

**The Proposed Lake Powell Pipeline:
A Report on Its Effects on Socioeconomic Resources**

Prepared By

David Tufte, Ph.D.

June 30, 2008

Associate Professor

Department of Economics and Finance

School of Business

Southern Utah University

351 W. University Blvd.

Cedar City, UT 84720

Funded by: Citizen's for Dixie's Future

Abstract

This report has three goals.

- Rebut John Groesbeck’s position paper for the Washington County Water Conservancy District (hereafter WCWCD) entitled “An Analysis of the Economic Costs of Not Building the Lake Powell Pipeline In Washington County, Utah” (hereafter the Groesbeck Report).
- Address the socioeconomic resources topics from the Lake Powell Pipeline Pre-Application Document.
- Detail aspects of the proposed Lake Powell Pipeline project (hereafter the Pipeline) that currently are insufficiently studied.

Executive Summary

In support of its position in favor of the Pipeline, the WCWCD contracted out for the Groesbeck Report. This report has two major flaws. First, it does not consider a full range of scenarios in producing its gloomy predictions. In fact, it avoids some reasonable scenarios that might entail tough decisions on the part of the WCWCD. Second, it asserts that there will be a net benefit to the local region from construction of the Pipeline. This conclusion is in line with those that are common for public works projects, but the particulars of this project are not in line with what is common for public works projects. This is a locally funded project: claiming that it will provide net benefits is like claiming that taxing your right pocket to provide money for your left pocket will make you rich.

The Lake Powell Pipeline Pre-Application Document lists a number of socioeconomic issues to be explored at this stage. Highlights are:

- The Pipeline can help accommodate population growth, but it will also encourage it, and hasten the ultimate exhaustion of developable water sources.
- The Pipeline could be pursued directly by the state, but the state passed on it. Benefits may accrue to St. George whether the project is pursued at the state or local level. However, local pursuit means the assumption of project risk locally without increasing those net benefits.
- The Pipeline is not clearly superior to a conservation alternative.
- The Pipeline is affordable, provided that in-migration follows the forecast path. Simulations have not been done by the WCWCD describing the outcome if that assumption is faulty.
- Because of the amenities that draw migrants from other parts of Utah, the financing plan for the Pipeline amounts to an indirect tax on residents of other parts of Utah.

The big issue that needs to be addressed is the role of the policy process in encouraging the Pipeline, and in discouraging needed thinking about a “soft landing” for St. George. St. George is in a period in which historical constraints on growth are no longer binding. The water constraint will bind within a century, probably much sooner. Planning can make the approach to this binding constraint softer, with a landing at a planned time. Avoidance of planning for this constraint will lead to a “hard landing”. The current policy nexus is biased towards avoiding planning for a soft landing – the Pipeline is the result. This does not preclude a soft landing in the distant future, but it isn’t encouraging, and it does reduce the size of the window of opportunity. The reason for all this is the self-fulfilling prophecy aspect of the state’s population projections: policy choices encourage population growth, the state projects that growth to continue, the WCWCD accommodates the forecast with a development plan whose financing depends on the population influx, and success of the plan leads to a continuation of population growth.

A Rebuttal to John Groesbeck’s position paper for the Washington County Water Conservancy District entitled “An Analysis of the Economic Costs of Not Building the Lake Powell Pipeline In Washington County, Utah”
(hereafter The Groesbeck Report)

The Groesbeck Report suffers from two errors. Both are fatal to its conclusions.

The title of the Groesbeck Report indicates that it will analyze the “costs of not building the Lake Powell Pipeline”. This is disingenuous. A better title would phrase this as the “costs of not building the Lake Powell Pipeline in the special case combining a large population increase with no effort to increase the retail price of water appropriately for this influx”. So, the first problem is that the *only* case considered is a possibility, and the Groesbeck Report does not include a wide variety of other more plausible scenarios whose outcome is hardly as drastic as the single one presented.

The second problem is that the report adopts – without question – the assertion that a large scale construction project like the Lake Powell Pipeline will economically benefit the local area. This assertion is true under certain conditions, but those conditions are not met in this case. A more reasonable assumption would be that the construction phase of the Lake Powell Pipeline will provide *zero* net economic benefits to the region.

