

# THINK TANK HOA

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## FROM DATA TO ACTION

*How data and simulation make HOAs better stewards*

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# ABOUT THE SPEAKER



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20+ years helping infrastructure, transportation, and government leaders apply emerging digital and AI technology to real capital and operations decisions. At AECOM, leads a global advisory team of 500+

## AREAS OF EXPERTISE

Digital Strategy

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Surfside, June 2021. The signs were there, reserve funding was not.

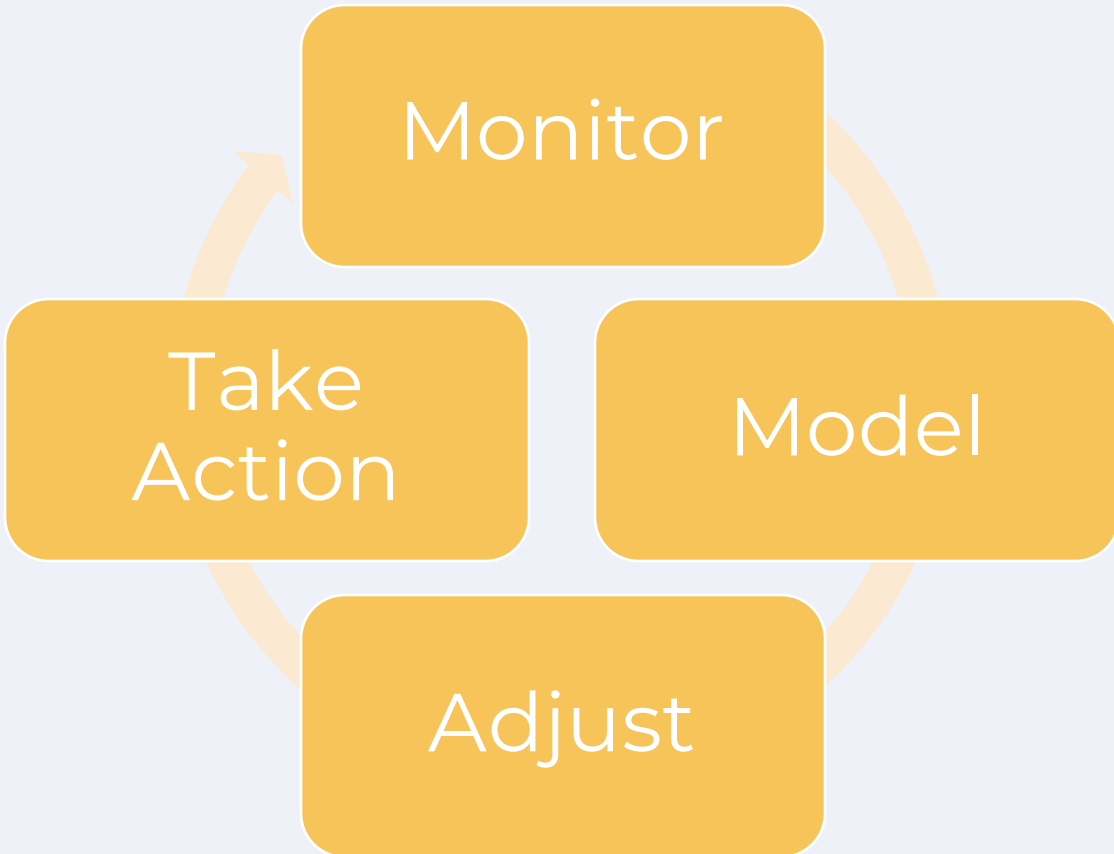
# Good intentions are not enough

## What HOAs already do well

- Boards that genuinely care about the property
- Reserve studies commissioned on cycle
- Capital plans reviewed every year

## What's still missing

- Real condition data, not assumptions
- Linkage from O&M (and life safety) reality to capital plans
- A transparent and credible way to test “what if” to justify reserve increases



## WHAT “GOOD” LOOKS LIKE

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Boards that can scenario-plan can act from a position of strength.

Technology makes this easier.

