



# Improving Utah's Air Quality

**Bryce Bird**  
Utah Department of Environmental Quality



## A challenge as clear as the mountains around us



# Air Pollutants

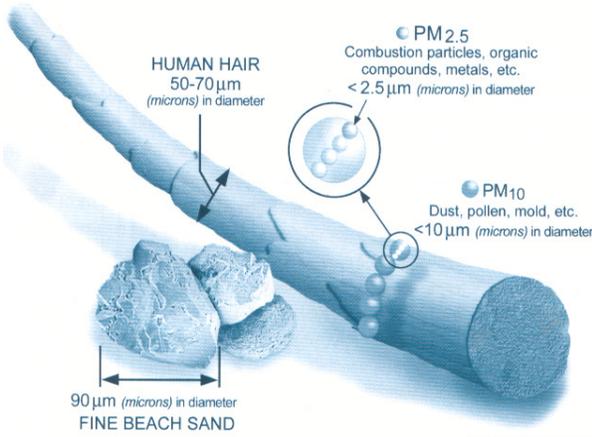
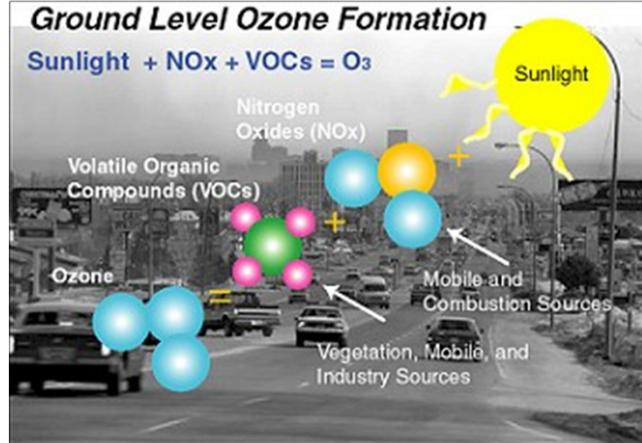
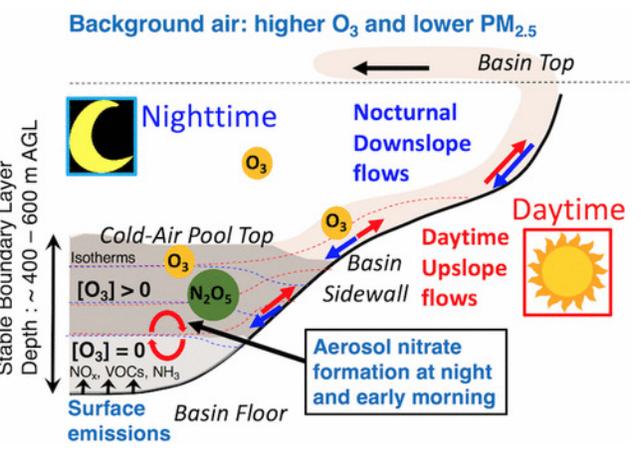
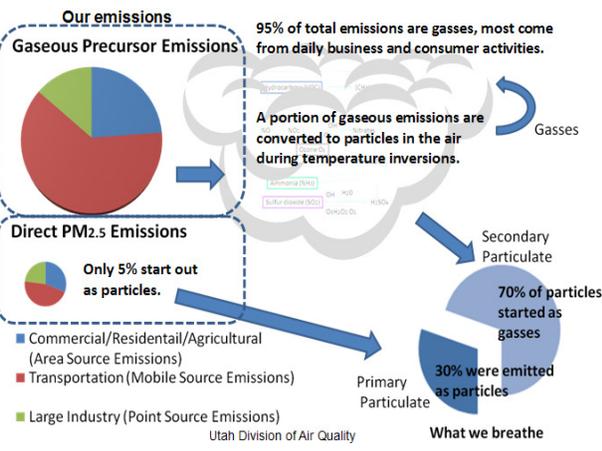
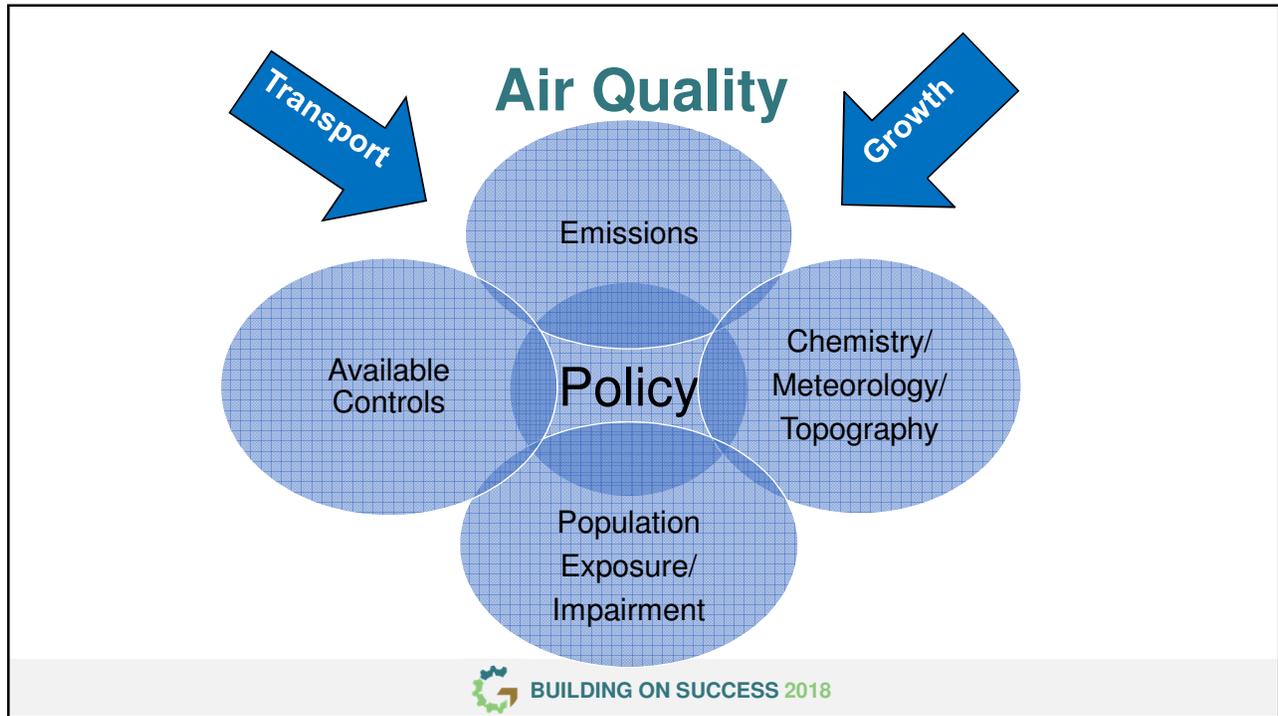


