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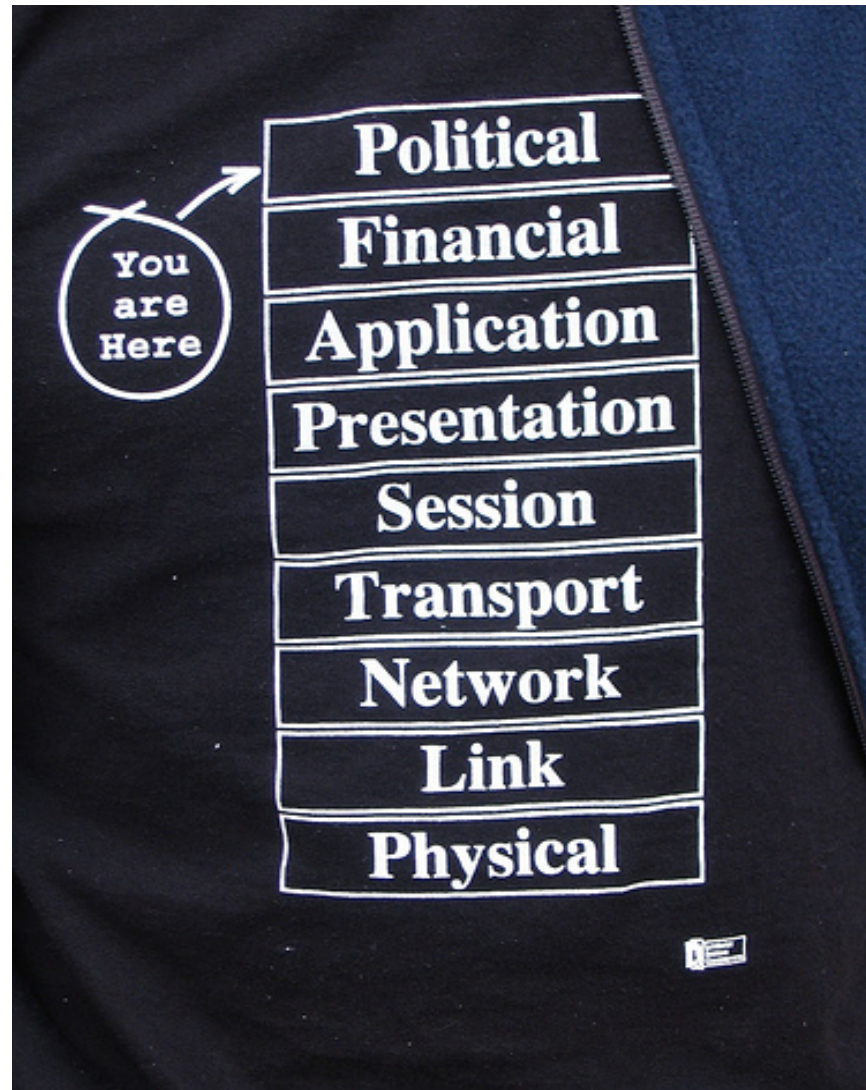
Using Flow for Municipal Planning:
Political, Economic, Social and Technical Contexts of the City of Pittsburgh

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Introduction

- Flow's use relevant to municipal planning and workforce development can be exploited further

- Enhance understanding of the *political*, *economic* and *social* context and how it impacts the *technological* environment (PEST)

- Access to small scale municipal network provided an opportunity to work on real data without security considerations of large, federal networks

- Coupled with CIS Project gave contextual perspective albeit no easy answers!

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Introduction

- Focus is on a PEST analysis of the City of Pittsburgh and how Flow reconciles analyst and management perspectives within the context of a municipal government

- Recommendations relevant to replicating and expanding university/municipal partnerships and the value that can be provided to both parties

- Universities see the value

- Municipalities need convincing – little awareness of Flow, traffic analysis and how it can inform decision-making

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Historical Shifts

Once the center of the "arsenal of democracy" the decline of the steel industry in the 1970s-80s has had profound impacts on:

- How the city operates

- How it generates revenue

- How its population has evolved, and

- How technology affects the ability of Municipal government to respond to these shifts

Pittsburgh rebounding after decades of stagnation – economic legacy impacts IT Policy and Management decisions