## THE FRAMEWORK

DATA + SIMULATION = BETTER DECISIONS

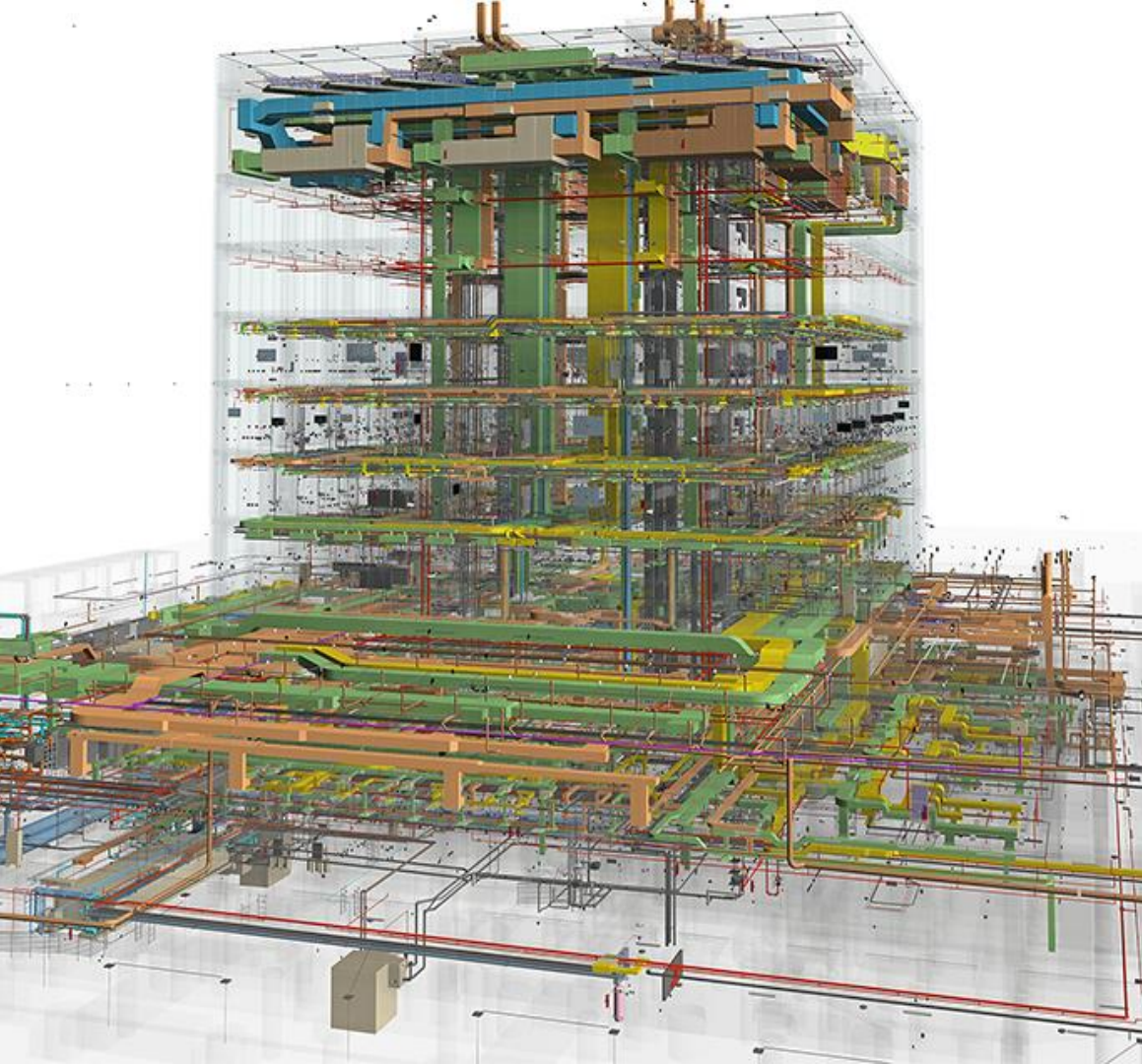


# A FOUNTAIN OF DATA

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What could we know about this fountain — and what data are relevant?

*Photo: Baxter Village neighborhood*



# THE NEXT LEVEL: BIM

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A Building Information Model (BIM) creates a 3D replica of a structure

# What you can capture today

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1. Geospatial — GIS, spatial layers, ownership, drone/sat/aerial imagery
2. BIM and LIDAR — built form and physical reality
3. Asset systems — CMMS, work orders
4. Resident data – names, violations, etc
5. Capital planning – financial systems and spreadsheets
6. Sensors — cheap, real-time, increasingly default



## UNSTRUCTURED DATA

Raw. Unorganized. Untapped.



# AI: A DATA ACCELERATOR

AI technologies can increasingly process and catalog data, particularly unstructured data like forms and documents.

AI (OpenAI) Generated Image

# Two big traps with data

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## Data hoarding

- Capturing because you can, not because you'll use it
- Storage and pipelines you'll pay for forever
- No clear decisions tied to the data

## Data purgatory

- Endless ontology debates
- Cleanup that never ends
- “Free data tomorrow”



*What supports better decisions at the right cost of acquisition?*

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**The only data question that matters**

*Capture is cheap. Cleanup, integration, and ownership are not. Start from the decision, work backward to the data.*

## THE FRAMEWORK

DATA + SIMULATION = BETTER DECISIONS



# DO NOT PASS GO

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Is the Monopoly boardgame a valid simulation tool? It depends...

# Match the fidelity to the decision

## Right tool, right job

- Monopoly: Teaches a 9-year-old basic economics
- A spreadsheet: models reserve adequacy in an afternoon
- Advanced digital twin with sensor-driven chem/bio/physics model: reduce chemical and energy consumption to save millions in OpEx at a wastewater plant

## Wrong tool, wasted money

- Monopoly to model Manhattan rents to support financial decisions? Absurd
- A really, really expensive “model railroad”
- Fancy tech that can’t model reality

## DIGITAL TWINS, DEMYSTIFIED

A digital twin is just a digital model of reality that's good enough to drive a desired outcome.

