I appreciate your time to read through this. 44 years of my life culminating into a greater understanding of problem that reaches so much further than West Maui.

## "The Plan"

"The Plan is used to inform elected and appointed officials as well as County departments in making decisions about future development"

"The Plan informs residents, property and business owners, and developers about the community's vision and priorities for the future"

*Well I'm scared. Because the current draft Plan doesn't anywhere near address the root problem, that will absolutely destroy all these intended priorities.*

### What's the problem?

So there's a dish, such like an enclosed Petri Dish, with a single bacterium cell inside it. That bacterium grows by multiplying itself every minute; from one to two, then two to four and so forth. The mathematician; based on the size of the dish, the doubling rate and the size of the bacteria, knows the dish will be full in 60 minutes, or one hour.

*Question for all CPAC MEMBERS:*

*At what time within those 60 minutes, is the Petri Dish 1/2 full?*

*How about just a 1/4 full?*

We'll come back to this.

### Do we understand this problem on a greater human scale – *No*.

Rumor has it, the game of chess was said to have been invented in medieval times by a mathematician, who presented the game to his King. The King being so delighted with the game, asked the mathematician how he could repay him. The mathematician said to the king his needs were simple: Just one grain on the first square of his chess board, the second square two grains, the third four and merely double the amount of the square previous until the board is full.

The King, laughing at the mathematician scoffed "Even thousands of grains, such a small amount. And here I was prepared to pay you a real reward!"

The amount, by the time the grain reached the 64$^{th}$ square of the chess board:

**18446744073709600000 Grains**

**(or just say roughly 18446744073709 Bags of 1 Million Grains Each)**

***Or basically a number in a realm way beyond the entire yearly production of world grain today***

Yet the King had laughed.

*Amazing what a 'doubling rate' can do*

but we'll come back to this.

## Do we understand what this problem on a local level either – *No.*

As many of you remember I went around the room after the first CPAC meeting, asking members of the newly formed committee and the Maui Planning Committee:

What is a sustainable growth rate in terms of economy, population, tourism, etc… ?

- A handful of members diverted and waxed poetically about the social deeds you've done for the community [and I do appreciate these]
- A few also went on to state their case and their purposes for being there on the committee [and I appreciate each of you for all of that as well]
- A many few came back with political catch phrases like "affordable housing" & "sustainable growth"
- But many looked bewildered or confused when pressed for an answer to the question or caught off guard.
- Some when pressed for a specific %, asked me who I was a reporter for. [I found that funny, but actually complimentary, Mr Pluta :) ]
- Doing my best to clarify the question, it was clear that the answer was either not understood, too complex to provide an immediate answer by some … but also to me rather clear that:

  The question, "What is a sustainable growth rate?", is simply not understood.

A few, a brave few, were actually willing to throw out some actual numbers [God bless you – *you are fricking awesome for your willingness to contribute! Mahalo!*]

Dylan Payne – 1%
Yvette Celiz – 0-2%
Kate Blystone – "I think a sustainable growth rate can only be 1% or less" and quoted the work of Zovanyi

Kate …. is our communities diamond in the rough. Kate is smart. Kate needs to be a PIVOTAL lead on the Maui Planning Board.  Kate … is by FAR the closest candidate to be the most understanding of the problem and when it comes to comprehending the question WHAT IS A SUSTAINABLE GROWTH RATE?

The fact is that not a single person actually came out with the answer immediately, nor despite attempts, was the answer ever actually answered correctly. Sorry Kate, even you. Which highlights that the problem is still so far from understood.

But we'll come back to this.

Let's continue with some examples that continue to illustrate this understandable lack of understanding of this significant issue:

Page 7 of the draft stated that "talk story" sessions were conducted that lead to the identification of "key issues" which in turn produced "Technical Research Papers" covering the following areas:

- Community Profile
- Wastewater
- Water
- Housing
- Drainage and Stormwater
- Climate Change and Sea Level Rise
- Historic Preservation
- Economic Prosperity [ My Personal Favorite!]
- Recreation Network
- Mobility
- Land Use

But **Sustainable Population & Economic Growth**  …. *The most MAJOR key issue if not the only issue. Nowhere to be found. Not on a top level list. Nor addressed thus far in the CPAC plan outside of just one line….*

"In the next 20 years the population of West Maui is expected to grow by approximately 8,754 new residents (County of Maui Socio-Economic Forecast Report 2014)" – West Maui CPAC draft plan

*HOLY CR\*P  WE HAVE A PROBLEM– that figure is so WRONG. The real number is going from 25,000 today, to an easy 50,000, in just 20 years! Whomever came up with this number should be …. educated. Hard. Very, Very Hard.*

**Worse:**

"This Growth Framework will help decision makers and County Departments for the land uses, services and infrastructure that West Maui needs now and into the future."

