Increasing Tempe's Rebate Policy to Remove Commercial Grass Strips

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Internship For Science Practice Integration

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Objective

How can removing grass strips to install xeric landscaping benefit commercial businesses in terms of water savings? How much could the City of Tempe help compensate this conversion through its rebate program over a two year period?

Grass strips can be found throughout the Tempe area where the majority are owned by commercial businesses. Due to their need to be irrigated, these grass strips are unsustainable. One indicator is looking at the amount of water that covers the sidewalks in such areas, often causing water damage to these pathways over time. Currently, Tempe offers a rebate for removing turf and installing xeric landscaping at $0.25 per square foot. However, this rate only covers a small portion for the overall cost. The purpose of this project is to first show the amount of water being consumed by these grass strips and then calculating a rebate amount that would help offset the cost to remove grass strips over a two year period.

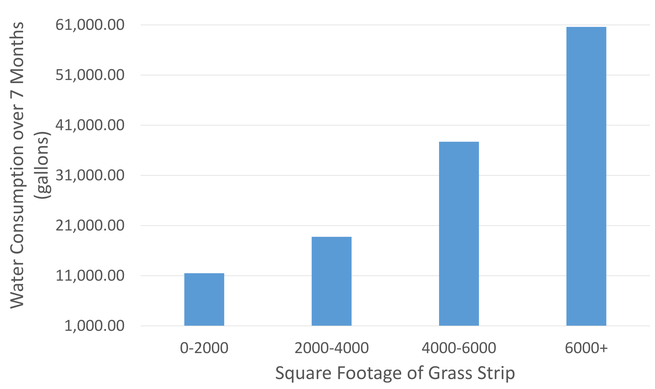
Methods

Using the City of Tempe as the study area 30 commercial addresses were randomly selected. This was done using *Maricopa County Assessor* to identify parcel boundaries and *Google Satellite Imagery* to the measure grass strips. Across those 30 commercial addresses 58 grass strips were analyzed in this research. Landscaping booklets were used to identify different sprinkler head gallons per minute which were based on the widths of the grass strips. Six different landscaping companies were contacted to obtain an average cost for xeric installation. Water consumptions were calculated over a 30 week period (7 months). Water savings were calculated over a two year period (cost to irrigate/maintenance cost) which were subtracted from cost to convert strips to xeric landscaping (avg. amount from landscaping companies). Tempe's rebate was then calculated to find the amount needed to offset the xeric installation cost over two years.

Figure 1: Case example of Grass Strip outside a Tempe Business. Strip is outlined in Yellow, and is located between the road and the footpath.

Results

Figure 2: Average Water Usage for Grass Strips



Strip Area	Sample Size Grass Strips (ngs) and Businesses (nb)
0-2000	ngs = 11 nb = 9
2000-4000	ngs = 18 nb = 10
4000-6000	ngs = 9 nb = 3
6000+	ngs = 20 nb = 8

