

MEETING NOTES: CTB Innovation Subcommittee

DATE: Tuesday, April 19, 2022

TIME: 11:00 a.m.

The meeting of the Commonwealth Transportation Board (CTB) Innovation Subcommittee was held at the Virginia Department of Transportation Central Office Old Highway Building Computer Lab, 1221 East Broad Street, Richmond, VA 23219. Director of Transportation Research and Innovation Cathy McGhee called the meeting to order at 11:10 a.m.

Present: Mr. Yates, Ms. DeTuncq, Mr. Stant, Mr. Johnsen, Ms. Hynes, Mr. Merrill, Mr. Fowlkes, Mr. Coleman, and Ms. McGhee.

Approval of March 2022 minutes – *The minutes from the February meeting were approved without comment.*

Update to Proposed FY23 ITTF Program – Cathy McGhee, Director of Research and Innovation told the committee that the ITTF proposed projects would be presented in the CTB Workshop that afternoon. The projects are the same as were presented in March except that two have been removed and a third scaled back.

Innovations in VDOT – Hari Sripathi, Director of the Office of Strategic Innovation, provided an update of innovations across VDOT. His presentation is attached for reference. Cathy McGhee told the Committee that as a result of some VDOT reorganization, Hari's team will be integrated into the Research Council.

Committee members asked about the possibility of creating Innovation Awards to further encourage participation in ideaDRIVER across all levels of the organization. Cathy and Hari agreed to investigate how this might be done.

Cathy mentioned that there will be a presentation from VTTI on their current activities at the May subcommittee meeting.

There were no public comments.

ADJOURNMENT: The meeting adjourned at 12:00 p.m. on April 19, 2022.

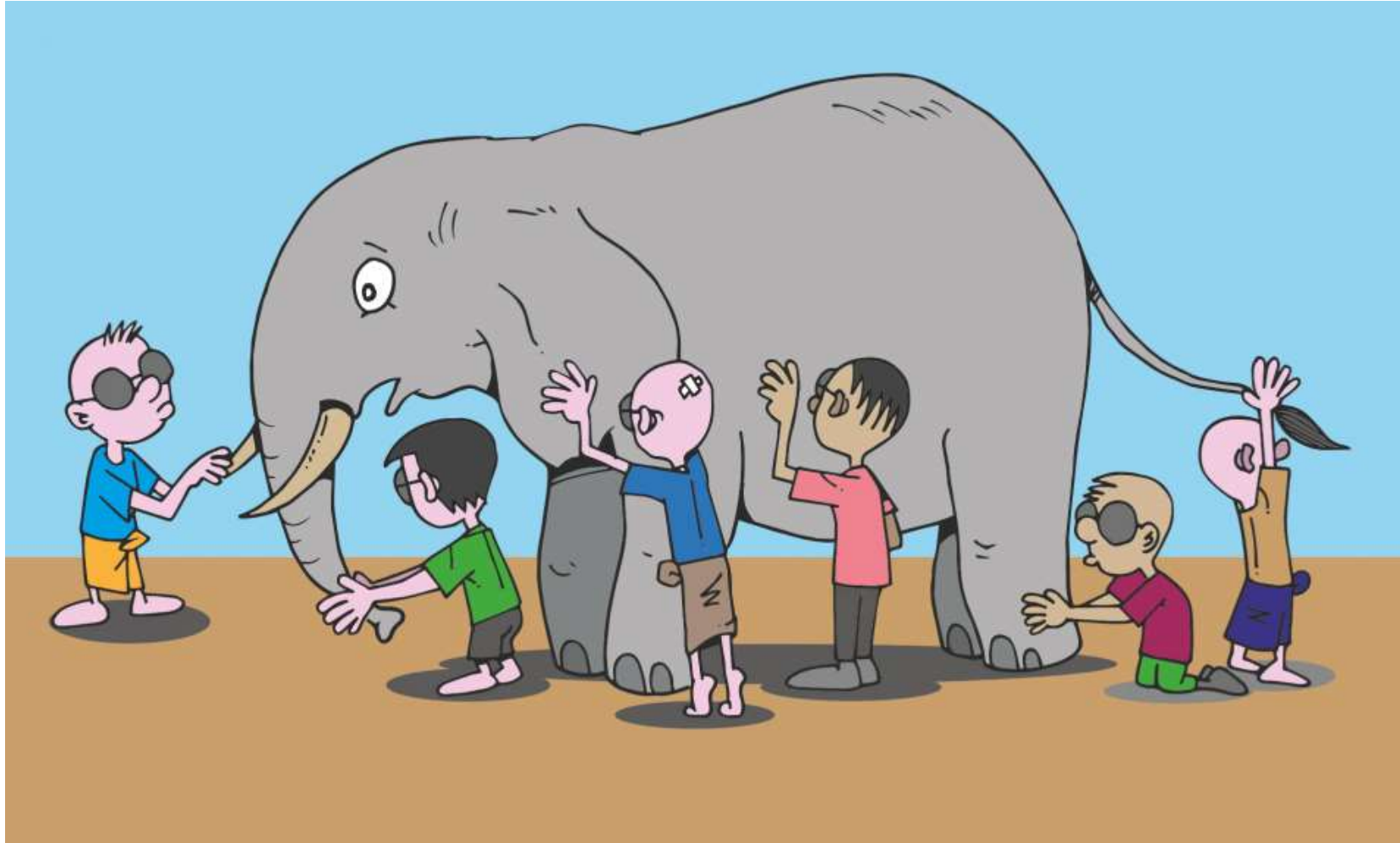
INNOVATION AT VDOT

Update to CTB Innovation Committee

 Hari Sripathi, P.E.