ERROR ONE

At its simplest, the roll of the WCWCD in the Lake Powell Pipeline policy process can be boiled down to two decisions. One is whether or not to build the pipeline. The second is whether or not to price water to cover costs and to limit demand in the face of a scarcity of developed water sources.

Decision Matrix for the WCWCD State Population Estimate Assumed Correct		Pipeline Decision	
		Build	Don't Build
Demand Decision	Price Appropriately	I	III
	Do Not Price Appropriately	II	IV

Scenario I is the path the WCWCD asserts that it is moving down. Whether or not the Pipeline is favored, the WCWCD should be applauded for working out a financing plan to cover its costs. Pricing appropriately in this case entails passing along the construction costs to the developers of new property in St. George, and passing on the marginal costs of water to end users. This section makes no judgment on whether or not that plan is appropriate. In this case, the state’s population projection is assumed to be accurate now and in the future.

Scenario II entails the WCWCD building the pipeline with some form of inappropriate pricing. Without going into detail, this conforms with the numerous comments on the FERC website (under Docket P-12966) from people in favor of the pipeline but not in

favor of its current financing plan or the uncertainties that this may entail. Many of these proposals are less financially responsible than the WCWCD financing proposal. It also includes situations of financial malfeasance on the part of the WCWCD requiring a future bailout from some policy authority; this includes the situation in which the collection of impact fees are too low and surcharges on local residents are required. In this case, the state's population projection is assumed to be accurate now and in the future.

Section III corresponds to a cancellation of the Pipeline project, and a change in the pricing of water by the WCWCD. In this case, appropriate pricing would entail a sharp increase in water prices and surcharges to keep consumption within the boundaries established by existing supplies of water. In this case, the state's population projection is expected to be correct at this time, but will increasingly fall on the high side in the future (as higher prices discourage future in-migration).

Section IV corresponds to a cancellation of the Pipeline project, with little or no change in WCWCD water pricing to discourage in-migration. In this case, the state's population projection is accurate now and the future.

The problem with the Groesbeck report is that it does not compare Scenario I to the other three. Instead, it focuses on Scenario IV in the bottom right: the pipeline is not built so there isn't enough water, but prices are not adjusted to reflect scarce resources. Thus, there is no mechanism to dissuade move-ins to the area. This isn't as unreasonable as it sounds: historically, the WCWCD has not had to change prices much in response to scarcity. But, historical relevance and future relevance are very different things: this isn't surprising since the WCWCD has run into shortage of developed sources but not a shortage of sources themselves. I suggest that a low probability should be assigned to the chance that if the pipeline is not built that local authorities will not change permit prices and utility rates to reflect changing conditions. Yet, this is the only alternative to Scenario I considered in the Groesbeck Report.

A more reasonable approach would assign probabilities to all four possibilities, and work out the costs from there. This report does not perform such analysis, but what follows is an outline of how to proceed.

An unbiased assessment of the Pipeline project might assign a probability of 50% to its being built, with that split between the pricing decisions. It seems reasonable to conclude that if the Pipeline is built, that it will be financed along the lines outlined by the WCWCD, so a 40/10 split seems reasonable. Faith in the professionalism of local policy authorities to price resources appropriately when constraints on their use become binding leads me to suggest a probability of 45% for appropriate pricing if the Pipeline is not built. This leaves 5% for Scenario IV (and frankly, this is probably too high).

Combining these together, we see that the Groesbeck Report arrives at its large costs by comparing an outcome that will occur with a 40% chance, to one that will occur with a 5% chance. The other two possibilities are ignored. A correct simulation would address this shortcoming.

It should be noted that there are concerns (addressed below) about the usefulness of the population estimates provided by the state's Governor's Office of Planning and Budget. However, I emphasize that these uncertainties might affect the magnitude but not the general conclusion of this subsection.

An additional concern is that this simple framework has at least 4 more scenarios. These are analogs of the four scenarios listed above, but add the small, but non-zero probability that global climate change will reduce water availability in Lake Powell. Because Utah's rights to water from Lake Powell are junior to other states, these scenarios involve considerably lower net benefits to scenarios where the Pipeline is built, and considerably higher net benefits to scenarios in which it is not. These scenarios are not addressed in WCWCD publications or in the Groesbeck Report. Again, better simulations can deliver better answers.

