

The background image shows industrial machinery, likely for manufacturing, with large stainless steel tanks and pipes. An orange horizontal band is overlaid across the middle of the image, and a blue gradient band is at the bottom. The text is centered within the orange band.

Rising to the challenge of making PPE as a community
and what it means for recovery



MAGNET

Ohio

Manufacturing
Extension Partnership

NEO manufacturing is a powerhouse...



Almost half
the regional
economy



Almost
300,000
jobs



Every job delivers four more



38% of Ohio's
manufacturing GDP

But the future is coming fast...



TALENT TIMEBOMB

In Jan 2020, 60% of NEO
manufacturers said they
couldn't find the skilled
workers they need to grow



AVOIDING INDUSTRY 4.0

Industry 4.0 is at the bottom
of the priority list for NEO
manufacturers



IGNORING INNOVATION

75% of NEO manufacturers
say innovation is
NOT a priority

Our vision for manufacturing



Talent
Surplus

WE HAVE A TALENT SURPLUS.

People are lined up for manufacturing jobs. We are the capital of manufacturing education in the U.S.



Diverse
Workforce

WE BUILD A DIVERSE WORKFORCE

Our factories are as diverse as our cities. Manufacturing gives everyone a potential pathway from poverty to prosperity.



Ignite the
Pride

WE IGNITE THE PRIDE IN MANUFACTURING

We are proud to be one of the fastest growing and most innovative manufacturing hubs in the world.



Digital
Leader

WE ARE A DIGITAL LEADER IN MANUFACTURING

We are no longer the "rust belt." We are the "technology belt." We adopt Industry 4.0 a decade before our competition.



Innovation
Culture

WE HAVE AN INNOVATION CULTURE

We lead with ideas. NEO is the "first choice" for manufacturing start-ups and leads the country in R&D.



Investment
Hotbed

WE ARE AN INVESTMENT HOTBED

Our manufacturing know-how, community commitment, innovation, and digital leadership deliver very attractive returns.



Partnership
Powered

WE ARE PARTNERSHIP POWERED

Companies and communities work together to solve systemic problems because we all believe manufacturing is our future.

4 KEYS

Unlocking Our Future



TALENT

Build the workforce
we need to win
in the future, today.



TRANSFORMATION

Use Industry 4.0
technologies to
unlock advantage.



INNOVATION

Pioneer new products
& services, and new
ways of working.



LEADERSHIP

Boldly lead
our companies
and region



- Manufacturers stepped up to make PPE in Ohio demonstrating rapid pivoting and resiliency
- Economic development and government worked together to facilitate impact
- Glimpsed a vision of the path out of recovery built from Industry 4.0, workforce, and reshoring



Ohio

Manufacturing
Extension Partnership

Our collective goal was to find and/or make PPE as fast as possible for our first responders



Opportunistically identifying ready-to-go sources and handing them off



Finding new ideas and engaging manufacturers with capabilities to help including creating a Makers' Exchange



Understanding/researching specifications and needs from hospitals and FDA/CDC on specific PPE in order to share with manufacturers and engineers



Identifying, coordinating, designing, and vetting with users alternatives for each major PPE product need



Problem-solving supply shortages for each major PPE product need and finding local manufacturers to produce