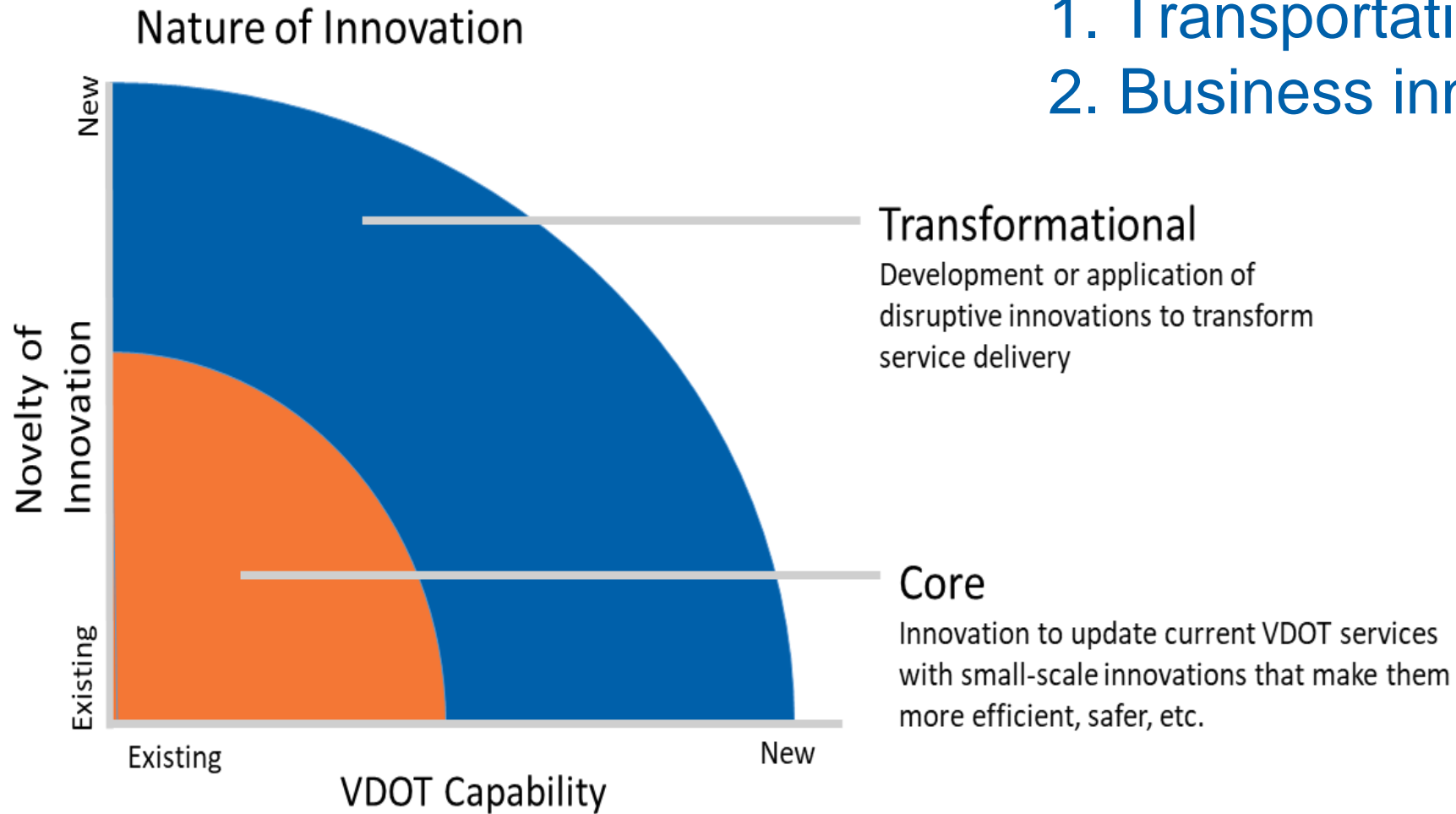
April 19, 2022

Innovation at VDOT



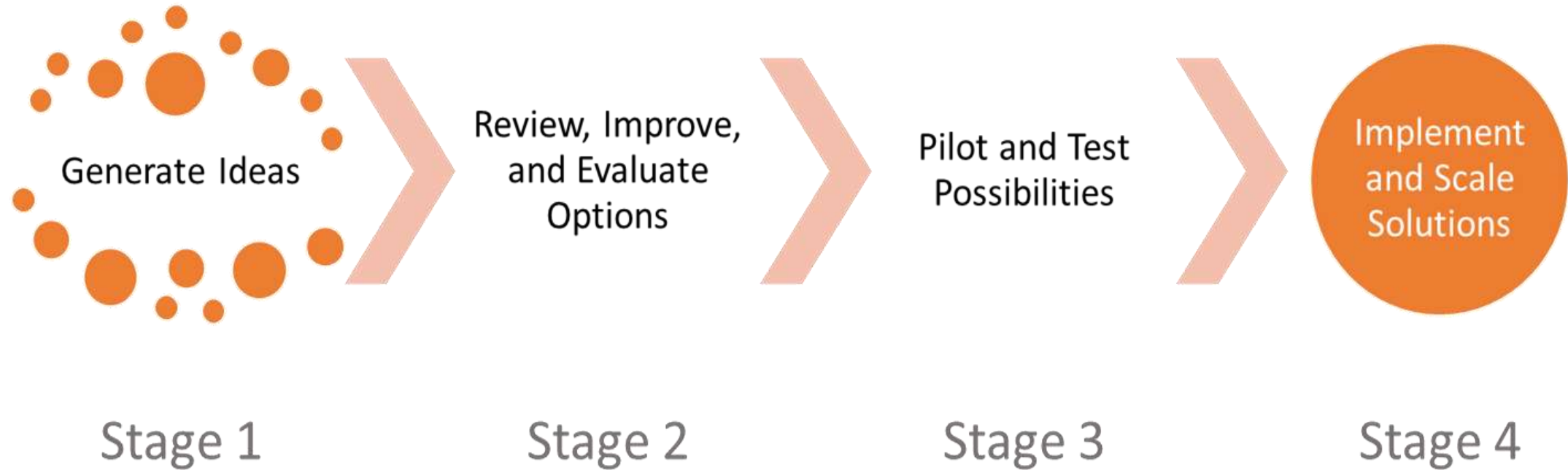
Innovation at VDOT

- VDOT has
1. Transportation innovation
 2. Business innovation




Core innovations

Promoting an orderly process



ideaDRIVER - Advancing Innovation through Collaboration

- Over 2,650 members
- 11 campaigns in the last 12 months
 - **Engagement (in the last 12 months):**
 - 303 ideas shared
 - 1434 votes cast
 - 741 comments posted
 - **Implementation (in the last 12 months):**
 - 18 ideas implemented
 - 16 ideas in pilot
 - 23 ideas in development

	
Process Automation Campaign	Supporting LowCode/NoCode CoP by providing ideation and collaboration space, and idea progress visibility
Innovation Lab Campaigns	Supporting District Innovation Labs by providing ideation and collaboration space, and clear and transparent idea assessment and implementation progress
Mobile Cell Tower Campaign	Supporting problem solving collaboration across the districts
3D Printing Campaign	Promoting new capabilities and collecting use cases
Safety Ideas Campaign	Promoting culture of safety and sharing safety ideas and best practices throughout the agency. Supporting VDOT Safety Excellence Program

Innovation Labs

4 District Innovation Labs conducted in 2021: 5 multidisciplinary teams were trained to solve problems

Fredericksburg

- Battery powered chain saws and cooking oil as a chain lubricant Innovation Lab Winner Implemented

Salem

- Emergency Operation Equipment Enhanced Cleaning Innovation Lab Winner Implemented

Bristol

- Daily Check-in Work Safety App Innovation Lab Winner Implemented
- File Share Solution Implemented
- Solar Pole Lighting Pilot
- Residency Tree Crews Pilot
- Residency Operations Support Specialists (ROSS) / Residency Operations Analyst (ROA) Pilot

Northern Virginia

- Automated Contractor Truck Check-In for Snow Events (phased implementation) Innovation Lab Winner

VDOTVOICES

DISTRICT SUCCESS SERIES

Makers of Success: How the Central VDOT Sign Shop Serves the Commonwealth

VDOT Voices is proud to introduce the *District Success Series*, which will spotlight unique and special stories for each district.

The Richmond District will kick off the series by showcasing the Central VDOT Sign Shop, which creates all the signs and decals for the Commonwealth. Learn more about the facility, as well as the people behind the signs and decals that enhance driving safety and provide information to motorists. Richmond District staff will be available to answer questions about the sign shop after the presentation.