ERROR TWO

It is commonplace to hear of the benefits of public works projects to local communities. This is an idea that has good grounding in economics, subject to an examination of some serious limiting assumptions. Often that second step is avoided, as in the Groesbeck Report. This error cannot be addressed with better simulations.

In order for a construction project to yield net economic benefits, two pitfalls must be avoided. First, the source of financing needs to be separated from the location of the work. Second, there must be some underutilized resources in the local area which could benefit from being employed.

The idea that public works projects can have effects that are larger than the amount spent – so that there are benefits from merely pursuing them – goes back to policies we now call Keynesian which were introduced under Roosevelt. Keynesians asserted that the benefit from spending exceeded the costs of financing projects – that there was a multiplier effect. Calculation of such multipliers is now standard practice in project evaluation. However, the statistical packages only perform the calculations; they do not check that the assumptions are met. An essential part of the theoretical justification for their use is that the organization doing the spending stand apart from the economy receiving the benefit: the initial spending must be autonomous (unrelated to income) with respect to the economy in question. This is not the case with the Pipeline project.

An analogy may help. A rancher needs more irrigation, and asks family members to chip in for tools and provisions for the job. The family uses the tools to do the job, and consumes the provisions. When the irrigation job is finished, the future calves benefit a lot from the improved water supply, and perhaps the family benefits too if they can capture the calves' gain in higher sale prices. However, it would be silly to argue that the family benefits from the construction itself: they paid for the tools and provisions, and they did the work. If anything they're probably not inclined to help with this scheme because it requires them to put out their time and money first, with no certainty that the future benefits will exceed the current costs.

The WCWCD is like the rancher in this analogy, while the residents of southwestern Utah are the rancher's family. The calves correspond to the potential amenities that the provision of more water might provide to future residents of St. George. Some of those amenities might even accrue to current residents.

Except that the reality is worse than that.

The WCWCD is proposing to finance the Pipeline project with fees imposed on future taxpayers. This is akin to the rancher telling the family that everything is OK because the unborn children will pay back the rest of the family for the work they did. Now the WCWCD sounds not so much like a rancher, but more like Cinderella's stepmother.

The bottom line is that any claim that the net benefits of the construction of the Pipeline are anything other than zero should be treated with extreme caution.

Fundamentally, this is about gross versus net benefits. It is not the gross size of a project that produces net benefits. Rather, it is the nature of the project itself. Even a small project will produce net benefits if it has some outside funding and uses slack resources. But no project – no matter how large – will produce net benefits if these conditions are not met. The Pipeline falls into that class.

Socioeconomic Resources Topics from the Lake Powell Pipeline Pre-Application Document

POTENTIAL TO ACCOMMODATE OR AFFECT POPULATION AND ECONOMIC GROWTH

There can be no doubt that the Pipeline project has the potential to provide a large volume of water capable of supplying additional population of up to 190,000 (70,000 acre-feet, with 0.89 AF per ERU, 2.4 people per ERU).

There is considerable uncertainty about where, in the range from 0 to 190,000, the true figure of population support from the pipeline lies. This problem is twofold. First, Utah's claim to the remaining water from the Colorado River is junior to other states' claims. Second, we live in a time of overarching climate concerns, with accumulating evidence that the last century or so may have been unusually wet in the southwestern U.S. There are two ways to look at this: it implies either that 1) the supportable population projections are too generous, or 2) the impact fees used to cover the costs of the project are understated for the water that will be delivered.

There is an additional concern that approval of the project will affect population growth. A major justification for the project is to maintain current water usage levels and prices in St. George. Those prices allow homeowners to maintain lush landscaping that is simply not common anywhere else in the Mojave Desert. However, it goes unstated in WCWCD publications that the expected continuation of increasing real per capita incomes in the U.S. will continue to make it cheaper for families to afford their water bills if they relocate to St. George. It is therefore reasonable to conclude that perpetuation of unnaturally low water prices in the area, in conjunction with national economic growth, may lead population growth rates to accelerate in St. George. This is in contrast to the state population projections which forecast growth rates to decline.

