TSDOS TRANSMISSION & SUBSTATION DESIGN & OPERATION SYMPOSIUM

THE UNIVERSITY OF TEXAS AT ARLINGTON

Methodologies for Adopting New Physical Security Technologies

September 6, 2018

BURNS McDONNELL

http://dilbert.com/strip/2006-02-18

WE NEED TO MAKE SOME ASSUMPTIONS ABOUT OUR POTENTIAL ADVERSARY

DANG! THE ONLY ADVERSARY THAT WOULD POSSIBLY ATTACK US IS AN INEBRIATED HILLBILLY

IN THE LAND OF UNREALISTIC ASSUMPTIONS, THIS GUY IS YOUR ONLY ADVERSARY

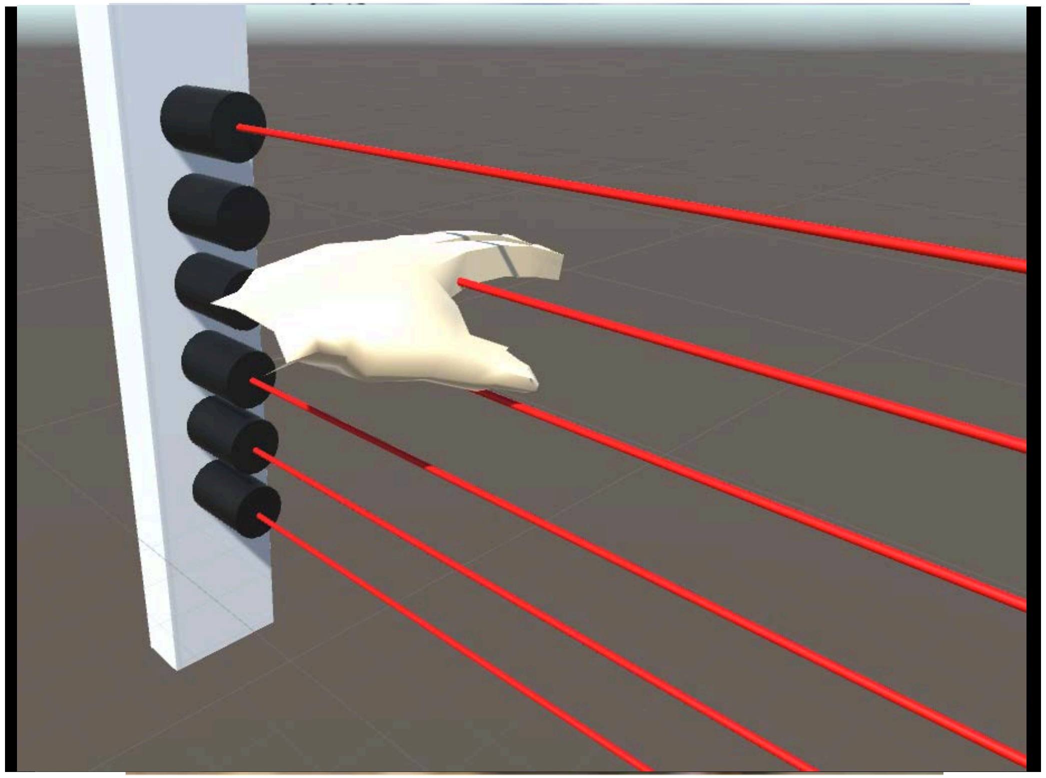
A Word of Caution

Why bother with this process?