Learning Objectives:

- How the sign shop crafts roadway signage for all of Virginia
- A walkthrough of the sign crafting process from start to finish
- Challenges and innovations faced by the only remaining VDOT sign shop
- Why it is important to keep this valuable resource within VDOT and not outsource

Wednesday, Mar. 9, 2022

1 p.m.

[Add this event to your calendar](#)

Lynchburg Innovation Lab winner from previous year

LYNnovation Lab

Structure High water Monitoring

Innovation Lab Winner Edited

 Build Team

 **Bill.Lewis**

05/Aug/20 7:44 AM

Team Building
5 of 5 Team members have joined



There are several structures in LYD that are frequently subject to high water. For these structures a remote high water monitoring device may be extremely useful to allow for remote/instant monitoring. Whether simply a device that sends a notification at a certain water level or something more elaborate as a cellular remote camera to allow real time view- this type of instant monitoring could save time and enhance safety by not having an in person inspection/monitor during hazardous weather conditions. If expanded, it could also provide guidance to which structures need to be inspected promptly- providing a more efficient plan to reviewing structures after a weather event.

Idea Team Members

Fredericksburg Innovation Lab Winner

Battery Powered Chainsaw

- Work continues on code orange days
- Less exposure to fumes
- Part of overall use/solution



Salem Innovation Lab Winner

- Prevent Corrosion
- Neutralize and remove corrosive chemicals from undercarriage of equipment including steering components, suspension parts, frame, under body and, brake components
- An average AHQ with 9 vehicles will pay off a \$20,000 investment in 13 months




Bristol Innovation Lab Winner - Crew Locator App

IDEA - 8/16/2021

Bristol Trails to Innovation

Daily Check-in Work Safety App Innovation Lab Winner

Implemented Edited

 **John Bechtold**

16/Aug/21 9:25 AM

Last Edited by **Natalia Cornwell** 7 hours ago

What is your idea or problem you are trying to solve?

Every morning field crews send an e-mail with the work location and type of work they will be completing each day to their supervisors and the safety managers. The information received is in a variety of formats and it is difficult to quickly process this information to see where everyone is going to be and what type of work is going on. Using an App would standardize the responses making it easier to see where each crew is planning to work and if other crews are going to be working in the same area.