Political Shifts

- Pittsburgh is a Union/Democratic town and has been for better part of century
- Pittsburgh politics governed by intra-party rivalries
- History of strong mayors until last two decades
- City Council increasingly strong and resistant to strong executives
- Frequent disagreements between policy makers
- Every recommendation colored by a political perspective – very difficult environment for the analyst

Economic Shifts

- Once the largest center of fixed capital in North America – Pittsburgh no longer an economic powerhouse

- Decline of the steel industry and the associated loss of finance has meant decreased corporate and individual tax revenue and ability to adapt to changing conditions

Social Shifts

- Economic base no longer supports historic population
- Exodus of almost half of under 30s during 1990s - decreased tax base and human capital
- Population is second oldest in the United States
- Deeply entrenched union support amongst retired Pittsburghers
- Little public appreciation for IT investment and the shifts in threat environment in the Information Age
- Unless something goes wrong…

Technological Shifts

- Once at the forefront of municipal IT planning, Pittsburgh in 10 years has stagnated, losing personnel and institutional memory (30% in last year, additional 20% in next two years)

- Limited ability to invest in new IT infrastructure

- Limited ability to offer competitive salaries and bring in fresh perspectives

- Networking technology and threat environment continues to evolve at an increasing pace

- Growing challenges – malicious and benign (Network Situational Awareness)

Technological Shifts Pittsburgh CIS

Pittsburgh Outsourcing Project – The high level view

- Rapidly degrading trajectory
- Team tasked with analyzing outsourcing and finding other efficiencies
- Given full authority to examine all possible solutions and creatively rethink:
  - Processes
  - Procedures
  - Systems

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"Most livable city"

- More IT challenges
- Potential Terrorist Threat – softer target
- Movie Industry
- G20, Hacktivism and protest movements

Failure Points

- Exchange Administrator – Mail server down, no staff backup
  - Verified by Flow Data (Google Mail)
- Police MDTs – down for three weeks
  - No maintenance contract – person that maintained system left CIS with no replacement
- Malicious Traffic from overseas
  - Scanning
  - Spam Runs
  - Suspect DNS traffic from .ru, .ro and ***.su***?

Budgets

- Despite growing problems, budgets continue to shrink

- How can Flow inform decisions relevant to outsourcing and infrastructure investment

- To maintain functionality CIS increasingly reliant on outsourcing (Google Mail and Docs)

- Alternatives if structural problems not addressed – Neither is Viable Outcome:

  - Disband CIS and wholly rely on contractors

 - Face significant network/security failure

Political Assessment

Despite severity and immediacy – change requires holistic approach

- No easy answers!

- No pain-free solution!

- Failures are dramatic with significant political fallout but only realized "in the negative"

- Getting buy-in from all parties – requires solid analytic evidence

- Flow informs decisions otherwise colored by political agendas

Economic Assessment of other Municipalities

New York, NY

Philadelphia, PA

Buffalo, NY

Arlington, VA

Cleveland, OH
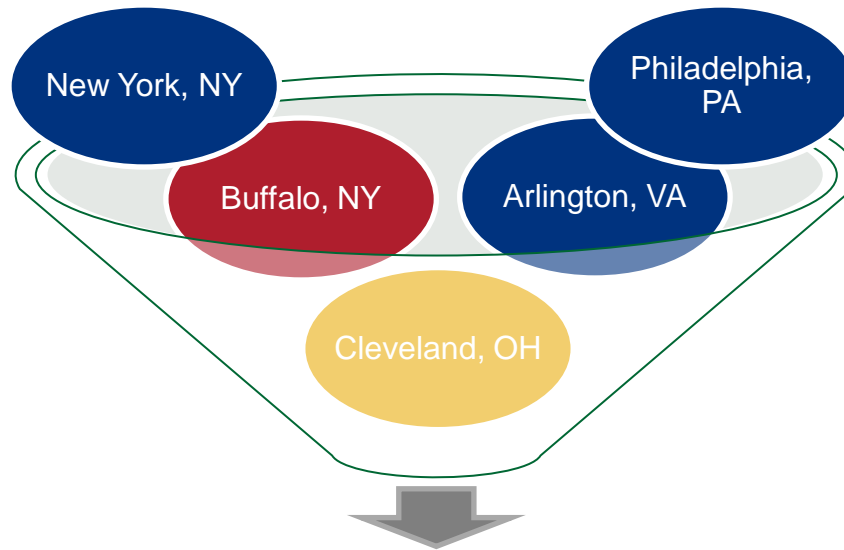
Key Insights

- County consolidation of services
- Outsourcing commoditized services
- Detecting fraud, waste and abuse
- Countering Union pushback
- Existing Training Pipelines
- Commonality with Pittsburgh – Flow Analysis can inform all of these decisions, but limited actual use beyond a pure "tech" context