Image courtesy of the U.S. EPA



# Air Pollutants





## SUCCESS+

GOAL: Reduce the total state-wide rate of air pollution emissions by 100,000 tons per year by 2026 through implementing programs and policies to address the current rates of human-generated air pollutants and that minimize the additional impacts that are associated with the anticipated growth in population.

## SUCCESS+

**SOLUTION:** Air pollution sources will be identified and strategies will be defined to address the cost and potential benefits of available options to reduce the rate of air pollution emissions. With policy recommendations identified, partnerships in government, advocacy organizations, media, and the business community should work together to identify tactics and strategies to achieve the targeted reductions.



## SUCCESS+

### Strategy 1: **Research**

Understanding the scientific perspective of the sources and available controls will allow the Division of Air Quality to identify the most effective and efficient emissions reductions.

### Strategy 2: **Community Partnerships**

The Division of Air Quality's role in reducing emissions overlaps with the interests of several community partners.

### Strategy 3: **Policy**

Identify legislation and associated regulations to reduce air pollutant emissions in Utah.

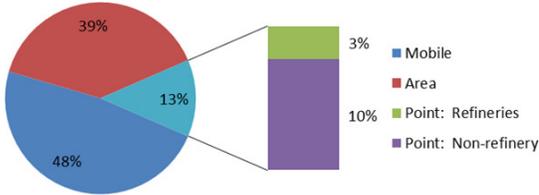
### Strategy 4: **Market Forces**

Capitalize on economic forces that are working to curb emissions.

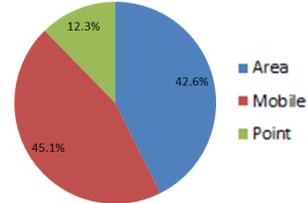


# Air Pollution Inventories

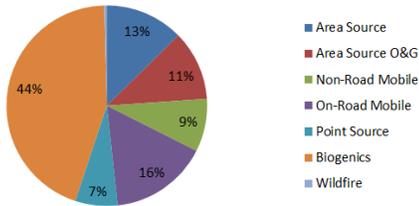
Wasatch Front Winter (PM2.5)



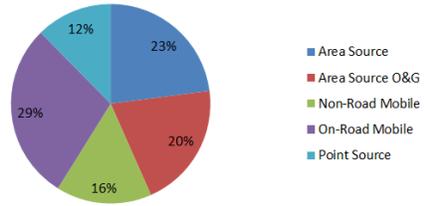
Wasatch Front Summer (ozone)