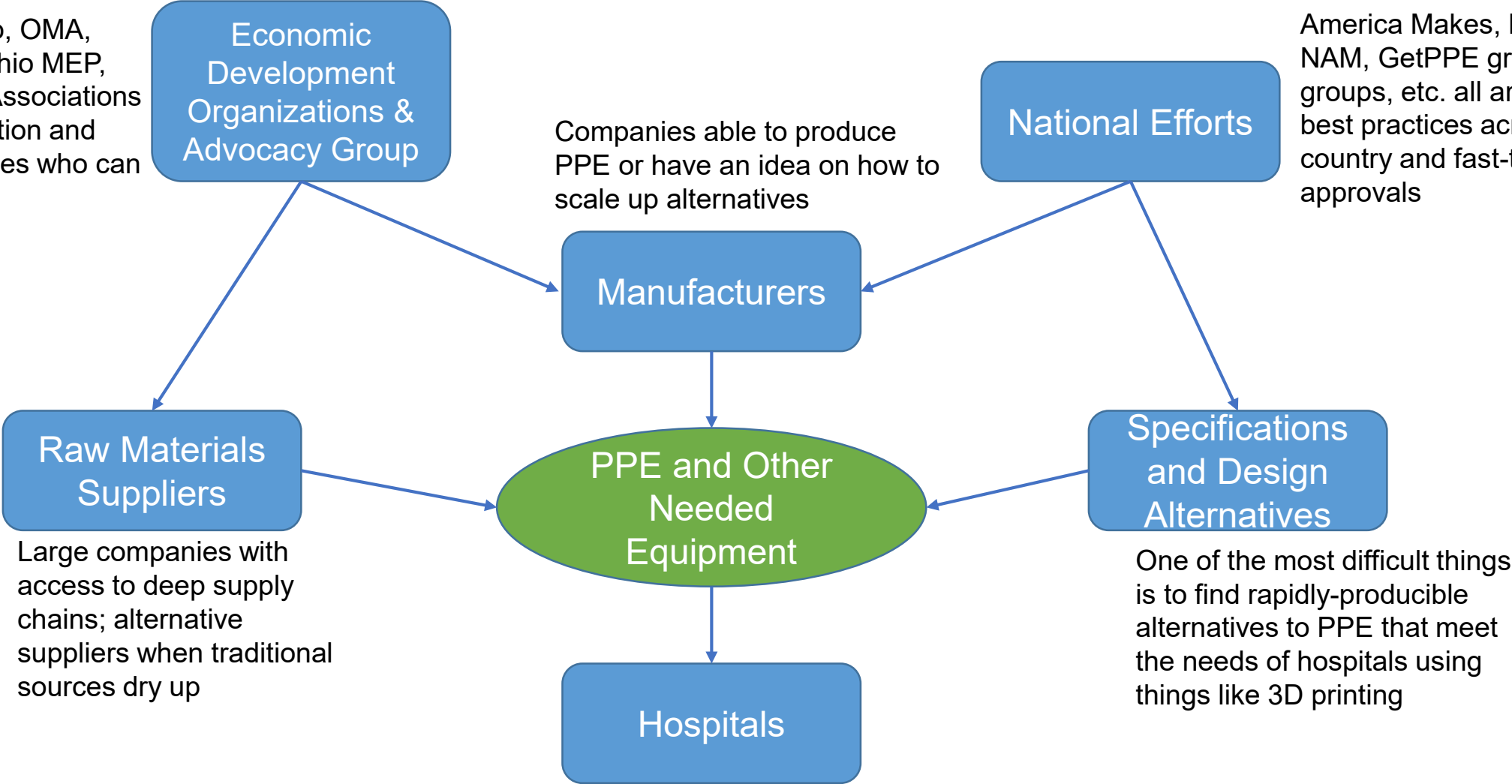
Streamlining manufacturer outreach to hospitals and end-users to speed development and coordinate activities



We showed that there were so many ways to collaborate



State of Ohio, OMA, JobsOhio, Ohio MEP, Chambers, Associations feed information and find companies who can participate



America Makes, NIST MEP, NAM, GetPPE groups, maker groups, etc. all are sharing best practices across the country and fast-tracking FDA approvals

Hospitals are actively sharing demand as well as vetting new ideas through their supply chain offices