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Social Assessment

- Inability of City Networks to accommodate economic recovery and grow tax base
- Little Opportunity to make public case without concrete data
- Need for qualified personnel, conversant in Flow toolsets
- Pool of underemployed talent – non technical backgrounds
- "Cyber Corps" Public-Private Partnership to grow human capital
- Train network analysts in exchange for service

What can be done?

- Use of Flow to raise awareness amongst policy makers
- Investment of COP to allow for competitive hiring/training of qualified talent and infrastructure spending
- Incentivize recruitment and retention of Flow Analysts
- Establish analyst training pipeline in partnership with local education (secondary and post-secondary)
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Questions?

Staffing Recommendations/Cyber Corps

Staffing Recommendations

‣ Civil Service Reform
‣ Performance Qualifications
‣ Performance Evaluations
‣ Cross Training of Work Duties
‣ Pittsburgh Cyber Corps

Cyber Corps - Benefits

City Employee Union

The following are key benefits to city employee union:

‣ Influx of highly qualified Cyber Corps union members
‣ Union members will not be replaced
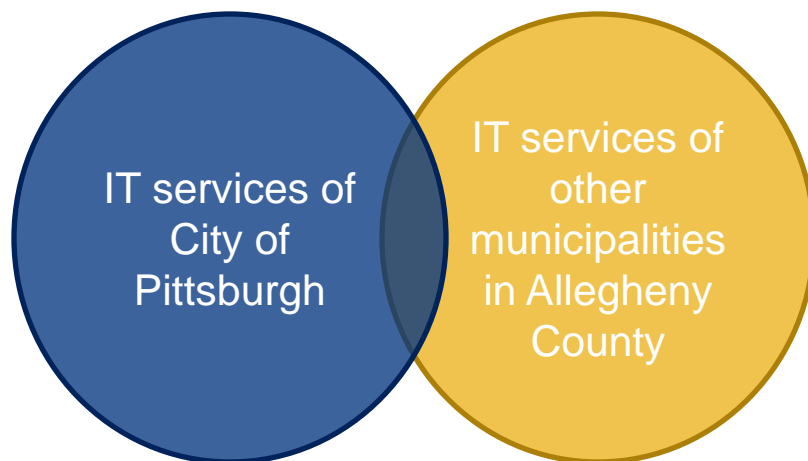‣ Cyber Corps employees will add new skills to union
‣ Unions can save training costs