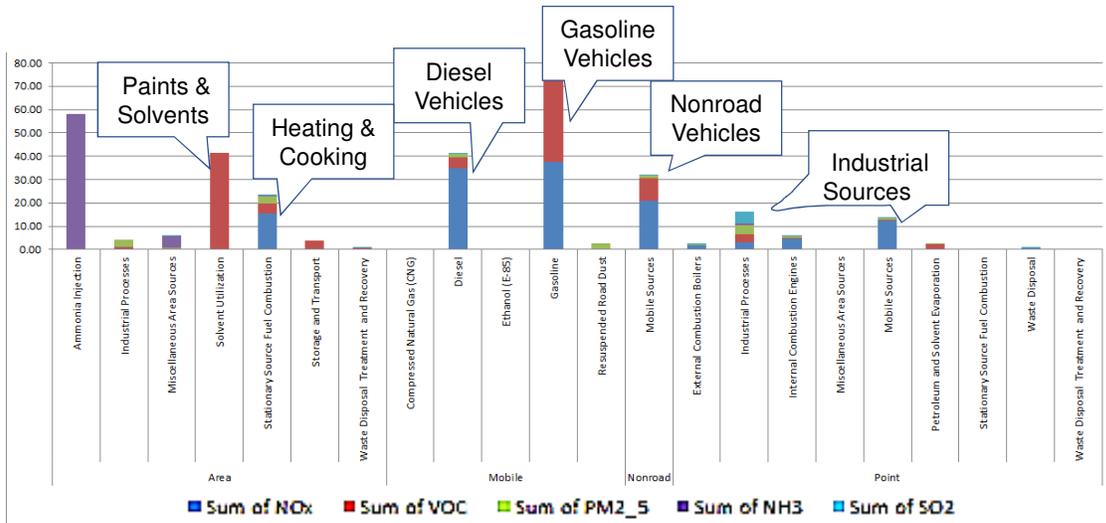
State Annual All Sources

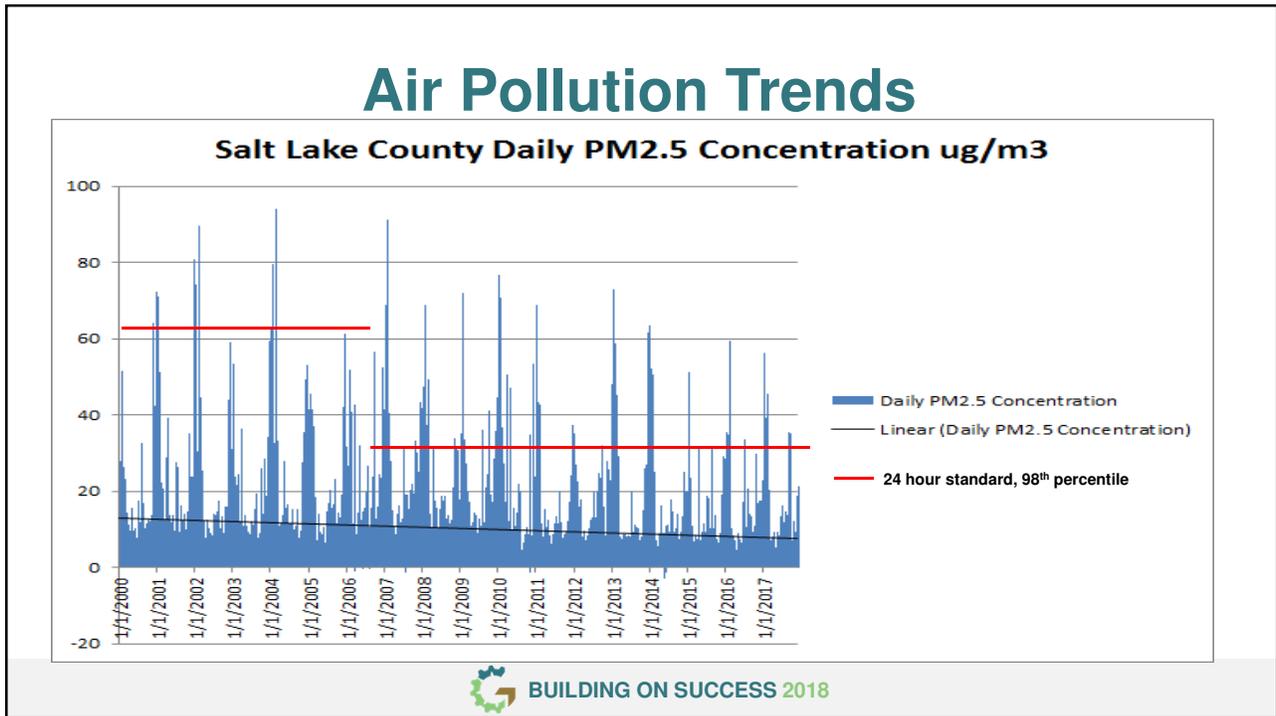
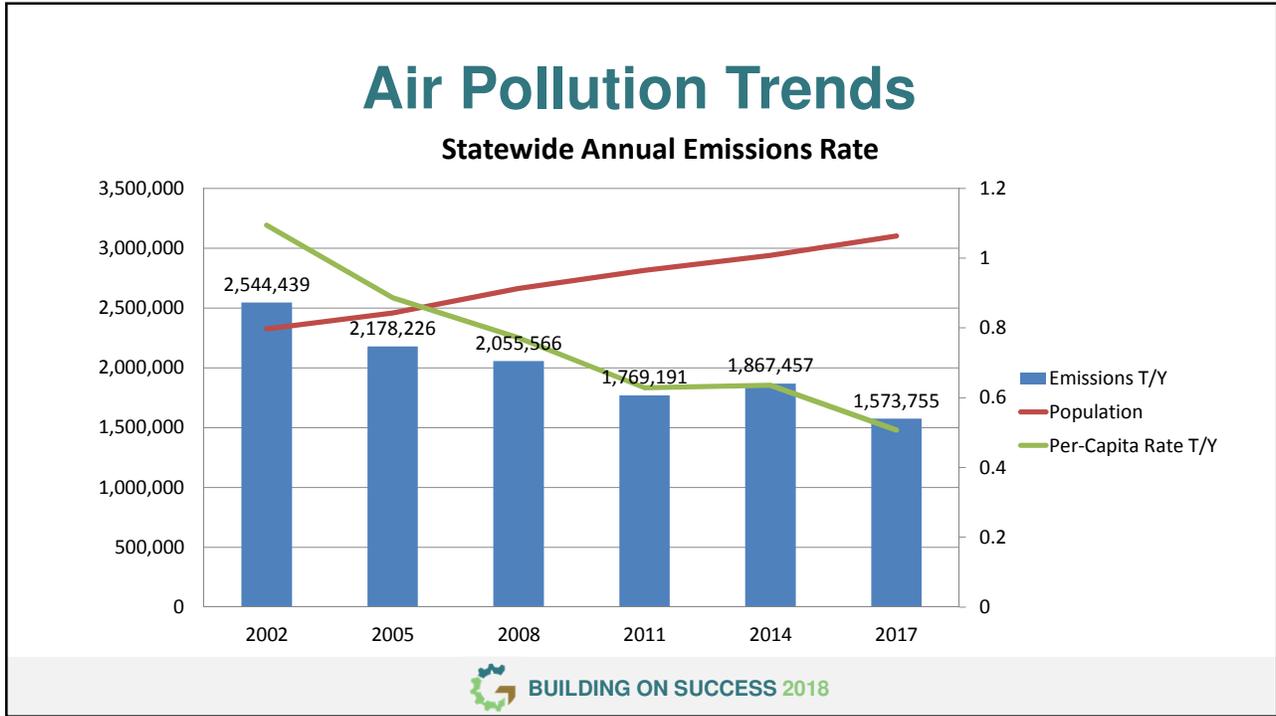