More details in this video - <https://youtu.be/Q5HOpYIbC0Q>

Implemented - 3/16/2022

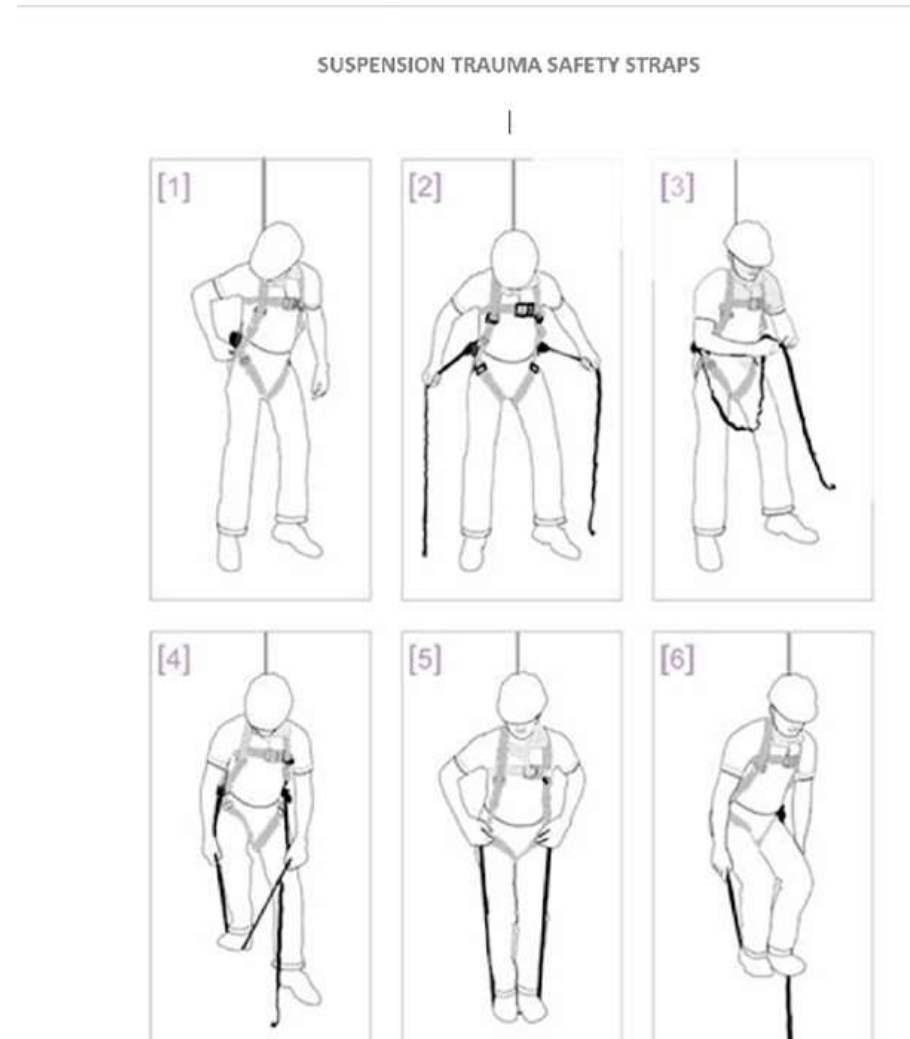


Solar Pole Lighting

- Bristol Innovation Lab runner up
- Solar light poles installed at two salt storage facilities for the Abingdon Residency to support night operations
- Cost savings of \$60,000 over a 10-year period



Suspension safety strap idea from a Bridge crew member



Think, Share and Collaborate

Digital Snow Maps for plow contractors Implemented

 2 **Larry.Camp**

18/Jun/20 4:43 PM

Mobile GIS technology exists to publish online each of NoVa District's 645 Snow Maps. Using ArcGIS Online mobile app, contractors could load their p
be used to help the driver nav
to be plowed.