# Two traps in simulation

## Wrong fidelity for the goal

- Building a digital twin of 1935 Manhattan when Monopoly would do
- Neat simulations that don't drive a decision
- Data that aren't available, accurate, or cost-effective enough to drive a simulation

## Unconstrained problems

- Wastewater plants behave; stock markets don't
- Pump vibrations: yes. Pedestrian flow at scale: maybe not
- Some questions don't yield to simulation. Use judgment.

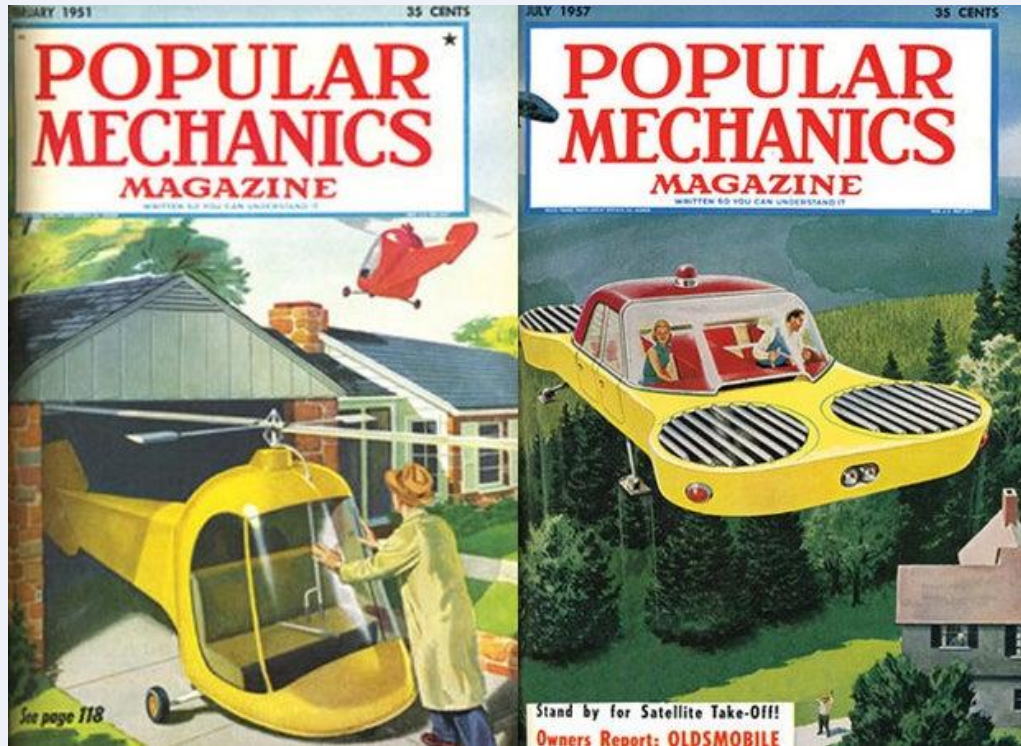
# Decisions you can make via simulation

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1. Real tradeoffs — defer, fix, or replace?
2. Portfolio-level optimization
3. Outlier detection
4. Best/Worst case outcomes: the power of the bell curve

## THE FRAMEWORK

DATA + SIMULATION = BETTER DECISIONS



# DUDE, WHERE'S MY (FLYING) CAR?!

Build a culture where decisions are diagnosed and improved not a ticket to the woodshed or déjà vu all over again.

*Photo: Popular Mechanics, 1951, 1957 (not shown 1971, 2019, 2011, 2021...)*

# START MONDAY

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*What to do this week, this quarter, and this year.*

# Experiments beat big bangs

## The big-bang trap

- Long, expensive, and subject to the “siren’s song of due diligence”
- Locks you into one vendor's worldview
- Pays off in years — if it pays off at all

## The experimental path

- Pick one decision worth getting right
- Instrument and model just that decision
- Learn, adjust, and launch the next experiment

# Start capturing today

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1. Use LLMs to extract data from PDFs you already own
2. Let AI bridge the tools you already paid for
3. Pick one decision and instrument it end-to-end
4. Don't wait for perfection, the goal is *better* decision making
5. Play with LIDAR and 3D imagery with the tools you already have

# And then...

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1. Scale and harden your experiments
2. Identify opportunities to improve your decisions via better data/simulation
3. Add BIM to any new construction and/or build a digital twin
4. Think in terms of crawl/walk/run
5. Transition from macro decisions to more micro (O&M, budgeting, resident communications, etc.)

# DISCUSSION PROMPT

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## Where in your portfolio would one better decision pay for the entire effort?

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### Things to consider:

- Which community? Which asset? Which decision?
- What data would you need — and what do you already have?
- What experiment can you launch *this week*?

## THE TAKEAWAY

If it doesn't change a decision, it isn't data. It's noise.

# THINK TANK HOA

# THANK YOU

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*Pick one decision. Instrument it. Tell me what you learned.*

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