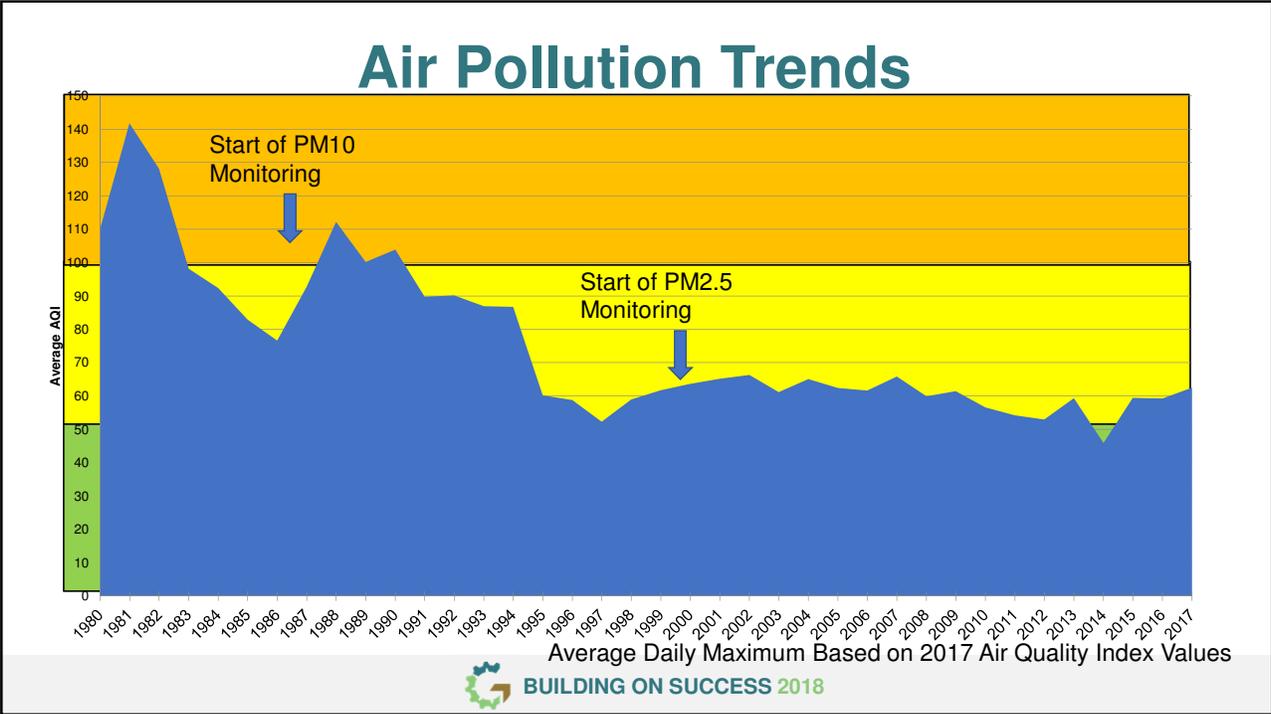
State Annual Anthropogenic



# Wasatch Front Baseline Inventory







**UTAH OPS**  
& GOLDRATT CONSULTING

## Protecting Utah's Food Supply

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**Scott Ericson**  
Utah Department of Agriculture and Food



## Operational Excellence is Imperative

Has anyone experienced a  
foodborne illness?

UDAF's regulatory responsibility  
ensures that Utah food supply is safe  
for consumers.



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## Good vs. Bad Inspections



### Good inspection

- A focus on issues of real public health risk
- Good two-way communication with operator and other on-site personnel
- Inspector educates and explains significance of findings
- Inspector and operator create risk control plan, agree on corrections timeline
- Inspector follows up to verify corrections made
- Public health is safeguarded

### Bad Inspection

- Doesn't recognize more serious risks, focusing on less important details related to physical facility
- Doesn't conduct interviews or communicate with operators during inspection
- Doesn't understand or educate about public health significance
- Doesn't listen to operator and doesn't create expectation for needed corrections
- Public health is not safeguarded



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## Slide 15

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- 1 Are you sure you want this video in there?  
Cody James, 9/20/2018

# System Success

**Case Study:** 2015 Costco Chicken Salad  
*E. coli* Outbreak

UDAF played a key role in identifying the source, revealing 19 positive cases nationwide and five within Utah.

Inspector who identified it had been working for UDAF for 15+ years at the time.



# System Success

**Case Study:** 2018 *Salmonella* Outbreak



UDAF was instrumental in identifying an illegal Kratom distributor who's product was linked to multiple types of *Salmonella* identified in 199 cases, including three in Utah.

Inspector who identified it had been working for UDAF for five years at the time and had many years of prior experience as regulator.

## System Failure

### Case Study: 2014 Raw Milk Outbreak

UDAF was understaffed during an outbreak of *Campylobacter Jejuni*, associated with raw milk, that totaled up 99 confirmed and probable cases that resulted in dairy no longer selling raw milk.



Inspector handling the case had less than a year of experience and left shortly after.



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## Core Conflict: Turnover



All three UDAF divisions that require inspectors were having significant turnover issues, over 50% per year.

When UDAF has trained inspectors with experience, we identify and resolve outbreaks swiftly.

When we experience elevated turnover or inadequate staffing levels, outbreak response, investigation, and enforcement are compromised, putting the public at risk.



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## System Constraint: Training Time/Costs

Three UDAF divisions require substantial training for inspectors.

It takes one year to fully train an inspector before they can perform solo inspections.

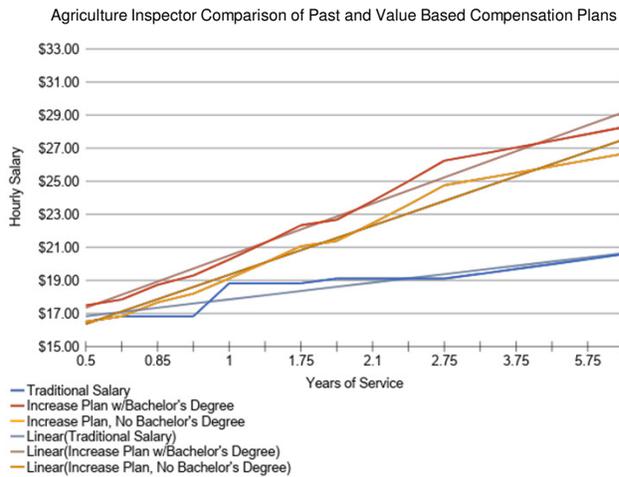
Standard of Work ensures that the same level of inspection is performed at every location.

Quality of Source establishes a more thorough inspection, solidifying greater compliance, creating more efficiency and less need for follow-up inspections.



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## Solution: Value-Based Compensation



Because UDAF administers federal programs, employees are not able to perform inspections until fully trained.

UDAF's Value Based Compensation program gives inspectors line of sight growth, tied to the value they provide the department.

The program incentivizes them to quickly become proficient and trained within a three-tiered system.

Each division has their own tiered compensation plan, but they follow similar trajectories.



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# Compliance Specialists



Inspect seed, feed, fertilizer, organic food, Good Agricultural Practices, Food Safety Modernization Act, hay, nursery, bees, fruit, vegetables.

