

GUAC WMAP Funding – Potential Projects

[Draft: For Discussion Only]

Background:

Proposed projects:

- Will provide data on a regional basis (i.e. be useful for the majority of the AMA)
- Will involve multiple utilities, agencies and/or research entities.

Representatives of:

- The City of Chandler, Central Arizona Project, City of Gilbert, City of Glendale, City of Phoenix and Salt River Project met to discuss possible research projects that would assist both the individual organizations and the region.
- Two priority projects were identified:
 - o A regional single family water use study
 - o First phase of a regional industrial/commercial/institutional (ICI) study.
- The information provided by these studies would:
 - o Identify baseline conditions including specific water end uses (e.g. clothes washer use; landscape irrigation use; cooling tower use)
 - o Estimate adoption rates of more water efficient devices and practices, and
 - o Project future demand for both existing and new (future) customers.
- While the four utilities in the study group would be responsible for working with consultants to collect and analyze data, it is possible that other Phoenix Metropolitan area utilities may wish to become part of one or both projects and contribute staff time and meter data.

Water demand is declining across many if not all sectors, but the declines are occurring at different rates. The research findings will be useful for multiple utilities and agencies to estimate future demands and to be able to better plan for the reconciliation of supply and demands in the medium and long terms (5-35 years).

The research findings can also be used to help water utilities and agencies to identify sectors that could be targeted to accelerate the rate at which older inefficient devices, fixtures, or practices could be upgraded. The methods for accelerating efficiency upgrades could range from education and outreach efforts to loan guarantees and financial incentives.

Priority Research Projects

Project 1: Regional Single Family Water Use Study

Description

A regional single-family end-use study that would compare and contrast different municipalities/utilities in the Valley.

Such a study would:

- Replicate national studies done in the past to collect detailed information on indoor and outdoor use by samples of single family residences, although with a slightly different, localized approach for landscape/irrigation evaluations of single family parcels.
- Collect supplementary data specific to the Phoenix AMA (i.e. surveys and some data-logging that would add to what WSD has already done) that is currently not widely available and hard to find.
- Look at the potential impact of variables like turf removal rebates, urban design guidelines, public outreach programs and water rates on relative water use by single family homes in different utility areas.

Type of Consultants to Be Utilized

It is highly likely that this project would be awarded through a sole source procurement process since the firm Aquacraft has done numerous studies of this kind with a wide variety of organizations and it is unlikely that any other consulting firm would have the skills and equipment necessary to successfully implement a study of this type. Vehicles equipped with data-loggers, computers equipped with proprietary data-logging software, and staff experienced in both data-logger installation/collection and interpretation of the signatures of specific devices/practices would be required.

Anticipated Products

The study would:

- Collect detailed information on a sample of approximately 250-500 homes located in participating utility areas that would be generally representative of the size, type, age and cost of single family homes found in the Phoenix AMA.
- Obtain data from water meter usage, County assessment information, landscape analysis, detailed data-logger information on interior fixture/appliance use, mail/email surveys and perhaps even site visits/audits.

This information would then be used to estimate and project demand by providing:

- Detailed estimates of water demand by irrigation systems, pools, appliances & fixtures for different age cohorts, sizes and locations of homes in 2016.
- Estimated inventories by age, type and capacity of indoor devices like toilets, washing machines and shower heads.

- Estimated inventories of landscapes, irrigation systems, pools and other outdoor water features, with associated estimates in the rate of transition from water-intensive landscapes to more efficient landscapes and for pool installation and removal over time.
- Simple projections of the rate of decline of water demand in single family households based on criteria like: age cohort; size of home; size of lot; geographic area; etc.

This information would be very useful for utilities/agencies that only want to do relatively simple spreadsheet-based projections of water demand or for utilities/agencies that want to use the primary research data as an input to more complicated models.

Anticipated Cost:

At approximately \$400 to \$500 per house, the cost of this project is expected to be between \$100,000 and \$250,000 depending on the size and geographic distribution of the sample chosen.

Project 2: Regional Industrial/Commercial/Institutional Water Use Study (Phase 1)

Description

A regional industrial/commercial/institutional (ICI) end-use study that would investigate water use trends in a limited number of sectors such as schools, medical facilities (focus on hospitals and clinics), and hotels/motels/resorts.

