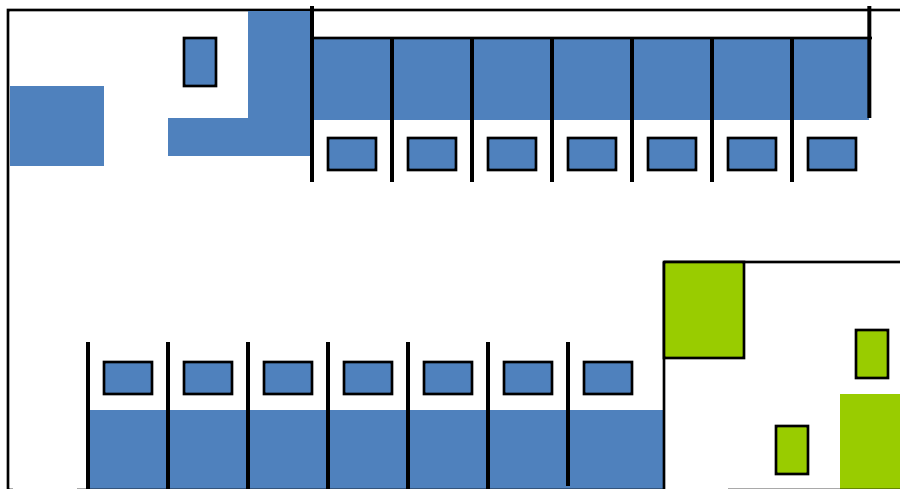




# Using Second Life for Strategy and Tactics

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Krasnow Institute



Microeconomic Systems Approach  
 $S = (e, N, I)$