So we don’t end up with this:

https://www.justpo.st/channel/too+many+security+cameras

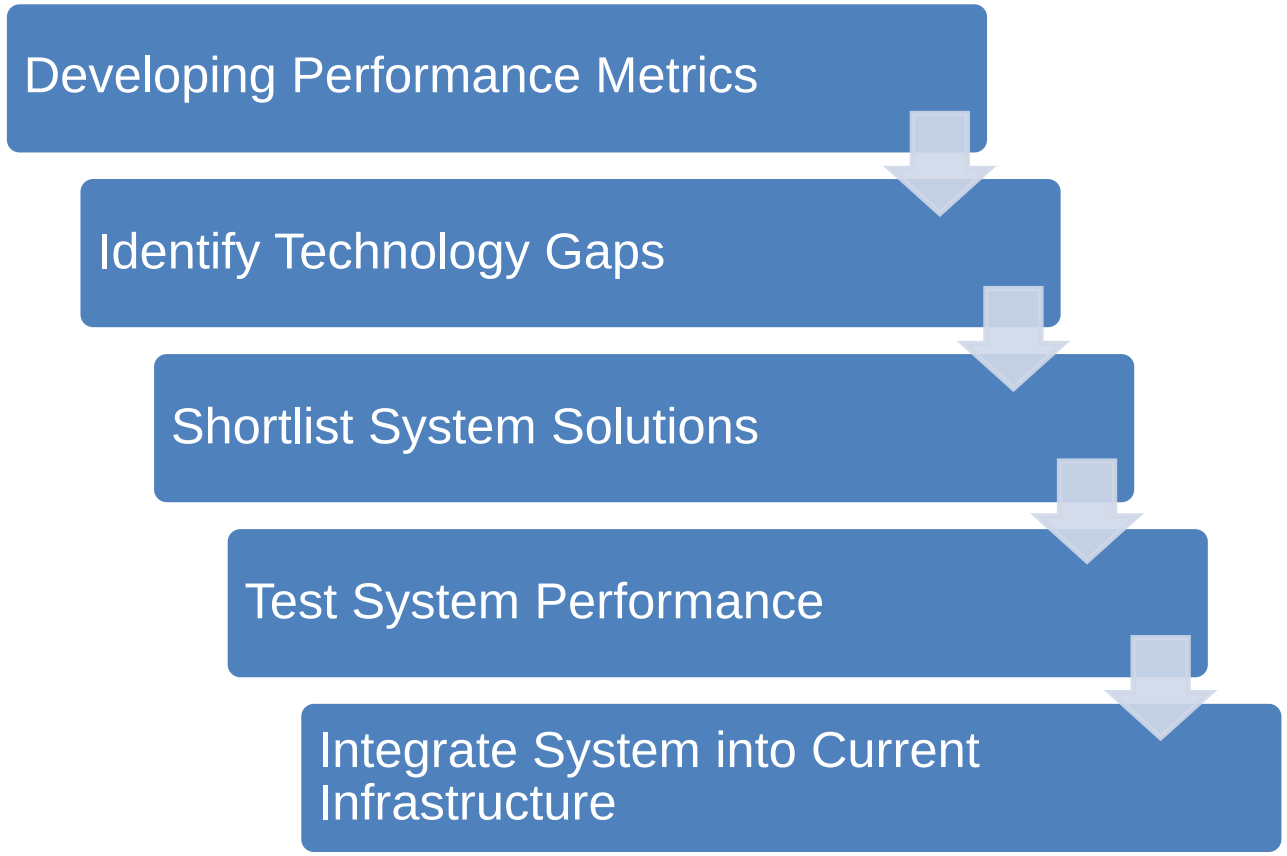
Common Perimeter Intrusion Detection Technologies Utilized by Utilities



https://www.[illegible] -detection

- Thermal Cameras with Video Analytics
- Ground Based Radar with PTZ Cameras
- Unattended Ground Sensors
- Break Beam and Vibration Sensors
- Drone Detection Systems

Phases of Technology Adoption



Developing Performance Metrics

Performance Metrics should be based on security standards and may include:

- Functionality Metrics
- Usability Metrics
- Communication Metrics
- Environmental Metrics
- Costing Metrics
- Viability Metrics

Identify Technology Gaps

New Drone Detection Standard for Utility X:

Detect 90% of Unauthorized drones within 100 meters of Critical Facilities

Develop Performance Metrics → **Identify Technology Gaps** → Shortlist System Solutions → Test System Performance → Integrate into Existing Infrastructure