This study would attempt to provide baseline data, usage trends, and projections of future use with a focus on sector-specific metrics (e.g. hotel usage on a per-room basis or hospital usage on a per-bed or per patient visit basis).

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- Collect detailed information on a sample of approximately 30 – 200 schools, hospitals/clinics and hotels/motels located in participating utility areas that would be generally representative of these types of uses found in the Phoenix AMA.
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This information would then be used to prepare:

- Detailed estimates of water demand by cooling systems, specialized equipment, irrigation systems, pools, different types of appliances & fixtures for the different targeted ICI-subsectors in 2016.
- Estimated inventories by age, type and capacity of commonplace indoor water using devices AND more specialized equipment and cooling systems, with associated adoption rates for more water efficient devices over time.
- Estimated inventories of landscapes, irrigation systems, pools and other outdoor water features, with associated adoption rates from water-intensive landscapes to more efficient landscapes and for pool installation and removal over time.
- Simple projections of the rate of decline in water demand in targeted ICI-subsectors based on criteria like: age cohort; size of home; size of lot; geographic area; etc.

This information would be very useful for utilities/agencies that only want to do relatively simple spreadsheet-based projections of water demand or for utilities/agencies that want to use the primary research data as an input to more complicated models.

Anticipated Cost:

Based on the experience of the City of Phoenix in undertaking past ICI studies, it is expected that phase 1 of this study, probably focusing on schools, medical facilities, and the hospitality sector, would cost \$200,000 to \$300,000.

GUAC WMAP Funding – Potential Projects

[Draft: For Discussion Only]

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Proposed projects:

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- While the four utilities in the study group would be responsible for working with consultants to collect and analyze data, it is possible that other Phoenix Metropolitan area utilities may wish to become part of one or both projects and contribute staff time and meter data.

Water demand is declining across many if not all sectors, but the declines are occurring at different rates. The research findings will be useful for multiple utilities and agencies to estimate future demands and to be able to better plan for the reconciliation of supply and demands in the medium and long terms (5-35 years).

The research findings can also be used to help water utilities and agencies to identify sectors that could be targeted to accelerate the rate at which older inefficient devices, fixtures, or practices could be upgraded. The methods for accelerating efficiency upgrades could range from education and outreach efforts to loan guarantees and financial incentives.

Priority Research Projects

Project 1: Regional Single Family Water Use Study

Description

A regional single-family end-use study that would compare and contrast different municipalities/utilities in the Valley.

Such a study would:

- Replicate national studies done in the past to collect detailed information on indoor and outdoor use by samples of single family residences, although with a slightly different, localized approach for landscape/irrigation evaluations of single family parcels.
- Collect supplementary data specific to the Phoenix AMA (i.e. surveys and some data-logging that would add to what WSD has already done) that is currently not widely available and hard to find.
- Look at the potential impact of variables like turf removal rebates, urban design guidelines, public outreach programs and water rates on relative water use by single family homes in different utility areas.

Type of Consultants to Be Utilized

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The study would:

- Collect detailed information on a sample of approximately 250-500 homes located in participating utility areas that would be generally representative of the size, type, age and cost of single family homes found in the Phoenix AMA.
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This information would then be used to estimate and project demand by providing:

- Detailed estimates of water demand by irrigation systems, pools, appliances & fixtures for different age cohorts, sizes and locations of homes in 2016.
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Anticipated Cost:

At approximately \$400 to \$500 per house, the cost of this project is expected to be between \$100,000 and \$250,000 depending on the size and geographic distribution of the sample chosen.

Project 2: Regional Industrial/Commercial/Institutional Water Use Study (Phase 1)

Description

A regional industrial/commercial/institutional (ICI) end-use study that would investigate water use trends in a limited number of sectors such as schools, medical facilities (focus on hospitals and clinics), and hotels/motels/resorts.

This study would attempt to provide baseline data, usage trends, and projections of future use with a focus on sector-specific metrics (e.g. hotel usage on a per-room basis or hospital usage on a per-bed or per patient visit basis).

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- Simple projections of the rate of decline of water demand in single family households based on criteria like: age cohort; size of home; size of lot; geographic area; etc.

