Embedded Engineering
A Solution to Agency Staffing Issues

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Burns & McDonnell / KDOT

Why this topic?

- An option to help mitigate the staffing shortages

- Today's purpose:
  - What's a consultant's role?

  - What's an agency's role?

  - KDOT ITS Program Overview

Different Types of Embedded Positions

Embedded Engineer - An engineer from outside of an organization that is integrated into an agency to work on its behalf

- Internal

- External

- Task

- Project

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How Did KDOT ITS Embedded Start?

- KDOT ITS had 3 employees

- Other divisions used embeds

- Recruiting and retaining challenges

- Upcoming projects
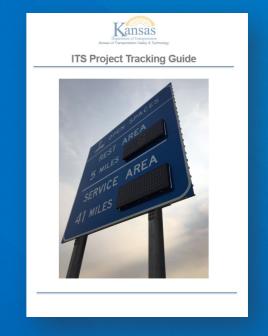
- Oversee consultants' work

How has KDOT ITS evolved over the years

- Year 1
  - 40 hours
  - Topeka
- Year 2
  - 32 hours
  - ½ in Topeka / ½ Remote
- Year 3+
  - 2 embeds
  - 20 hours
  - Remote

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KDOT ITS Embedded Engineers

- Point of contact

- Balance workload

- Construction management

- Activity tracking

- ITS device operations

- Maintenance tracking

- Review plans

- Future planning

- Procurement of equipment

- Guide for future KDOT employees and/or embeds

Benefits

- Consultant
  - Learn agency's processes and procedures

  - People and culture of the agency

  - Build connections

  - Variety of projects

  - Fresh perspectives

  - Full life cycle of a project

- Agency
  - Additional workload capacity

  - Consultant's experience and background

  - Consultant's company resources

  - Additional staff when hiring is not an option

  - Not competing with private sector

Challenges

- Consultant
  - Assigned away from company office

  - Represents the company to an agency

  - Can not send a new engineer

  - Low profitability

  - Some projects are "off limits"

- Agency
  - Roughly twice as expensive as hiring an employee

  - Need to get leadership on board with program

  - Errors and omissions, liability

  - The embed consultant would be omitted from certain tasks or projects

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Conflict of Interest

- ASCE's Code Of Ethics: Canon 4

  "Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest"

- Case Study – ITS Maintenance

Future of Embedded Engineering at KDOT and Beyond

- 2nd contract / 5th year

- Two embedded
    - part-time
    - partially remote

- Agreed to contract extensions

- Possible embedded positions with multiple agencies

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QUESTIONS?

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