ALLIANCE PARTNERS



OHIO MEP PARTNER ORGANIZATIONS



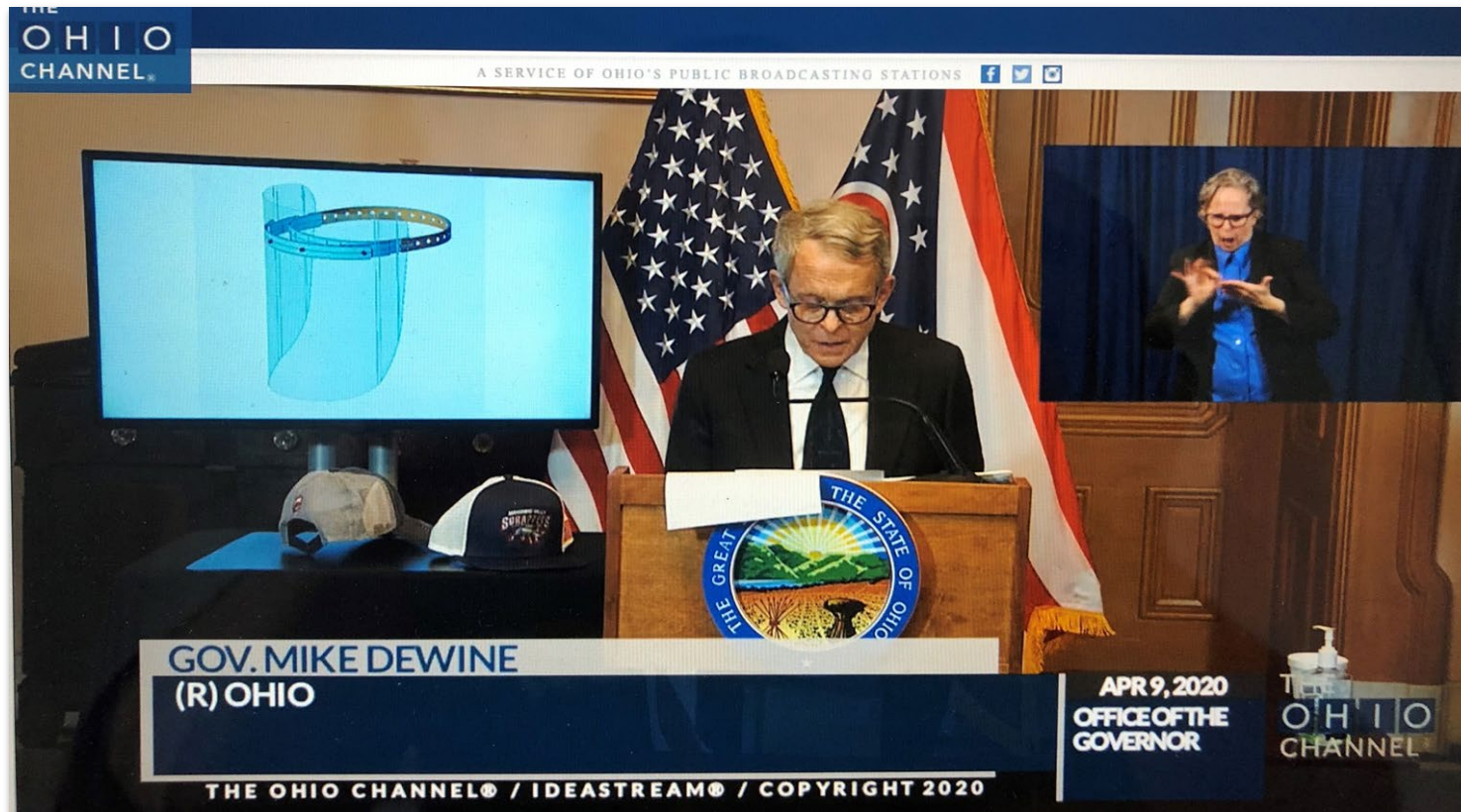
OHIO'S INDUSTRY SECTOR PARTNERSHIPS



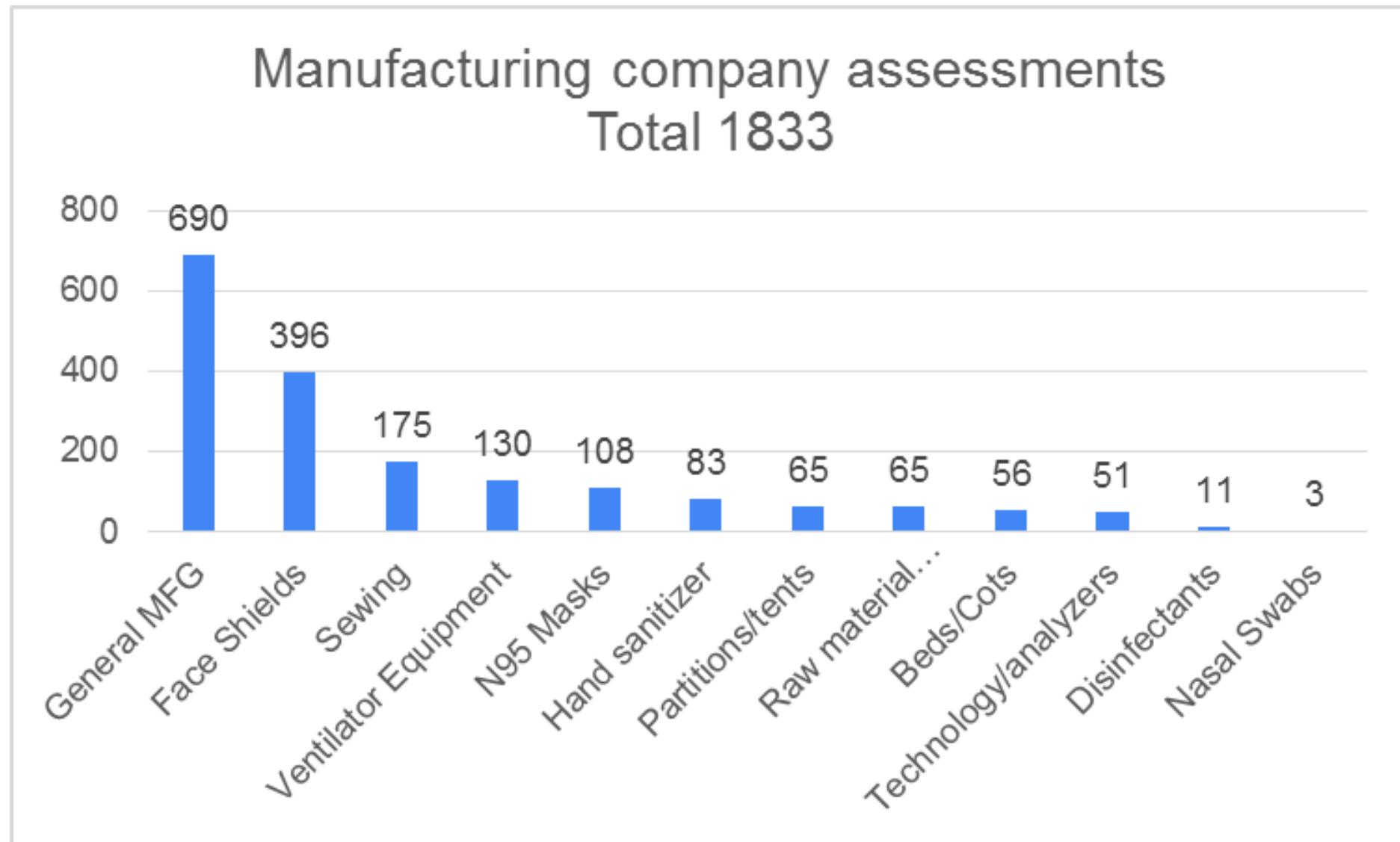
JOBSOHIO PARTNERS



From idea to running after one press conference



1800 companies responded in days after announcing this initiative