There are two components to economic growth from the Pipeline project: net benefits to construction, and net benefits to a larger water supply. It is argued above that there should be no expectation of positive net benefits from construction. As to the net benefits from more water in the future, these cannot be denied provided that the water is available to be withdrawn from the lake. This clearly benefits the people who choose to move to St. George in the future. However, what should be emphasized is that these will "steal" growth from other parts of the country without making the country as a whole any richer. It isn't clear why this benefits the citizens of St. George or Utah. It certainly would benefit the government and quasi-governmental organizations in Utah, who would have greater representation in Congress, and a larger tax base on which to draw.

CONSISTENCY WITH STATE AND REGIONAL WATER RESOURCE PLANNING EFFORTS

This report offers no comment on consistency with state and regional plans.

It should be noted that the Pipeline project will use water allocated to the state of Utah. However, the state of Utah – while supportive of WCWCD plans – is not interested in pursuing a state-funded project to bring more water to southwestern Utah. There are two possible reasons for this: 1) the state has examined the project and passed on it because of concerns over its net benefits, or 2) the state expects net benefits but is concerned about the variability of those benefits and would prefer that the risk be borne by St. George.

INTEGRATION OF WATER CONSERVATION AND MANAGEMENT PROGRAMS

The WCWCD does integrate programs for conservation and management.

Their management program considers a wide variety of available sources, many of which have been developed over the years. Their largest single potential source of water is the Pipeline project. A large number of smaller possibilities were detailed in the 1995 Boyle Report. Collectively these exceed the water availability from the Pipeline project. For the most part, the WCWCD has not pursued these, and instead has put all its eggs in one basket to aggressively pursue the Pipeline project. This is not wholly unjustified, given the estimated unit costs for some of the other sources.

Their conservation programs have led to a reduction in per capita water usage in recent years.

However, it should be noted that per capita water usage in St. George has historically been far higher than in other communities in the American southwest, particularly those that share its Mojave Desert climate. Further, in spite of recent reductions in usage, per capita figures in St. George are still higher than Las Vegas, whose water use is still not low when compared to other cities in the region.

Economically, these conservation efforts are sorely lacking. They focus on moral suasion (*e.g.*, advertisements encouraging a reduction in water use) and dated command-and-control techniques (*e.g.*, fines for breaking rules regarding watering times). There appears to be little effort to reduce water consumption through the primary variable affecting consumer decision-making: price. In large measure, per capita water usage is high in St. George because the cost of such usage is so cheap. This is a simple outcome of elasticity: economists focus on how price changes affect decision-making because people are simply more responsive to price changes. The WCWCD – like many utilities – actively avoids discussing price changes.

The WCWCD also has no plans for large scale compensation for homeowners who choose to xeriscape their properties. Typical rates for xeriscaping are in the range of \$3.50 to \$10 per square foot. A quarter-acre lot with 50% grass coverage could then be xeriscaped for between \$20,000 and \$50,000. At the current estimated price for the

Pipeline project, this means that ten to thirty thousand properties of this size could be xeriscaped. Since this is large for a typical lot in St. George, this is probably a conservative number. With a little less than 3 people per household, the price to xeriscape the entire existing property stock – or at a minimum to heavily subsidize it – are then competitive with the price tag for the Pipeline. Doing so, in conjunction with new regulations requiring xeriscaping, would easily be expected to reduce consumption by over 20%. For the 607,000 population predicted for 2050, the number of people's consumption “saved” is comparable to what the Pipeline will supply.

NEED FOR THE PROJECT EVEN WITH NEW CONSERVATION AND WATER MANAGEMENT PROGRAMS IN PLACE

There is no need for this specific project at this time.

There is a need for a comprehensive water management plan that includes development of other sources of water, conservation efforts based on current landscaping, and subsidization to replace current landscaping. The WCWCD has such a plan, although reasonable people will quibble over the details.

Within an overarching plan, the Pipeline project is certainly not the worst. Its main benefit is that it has the potential to deliver the largest amount of water in one project. Other projects are available that could collectively exceed the deliverable water of this project (see the Boyle Report). These projects are a mix of cheaper and more expensive sources, so there is no predisposition towards the Pipeline project based on price.

COST-EFFECTIVENESS OF THE PROJECT

The Pipeline project is the highest cost proposal yet made by the WCWCD. However, it has the potential to deliver the largest volume of water, so its per unit cost – while high – is not excessive compared to other sources (see the Boyle Report).

