


Adapted from Donella Meadows, *Places to Intervene in a System*, Whole Earth, Winter 1997.

<p>#9: Numbers</p>	<p>The importance of numbers in a system can be overestimated. Delays in delivering accurate data/numbers make a system less responsive to short-term change. This can create wide swings (oscillations)</p>
<p>#8 Materials (also Design)</p>	<p>Design may determine outcome. In some big physical systems (roads, Beltway, etc) the system can be difficult to change & can create near-unstoppable forces (global warming) OTOH, A big and slow system can be a buffer, maintaining stability. Have to understand the buffer & its limits</p>
<p>#7 Regulating negative loops</p>	<p>1. GOAL: may be maintaining constancy 2. MONITOR: (w/signal) to alert to change, out of whack 3. RESPONSE: Bring back into equilibrium Negative loops are often too weak or confused to do their job.</p>
<p>#6 Driving positive feedback loops</p>	<p>Use the self-reinforcing power of +loops (these can have both positive & negative outcomes) TO MANAGE OVERLY FAST GROWTH: Reduce the gain around the +loop. (We could have regulated who qualified for a mortgage, for example)</p>
<p>#5 Information flows</p>	<p>What can be seen or known changes behavior. We must provide feedback to make the system accountable.</p>
<p>#4 System rules</p>	<p>Contracts, punishment, rewards, incentives--all social rules. Are the rules we have the ones we want?</p>
<p>#3 Power of self-organization</p>	<p>How much can the participants self-organize? New options may be available w/power of social networks. See self-org. as a source of diversity in design.</p>

UNDERSTAND THE LIMITS; BOTTLE-NECKS OF A SYSTEM!

Do What if? Exercise. "What if teachers are accountable to students?"

<p>#2 Goals of the system</p>	<p>Are the goals what we think they are? Goals are usually in a <u>hierarchy</u>. Do we know which goal we are serving?</p>	
<p>#1 Mindset: "The Frame"</p>	<p>What is considered to be valuable? What's our underlying assumption? Fairness? Growth? Etc.</p> <p>A dominant leader can have a profound effect on the mindset.</p> <p>Keep in mind that a paradigm shift can change the mindset in an instant.</p>	
<p>Adapted by Leading Futurists, LLC, 2009.</p>		