# Compliance Specialists



## Training Time and Costs

- 18-month process
- Course/field work training \$13,604.80 (160 hrs/3mos.)
- BIT certification \$3,301 (out-of-state training)
- Organic training \$17,062.25 (3 out-of-state trainings)
- Phytosanitary certification \$2,893 (out-of-state training)  
Required to have been certified for 12 months prior to training

= Total training costs of **\$52,113**

# Compliance Specialists



Salary	Actual Employee Name Removed	Date
	Actual	
\$ 17.50	Hired	2/21/2017
\$ 16.83	2% salary increase	7/1/17
\$ 18.83	End of probation and series grade promotion to Compliance Specialist II	2/21/18
\$ 19.30	2.5% salary increase (legislature)	7/1/2018
	Based on Plan (foreseeable future)	
\$ 17.79	Hired with bachelor's degree in GIS (6% increase from base?)	2/21/17
\$ 18.68	Quarantine and Trapping training completed 5/4/17, then conducted a summer of trapping (5% increase)	9/15/17
\$ 19.24	Basic in-house training for nursery, seed, and fertilizer inspection/sampling plus a full season of successful inspections season ended October 2017 (3% increase)	10/1/17
\$ 19.82	BITS training completed on 10/26/17, then completed 3 months successful inspections/sampling (3% increase)	1/26/18
\$ 20.81	Complete Phytosanitary ACO training (1/24/18) then conduct 5 inspections (5% increase)	2/15/18
\$ 21.85	Weed free hay training test at weed meeting (2/21/18) then conduct 10 certifications (approximately 6/15/18), get non-commercial pesticide license (5% increase)	6/15/18
\$ 22.94	Organic Training 1 completed (likely grower) (completed around July 2018), then 10 certifications (5% increase)	8/15/18
\$ 24.09	Organic Training 2 (can chose one more of the 3 certifications, so should have 2 certifications now)	8/15/18

# Meat Inspectors

These are physically on-site at harvesting facilities as animals are slaughtered.



# Meat Inspectors

## Training Time and Costs

- 18-month process
- Course/field work training \$61,407 (4 wks in office, 7 wks shadowing; 8 supervised hrs/wk for one year)
- USDA inspection training \$11,357 (29-consecutive-day training out-of-state)

= Total training costs of \$81,430



# Meat Inspectors

Description of training/ Accomplishment	Time Scale
Base pay, Starting \$16.00;	
Based on applicant work experience	Immediately
Meat Inspection experience (not to be combined with slaughter/processing experience or education).	
• Slaughter inspection experience = 15%	
• Processing + Slaughter experience = +5%	
• Federal Inspection Methods Training = +5%	Immediately
Industry experience (Slaughter / Processing)	
Education Associates, Bachelors/Masters (Animal Science, Biology, Chemistry)	
• Degree in related fields +1 yr. industry experience	Immediately
Successful completion of Slaughter Training Modules.	
• Plant familiarization	
• Professionalism	
• Humane slaughter	
• Ante mortem inspection	
• Swine post mortem inspection	
• Cattle post mortem inspection	
• In-Plan Safety Quiz	
• Food safety standard	
• HACCP overview	
Successful completion of 37 different Processing Inspection Training Modules.	*
Successful completion of State PHIS Computer Program Training.	*
Successful completion of Field Hands-on Slaughter Training, independent ability to conduct Slaughter Inspection.	*
Successful completion of Field Hands-on Processing Training, independent ability to conduct Processing Inspection in assignment.	*
Successful ability after training to collect samples, maintaining integrity, form completion, submission to laboratory.	*
Documentation of noncompliance which accurately reflects conditions of the establishment(s) in assignment.	*
*Successful completion of 1 year probation, dependent on level of success in position	Immediately
Successful completion of Federal Inspection Methods/PHIS Training.	Immediately



# Environmental Health Scientists



These inspect grocery stores, food manufacture facilities, and dairies.

# Environmental Health Scientists



## Training Time and Costs

- 24-month process (7 mo. avg. to pass EHS Test)
- Multiple out-of-state trainings
- EHS certification \$42,105
- Retail food training \$21,106
- Manufactured Food \$16,705
- Dairy training \$17,020.64

= Total training costs of \$96,937

# Environmental Health Scientists



Description of training/ Accomplishment	Time Scale
EHS-in-Training: Base pay, Starting \$16.50/hr • Bachelor or Masters • 30 Semester hours from three areas of study • 12 month training EHS I: \$18.97/hr or more • Pass REHS(RS) Exam • Complete retail coursework within 18 mos.; Complete 40 accompanied inspections; Complete 40 independent inspections OR • Complete 20 accompanied and 20 independent dairy farm inspections; 10 accompanied and 10 independent dairy plant inspections; 6 mos. Accompanied and independent pasteurizer equipment tests; Complete 5 accompanied hauler evaluations; Complete 5 independent hauler evaluations while being evaluated by SSO with 80% minimum agreement	Upon hire  18 Months And upon completion of requirements
EHS II: \$21.20/hr or more • FDA Retail Program Standardization. • Successfully demonstrate the ability to work in two or more food program areas with the division (Retail, Manufactured, Dairy, Produce Safety). • "Utah MFRP Basic Training Requirements (Level 1 Training)" and successfully demonstrate a high degree of performance, dependability and professionalism. • Complete requirements for EHS II and demonstrate the ability to work independently with a high degree of performance, dependability and professionalism.	Upon completion of requirements
EHS III: \$23.31/hr or more • "Utah MFRP Advanced Training Requirements (Level 2 Training)" and successfully demonstrate a high degree of performance, dependability and professionalism. • Specialize in an area of food safety and become the department's authority / coordinator in that area (Dairy State Rating Officer*, Shellfish, Meat Compliance, Country of Origin Labeling, Bottled Water, Dietary Supplements) etc.). • Continue to perform with a high degree of professionalism and dependability in the dairy program * Complete all requirements including class work to perform as a State Rating Officer. Includes 10 independent dairy farm inspections and 5 independent plant inspections while being evaluated by FDA.	Upon completion of requirements
EHS III: \$23.31/hr or more • Functions as a lead over lower level EHS staff. • Provides and Develops training for lower level staff within multiple programs (Retail, Manufactured, Dairy, Produce Safety). • Trains staff on policies and program standards, standardizations and audits in areas of retail, manufactured foods and dairy programs. • Writes and files civil and criminal complaints and administrative actions including "Notices of Violation", "Warning Notices" and "Administrative Citations". • Prepares Reports. • Supervises staff and serves as a back up to a program manager when needed (Retail, Manufactured, Dairy, Produce Safety).	Upon completion of requirements