Municipality consolidation could provide long term solution

IT services of City of Pittsburgh

IT services of other municipalities in Allegheny County

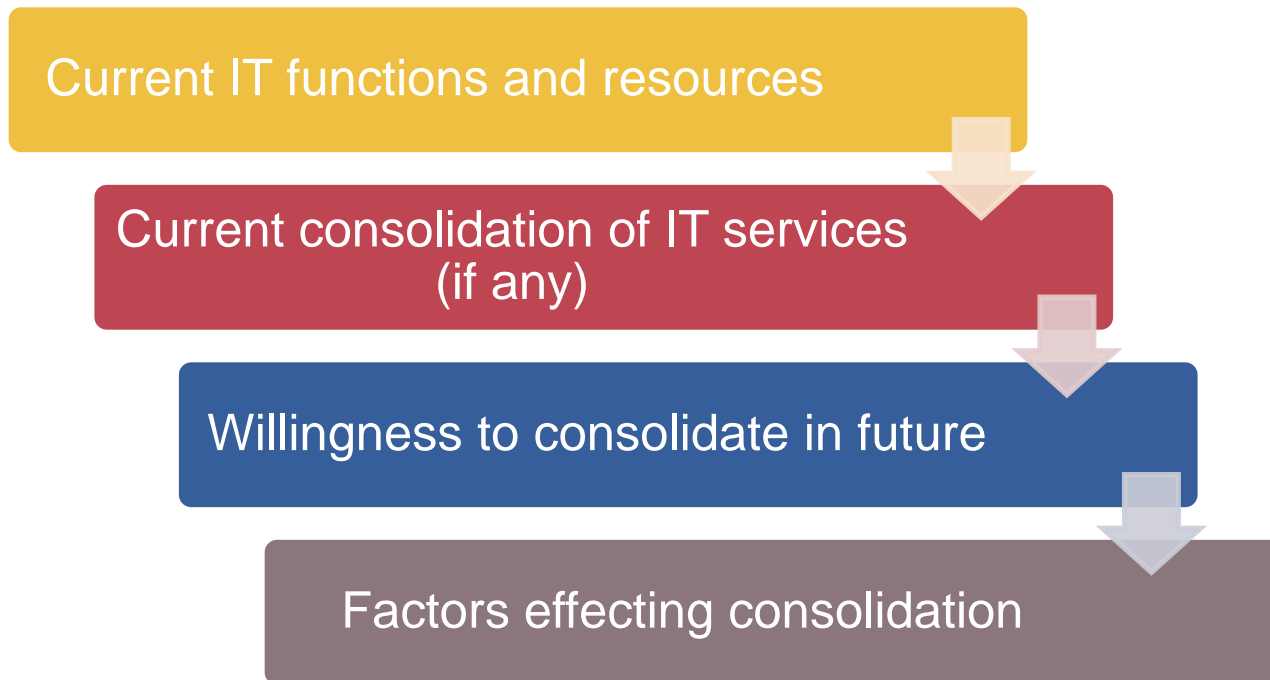**Carnegie Mellon University**

Municipality consolidation could provide long term solution

Over 40 municipalities were surveyed to gauge their willingness and ability to consolidate
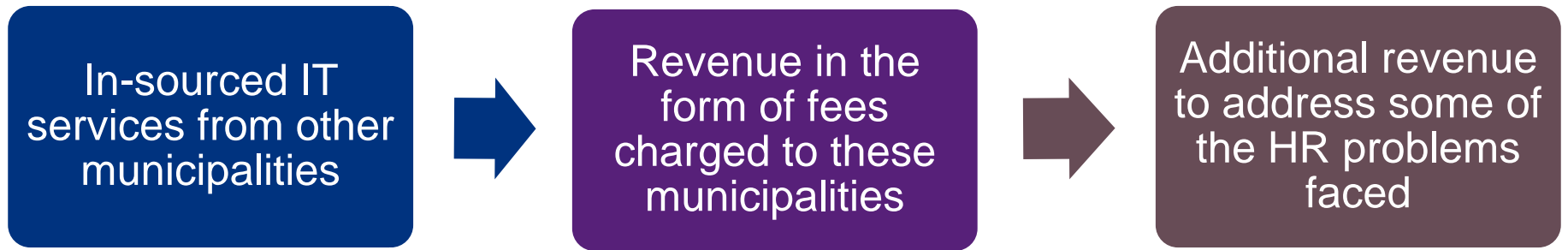
Current IT functions and resources

Current consolidation of IT services (if any)

Willingness to consolidate in future

Factors effecting consolidation

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Still not going to be easy...

