements. Without them, the ranges cannot fly—cannot succeed—regardless of funding for physical improvements.

None of this can happen without the approval of our request. And its important to understand that this is not a "like to have" number – that was $7.1MM. The $3.5MM is the amount absolutely required to allow Oregon to become competitive in this industry sector and bring our ranges up to the level required by the FAA.

Executive Summary

Oregon has a once-in-a-century chance to lead a new industry valued at $6B today and $90B over the next decade: civilian unmanned aircraft systems (UAS or "commercial drones").

To help seize this opportunity, SOAR Oregon, a 501 (c) 6 established in late 2013 to develop Oregon's UAS industry, has prepared a lean, entrepreneurial business plan to make Oregon's three UAS test ranges, located in Pendleton, Warm Springs and Tillamook, operational.

SOAR Oregon asks the Oregon Legislature to make this plan a reality by investing $3.5 million through Oregon Innovation Council funding in the 2015-17 biennium.

SOAR Oregon's business plan proposes two alternative paths toward our goal of having three fully operational test ranges:

- Via an RFP, find a vendor who will run all three ranges simultaneously on a "services on demand" basis; or
- In the event we are not able to find a suitable vendor, use our budget to make the ranges operational in sequence. We will focus our initial efforts on the Pendleton range, which has strong financial support and commitment from the City of Pendleton[1], defined customer interest, and is the most operationally advanced of the three ranges. This first range will serve as a stepping-stone to making the Tillamook and Warm Springs ranges operational.[2]

The test range opportunity is time-sensitive. If not funded this biennium, Oregon will miss the chance to lead an industry that promises to bring jobs and economic development to rural communities and the I-5 corridor. What's more, if Oregon does not bring its test ranges online soon, the state's existing UAS industry, which currently provides more than 1,000 jobs, may plan to expand outside of Oregon, in states that *do* have operational test ranges.[3]

The range(s) will anchor a UAS ecosystem that creates jobs statewide in a broad range of industries, including software, robotics, chips, and aerospace. In the civilian, manned aviation industry, test ranges have anchored innovation and high-value supply chains (machining, materials, electronics, etc.) for several decades. Likewise, this $3.5 million investment will produce an enduring benefit to be measured over a span of decades, or at least as long as we can imagine humankind using air traffic for commerce.

Funding this business plan will:

- **Create high-wage jobs.** If we bring ranges on sequentially, we predict the Pendleton range will net 90 jobs. We conservatively predict three fully operational ranges will bring 1,510 new jobs—687 directly related to test range support and 823 in related industries – with an average industry wage $20,000 above the state's average.[4]

[1] To date, only the City of Pendleton has committed the funds and time sufficient (approximately $535,000 and twelve months of work) to have flown an FAA-approved test range flight.
[2] Supplemental operational funding of $2.95 million - not sought in this business plan - would allow the Warm Springs and Tillamook test ranges to also become operational on a daily basis.
[3] Soar is aware that at least 3 Oregon companies are flying test ranges in Nevada, North Dakota and elsewhere.
[4] Figure based on $68,000 average industry wage in the Gorge vs. statewide average of $45,780.

- **Retain and attract economic activity to the state.** Today, Oregon is virtually unknown as a potential test-flight market; even customers from Washington and Oregon have approached sites other than Oregon for opportunities to fly. The Oregon Innovation Council funding will be used to build awareness that Oregon is an active location nationally and within the Pan Pacific test site.

  Functional ranges are where Oregon businesses can test close to home on a daily basis. A fully functional range will keep Oregon companies from exporting their test activity, jobs and economic impact to other states with FAA test sites. Oregon ranges are also the closest to aerospace and technology centers in southern California, Silicon Valley and Seattle, where we plan to start recruiting once we have a range running on a daily basis. This will be the first step toward an estimated $404.6 million in total economic activity that will be brought to Oregon three to five years after the 3 ranges are fully functional, this on top of the existing established local UAS industry cluster, worth more than $330 million today.[5]

- **Boost the economy in rural areas.** All of our test ranges are located in rural areas. Even a single test range will boost the economy in rural Oregon immediately, and will also create a statewide impact. Companies supporting flight activity and product development located in Central Oregon, the Gorge, Portland and the I-5 corridor will reap benefits right away. The statewide benefit will become more pronounced as all ranges come into full time operation. Meanwhile, many of the proposed UAS applications, such as those that support precision agriculture, would also have a positive economic impact on rural areas.