PROJECT AFFORDABILITY IN THE STATE AND LOCAL COMMUNITIES

The Capital Facilities Plan (CFP) of October 2006 and the Baker, Craft and Tufte report of October 2007 show that, on paper, the financing of the project is reasonable.

The CFP calls for the project to be funded with impact fees on new equivalent residential units (ERUs). An ERU is about 2.4 people. These fees are predicted to rise from about \$5,000 to \$35,000 by 2050. These prices will be built into the price of new properties.

Collection and saving of collected funds is intended to start as soon as possible. Because the size of the project will far exceed the debt carrying capacity of Washington County, the financing of the project will use short-term debt that is constantly rolled over with new impact fees. The current debt carrying capacity of Washington County is about \$200 million, with about 75% of that available for use. Forecasts call for a less than a tenth of that to be needed for short-term financing in the mid 2020's. This all assumes that the project won't go over budget, and that the impact fees will be collected in a

timely manner. No simulations from the WCWCD are available about how the project will proceed if there is a shortage of impact fee collections. These are needed.

Note that if approved, the Pipeline project will be the single biggest public works project ever undertaken in Washington County, dwarfing the projects of the school district and city of St. George.

Also note that the WCWCD has the power to tax and borrow within the county to fund the project. This authority has no basis in “affordability ... in the local community”. Great care must be taken to ensure that the project is in fact affordable before the job of financing is passed along to WCWCD. The critical part here is a simulation of cash flows allowing for variability in the arrival of new ERUs. No such simulation has been presented by the WCWCD.

As with all major public works projects, cost overruns are an issue. Conservative estimates usually add ¼ to published estimates from planning authorities. Of course, there is always the possibility of huge overruns, like the 150% inflation adjusted overrun experienced by Boston with the “big dig”.

COST ALLOCATION AMONG EXISTING AND NEW WATER USERS

Financial plans for the project entail spreading the fixed costs across new units of construction with an impact fee. On paper, no charges will be laid on current properties. No statements have been made regarding changes to the marginal price for water paid by consumers.

Serious doubts exist about the interpretation of this plan for current residents. The following argument is drawn from data in “Southwestern Utah Population and Economy: A Five County View”, by Pamela S. Perlich, from the Bureau of Economic & Business Research at the University of Utah.

Net in-migration to Washington County appears to lead the business cycle by a few years. Troughs in net in-migration drop the proportion of in-migration to just above half of the population increase. Peaks in net in-migration shift the proportion up to around 80%.

There is a local urban myth that most of this in-migration is coming from out-of-state, particularly from southern California and the Las Vegas area. The truth is that well over half of the in-migration into Washington County is people from other parts of the state.

In conjunction with the business cycle driven changes, this suggests that 60-80% of the in-migration to Washington County is from the rest of Utah.

This suggests that the Pipeline financing plan in the CFP is best thought of as an indirect tax on residents of Utah outside of Washington County, for a project that the state government has never had a serious interest in pursuing on behalf of the state. It would be naïve to counter argue that this indirect tax will not affect all state residents. To a

reasonable approximation, the state is a closed economic system. Relocating from elsewhere in the state to St. George (as opposed to some other destination) will require paying an impact fee. The funds for that fee could have been spent in other parts of the state, but won't be because of the Pipeline. The relocaters will get a benefit, non-relocaters will pay a cost, and the move will be a wash for the state as a whole. Of course, the state will benefit from the relocaters who are from out-of-state.

This emphasizes the point made above that this is really a state-wide project whose risk has been shifted to residents of St. George. If the water comes through as planned, the winners are the state itself and the people who would not be able to relocate to St. George without the Pipeline. The losers are people who could relocate, but choose not to. The net benefit is harder to evaluate for current residents of St. George: they gain from the influx of population, but they lose from the associated costs. What is certain is that they bear the downside risk if fewer people relocate than planned, or if they relocate at a slower rate necessitating assessments on locals.

TYPICAL RESIDENTIAL WATER BILL WITH THE PROJECT IN PLACE

Information on this is available from the WCWCD.

It is important to note that the financing plan presumes that population projections will match forecasts. Any shortfall will be made up by residents, possibly through their water bills.