This information would be very useful for utilities/agencies that only want to do relatively simple spreadsheet-based projections of water demand or for utilities/agencies that want to use the primary research data as an input to more complicated models.

Anticipated Cost:

At approximately \$400 to \$500 per house, the cost of this project is expected to be between \$100,000 and \$250,000 depending on the size and geographic distribution of the sample chosen.

Project 2: Regional Industrial/Commercial/Institutional Water Use Study (Phase 1)

Description

A regional industrial/commercial/institutional (ICI) end-use study that would investigate water use trends in a limited number of sectors such as schools, medical facilities (focus on hospitals and clinics), and hotels/motels/resorts.

This study would attempt to provide baseline data, usage trends, and projections of future use with a focus on sector-specific metrics (e.g. hotel usage on a per-room basis or hospital usage on a per-bed or per patient visit basis).

Type of Consultants to Be Utilized

Prior research efforts at the City of Phoenix and elsewhere indicate that it is challenging to find consultants with the right mix of analytical capabilities, site audit experience and research-oriented philosophy to successfully undertake water demand in ICI sectors. While many possible combinations are possible, it is highly likely that a firm with very good high-level analytical capabilities will have to be teamed together with a firm or firms that excel in undertaking site audits that produce detailed water balance calculations and inventories of equipment and practices.

Anticipated Products:

The study would:

- Collect detailed information on a sample of approximately 30 – 200 schools, hospitals/clinics and hotels/motels located in participating utility areas that would be generally representative of these types of uses found in the Phoenix AMA.
- Obtain data from water meter usage, County assessment information, aerial imagery analysis, interviews with facility managers & engineers, site audits, review of equipment/device specifications on the internet and in manuals, and interviews with product support personnel and industry experts.

This information would then be used to prepare:

- Detailed estimates of water demand by cooling systems, specialized equipment, irrigation systems, pools, different types of appliances & fixtures for the different targeted ICI-subsectors in 2016.
- Estimated inventories by age, type and capacity of commonplace indoor water using devices AND more specialized equipment and cooling systems, with associated adoption rates for more water efficient devices over time.
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Anticipated Cost:

Based on the experience of the City of Phoenix in undertaking past ICI studies, it is expected that phase 1 of this study, probably focusing on schools, medical facilities, and the hospitality sector, would cost \$200,000 to \$300,000.

GUAC WMAP Funding – Potential Projects

[Draft: For Discussion Only]

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Proposed projects:

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The research findings can also be used to help water utilities and agencies to identify sectors that could be targeted to accelerate the rate at which older inefficient devices, fixtures, or practices could be upgraded. The methods for accelerating efficiency upgrades could range from education and outreach efforts to loan guarantees and financial incentives.

Priority Research Projects

Project 1: Regional Single Family Water Use Study

Description

A regional single-family end-use study that would compare and contrast different municipalities/utilities in the Valley.

Such a study would:

- Replicate national studies done in the past to collect detailed information on indoor and outdoor use by samples of single family residences, although with a slightly different, localized approach for landscape/irrigation evaluations of single family parcels.
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Anticipated Products

The study would:

- Collect detailed information on a sample of approximately 250-500 homes located in participating utility areas that would be generally representative of the size, type, age and cost of single family homes found in the Phoenix AMA.
- Obtain data from water meter usage, County assessment information, landscape analysis, detailed data-logger information on interior fixture/appliance use, mail/email surveys and perhaps even site visits/audits.

This information would then be used to estimate and project demand by providing:

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Priority Research Projects

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Description

A regional single-family end-use study that would compare and contrast different municipalities/utilities in the Valley.

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The study would:

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- Replicate national studies done in the past to collect detailed information on indoor and outdoor use by samples of single family residences, although with a slightly different, localized approach for landscape/irrigation evaluations of single family parcels.
- Collect supplementary data specific to the Phoenix AMA (i.e. surveys and some data-logging that would add to what WSD has already done) that is currently not widely available and hard to find.
- Look at the potential impact of variables like turf removal rebates, urban design guidelines, public outreach programs and water rates on relative water use by single family homes in different utility areas.

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Anticipated Products

The study would:

- Collect detailed information on a sample of approximately 250-500 homes located in participating utility areas that would be generally representative of the size, type, age and cost of single family homes found in the Phoenix AMA.
- Obtain data from water meter usage, County assessment information, landscape analysis, detailed data-logger information on interior fixture/appliance use, mail/email surveys and perhaps even site visits/audits.