Oregon's Test Ranges' Role in Launching a New Industry

Across the nation, there are only a handful of FAA-designated test ranges where civilian UAS can be flown and their uses developed. The Teal Group estimates approximately $9 billion of latent demand which can be met if the FAA:

- Provides air space to develop safe, airworthy, market-ready products.
- Develops the critical safety processes and certifications needed before UAS will be allowed to fly in the National Airspace System (NAS).

The FAA expects the test ranges to be the major conduit to achieve these two goals. In the first decade after UAS are integrated into the national air space, studies assess industry impact of nearly $100 billion, with 100,000 jobs created by 2025.[6]

Fully functioning test ranges are necessary, foundational elements in establishing this new industry. PCs and the Internet were the job platform for the 1990s; mobile devices are the job platform now. Autonomous systems will be the next high-tech job platform. Commercial drones are not only Oregon's entry point to that market—they are the way to become a national leader.

That being said, Oregon cannot operate *<u>any</u>* test range without the investments necessary to meet the FAA's exacting guidelines for test range staffing. To operate, a range must have a

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[5] Using inputs of 1000 direct employment for the Oregon/Gorge UAS cluster and the standard economic impact multipliers from the OSU Soar study.

[6] The Teal Group. 2014 UAS market profile and forecast and http://www.auvsi.org/econreport

minimum core set of skills embodied in its staff. Without those skills on the ground, a range is unable to function on a dependable (i.e. when industry needs) basis. It is akin to putting only 2 or 3 wheels on a car. Details about these requirements are included in the SOAR Business Plan.

Why Oregon is a Natural Fit for Developing UAS

"Commercial drones" are an entry point to the much bigger field of ever more capable autonomous robotic systems. Autonomous vehicles, whether on ground, in air, or in water, sit at the confluence of dozens of technologies Oregon has prioritized as paths to a prosperous economic future: high tech, software, data analytics, robotics and precision manufacturing, composites, battery and energy storage technology, forestry, agriculture, marine sciences, wild land firefighting and tsunami (disaster) management. A developed UAS ecosystem will drive innovation and industry cluster development in all of these areas for many decades.

In the mid-2000's Oregon, and Deschutes County in particular, had a growing aeronautics sector. The recession eliminated hundreds of jobs in the industry. The burgeoning UAS sector could give the talent associated with those lost jobs a new, high-wage place to apply their skills.

How SOAR Oregon Has Put Prior Grant Funding to Work

SOAR Oregon was founded in the 2013-2015 biennium by an $882,000 Business Oregon grant. SOAR's mission on founding was to use select industry grants to grow jobs and seed strategic products. Mid-way through the biennium, as the importance of test ranges became apparent, Business Oregon and SOAR pivoted to the crucial task of bringing the test ranges into operation to anchor strategic clusters for Oregon.

In the 2013-2015 biennium, the $882,000 was used to:

- Fund targeted business-development grants that were leveraged at more than 8:1 by industry funds. These grants establish the basis for the addition of 80+ jobs as these projects are completed.
- Hire an Executive Director to coordinate the State's first year of actions and its relationship with Alaska as part of the Pan-Pacific UAS Test Range Complex (PPUTRC), and establish how the FAA and industry wish to work with the test ranges.
- Hire a Chief Operations Officer to serve as "air boss" for the State's three ranges. The COO is the first of a core group of employees who bring skills required by the FAA to operate a test range.
- Commence marketing Oregon test ranges at national and regional industry meetings.

Why More Funds are Needed Now

The December 2013 FAA designation of three Oregon test ranges did not come with any federal funding. Since that time, no state money has been available to make the Oregon ranges operational, in part because they received FAA designation after the 2013-2015 biennium budget was set. Consequently, some 18 months will have passed without the opportunity for the state to make a considered financial commitment to its test ranges. In contrast, Alaska, Nevada, North Dakota, Texas, New York, and Virginia have each allocated

from several million to tens of millions of dollars to establish their ranges (see table on page 14 of the Business Plan). Fortunately, to date, Oregon has lost no serious ground to its competitors. This will not be the case if the Oregon range(s) are not funded in this biennium.

