Hydrail Meets Niccolo Machiavelli: “The Difficulty of Change”

Presented by Bill Thunberg
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“...there is nothing more difficult and dangerous, or more doubtful of success, than an attempt to introduce a new order of things... whenever the opponents of the new order of things have the opportunity to attack it, they will do it with the zeal of partisans, whilst the others defend it but feebly...”

- Niccolo Machiavelli, *The Prince*
CATS Procurement & Contracting Section – Procurement Service Request (PSR) Process

**Process P01**

1. **Requestor / Project Manager Completes Form**
   - Division Manager Signs Form
   - Procurement Assistant Routes Form
   - Chief Procurement Officer Assigns Project
   - Procurement Assistant Enters PSR into ARMS

2. **Finance Administrative Assistant Routes Form**
3. **Budget Officer Validates Funds**
4. **Budget Supervisor Signs Form**
5. **Civil Rights Electronic Review (ARMS)**
6. **Information Technology Electronic Review (ARMS)**
7. **Procurement Assistant Scans, Emails & Files Form**
8. **Procurement Officer Initiates Procurement**
   - Procurement Officer Assigns Project Procurement Assistant Enters PSR into ARMS
   - CATS Legal Emails Attorney Assignment
   - P-Card

**Preparation**

1. 1-10 days

2. **Start**

3. **Division Manager**

4. **Budget / Finance**

5. **Supporting Divisions**
**CATS Procurement & Contracting Section: Document Execution (Signature Routing Process)**

**Post-Award**

### Procurement Officer

1. **Award**
   - Procurement Officer Prepares Documents
     - **Documents for Review & Signature**

2. **Vendor Signature Required?**
   - **Yes**: Send to Vendor for Signature
   - **No**: Procurement Officer Prepares Digital Documents for Review

3. **Encumbrance Memo Receipt?**
   - **Yes**: Create Encumbrance Memo (CATS Finance)
   - **No**: Procurement Officer Prepares Printed Documents

4. **Printed Review (Budget Manager & Chief Financial Officer)**
   - **CEO Signature Required?**
     - **Yes**: Procurement Officer Prepares Printed Documents
     - **No**: CM Signature Required?

5. **CM Signature Required?**
   - **Yes**: Encumbrance Required?
     - **Yes**: Procurement Assistant Prepares File Folder (if needed)
     - **No**: End
   - **No**: GEAC Entry Required?
     - **Yes**: Procurement Officer Posts to Clerk Site
     - **No**: Procurement Assistant Prepares File Folder (if needed)

6. **Procurement Officer Posts to Clerk Site**
   - **Completes File Folder (if needed)**
   - **Submits Requisition in GEAC**

### Support Staff

1. **Digital Review of Documents (Civil Rights, FAR/Audit, PM & CATS Legal)**
   - **Send to Vendor for Signature**

### Signatory

- **Procurement Assistant Routes Printed Documents**
- **City Finance Signature & Encumbrance**
Each step of the process is managed or completed by people—people who have absolutely no incentive to try something new and every incentive to avoid risk.

Indeed, these people—transit employees or consultants—perceive their professional survival as linked to *not considering change*...only considering incumbent technology...so that the “proven” method becomes the unquestionable default.
The only timely way to “cut this Gordian Knot” is to make the public very aware that a wireless alternative (hydrail) is now emerging which—at least in the USA—costs about €4 million less per km to construct...and eliminates the whole unsightly tangle of overhead catenary wiring.

Sunlight—media directed public awareness—is the only “solvent” that can dissolve the bureaucratic "glue" that holds barriers to innovation, like hydrail, in place.
There is an honest tension between the interests of legacy rail technologies, including carbon...

... and the interests of society:
There is a reason why companies that build very long lasting infrastructure tend to have very conservative cultures:

The very *thought* of change is so painful that innovators are marginalized or weeded-out.
But even to the heaviest, most capital-intensive industries, *disruptive change must come*:

The objective is to manage this transition to yield the best outcome for both society *and* industry.
Depend upon it:

• Climate change *will* be disruptive.

• Adaptation of technologies to the defend against it *and* the technology change opportunities it creates will be *very* disruptive.

• **Hydrail** will be a defense—if we wait—but an opportunity... *if* we “pre-act” to climate change.
Whether we “pre-act” or “react” is a choice now—but it may not remain *optional* much longer.
The best way around this tension may be Clayton Christensen’s solution, as described in his book *The Innovator’s Dilemma*. It might be called “ideas in exile”. 
Buy, merge or partner with a smaller company far, far away...where the disruptive idea is not a threat.

Plant the disruptive technology there; water it with cash; watch early versions die; and then...
...when the feared innovation is proved viable, bring it home and introduce it to the corporate family.
How could hydrait fit this process? One instance: GE’s hybrid Evolution® locomotive could be shipped—minus its diesel genset—for “hydrailizing” in Turkey.
No technology lasts forever...not even in the railroad industry. The options?

• Transition gracefully and economically now...or

• Wait for a climate crisis to absolve us from having to choose or plan.
Bill Thunberg
Executive Director
Lake Norman Transportation Commission

175 North Main Street
Mooresville NC 28117
USA

+1 704 604-5057          bthunberg@lakenormantrans.org