Municipality satisfaction with third-party provider
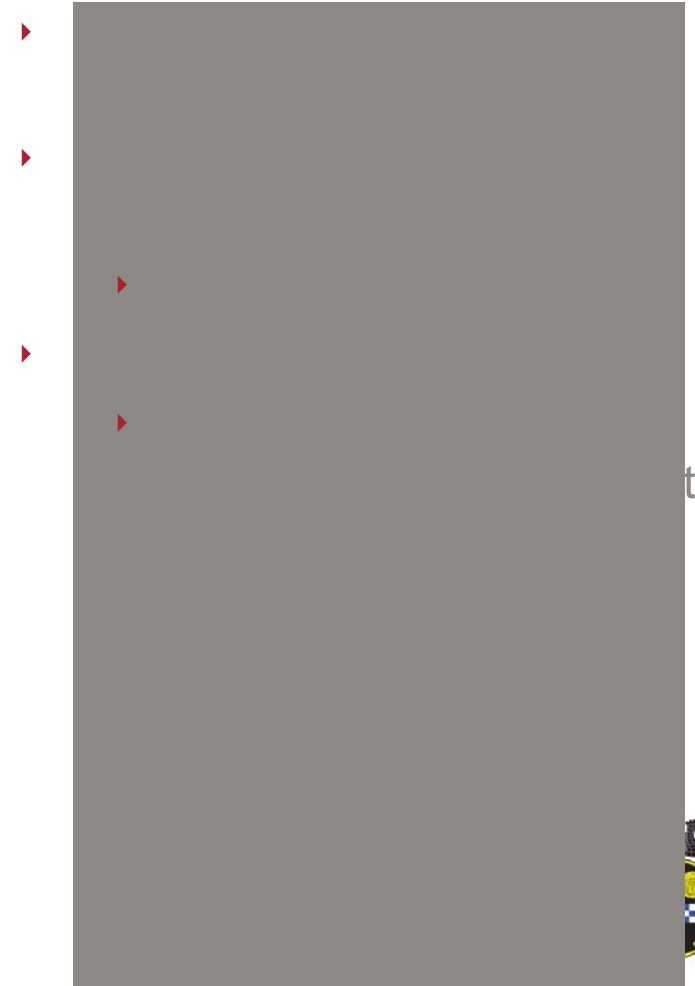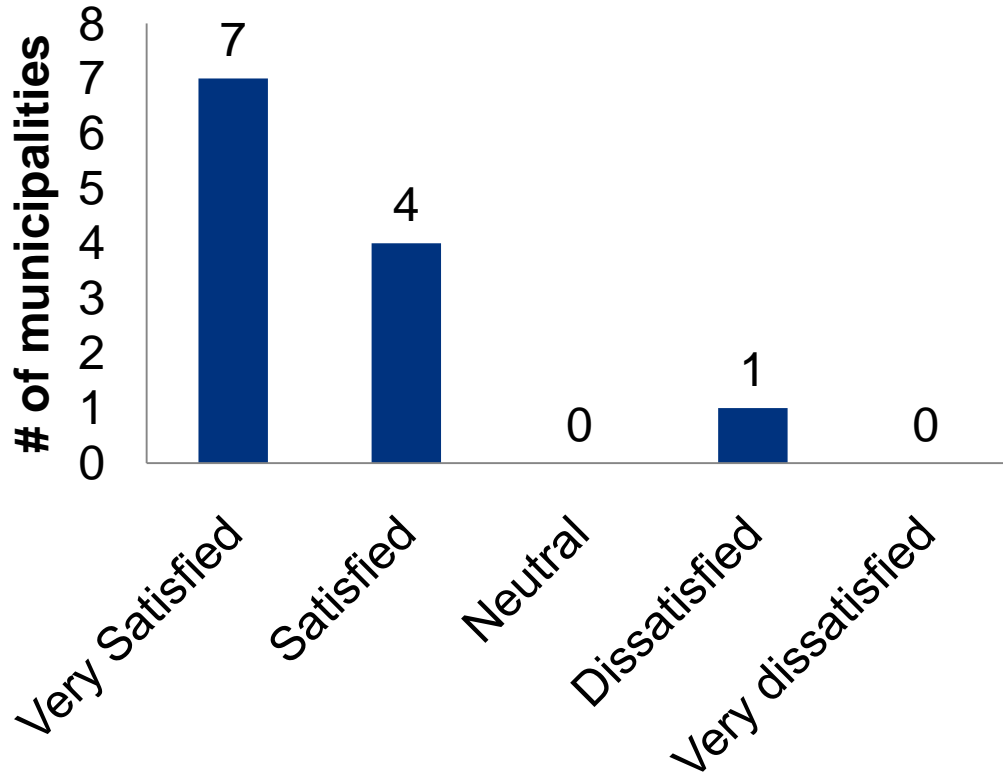
Municipality consolidation can bring revenue for CIS if CIS in-sources IT services

In-sourced IT services from other municipalities → Revenue in the form of fees charged to these municipalities → Additional revenue to address some of the HR problems faced