Needed products at the beginning of the pandemic



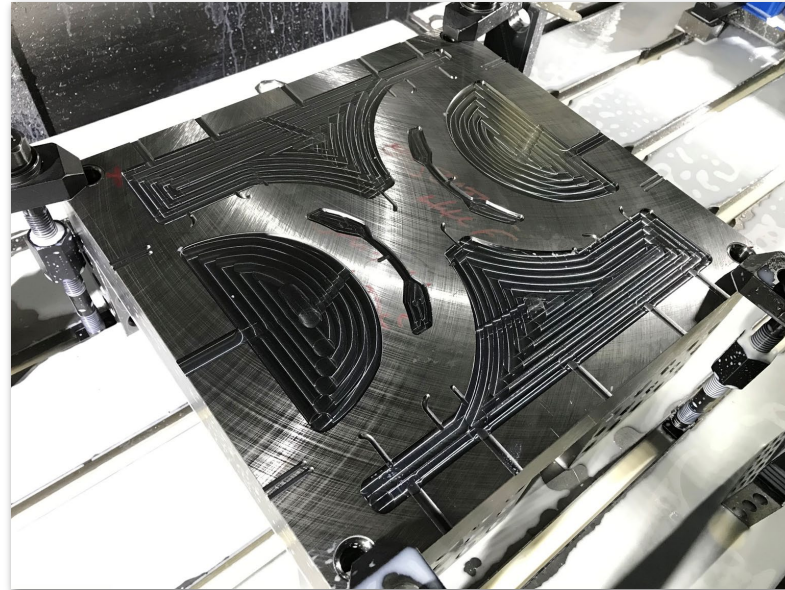
COVID-19 critical supply list

Providers can expect the following supplies to currently face or be at-risk of facing major supply shortages

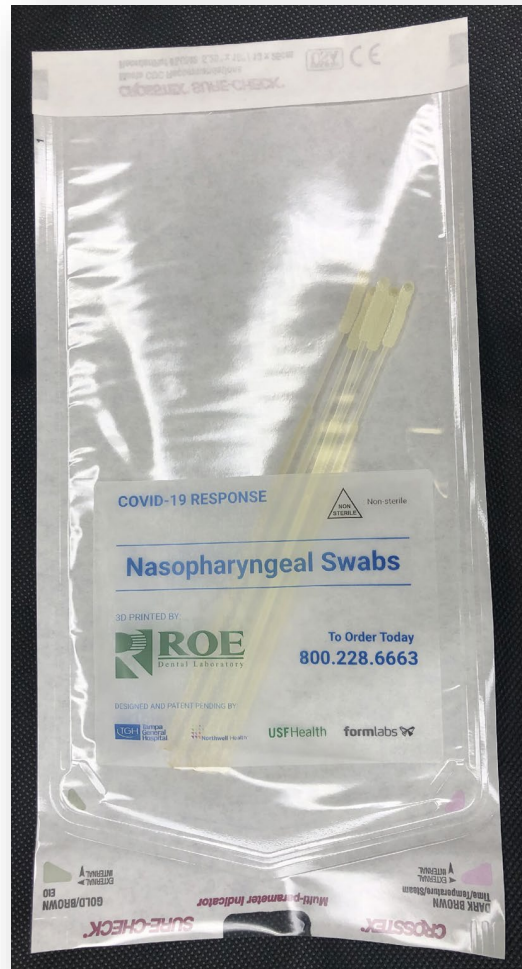
■ Currently facing shortages
■ Expected shortages in immediate term