Oregon is at a critical juncture: without additional investment, the state risks losing both its competitive advantage in this industry and established companies that have grown our economy over the last decade. Oregon must now invest in the assets necessary to receive FAA approval on proposed flights at our test ranges. $3.5 million in 2015-2017 will allow us to:

- Fund one of our two paths to three fully operational ranges, as outlined above;
- Start marketing Oregon as a place to flight test;
- Execute strategic business development projects—focused on retention, recruitment, and "grow-in-place" partnerships, specifically:
    - Recruit: We currently have leads with two major out-of-state UAS manufacturers and certain members of the Small UAV Coalition (which includes Airware, Amazon, Facebook and Google).
    - Retain and "grow in place": We want to "bring home" a number of local UAS companies who are currently flying at other test ranges and in Canada and Australia. At least one of our natural constituents, a northern California UAV company with a stated preference for flying in Oregon, has submitted applications to fly at competitor test sites. This illustrates the very real risk of local companies voting with their feet and taking existing Oregon jobs to other states;
- Manage day-to-day relationships with various stakeholders, including Oregon State University, Oregon's Congressional delegation, and the FAA along with other regulatory bodies;
- Work with the Oregon Office of Emergency Management to develop plans to test UAS in a number of disaster scenarios, a business opportunity we cannot pursue given current assets; and
- Better position Oregon to grow its leadership role in the UAS industry.

SOAR Use of $3.5 M of Oregon Innovation Council Funds 2015 -2017		
	$1.86M	Core unit of range skill sets via contractor for three ranges, or 11 employees (PDT)
	$1.15M	Chief Operations Officer, Designated Airworthiness Representative, Executive Director, Business Development lead, office support
	$495K	Contracted services, marketing expense, insurance and running costs

Most of these dollars will fund the hire of the full cadre of specialists the FAA requires ***before*** regular flights can take place at Oregon's ranges.

Return on Investment

The ranges' economic goal will be to generate more long-term private economic activity than public cost.[7] However, the test ranges must be viewed as the infrastructure necessary to establish an industry cluster, rather than as significant moneymaking opportunities in themselves. Just as highways and airports are judged in terms of the economic activity they facilitate, UAS ranges must be valued by the businesses they directly and indirectly propagate.

A local flight test option will aid in retaining existing jobs in Oregon. If the precedent of manned aviation is followed, then this job and innovation platform is likely to continue generating jobs and innovation for many decades, just as it has in southern California.

The OSU/Soar study estimated the generation of $404.6 million of economic activity within 3 to 5 years of Oregon's ranges becoming fully operational, thus multiplying the return on the State of Oregon's $3.5 million investment by more than 100 times.

Call to Action

Compared to other states with test sites, Oregon has yet to provide the funding necessary to bring its test ranges into operation. Meanwhile, our competitors in other states have invested millions in their test ranges to capitalize on the business opportunities and jobs associated with UAS. If the Oregon ranges are not developed, the State runs **a strong risk of losing many of its existing UAS businesses**, as they will naturally gravitate to other states that offer test capability. To lose these businesses would represent the loss of 1,000 **existing** jobs and close to a third of a billion dollars of economic impact.

Today, Oregon is the only state without the core people in place required to operate its test ranges. **SOAR Oregon** is primed to prevent the loss of existing Oregon jobs and make our state a player in the UAS testing market. To make this vision a reality, however, we must secure $3.5M in the 2015-2017 biennium to provide Oregon's ranges with sufficient physical assets, world-class technical personnel, and product offerings tailored to customer needs. With this funding in place, we expect the Oregon ranges to be self-sufficient within 2-5 years.

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[7] Fortunately, UAS systems require much less physical infrastructure than, for example, a major airport. Range capability—and competitiveness—will be defined largely by human expertise and the sophistication of a range's flight and business operations in addition to reasonable capital investment.