Environment

Institutional Performance

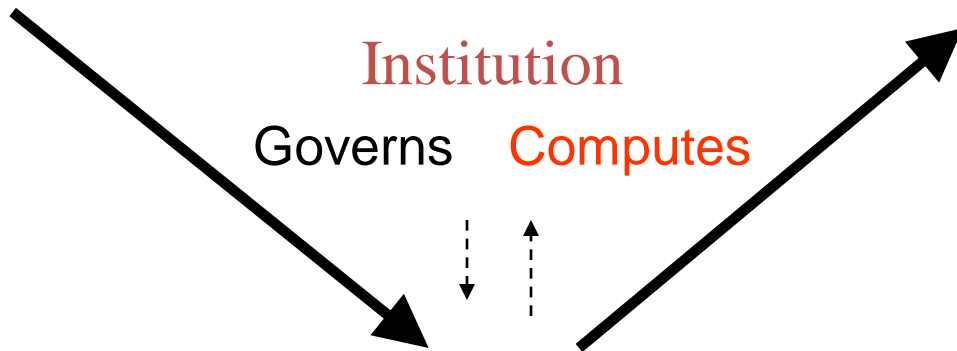
.....▶ Outcomes

Institution

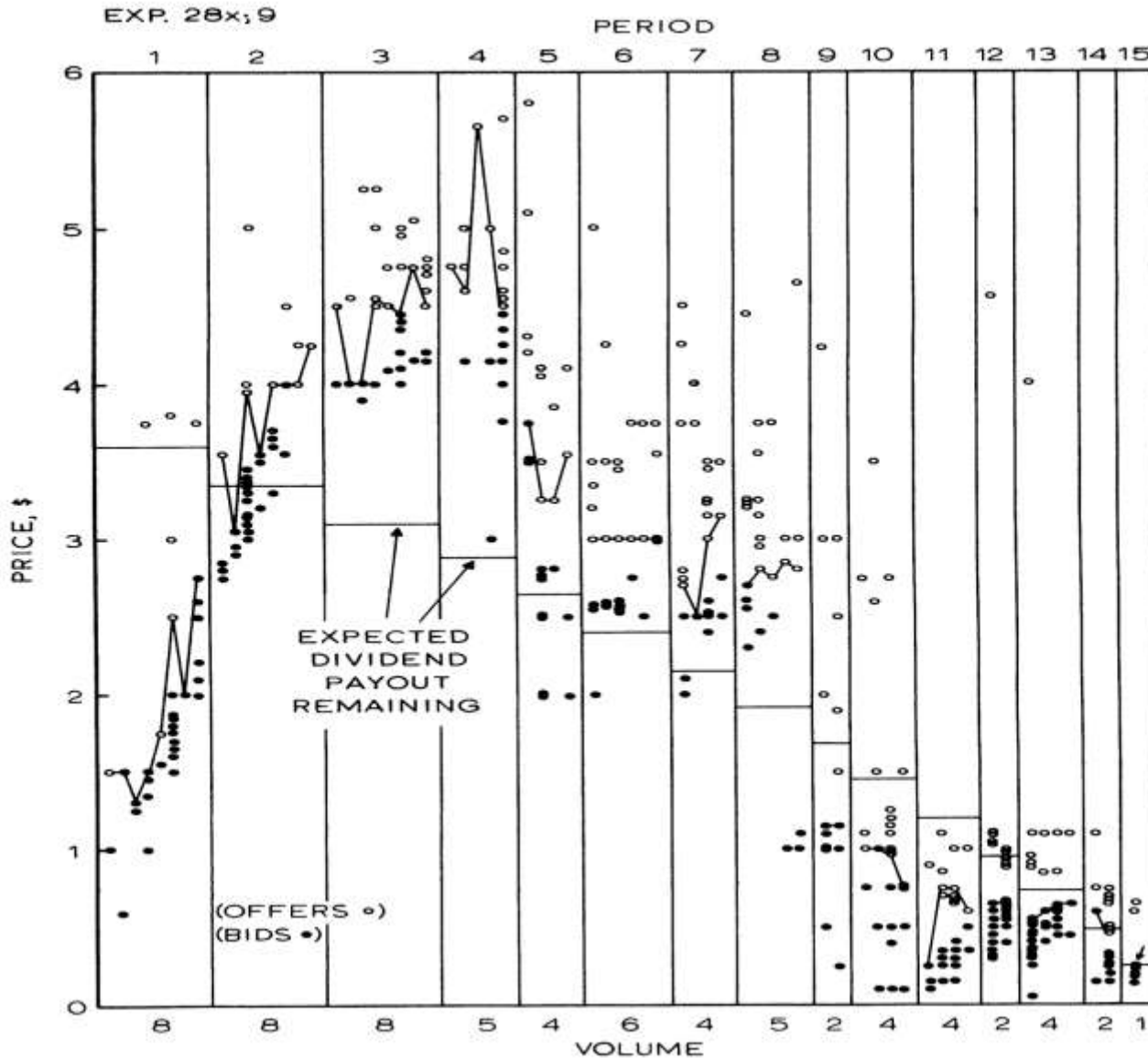
Governs

Computes

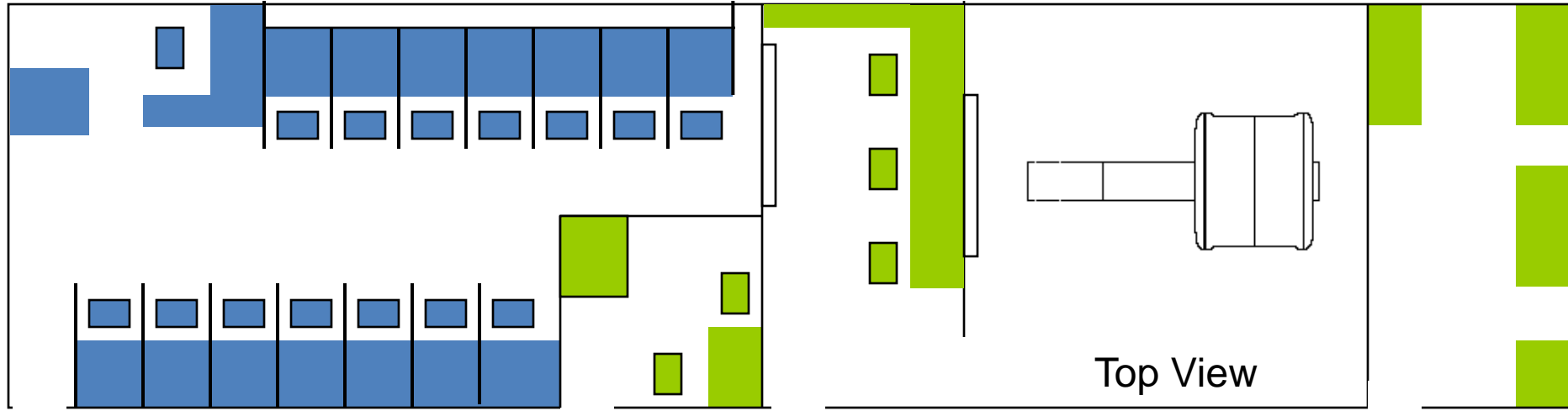