Existing Snow Maps are already
maps. Could also be broken c

+ Add Tags... arcgis

Add  **Linked Ideas**

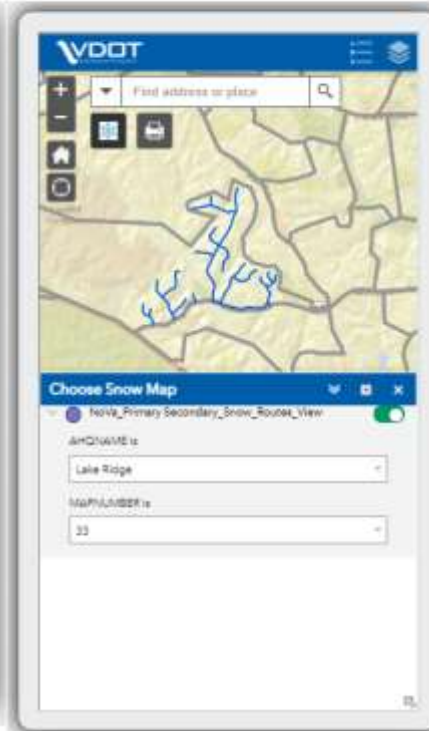
 Reserve

Reserve

Salem



Northern Virginia



Staunton



GPS could
that needs

separate

Think, Share and Collaborate

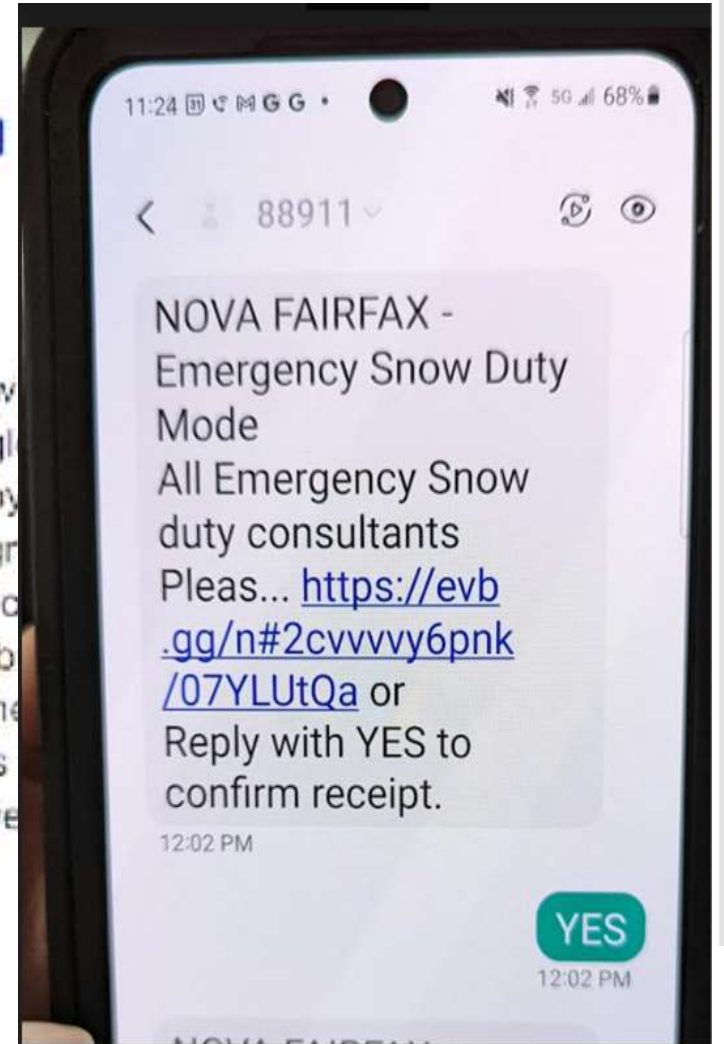
Mass Notification Time and Effort Saver Implemented

 **Leon.Treutle**

03/Feb/21 11:17 AM

This idea came from Emergency Snow Duty but the solution can be used on a Statewide problem is the amount of time it takes one or two people to physically call every single one of them that they are either in Push or Standby mode. This issue can easily be solved by having a contact in the Area Headquarters with iPhone's that have the capability of sending group texts. They can easily send a group text to all of the consultants in seconds to begin plowing operations and they are re-activated. This would not only save time and effort on the Department's part but also go faster when valuable time is spent finding them or otherwise contacting them, when roads quickly, possibly leaving the driving public in peril. It also helps the consultants get plowing operations to re-fuel, re-load or from a safety standpoint, take a well deserved

Idea Team Members



SWAS Insurance Expirations Implemented

implement...

 **Candice Gibson**

Reserve


15/Jun/21 8:37 PM

Please provide any additional information:

This idea is in regards to SWAS is based on the process of looking at expiration dates for vehicle registrations and expiration dates for vehicle insurance. As expiration dates are approaching within 30 days, employees manually have to send emails (multiple emails as well as phone calls) informing folks of expirations for auto insurance. This manual process (pulling report from SWAS, looking to see which insurances are within 30 day expirations, emailing vendors to let them know they are coming up on insurance expiration) would be very beneficial as an automated process and can free up time for employees to focus on other tasks.

Idea Team Members

VDOT SWAS Vehicle Insurance Expiration Inbox x Print Share

 **scott1.brown@vdot.virginia.gov**
to me ▾ 4:05 PM (6 minutes ago) Star Reply More



Our records indicate that your Auto insurance will be expiring within the next 30 days. Please submit updated insurance as soon as possible. It is the contractor's responsibility to maintain insurance coverage.

In order to work a snow event for VDOT, you must have current insurance for each vehicle. Please send updated insurance or any questions to scott1.brown@vdot.virginia.gov.

References to scott1.brown@vdot.virginia.gov will be replaced with residency email and vendor email addresses.

ideaDRIVER - Process Automation Campaign

Collaboration between OSI and Low Code/No Code Community of Practice

-  44 Ideas Posted 
-  1704 Idea Views 
-  213 Comments 
-  115 Votes 

All Stages	44
Ideate	1
Evaluate & Refine	3
Build Team & Develop	5
Pilot	3
Awaiting Production	4
Implement	0
Implemented	7
Ready to use	7
Idea Bank	14

Process Automation

Automate Guardrail hit reports from the field

[John.Mayhew](#)

08/Apr/21 10:05 AM

Assigned to [Nathan O'Kane](#)**Please provide any additional information:**

Currently, the way we record and submit guardrail hits to our district office for repair and reimbursement is to physically go to the scene of the accident, collect the data, return to the office and fill out a form that is then sent to a distribution email address. I propose developing an app that would automate the process from the field, on location. The app can use the geolocation service from a smart phone or tablet for precise GPS coordinates, capture photos of the damage, and have drop down boxes that correspond to the questions on the physical paper form. Once all the data is collected and saved in the app it could then be submitted to the distribution email address with the simple click of a button. This could be a very simple app that would streamline the process of recording and submitting guardrail hits, or really, any process that requires gathering data from the field for submittal.