# Triage: Training Costs

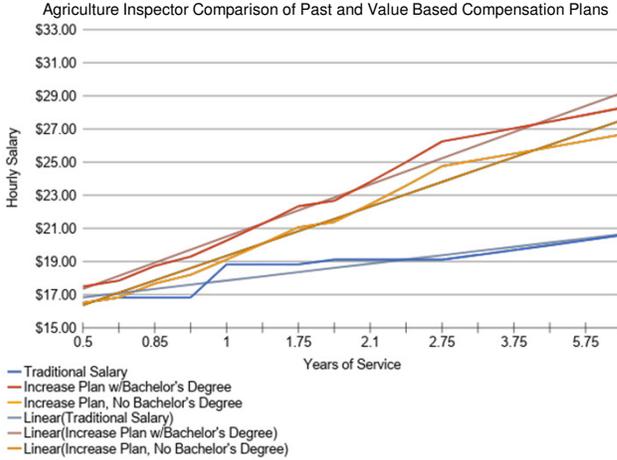
It costs UDAF less to retain than it does to train an inspector.

It takes five years to break even on the costs associated with training an inspector.

The old model for compensation was flat – no incentive to seek advanced training or to receive elevated compensation.



# Solution: Value-Based Compensation



UDAF's Value Based Compensation program gives inspectors line of sight growth, tied to the value they provide the department.

The program incentivizes them to quickly become proficient and trained within a three-tiered system.

Each division has their own tiered compensation plan, but they follow similar trajectories.

Because UDAF administers federal programs employees are not able to perform inspections until fully trained.



# Complete Solution

*"I really enjoy the work I do, but the salary could definitely be higher... I was down in Moab this weekend and I noticed that McDonalds was hiring for \$13/hr. We only hire our new employees at a few dollars an hour more than that and they are expected to do much more technical work."*

– Jason Noble, Compliance Specialist 2

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## Success Story: Meet Cole Dalton



Cole has been with UDAF since 2015 and has rapidly advanced from Environmental Health Scientist (EHS) I, to EHS II, and now EHS III working toward EHS IV.

He's demonstrated high levels of enthusiasm and commitment, performing more inspections and enforcements than all other inspectors combined.

Cole is a model food inspector employee, but where would he be without UDAF's Value-Based Compensation program?



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## DFCM Project Backlog

Clint Bunnell  
DFCM



## Executive Summary

- Identify constraints
- Determine the desired outcome
- Create solutions
- Create a business case to garner support
- Implement operational and outcome metrics



## Committee Stakeholders





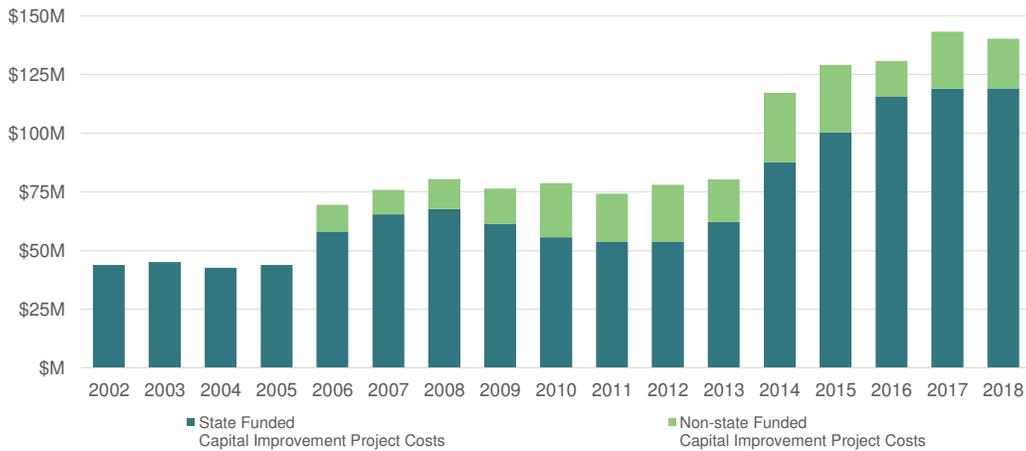
# Identify Constraints

Capital Development projects average 3 to 5 years to complete  
Some require a dedicated PM throughout the duration of the project  
Average 15 active capital development projects at a time