Messages



# Laboratory Stock Market



Krasnow Institute



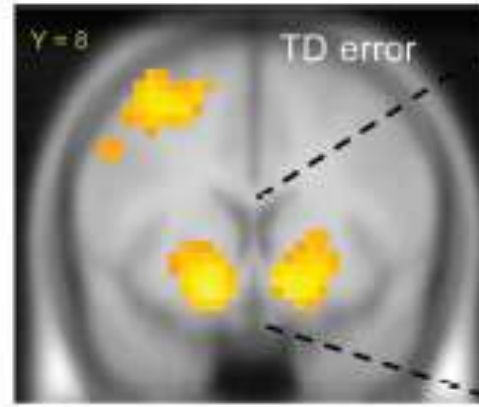
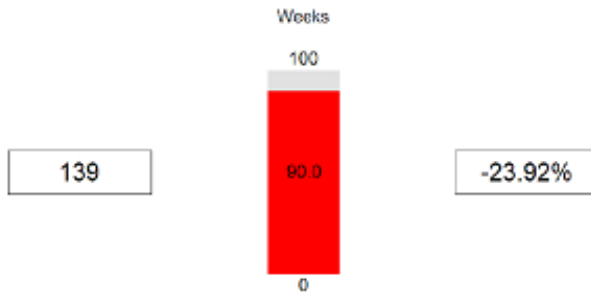
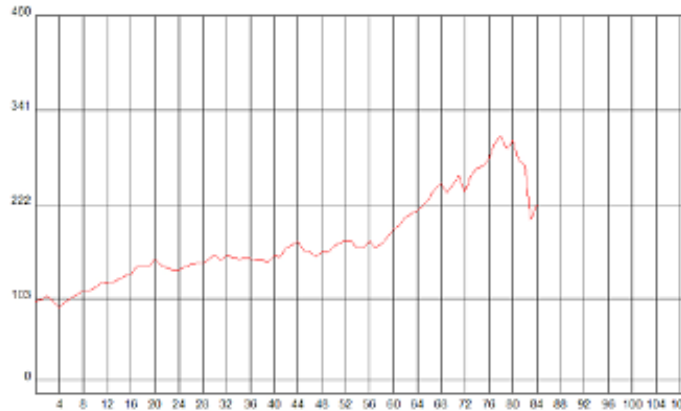
Top View