Diagnostics and testing	<ul style="list-style-type: none"> □ ELISA and RT PCR laboratory equipment and reagents □ Sample collection tubes □ Swabs for buccal sample collection □ Swabs for nasal sample collection □ Leak proof cups for aspirate collection □ Respiratory viral panel (RVP) □ CT contract agents □ Regular basic blood panel supplies □ Specimen transport bags 	Drugs and medical consumables	<ul style="list-style-type: none"> □ Paracetamols/Antipyretics □ Oxygen □ Infusion compound (Ringer's lactate) □ Hydroxychloroquine □ Antibiotics (for secondary infections)
Health facilities infrastructure and equipment	<ul style="list-style-type: none"> □ Ambulance with air isolation system for transport of contagious patients □ Mobile, basic diagnostic X-ray system □ Portable ultrasound □ Resuscitator □ Medical triage/treatment/isolation facilities □ Isolation room negative pressure HEPA filtration machines □ Packaging transport substance for viral sample transport □ Ventilators with portable and back-up power supply □ Ventilatory peripherals and disposables □ Anesthesia machines □ Beds 	Medical equipment	<ul style="list-style-type: none"> □ Infrared thermometer □ Laryngoscope, adult, child set □ Endotracheal tubes □ Ventilator disposables (i.e. HMEs, HEPA filters) □ Oxygen concentrator □ Oxygen face mask with reservoir bag, disposable □ Pulse oximeter, portable □ Syringes: 0.5 ml autodestruct (AD) and 5 ml reuse prevention (RUP) □ Infusion setup including pump □ Oropharyngeal and Nasopharyngeal airways □ Pulse oximeters □ Incentive spirometer □ Tracheostomy kits and devices □ Acapella valves □ Nasoenteric tube feeds □ Sequential compression devices
Personal protective equipment	<ul style="list-style-type: none"> □ Gloves □ Goggles □ Gowns (disposable and linen) □ ISO masks (PAPRs, CAPRs, N95s) □ Surgical masks and caps □ Eye/face shield □ Tyvek suits, sleeves, hoods or equivalent □ Safety box/sharps container (must be labelled "Biohazard") □ Scrubs 	Advanced	<ul style="list-style-type: none"> □ Home Care Kits for home isolation of asymptomatic cases or mildly symptomatic □ Antivirals/vaccines (in development)
		Disinfection consumables/ biohazardous waste management	<ul style="list-style-type: none"> □ Alcohol based hand-rub □ Bag, disposable for biohazardous waste PPE and clinical waste without sharps □ Body bags (suitable for burial or cremation) □ Disinfectant □ Soap, surgical □ Set: mask, gel and soap for targeted population □ Chlorine

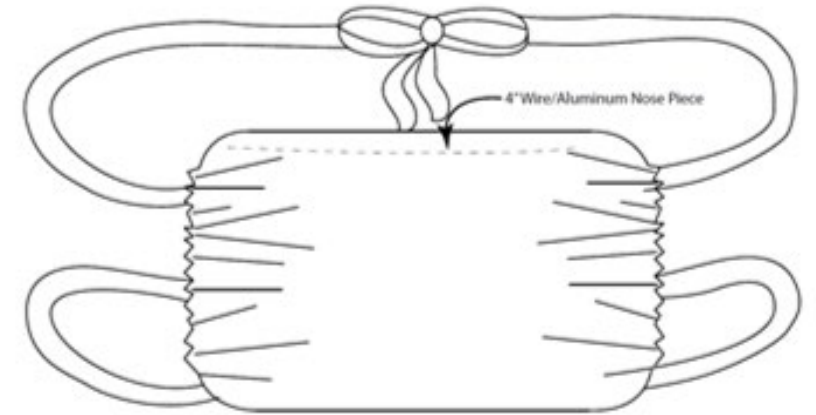
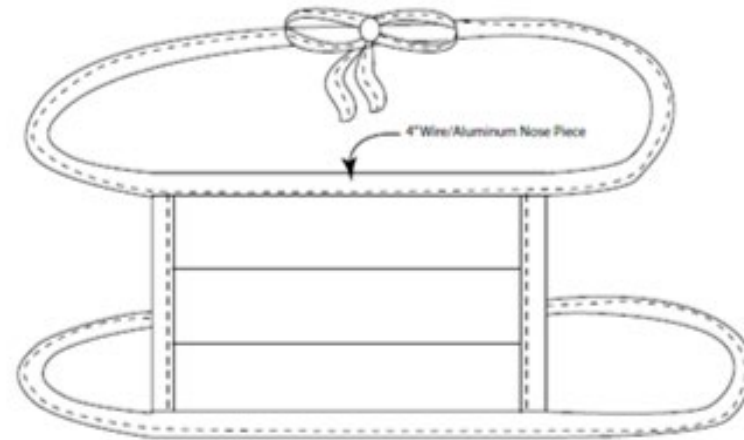
Shields