It is also important to note that any shortfall in water delivered through the pipeline will require the development of alternative sources which would undoubtedly add to local water bills.

IMPACTS ON LOCAL AND REGIONAL SOCIOECONOMIC RESOURCES FROM PROJECT CONSTRUCTION AND OPERATION

It is the position of this report that the net impact on local and regional resources from construction of the project (and operation through the 2039 horizon in the CFP report) will be zero.

More detail on this conclusion is available above, in the section rebutting the Groesbeck Report.

IMPACT ON LOCAL AND REGIONAL SOCIOECONOMIC RESOURCES WITHOUT THE PROJECT

The big question here is what the counties of southwestern Utah and the WCWCD will do in the absence of the project.

The logical thing for them to do is to price water resources accurately to reflect local scarcity. So far, this has not been done.

More details on these issues are reported below.

PROJECT CONSTRUCTION WOULD PROVIDE A SHORT-TERM ECONOMIC STIMULUS IN SOUTHWEST UTAH

It is customary to assume that large construction projects will stimulate local economies. It is fairly easy to tweak economic modeling software to confirm this result.

However, it must be emphasized that this conclusion is predicated on an assumption that is not met for the current project, suggesting that net economic stimulus is likely to be zero. The difficulty with this is that software generates answers; it does not check assumptions. If the assumptions are not met, the software will still generate numerical answers. In this case, there is no reason to believe *a priori* that taxing Washington County to build in Washington County will be anything other than a wash.

Aspects of the Proposed Lake Powell Pipeline Project That Currently are Insufficiently Studied

What is really lacking in the analysis presented by proponents and opponents of the Lake Powell Pipeline is a sense of what the ultimate maximum population of St. George actually is.

This will depend crucially on water availability. Within reason, all of the local sources of water – including Lake Powell – are known. Again, within reason, the lower limit on water usage is known.

Ideally, it would be best to approach this limit asymptotically, so that growth slows as that limit is approached so that it is never exceeded. This is a standard outcome in economics for dynamic adjustment toward a fixed resource constraint: a “soft landing” is optimal.

This is especially important since virtually all sources of fresh water in the western United States are already claimed. If St. George does not have a maximum population in mind, and a plan to approach it asymptotically, then sometime down the road they will have to consider a plan to pipe water in from the Mississippi-Missouri drainage basin or some other outlandish source.

Ballpark estimates are all that is necessary here. The Boyle Report identified 63,000 AF as developed water supply in 1995. *All* of the other sources they identified at that time – including the Pipeline – could supply an additional 170,000 AF. A total of 230,000 AF is reasonable. Using the state’s figure of 0.89 AF per ERU, this will supply 260,000 ERUs. The number of people per ERU varies somewhat, but a figure no more than 2.9 is reasonable. This places an upper bound on population of 750,000.

That figure could be increased with conservation. How much could conservation add? Current water usage in St. George is about 20% higher than in Las Vegas. This corresponds to a maximum population of 900,000. Rounding that to one million allows for a buffer, and the round number is convenient to think about.

This is a carrying capacity. It is actually a third more generous than the WCWCD’s CFP for the Pipeline of 2006, which identified 174,000 AF as a feasible plateau.

Typical population growth rates are about 2% in the U.S., and somewhat higher in Utah because of the large-family focus of the LDS church. Again, as an approximation, this suggests that once the carrying capacity is reached, that 20,000 people will need to be pushed out of St. George each year. Precisely what policy is going to be followed by local authorities to achieve this?

All of this may sound silly. It isn't. The well-known "rule of 72" for growth rates tells us how seriously we should take this scenario. The rule of 72 states that 72 divided by a growth rate per period yields the number of periods to double. Assuming a conservative 2% growth rate of population per year, doubling will occur in 36 years. Doubling will occur 3 times in 108 years. Doubling 3 times is equivalent to multiplying by eight. Eight times the current population of St. George is over one million.

Now you should see the big picture. *Within 100 years, with all of the water sources developed, and with all the water conservation possible, the game is up.* This includes the Pipeline, and assumes that there are no issues with water availability due to climate change.