Allegra 3T Scanner

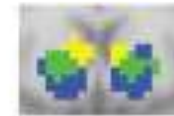


Front View

# Stock Market Bubble



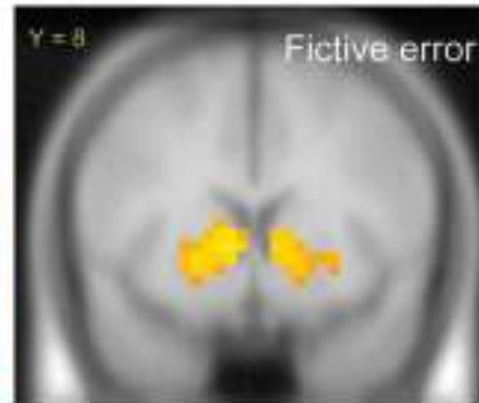
$p < 10^{-4}$



$p < 10^{-5}$

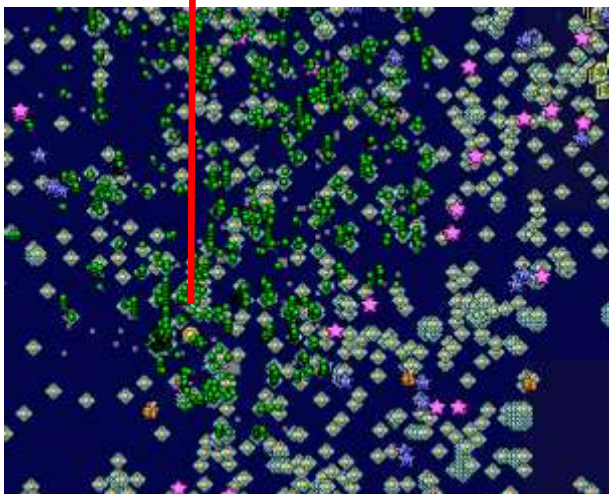


$p < 10^{-6}$



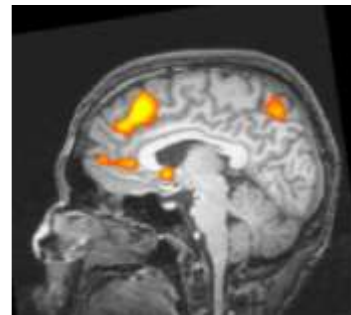
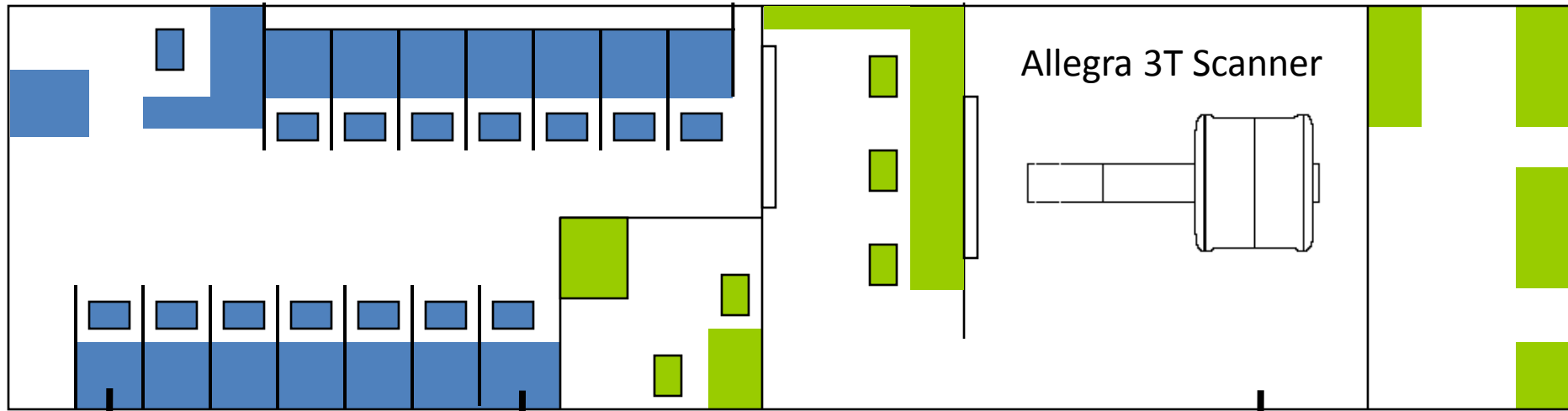
- fictive only
- TD + fictive
- TD error only

# TerraEcon in Second Life



Second Life is  
3D, Visualize  
immersive, Feels real  
user-created, Build once use often  
persistent, Start where you left off  
and, online. On your computer





# A Typical Economics Problem

## Managing the **Commons**

Elinor Ostrom, Governing the Commons, 1990,  
Cambridge University Press. **Self Governance**

A Resource under Common Control

Called a **Public Good** When the Benefits are  
Non-Excludable

Often results in individual **Free Riding** behavior

When individuals don't do their **Fair Share**  
Of the **Work**

# Implementation

160 Hour Build!



Avatar scale



Earned: 6L\$  
 [Maximum rate: 10L\$/minute]  
 [Current rate: 10L\$/minute]