Consolidation involves certain risks

Capability
- Difficulty in managing current resources
- Lack of in-sourcing experience

Cost
- Expansion of infrastructure and hiring of new staff to handle additional responsibility
- Risk of not recovering investment in upfront costs

Legal Liability
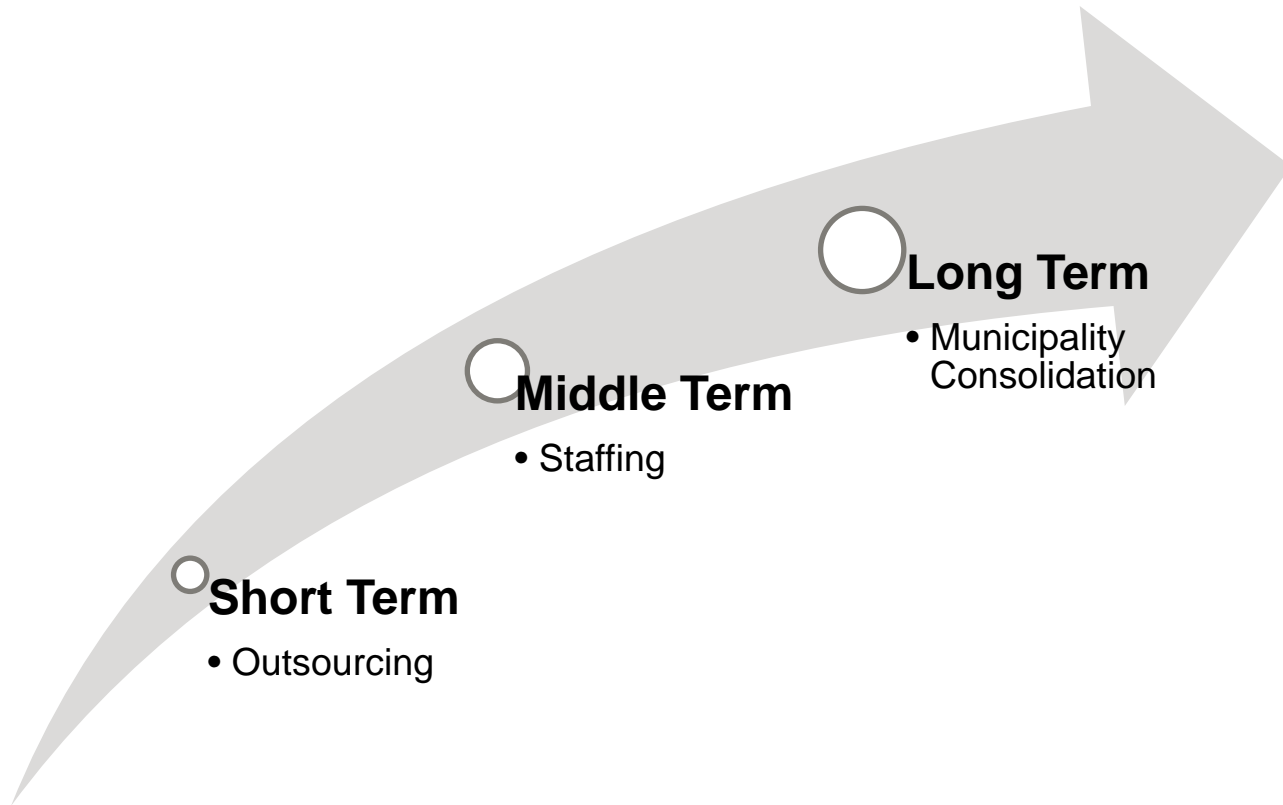- Willingness take legal liability for unfavorable circumstances