The state's population projections are actually worse. While they officially end in 2050, at that time they are showing a 2.4% population growth rate per year. At that rate St. George hits 1 million by 2072. It is also worth noting that population projections for St. George have been on the low side at least as far back as the publication of the Boyle Report in 1995.

Dovetail this state's population projections for the region. The state forecasts 607,000 by 2050, but nowhere does it claim this is the limit. Further, the CFP of the WCWCD confirms this in Figure 2 on page 9, where projected water demand is still rising after the completion of the Pipeline and other projects, and where the graph conveniently terminates in 2038 before the projections cross. Further, that crossing is decidedly not a "soft landing".

In fact, what the WCWCD is proposing is not a soft landing at all, within the planning horizon, or beyond it. What they are doing is delaying the hard landing that will inevitably take place if current conditions continue.

How did we come to this point?

The policy process is the problem. The WCWCD is obligated to use the state's population numbers to plan water supply many years in advance. However, the state's population numbers are extrapolations on past behavior, which was conditioned on past policy choices by the WCWCD and others.

In a very real sense, the causes of past growth in St. George, lead to population projections for future growth, which require water projects so extensive that they can only be financed by taxing migrants when they come to the region. The only way this can work is if the migrants actually make it here, implying that the population projection is helping to cause the future population rather than just forecasting it. This cycle can be broken if the state stops projecting population increases for St. George, and if policy authorities in the St. George region stop permitting the capacity for these increases.

This is critical because the pressure to move to St. George (Dixie) is not going to be relieved any other way.

Population growth rates have not always been high. For over a century, growth rates were low in Dixie despite high birth rates. A naïve explanation is that the low population growth rates were a result of out-migration. However, this describes the result not the causes. We need to remember that Dixie was not always a desirable place to live. Gradual improvements in reasonably priced access to necessities like water, transportation, and electricity allowed people to exploit amenities like a climate substantially more desirable than the rest of the state, history and temples to attract members of the LDS faith, and spectacular scenery.

Water has always been scarce in Dixie. Scarcity should lead to high prices, but the dominant story of the American West is that of water projects whose capital costs are paid by those outside the area, yielding low marginal costs for those who reside within those dry regions. Dixie is an exception to this pattern: most local water sources that have already been developed have been funded locally.

The same can be said for transportation and electrical power. The former was not provided to St. George (or most of the region) when railroads had to cover the fixed costs of establishing their lines with private money. The Interstate Highway system changed that with a publicly funded system for covering initial fixed costs, yielding very low marginal cost for users. Electricity provision, with lower fixed and higher marginal costs were more successful with private funding.

What is necessary to understand is that the long pattern of out-migration from Dixie was a result of the high marginal costs of water, transportation and electricity. The climate, LDS attractions, and scenery were always here.

More recently, population growth rates have increased. This dates from the completion of I-15 through Dixie, and the wider provision of electricity at lower rates from larger power plants transmitting over greater distances.

Water has not been a bottleneck for this process because enough water is available in Dixie to support a much higher population than has ever existed here prior to the current century.

Economically speaking, growth was historically constrained in St. George. The arrival of the interstate and the infrastructure for air conditioning removed those constraints. The problem is that it is becoming clear that population is approaching the carrying capacity of water supplies in Dixie.

The current period is not like the past because constraints have been removed. But, it is also not like the future, where a new constraint looms.

It must be emphasized that this is not a problem with a local cause. If I-15 did not pass through Dixie, population would be much lower. If relatively cheap electricity wasn't available, the need for air conditioning in Dixie would keep population down.

The WCWCD has been put in tough spot. Decisions made at the regional and national level have created a local problem. There are 3 ways to address this: 1) ignore it, 2)

attempt to solve it with local money, or 3) attempt to solve it with money from outside the region.

The approach of the WCWCD and their proposed Lake Powell Pipeline is to do # 2 and label it as # 3: to market the idea that the costs will be paid by outsiders (to St. George), when in fact they will largely be paid by insiders (to the state of Utah) with the default risk borne by locals.

Growth will be completely constrained in St. George within the century. At almost any time a soft landing can be made with a little policy coordination. If a soft landing isn't made, there will be hard landing. The Pipeline project is a way to delay the soft landing, and reduce the window in which it could take place. This is not encouraging for those who are concerned about a hard landing.