WHAT!?

*HOLY FHIT. WE'RE SUCKED.*


But we'll get back to this later too.


Let's get on to some further reflections in our own understanding again of this mathematical equation.

Some Quotes from the meeting:

Mayor Victorino

"We need long term plans for new development, land use, parks and infrastructure" [at what rate of development?]

"obtainable housing being one of the biggest desires in our community" "we have over 300 in the books right now and going" [ So if we have 300 today, when will we need 600, then 1200, then 2400?]

"I worked out there for 35 years" "When I started there was one light between here and Makawao" [well if there's 1 light then, and say hypothetically there's 50 now, would that not mean in 35 years from now there will be 100?]

"You know how many lights I used to see between here and Makawao at 5:00 a.m. 5" [Soooo. 5 35 years ago. 50 today, 100 in 35 years, 200 in 70 years then?]

"A plan that consists of what the people want and not what others want" [But what % of both foreign and domestic "want" is sustainable?]

Joseph Pluta

"Try to get the County, State and Government agencies to respect what's going on here (West Maui)" [Localization is actually a solution. Joe and Joseph have something in common]

Hans Michel

"There were 5000 people living in West Maui back then" [60 years ago. This is a VERY important statistic… because by research it's valid]

Aina Kohler

"The two worlds seems to be colliding right now and there's got to be a middle ground where we can all be happy" [yes, but what is it? What is that middle ground rate?]

Leilani Reyes Pulmano

"Be stewards of West Maui while we balance growth moving forward" [at what rate?]

Donald Gerber

"my concern with this is that we have the infrastructure available to build what we would like to have" [and how much infrastructure will we need in 20 years, then 40, then 60?]

Dylan Payne

"How quickly Maui was changing approximately 20 years ago" "fast forward to today and there a lot of changes going on" "Going at a faster click than ever before" [yes, the Exponential Effect at it's finest, yet not fully understood.  Today, going twice as fast as yesterday, with tomorrow going four times faster than that. And the day after … eight times faster than the very first day]

Joseph Aquino

"We want to see the community grow" [At what rate?] "I don't want to see growth being taken over by corporations and the locals left to solve the problem" [ Localization. Similar and good solution point like Joe Pluta]

Karen Comcowich

"Affordable Housing" [A word that we'll all find out actually ADDS to the problem. Yes. ADDS]

Ravi Bugga

"we could have picked many places to retire and we chose here" [Immigration. Adds to the problem. I'm guilty. Pam's guilty (see below). But temporary transients really exacerbate the problem]

Kai Nashiki

"provide for the needs of our residents and future generations as a priority" [Yes, a problem we absolutely MUST NOT hand off to our next generation of keiki.]

Pam Eaton

"Shout Florida is not the place that I would ever return to" "It is not what is was like when I grew up in Florida" "I once had a place where the water was clean and there weren't walls" [Yes, immigration, self-guilty … one of the biggest contributors to exponential growth. But the transient population again MUCH worse]


Again, notice how so many make references to this growth problem – yet never address it directly as a the major problem?

We can all see it.

Everyone talks about it.

But What Exactly Is It?

**So what is he problem, that simply can't seem to really be understood, revisited?**

Let's restart.

The experiment has been running for an hour. The bacterium doubling in size every minute…

*The Petri Dish is 1/2 full at minute :59 into the experiment - or just 1 minute left before The Petri Dish will be completely full. Just 1 minute.*

*The Petri Dish is only a 1/4 full at minute :58*

*The Petri Dish only an 1/8 full at minute :57*

*The experiment running for 60 minutes and the dish is only half full, just one minute before being completely full.*

*The Exponential Equation*

*Now ask yourself this rhetorical question that I pray haunts you at night like it does me:*

*At what point and time do the bacteria realize they're running out of space?*

*58 out of 60 minutes have gone by in beautiful harmony, and a vast expanse of 3/4 of the dish is still wide open for discovery, life and economic prosperity.*

*Yet in reality the bacteria are two minutes away from a catastrophic nightmare.*

*A nightmare that we're going to pass to this next generation of kids.*

*When do we wake up and get it?*

So the answer again in somewhat geek terms:

*ANY amount growing at ANY rate above 0% will ultimately approach a point on the X axis (time), where the amount is doubling so fast toward infinity on the Y axis (amount), that it can non longer move forward on the x axis; it reaches an 'upper spec limit' (or time – scary)*
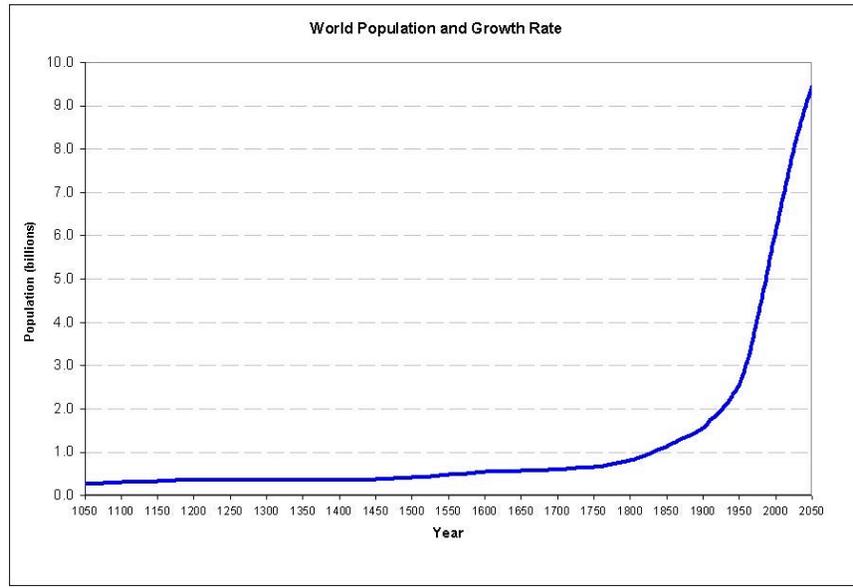
Wait, what?

In laymans terms:

**There is no such thing as a "Sustainable Growth Rate" – *it is a myth, a legend … a disease that could truly kill us all.***

*And we are running out of time. Fast. Very, Very Fast.*

Let's see if we can illustrate this in a couple simple graphs:

This is the world population growth since 1050:



Does that 'upper spec limit' I mentioned, that's caused by any growth rate growing consistently over 0% - make any sense now?

Now that's a population that been growing roughly at 1.8%, on average, over the course of 1000 years.

Or a doubling rate of approximately every 40 years.

So a population of 5,000…

Becomes 10,000 in 40 years,

20,000 in 80 years (just one lifetime)

40,000 in 120 years

And 80,000 in just 160 years.

Doubling every 40 years.

But wait…

Didn't Maui have about 5000 residents in 1960 according to Hans?

Yep.

And how many residents does West Maui have approximately now?

25,000

What Compounding rate is that?

**2.72%**

Wait, what!?

That's a lot more than the world population rate.

WHAT'S OUR DOUBLING RATE THEN FOR WEST MAUI?

Funny you should ask….

At that current rate,

Approximately every 27 years.

1960 – 5000

2020 – 25,000

2080 – 92,256

2160 – 526,097

**Table 1c.**
**State and Island Population Average Annual Percent Change 1950-2010**

| County | 1950-1960 | 1960-1970 | 1970-1980 | 1980-1990 | 1990-2000 | 2000-2010 |
|---|---|---|---|---|---|---|
| State of Hawaii | 2.4 | 2.0 | 2.3 | 1.4 | 0.9 | 1.2 |
| Oahu 1/ | 3.6 | 2.3 | 1.9 | 0.9 | 0.5 | 0.8 |
| Hawaii | -1.1 | 0.3 | 3.8 | 2.7 | 2.1 | 2.2 |
| Maui 2/ | -1.2 | 0.8 | 5.0 | 3.8 | 2.6 | 2.1 |
| Lanai | -3.9 | 0.4 | -0.4 | 1.4 | 2.8 | -0.2 |
| Molokai | -0.5 | 0.5 | 1.4 | 1.1 | 1.0 | -0.1 |
| Kauai | -0.6 | 0.6 | 2.8 | 2.7 | 1.4 | 1.4 |
| Niihau 3/ | 1.4 | -0.7 | -0.5 | 0.2 | -3.6 | 0.6 |

Table from : http://files.hawaii.gov/dbedt/census/Census_2010/PL94-171/pltable1_Island.pdf

*Check out Maui rates of recent history even compared to Oahu – yikes!*

**Quick Refresh on Doubling Rate**

A quick reminder of the "rule of 72"

If I how have $100 growing at 7%, how long will it take to turn into $200?

72/7 = 10.28 years.

Your $100 invested at 7% will become $200 in just 10.28 years.

**So what is an appropriate and sustainable growth rate for West Maui?**

If we go with Mr Dylan's answer of just 1%, as modes at that is, that still leaves Maui's population doubling every 72 years. Just one lifetime

If we go with Ms Yvette's answer of anywhere from 0-2%, that doubling rate could be anywhere from never, to 72 (1%) to doubling just every 35 years (2%). Just half one lifetime.