Figure 3: Average Water Cost for Grass Strips

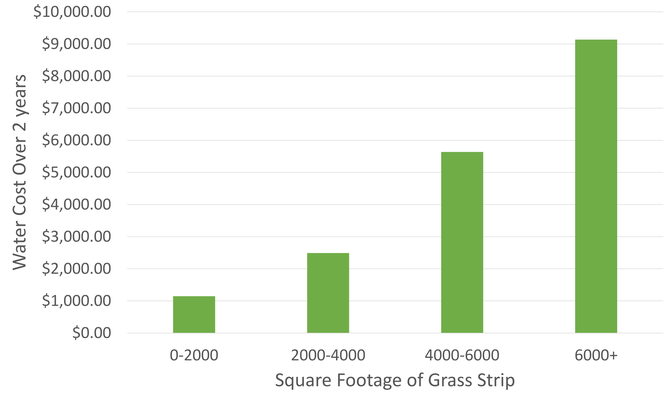


Figure 4: Average Cost to Convert Grass Strips with Xeric Landscaping

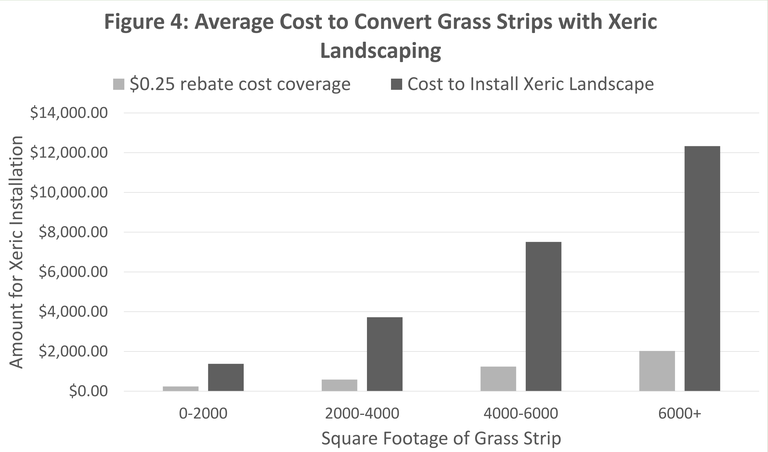


Figure 5: Average Rebate Amount Increase

Grass Strip Square Footage	Current Rebate Amount	Increase in rebate needed for pay-back in 10 years	Increase in rebate needed for pay-back in 5 years	Increase in rebate needed for pay-back in 2 years	Proposed Total rebate amount for pay-back in two years
0-2000	**$0.25/sq ft**	**$0.24/sq ft**	**$0.48/sq ft**	**$1.20/sq ft**	**$1.45/sq ft**
2000-4000	**$0.25/sq ft**	**$0.27/sq ft**	**$0.54/sq ft**	**$1.34/sq ft**	**$1.59/sq ft**
4000-6000	**$0.25/sq ft**	**$0.25/sq ft**	**$0.51/sq ft**	**$1.27/sq ft**	**$1.52/sq ft**
6000+	**$0.25/sq ft**	**$0.25/sq ft**	**$0.51/sq ft**	**$1.27/sq ft**	**$1.52/sq ft**

Summary of Graphic Results

- **Figure 2** shows water usage from grass strips tend to be quite high over the 7 month period. The lowest volume used by these grass strips was 11,000 gallons per month while the highest is volume is around 60,000 gallons per month.
- **Figure 3** shows the amount these businesses are paying in water costs over two years for having these strips. The lowest cost is around $1,000 while the highest amount paid is over $9,000.
- **Figure 4** shows the approximate amount it would cost to convert these grass strips to a xeric landscape, as well as the amount covered through the current $0.25 rebate. For high square foot areas the cost is over $12,000 while the current rebate only covers $2,000.
- **Figure 5** shows how much the $0.25 rebate would need to increase to cover a 10, 5, and 2 year neutral cost. The final rebate amount is shown in the far right column. The proposed rebate amounts are similar across all four grass strip area classifications. When averaged, they show that a final rebate amount of $1.50 per square foot would, on average, result in neutral costs for the business two years after a xeric landscaping conversion.

Conclusion

Water Savings:

- Removing grass strips can significantly reduce businesses water use (Figure 2) and will reduce the cost to irrigate (Figure 3) as well as maintaining these grass strips.

Cost and Rebate Amount:

- The proposed rebate amount that would be needed to create a neutral cost over a two year period would be around $1.50 foot regardless of total strip area.

Challenges:

- Grass strips have different sprinkler heads depending on their width.
- Businesses pay different amounts to irrigate depending on how many gallons they use per month.

Implications:

- This research could help Tempe revise the xeric rebate for residential homeowners.
- If the majority of businesses remove their grass strips it could help reduce Tempe's overall water consumption, thus making a more sustainable city.

Acknowledgements: This material is based upon work supported by the National Science Foundation under Grant No. SES-1462086, DMUU: DCDC III: Transformational Solutions for Urban Water Sustainability Transitions in the Colorado River Basin. Any opinions, findings and conclusions or recommendation expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation (NSF).