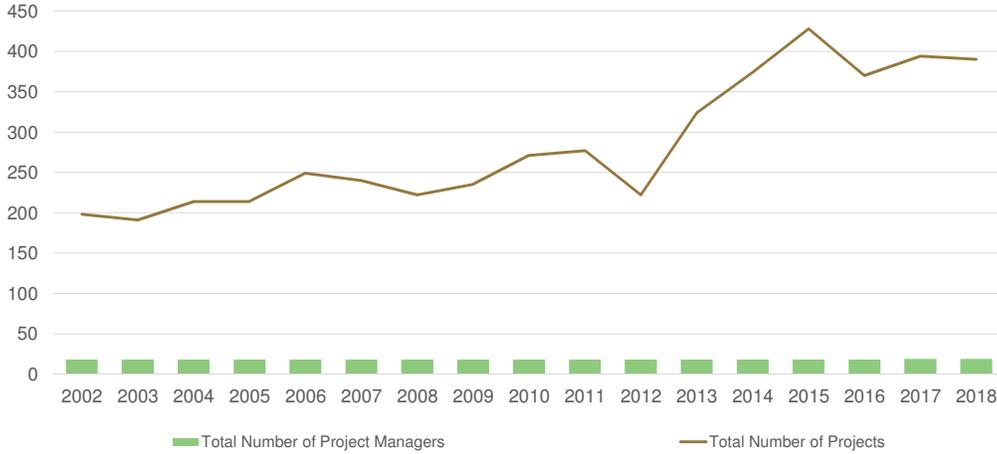
# Capital Improvement Projects

Capital Improvement Funding History



# Capital Improvement Projects

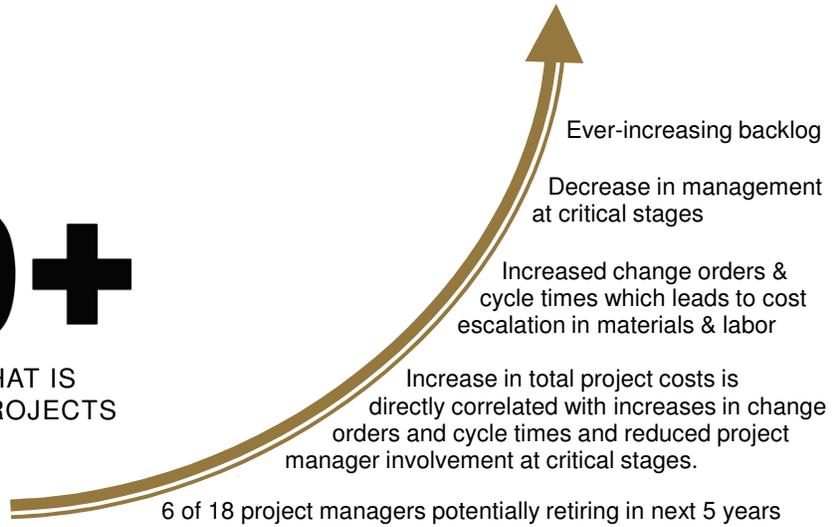
Personnel vs Number of Projects



# Capital Improvement Projects

# 200+

PROJECT BACKLOG THAT IS GROWING BY OVER 30 PROJECTS PER YEAR

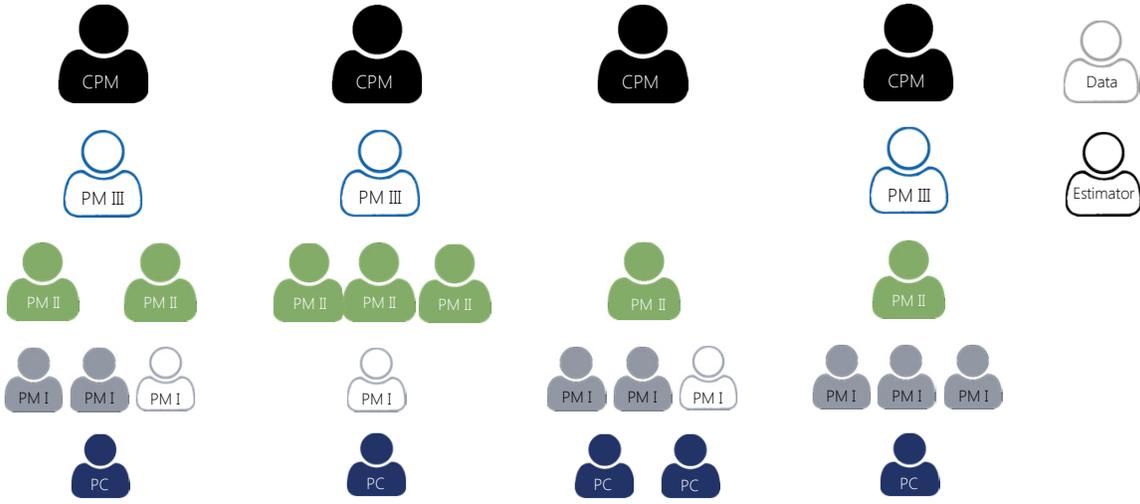




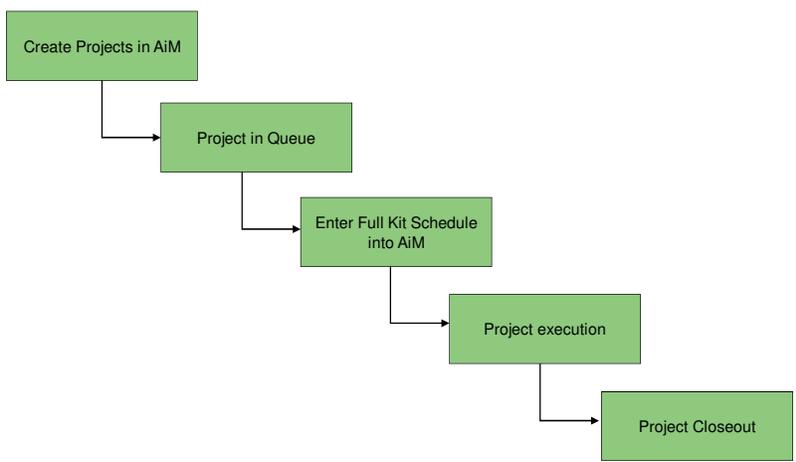
# Create a Solution



# New Team Restructure



# Work Execution Process



# Full Kit Checklist

Estimation	Programming	Schematic Design	Detailed Design
<ul style="list-style-type: none"> <li>Stakeholder identification</li> <li>Scoping</li> <li>Risk register</li> <li>Delivery method</li> <li>Communications plan</li> <li>Estimate</li> <li>Schedule</li> <li>RFP for programming</li> <li>Bid &amp; award programming</li> <li>FF&amp;E/Equipment</li> <li>IT/AV/Security</li> </ul>	<ul style="list-style-type: none"> <li>Project management plan</li> <li>Full scope document</li> <li>DFCM programmatic standards checklist</li> <li>Risk register update</li> <li>Communications plan update</li> <li>Estimate update</li> <li>Schedule update (Gantt)</li> <li>Energy modeling</li> <li>Owner's Performance Requirements</li> <li>BECx</li> <li>Commissioning agent (CX)</li> <li>RFP for Design (where appropriate)</li> <li>Bid &amp; award design (where appropriate)</li> <li>RFP for CM/GC (where appropriate)</li> <li>Bid &amp; award CM/GC (where appropriate)</li> <li>FF&amp;E/Equipment</li> <li>IT/AV/Security</li> <li>Sign-off (Architect, Agency, DFCM)</li> <li>Management approval</li> <li>Lead and asbestos survey</li> </ul>	<ul style="list-style-type: none"> <li>DFCM SD checklist</li> <li>Communications plan</li> <li>Risk register update</li> <li>Estimate update</li> <li>Programmatic review</li> <li>Schedule update (CPM)</li> <li>Sign-off (Architect, agency, DFCM, CM/GC)</li> <li>Management approval</li> <li>FF&amp;E/Equipment</li> <li>IT/AV/Security</li> </ul>	<ul style="list-style-type: none"> <li>DFCM DD checklist</li> <li>Communications plan</li> <li>Risk register update</li> <li>Estimate update</li> <li>Programmatic review</li> <li>Schedule update (CPM)</li> <li>Sign-off (Architect, agency, DFCM, CM/GC)</li> <li>Management approval</li> <li>FF&amp;E/Equipment</li> <li>IT/AV/Security</li> </ul>
Construction Docs	Pre-construction	Construction	Closeout