If we go with Ms Katie's answer things get better, but still, take any decimal even less than 1,and you still have a doubling rate…

.75% = every 96 years

.50% every 144 years

.25% every 288 years

(which really, is 288 years really that long?)

# So again…

# What is a Sustainable Growth Rate for West Maui?

# And if a Sustainable Growth Rate isn't mathematically Sustainable,

# What is??

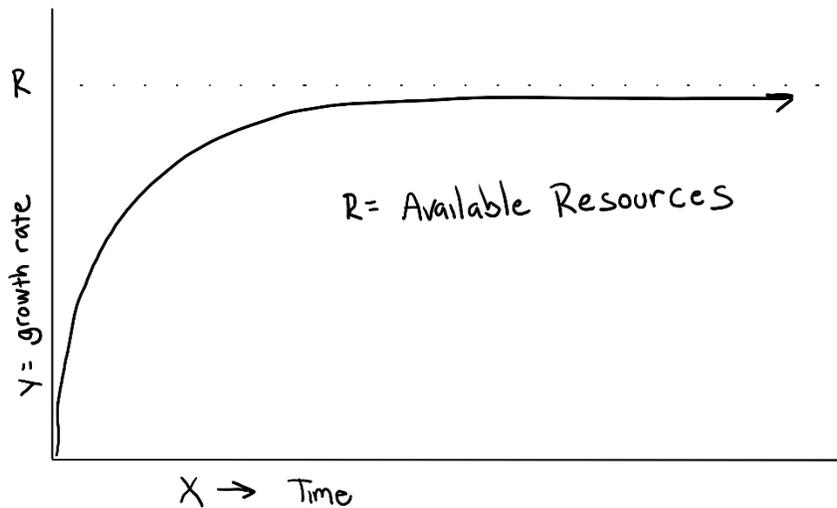I'll have your answer at the next CPAC meeting. :)

Love, Darren McDaniel

@TheMauiDarren

4 Solutions:

    1.) Develop a Plan
        a.  Identify the Resource Line
        b.  Estimate the reasonable growth curve using this equation: $\Delta N = rN((K-N)/N)$
        c.  Set Growth [ Limits ]

R

y = growth rate

R= Available Resources

X → Time

Then to protect the community:

    2.) Structure Community Zoning based around a restricted growth plan, renewing resources that already exist, and most importantly – on future resource development that will allow our future generations, and the generations after them, to thrive.

    3.) Develop laws, through planning, that bring taxes earned within any area, back to that area.

    4.) Restructure Tax Codes – based on overconsumption and carbon foot prints.


        On Vacation Rentals:

        a.  Non-Owner, Non-Resident – 1 House/Apt = +2%
        b.  Non-Owner Occupied, Non-Resident – 2 Houses/Apt = +4%
        c.  Non-Owner Occupied, Non-Resident – 3 Houses/Apt = +8%
        d.  "" – 4 House/Apt = double above%

        e.  Non-Owner, Resident – 1 House/Apt = +1%

f. Non-Owner, Resident – 2 House/Apt = +2%
g. Non-Owner, Resident – 3 House/Apt = +4%
h. '' – 4 House/Apt = double the above%


On Income Tax

a.) Above average income, but below +1σ = +2%
b.) Equal to or above +1σ of average income, below +2σ = +4%
c.) Equal to above +2σ of average income, below +3σ = +8%
d.) Equal to or above +3σ of average income, below +4σ = 16%
e.) Equal to or above +4σ of average income, below +5σ = 32%
f.) Equal to or above +5σ of average income = 64%

On Net Wealth Tax

g.) Above average Net Wealth, below +1σ = +2%
h.) Equal to or above +1σ of average Net Wealth, below +2σ = +4%
i.) Equal to above +2σ of average Net Wealth, below +3σ = +8%
j.) Equal to or above +3σ of average Net Wealth, below +4σ = 16%
k.) Equal to or above +4σ of average Net Wealth, below +5σ = 32%
l.) Equal to or above +5σ of average Net Wealth = 64%


On Child Birth (on a per-person basis)

m.) Zero child = -2% tax credit
n.) One child = 0% tax credit
o.) 1.5 child = + 2% tax increase
p.) 2.0 child = +4% tax increase
q.) 2.5 child = +8% tax increase
r.) 3.0 child = +16% tax increase
s.) 3.5 child = +32% tax increase
t.) Duggar Family = +99%  (come on I had to try and put something funny in here right)