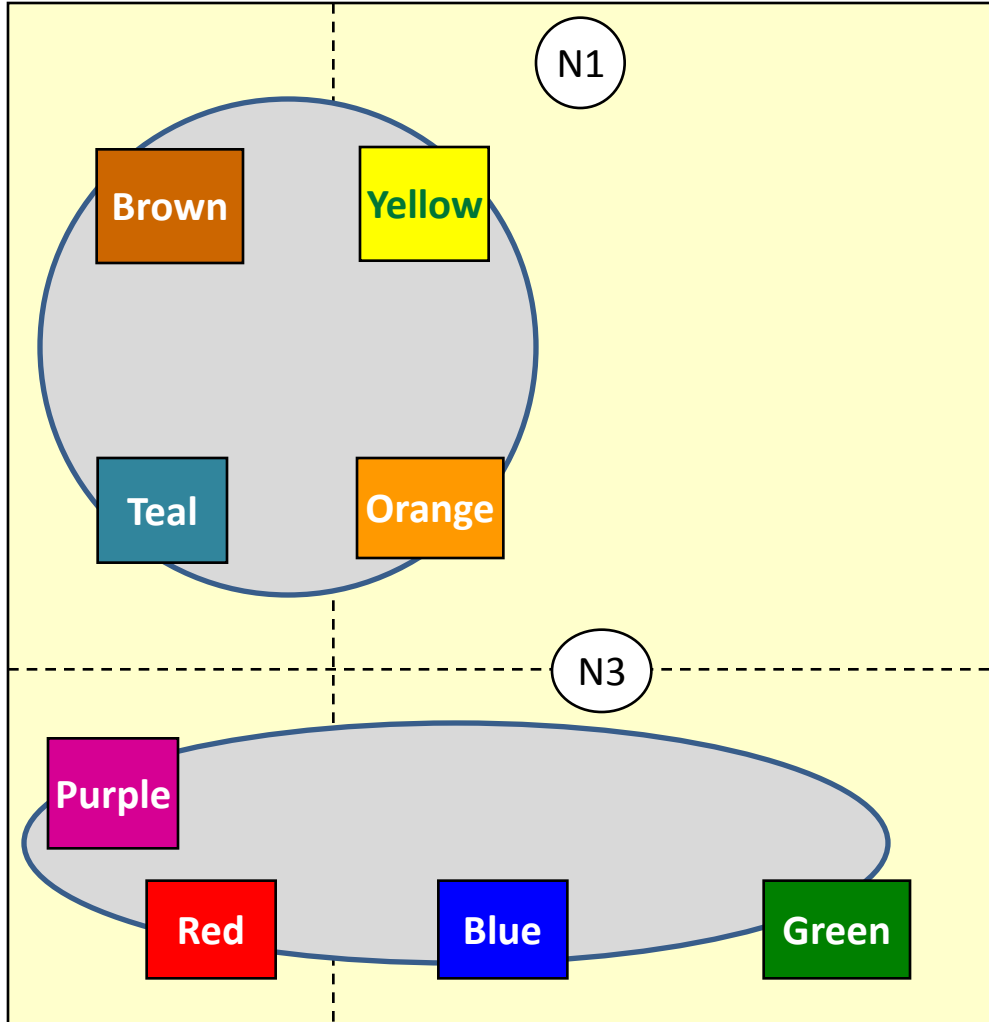
Session time:  
**3055**

House11  
 Structural Integrity:  
 East:100% North:10%

Damaged: 0%

Occupant: Kevin McCabe  
 Action: EARN  
 Earned: L\$6  
 Repaired: 00:00:00  
 Defended: 00:00:00

# Applying Game Theory



But then avatars in the upper Two Thirds each have an incentive to defend at N1.

In equilibrium one of the Avatars in the upper Two Thirds should choose to defend everyone. But how do they coordinate?

Avatars in the Lower Third each have an incentive to defend at N3.