<ul style="list-style-type: none"> <li>DFCM CD checklist</li> <li>Communications plan</li> <li>Risk register update</li> <li>EDMS plan &amp; approval</li> <li>Permit</li> <li>Inspections</li> <li>RFP for construction</li> <li>Bid &amp; award construction</li> <li>Estimate update</li> <li>Programmatic review</li> <li>Schedule update (CPM)</li> <li>FF&amp;E/Equipment</li> <li>IT/AV/Security</li> <li>Sign-off (Architect, agency, DFCM, CM/GC)</li> <li>Management approval</li> </ul>	<ul style="list-style-type: none"> <li>Construction stakeholder identification</li> <li>Communications plan</li> <li>QA/QC plan</li> <li>Safety plan</li> <li>Closeout plan</li> <li>Contractor training</li> <li>Pre-con meeting</li> </ul>	<ul style="list-style-type: none"> <li>All RFIs answered</li> <li>All PCOs processed</li> <li>All submittals approved</li> <li>All deferred submittals approved</li> <li>Establish OAC</li> <li>FF&amp;E/Equipment</li> <li>IT/AV/Security</li> <li>Moving</li> </ul>	<ul style="list-style-type: none"> <li>Certificate of Significant Completion</li> <li>Certificate of Occupancy</li> <li>Punchlist</li> <li>Redlines / As-built drawings</li> <li>Warranties</li> <li>O&amp;M</li> <li>User training</li> <li>Commissioning sign-off</li> <li>Ratings (AE, contractors, CX)</li> <li>Reconcile contracts</li> <li>Approve final payments</li> <li>Upload documents to Projectwise</li> </ul>



# Expected Outcomes

Project cycle times will decrease by at least 10%

Number of error and omission change orders will decrease by at least 10%

Throughput will increase by at least 10%

Attention to critical activities will lead to measurable cost savings and/or cost avoidance

No new projects will be added to current backlog

Current backlog can be resolved in 2.5 years

Within four years, savings resulting from imprint processes will exceed the cost of added resources





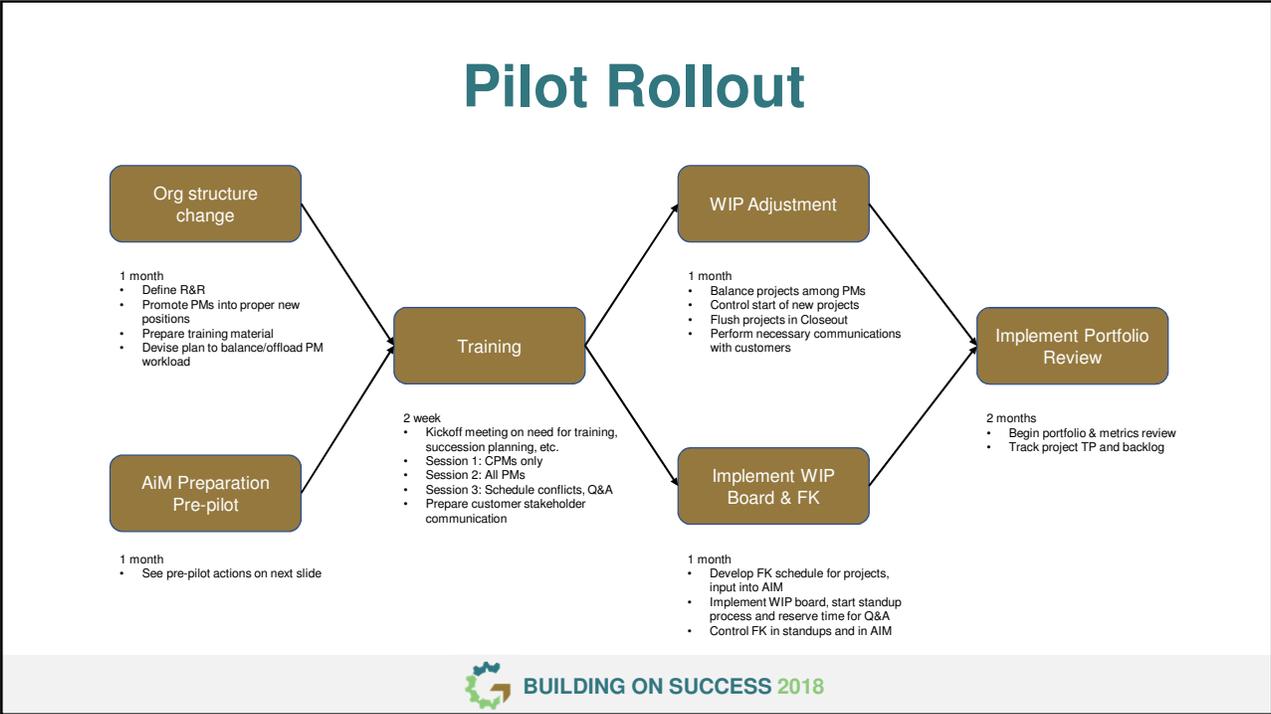
# Metrics

## Operational metrics

- Full Kit Compliance
- Schedule compliance
- Project phase milestone schedule

## Outcome metrics

- Decrease phase cycle times
- Eliminate backlog in 2.5 years
- Reduce change orders
- Increase communication



## Results to Date

Received necessary financial support

Implemented software process changes

Hired additional three project managers, data analyst, and cost estimator

Implemented new succession path, roles and responsibilities, trained on processes, full kits, work flow, and metrics review expectations

Tracking progress and expected outcomes

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