Identify Technology Gaps

Technologies Currently Used by Utility X		
	Video Analytics	Ground Based Radar
Functionality	No	Yes
Usability		Yes
Communication		Yes
Environmental		Yes
Costing		No
Viability		

Shortlist Technology Solutions

Develop a list of basic questions to **Disqualify** potential technologies:

- **Functionality:** Is the technology able to detect drones to at least 100 meters in the XY and Z dimensions?
- **Communication:** Can it support https protocol?
- **Environmental:** Is the technology IP 66 rated or higher?
- **Usability, Costing, Viability…..**

Shortlist Technology Solutions

Ranking Matrix

Metric	Tech A	Tech B	Tech C	Tech D	Tech E
Detection Coverage (Functionality)	5	3	2	4	1
False Alarm Rate per Site (Functionality)	2	1	4	5	3
Communication with existing infrastructure (Communication)	3	2	5	1	4
Environmental Rating (Environmental)	1	4	3	2	5
Deployment Cost (Costing)	2	3	4	5	1
Deployment at Similar Sites (Viability)	3	2	1	5	4
Totals	16	16	19	22	18

Test System Performance

- Understand how the technology works and develop tests to challenge the technologies ***strengths*** and ***weaknesses*** of the systems.

https://Personal-drones.net

Develop Performance Metrics → Identify Technology Gaps → Shortlist System Solutions → **Test System Performance** → Integrate into Existing Infrastructure

Test System Performance

Develop tests that:

- Challenge the strengths and weaknesses of the technology tested
- Are conducted in the same environments as the intended deployment environments
- Include as many environmental variables as feasible (weather, lighting conditions, etc.)

Test System Performance

Burn-In

Provides longer-term technology usability intelligence

Alarm ID	Date	Time	Cause	T/F Alarm?
12114	5/2/17	2:41 AM	Deer crossed into the sensor FOV	True
12137	5/2/17	9:45 AM	Unknown	False
12187	5/2/17	7:21 PM	Person walking	True
12189	5/2/17	7:47 PM	Tree blowing in the wind	False
12222	5/3/17	5:42 AM	Unknown	False
……	…..	…..	……	…..

Test System Performance

Scale Testing

Scale testing is performed to identify the ability of the system to handle the full load of all planned technology upgrades

- Due to hardware constraints scale testing may require simulated hardware
- Work with technology providers to develop a scaled test lab
- Scale testing should be done for at least twice the total number of sensor of all planned upgrades

Integrate into Existing Infrastructure

- **Simplify, Simplify, Simplify!**
  - Custom integrations can be expensive, complex and reduce reliability
- Are the systems required to be integrated to achieve the desired functionality?
- Can the systems be displayed in a way that makes them appear integrated without a custom integration being developed?
- How are you going to confirm the integration is consistently working?

Integration

Testing

Compare alarms at the sensor level to the system level

Sensor Alarm ID	Date and Time	System Alarm ID	Date and Time	Sensor Only/ Interface Only/Both
124	5/6/17 5:42AM	3542	5/6/17 5:42 AM	Both
196	5/7/17 2:22PM			Sensor Only
		3674	5/8/17 4:21 AM	Interface Only

Integration

Training

- For operators, installers and system administrators
- Part of the pilot
  - Feedback from each team
  - Incorporated into the decision to *adopt or not adopt* the technology

Conclusion

Investing in technology assessment and testing upfront pays dividends on the back end.

Don't be afraid to NOT ADOPT a solution.

Not *every* adoption project requires *every* step of *every* phase. This process can and should be adopted *as circumstances dictate.*

TSDOS TRANSMISSION & SUBSTATION DESIGN & OPERATION SYMPOSIUM

THE UNIVERSITY OF TEXAS AT ARLINGTON

Brock Josephson
Physical Security Specialist
816-822-4234
bcjosephson@burnsmcd.com

BURNS McDONNELL

Q & A