Idea Team Members

4

↑ 4 upvotes

↓ 0 downvotes

ASD-15 & 35 Streamlining - Statewide

IDEA - 5/5/2021

Process Automation

Stream Lining Contract Folders Implemented

J + **James.Dowell**
05/May/21 9:27 AM

Assigned to **Natalia Cornwell**

Please provide any additional information:
Make available the ability to E-File our contract files instead of/or in addition to having hard copies. That way every employee that has something to do with that contract can contribute/add to from any computer instead of having to do this personally. Examples include but not limited to; filing work orders, ASD-15's, ASD-35's, work zone safety check list and other required documentation.

[Implemen...](#) [Reserve](#)

Implemented - 10/1/2021

Save | Cancel | Copy link

ASD-15

This item was last updated on November 8, 2021

Please read these instructions carefully before starting your submission.

[CLICK HERE to Start Your Submission or E-File Existing Paperwork](#)

Approved Procurement Request for ASD-15 (Approved for open contracts and pending E-File submissions) prepared by the Procurement Services Group (ASD-15)

DESCRIPTION

- 1. This contract or contract order (ASD-15) is subject to review and approval through the Contract File Review and Approval (CFR) process.
- 2. Contract orders over \$250,000 do not require the approval of the Director of Administration Services.
- 3. All contract orders are subject to the approval of the Director of Administration Services.
- 4. All contract orders are subject to the approval of the Director of Administration Services.
- 5. All contract orders are subject to the approval of the Director of Administration Services.

APPROVED FOR SUBMISSION (This contract order must be approved by the Director of Administration Services)

- 1. Approved for submission by the Director of Administration Services.
- 2. Approved for submission by the Director of Administration Services.
- 3. Approved for submission by the Director of Administration Services.

APPROVED FOR SUBMISSION	APPROVED FOR SUBMISSION	APPROVED FOR SUBMISSION
ASD-15	ASD-15	ASD-15
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When approved for the Director of Administration Services, Submit completed forms and attachments to the State Administration of IT (SAS) website.

- 1. Procurement Request for ASD-15 must be accompanied by a contract file and approved by the Director of Administration Services.

All approved procurement requests are subject to the review and approval of the Director of Administration Services.

Note: This file is subject to review and approval by the Director of Administration Services.

C-120 Creation - Statewide

IDEA - 8/8/2021

Process Automation

C-120 creation Implemented

+ [James.Swanson](#)

08/Apr/21 11:38 AM

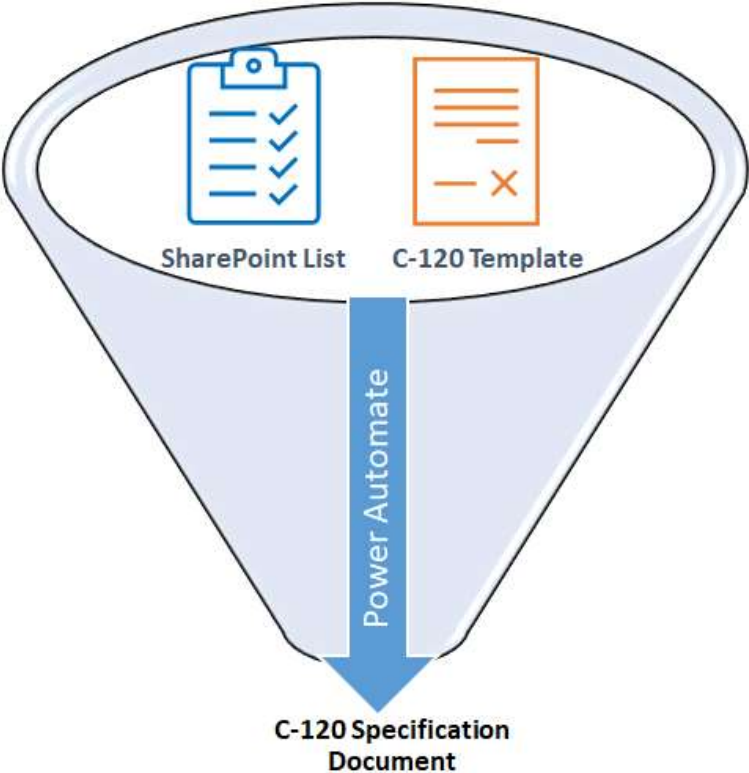
Assigned to [Krishna.Singh](#)

Please provide any additional information:

When a request to process a Specification Revision or Special Provision are entered into SharePoint, a requestor must enter data fields that name the Document Set in SharePoint. Once the Document Set is created, they have to manually download and edit a C-120 form that includes much of the same data. Then they must upload it to the Document set. It would be nice if creating the Document Set could automatically create and enter much of the data into the C-120.

Implemen... Reserve

Implemented - 8/16/2021



iPad with LiDAR

- Show the public planned work
- Layout designs in 3 dimensions in seconds
- Visualize investments
- Cost effective 1:1 scanning
- Next generation design process
- Beginnings of digital twin



(Left) A light pole foundation scanned from the I-81 Exit 140 park-and-ride lot was brought to a different location and visualized in AR. The result makes the AR object almost indistinguishable as a digital addition from the rest of the image.



(Right) The signal cabinet on the left is a clone of the signal cabinet on the right. The purpose of this demonstration is to show the size accuracy of scanned objects. Multiple objects can be placed into the same scene and screenshotted or captured using the built-in camera.