Swabs



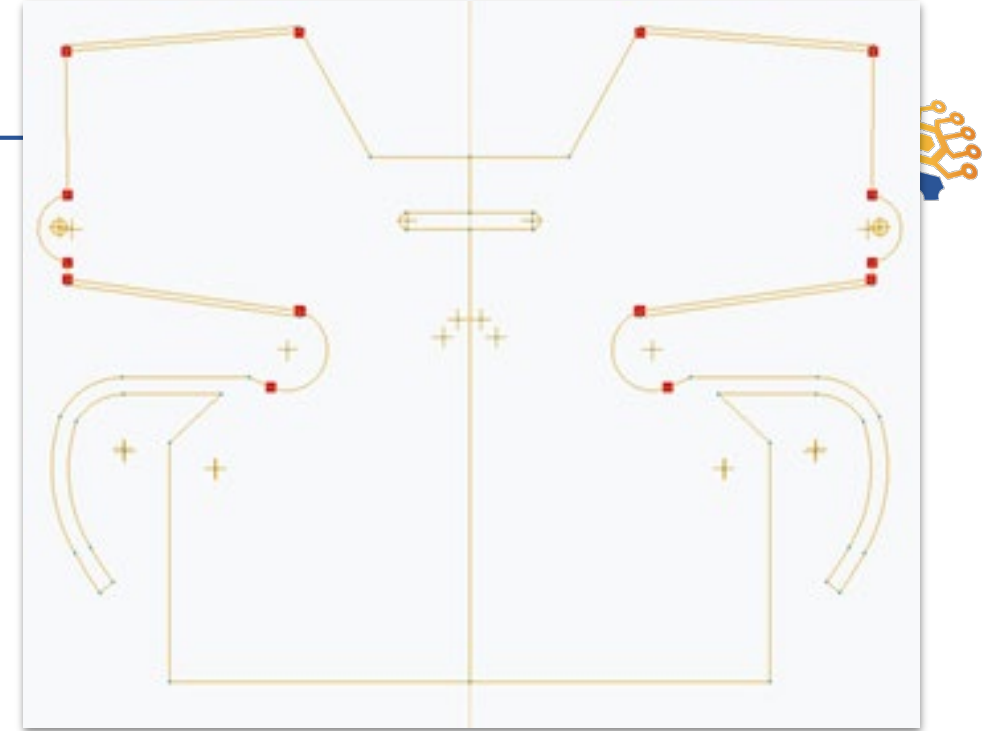
Community masks





Hand sanitizer

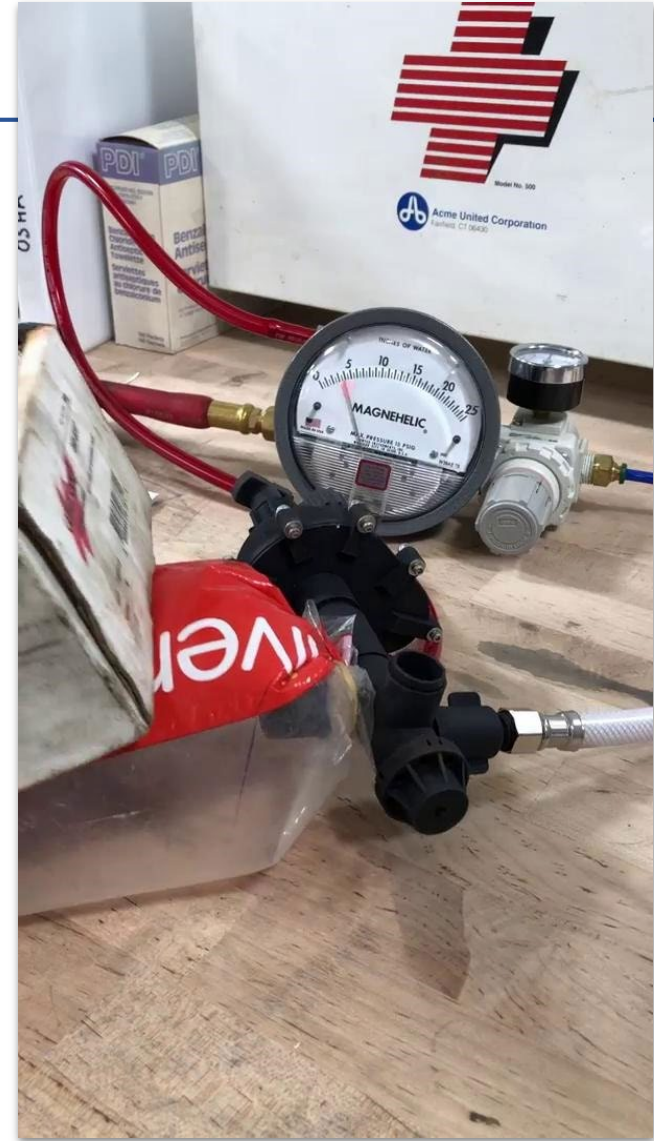




Isolation gowns



Testing booth



RapidVent





Gloves



>300 products, 250 companies, 1000+ transactions that we tracked

All listing types ▾

Grid

List

Map

ALL CATEGORIES

FACE SHIELDS

BEDS OR ROOM PARTITIONS

HAND SANITIZER

COTTON FACE MASKS

SPACE FOR HOSPITAL OVERFLOW

3D PRINTED SWABS FOR COVID-19 TESTING

GOWNS (ALL MATERIALS)


NON-COTTON FACE MASKS

PARTITIONS FOR COMPANIES (GROCERY STORES, ETC.)

GLOVES


OTHER

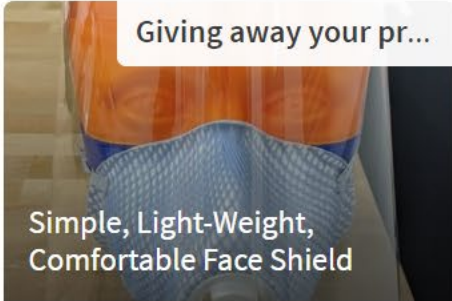
Minimum order size



\$18.50 / unit


Reuseable Face Shield

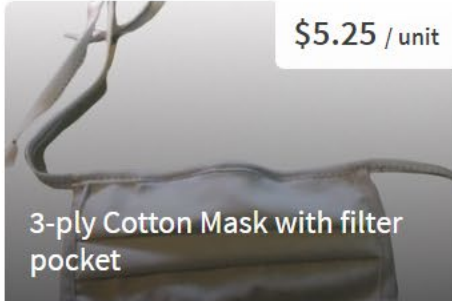
The Technology House



Giving away your pr...


Simple, Light-Weight, Comfortable Face Shield


MakerGear



\$5.25 / unit


3-ply Cotton Mask with filter pocket


Nicole H



\$13 / unit


Floor Graphics


Justin F



\$12 / unit


100% Cotton Face Masks


Davide Cotugno Studio




\$6 / unit

Cotton face masks with ties, filter pocket, and metal nose strip

Daniel B



19



While we were working to retool or repurpose for PPE, we were also providing guidance to businesses



- Industry Week published our **guide for staying Virus-free**, ways to reduce fear, ways to get the most from PPP loans and more
- Worked with **University Hospitals to create manufacturing guides** to staying safe
- Created a **COVID-19 checklist** including how to maintain culture, stay safe, use new technologies and more.
- Created **policy templates** for new COVID-19 policies in addition to webinars from major companies who were already facing them
- **Redesigned a classroom at MAGNET** to allow for our workforce programs to continue (ex-offender intro to manufacturing curriculum)

What's next? Reshoring and stabilizing future PPE



- Building on Industry 4.0 and advanced manufacturing and automation, we as a country have an opportunity to reshore, particularly PPE
- Our process:
 - 1) assess and aggregate demand,
 - 2) determine ideal design (or redesign), and
 - 3) determine automation scale required
- For products that are cost-competitive with automation (reduce labor costs), we are working with State of Ohio and the Ohio Manufacturing Alliance
- **In August, we will have reshored cotton masks as a first example**

Industry 4.0 technologies

- Collaborative robots
- Augmented reality/virtual reality
- Artificial intelligence
- the Internet of Things (IoT)
- the Industrial Internet of Things (IIoT)
- 3D printing
- Sensors
- Cloud technology
- Big Data
- Cybersecurity technologies
- More