Services utilizing the most resources at municipalities

# of municipalities

Next Steps

Long Term
- Municipality Consolidation

Middle Term
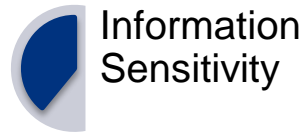- Staffing

Short Term
- Outsourcing
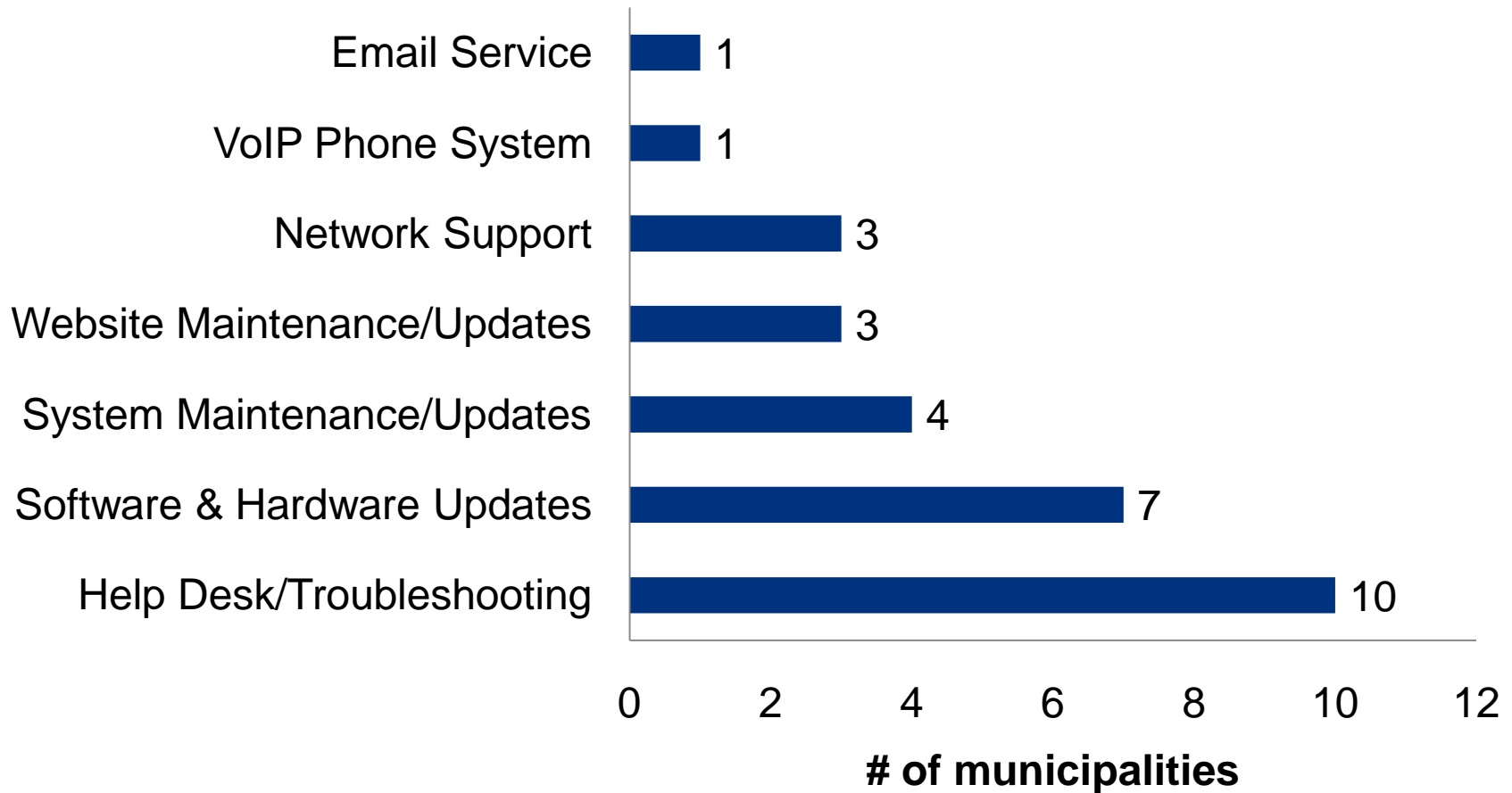
Future Application

How Flow Might Be Used by Municipalities in the Future:

1. Survey all the municipalities to gauge their ability and willingness to consolidate.

2. Analyze its own IT services to determine the potential for consolidation.

3. Create comprehensive plan for service consolidation.

4. Work towards attaining the necessary political support for consolidation.

2ⁿᵈ Tier Dimensions

Information Sensitivity

Political Sensitivity

Willingness to Outsource

35%   35%   30%

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