Virtual Reality at Public Hearings

- Public experience the completed project
- Visualize investments
- In-house tools to complete the design / render
- VDOT Oculus rift headset for public meetings
- 360 videos can be posted on VDOT website

<https://youtu.be/hm0y8mzUSq0>

<https://youtu.be/C3Ew0KMqSM4>



220 & 460 At-Grade DDI - Salem



Coalfield Express Option 5 - Bristol

Virtual Reality at Public Hearings Cont.

- Public can explore specific areas most important to them
- Comment on aesthetics (Steel Vs. Concrete stairs)
- Visualize access and parking



Computer Vision - Route 460 Salem Rumble Strip Detection

- Leverage Existing Imagery
- Custom models can detect any object visible
- Data driven maintenance, ex., signs / markings
- Safety performance of assets by correlating crashes and assets



3D Printing – Survey Tools

Semi Permanent Mobile Target and Mounting Brackets

- Mobile (Driving) and terrestrial (Static) LIDAR scanning required targets that can be easily identifiable in the both the field and in LIDAR scan for processing and geo-location. These target must be set, geo-located by VDOT or vendor survey crews using GPS and levels, and are then removed after the project. The targets are expensive, commercially available LIDAR targets cost between \$150 for a single target or \$900.00 for a set of six.

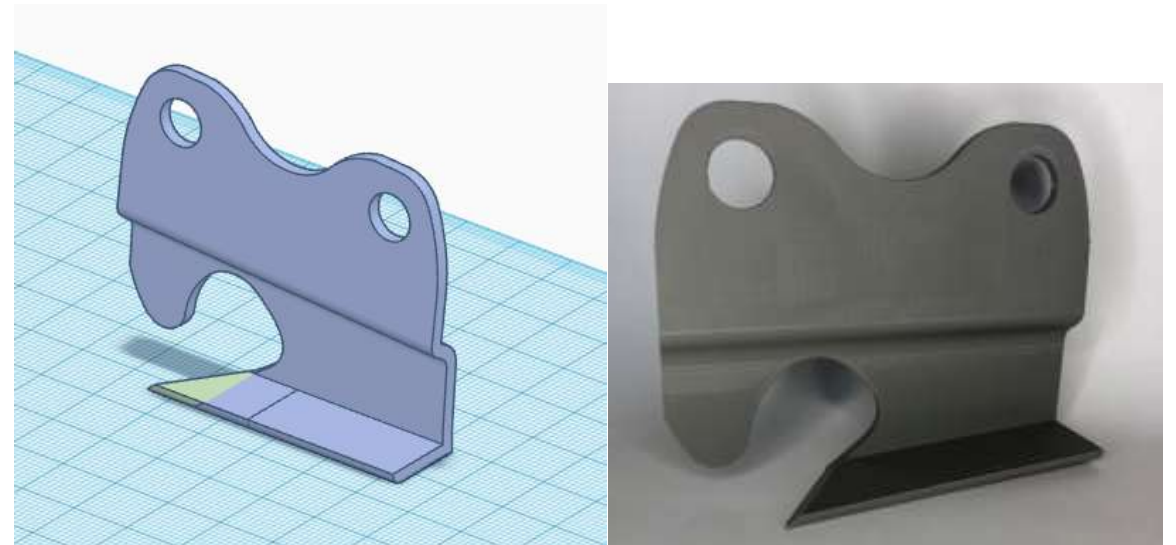
3D printing cost per unit is under \$7



3D Printing – Training Visual Aids

Chainsaw Sharpening Training Visual Aid

- Enlarged chainsaw tooth model was 3D printed to demonstrate the proper procedure to sharpen the teeth on the chainsaw.
- Salem District instructors use the 3D printed model to identify each part of the tooth, demonstrate which file to use where and at what angle when sharpening the cutting edge and how to grind down the depth gauge as the tooth gets smaller from sharpening it.



3D Printing - Parts and Tools

Mounting bracket for electric salt spreader display

- Requested by Winchester Shop
- Supplier part price \$103
- 3D printed cost is \$6.90