# Actual Data Excerpt

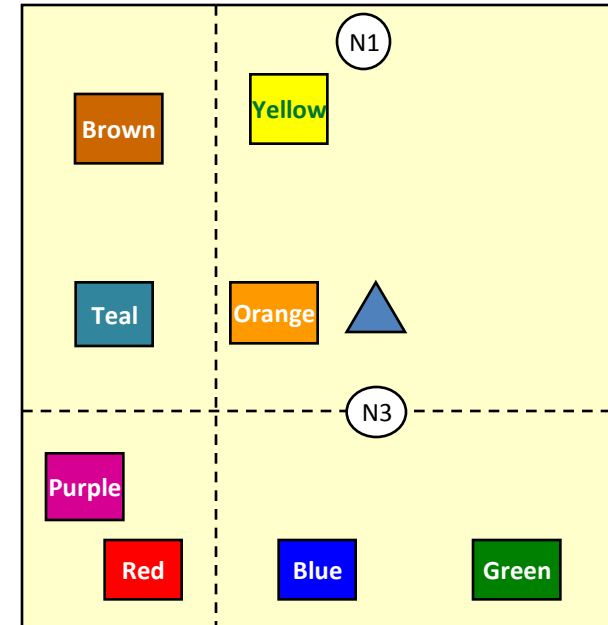
Storm 2 Yellow: I am right next to the north 1 defense station. Do you guys want me to stand there this next time?

Teal: Yeah

Orange: Purple you're covering next right?

Purple: yep

Storm 3 Purple: I'm here  
Purple: at station 3



Teal: dude? Who is in the weather stations?

# Experimental Design

Direction of Storms

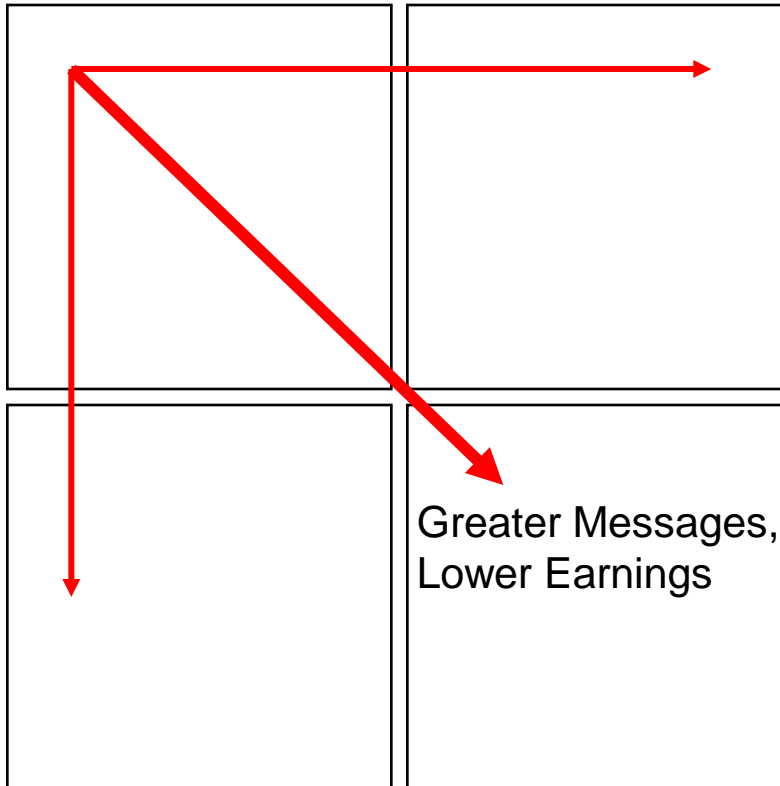
A                      B  
 North                North & East

Results

One Person

Two Person

Occupancy Requirement



281 840L	357 688L
606 746L	745 598L

1. Second Life can now be run behind a firewall.  
( **Security** )
2. VOIP is easily added ( **Voice Communications** )
3. SL builds can be modeled with agent based systems. ( **Rapid Planning and Decision Making** )
4. Avatars can be programmed and simulated in SL.  
( **Training** )
5. GIS terrain data can now be mapped directly onto islands. ( **Realism** )
6. Real time data can be imported and graphically represented in SL. ( **Operations** )

# GEORGE MASON UNIVERSITY | Thank You