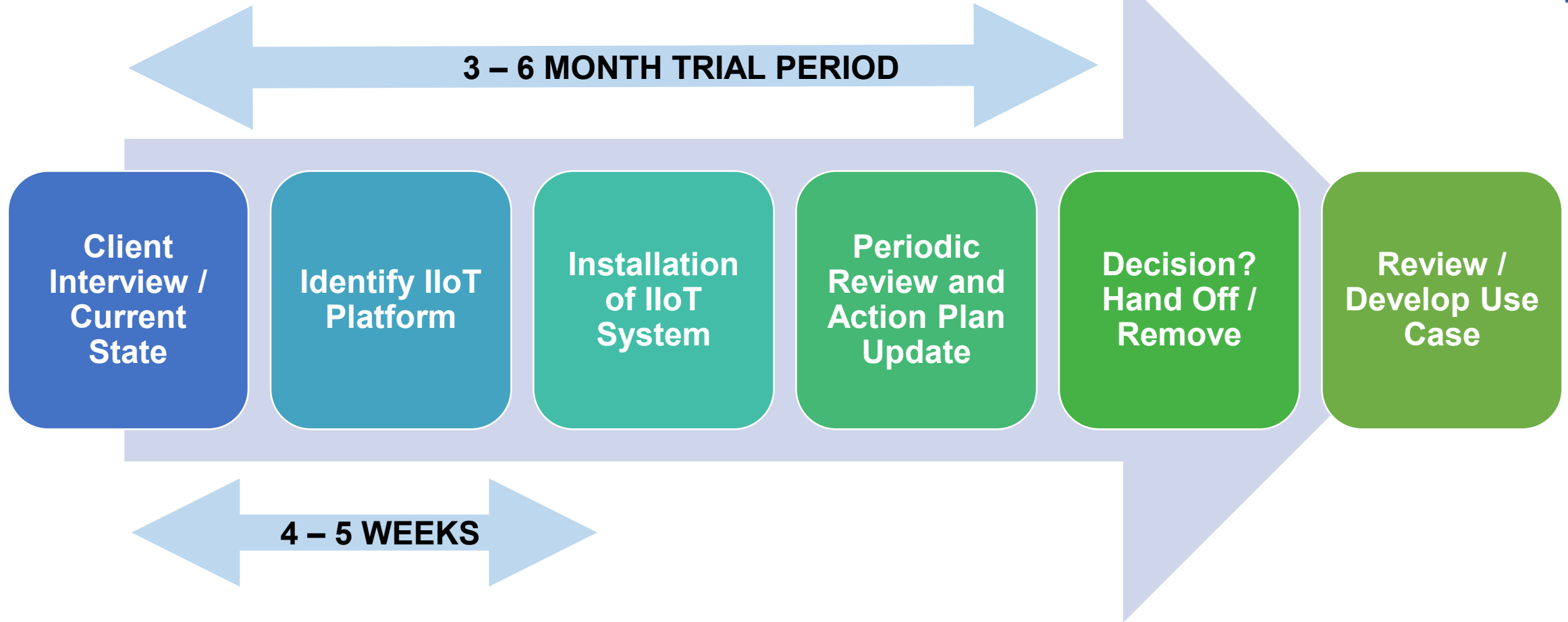


Manufacturing's future depends on Industry 4.0 transformation, which has very slow adoption on small and medium manufacturers



- Industry 4.0 is for the “**big guys**”
- Overwhelmed by the “**hype**” & consultant “**speak**”
- Interest but **confusion**
- How is IIoT different from what I have?
- **Complicated** implementation path
- Another potential **security breach**
- Return on investment is “**fuzzy**” at best
- Project funding unavailable in today's uncertain environment
- Dedicated time to projects is hard to find
- No on-site talent
- Uncertain return-on-investment (ROI)

While companies recover, we want to be sure they are transforming to come out stronger and be able to reshore and grow



Goal: Create lighthouses of companies who catalyze others to transform with Industry 4.0 and then grow/reshore



Appendix

We needed demand, supply, and technical resources to make this happen



DEMAND LEAD will act as the primary contact for all health care providers, first responders, or frontline health care teams in need of essential PPE to gather information such as products needed, priorities, quantities and specifications.

SUPPLY LEAD will serve as the primary contact for all manufacturers, suppliers, and vendors that have volunteered to gather information on companies' geographic reach, capabilities and capacity, retooling needs and on-hand inventories of products and raw materials.

ENGINEERING TEAM will:

- Develop or evaluate product concepts
- Re-design, “hack,” or retrofit existing product or sub-components
- Look for and assess open-source designs
- Keep up to date on any government-issued standards or specs
- Rapidly prototype
- Test and/or see that new product designs or re-designs meet the demand specs
- Offer design-for-manufacturing support and guidance
- Support manufacturers as they retool
- Coordinate the fabrication of urgently needed products among small/disparate organizations (*i.e. a statewide network of 3D printers*)
- Coordinate with national consortiums of technical resources working to find and design PPE alternatives like (*i.e. America Makes*)