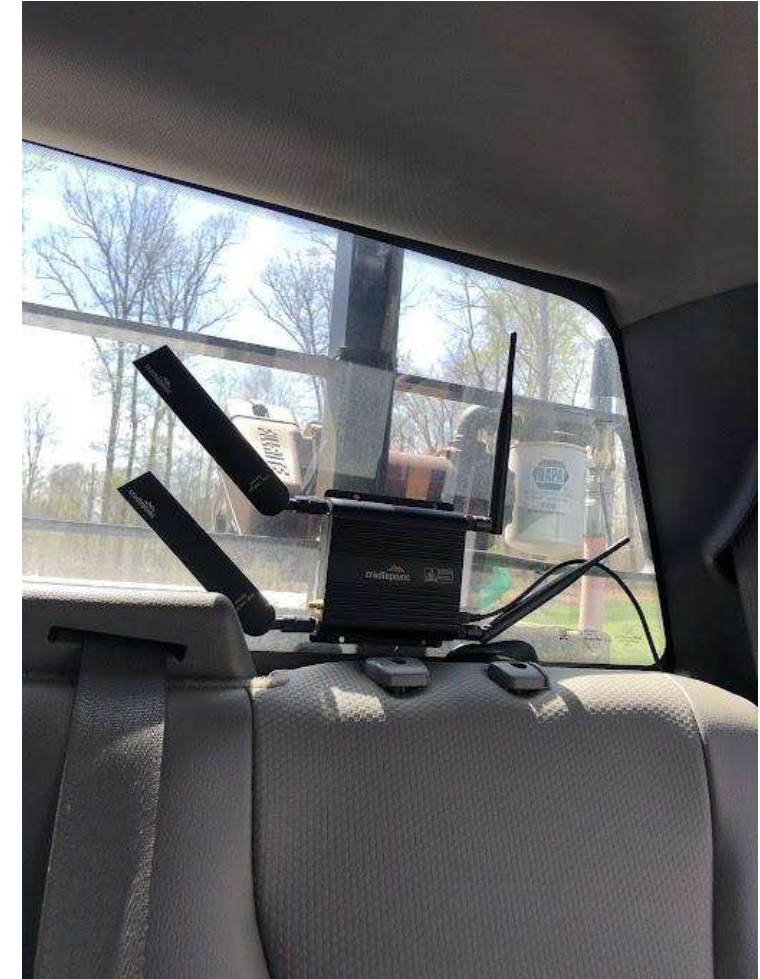
Looking ahead - 3D Printing

Investigate 3D viability for construction or repair of VDOT concrete assets such as the retention walls, bridge abutments, ADA ramps, highway medians, slope stabilization, or chemical storage and other facility buildings.



Cradlepoint - Mobile WiFi

- Connects Surface Pros
- Enables digital worker
- Connectivity to the field
- Real-time communication
- Movable between vehicles
- Dual Sim

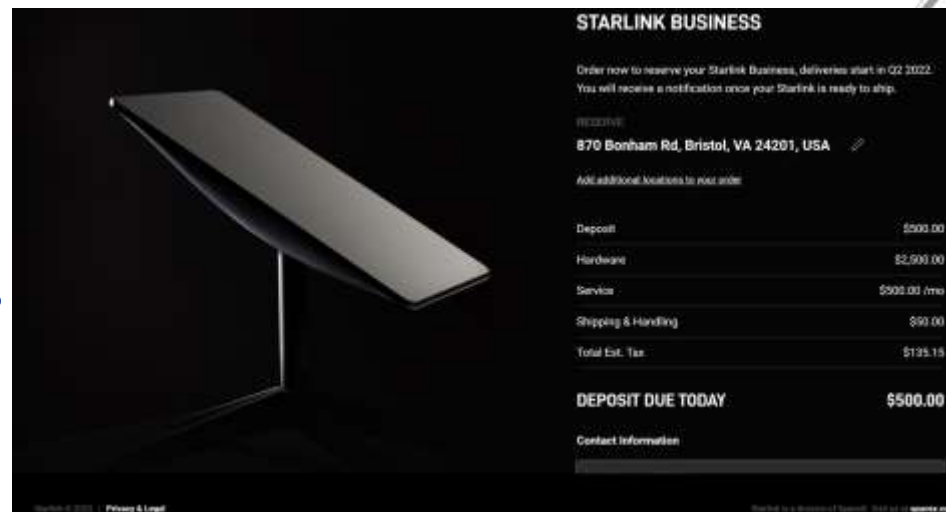
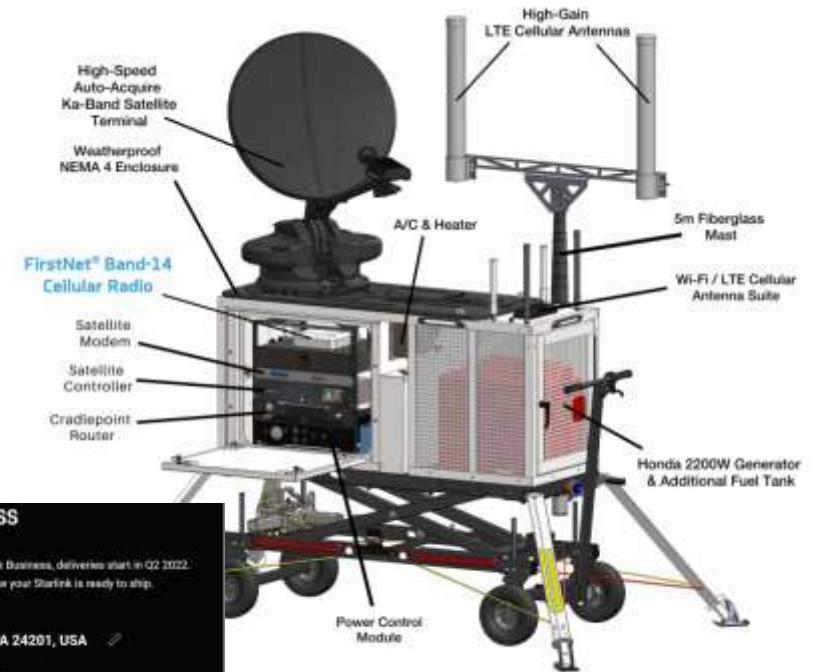


ideaDRIVER – Bristol Mobile Cell Tower Campaign

- A three-district effort to collect technology research, benefits, use cases, comments, and votes.
- Engaging employees across districts in business case building process

99 Idea Views 
29 Comments 
42 Votes 

- Implementing satellite connections from Hughes
- Exploring Starlink



Looking ahead



Tweet



Bill Gates 
@BillGates



The latest [#ClimateReport](#) is an important reminder of the work ahead. I'm especially encouraged by the focus on the breakthroughs we need to avoid a climate disaster. (The word "innovation" appears 4,989 times!)

Looking ahead

A new VDOT of Tomorrow technology initiative

- **Data management, Digital twin, 3D modeling**
- **Many other companies/agencies/industries developing it**
- **Opportunity for predictive/proactive work, run what if scenarios, better data driven decisions etc.**