This information would then be used to estimate and project demand by providing:

- Detailed estimates of water demand by irrigation systems, pools, appliances & fixtures for different age cohorts, sizes and locations of homes in 2016.
- Estimated inventories by age, type and capacity of indoor devices like toilets, washing machines and shower heads.

- Estimated inventories of landscapes, irrigation systems, pools and other outdoor water features, with associated estimates in the rate of transition from water-intensive landscapes to more efficient landscapes and for pool installation and removal over time.
- Simple projections of the rate of decline of water demand in single family households based on criteria like: age cohort; size of home; size of lot; geographic area; etc.

This information would be very useful for utilities/agencies that only want to do relatively simple spreadsheet-based projections of water demand or for utilities/agencies that want to use the primary research data as an input to more complicated models.

Anticipated Cost:

At approximately \$400 to \$500 per house, the cost of this project is expected to be between \$100,000 and \$250,000 depending on the size and geographic distribution of the sample chosen.

Project 2: Regional Industrial/Commercial/Institutional Water Use Study (Phase 1)

Description

A regional industrial/commercial/institutional (ICI) end-use study that would investigate water use trends in a limited number of sectors such as schools, medical facilities (focus on hospitals and clinics), and hotels/motels/resorts.

This study would attempt to provide baseline data, usage trends, and projections of future use with a focus on sector-specific metrics (e.g. hotel usage on a per-room basis or hospital usage on a per-bed or per patient visit basis).

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Anticipated Products:

The study would:

- Collect detailed information on a sample of approximately 30 – 200 schools, hospitals/clinics and hotels/motels located in participating utility areas that would be generally representative of these types of uses found in the Phoenix AMA.
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- Detailed estimates of water demand by cooling systems, specialized equipment, irrigation systems, pools, different types of appliances & fixtures for the different targeted ICI-subsectors in 2016.
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Based on the experience of the City of Phoenix in undertaking past ICI studies, it is expected that phase 1 of this study, probably focusing on schools, medical facilities, and the hospitality sector, would cost \$200,000 to \$300,000.

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[Draft: For Discussion Only]

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Water demand is declining across many if not all sectors, but the declines are occurring at different rates. The research findings will be useful for multiple utilities and agencies to estimate future demands and to be able to better plan for the reconciliation of supply and demands in the medium and long terms (5-35 years).

The research findings can also be used to help water utilities and agencies to identify sectors that could be targeted to accelerate the rate at which older inefficient devices, fixtures, or practices could be upgraded. The methods for accelerating efficiency upgrades could range from education and outreach efforts to loan guarantees and financial incentives.

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 - o Identify baseline conditions including specific water end uses (e.g. clothes washer use; landscape irrigation use; cooling tower use)
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Water demand is declining across many if not all sectors, but the declines are occurring at different rates. The research findings will be useful for multiple utilities and agencies to estimate future demands and to be able to better plan for the reconciliation of supply and demands in the medium and long terms (5-35 years).

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Priority Research Projects

Project 1: Regional Single Family Water Use Study

Description

A regional single-family end-use study that would compare and contrast different municipalities/utilities in the Valley.

Such a study would:

- Replicate national studies done in the past to collect detailed information on indoor and outdoor use by samples of single family residences, although with a slightly different, localized approach for landscape/irrigation evaluations of single family parcels.
- Collect supplementary data specific to the Phoenix AMA (i.e. surveys and some data-logging that would add to what WSD has already done) that is currently not widely available and hard to find.
- Look at the potential impact of variables like turf removal rebates, urban design guidelines, public outreach programs and water rates on relative water use by single family homes in different utility areas.

Type of Consultants to Be Utilized

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Anticipated Products

The study would:

- Collect detailed information on a sample of approximately 250-500 homes located in participating utility areas that would be generally representative of the size, type, age and cost of single family homes found in the Phoenix AMA.
- Obtain data from water meter usage, County assessment information, landscape analysis, detailed data-logger information on interior fixture/appliance use, mail/email surveys and perhaps even site visits/audits.

This information would then be used to estimate and project demand by providing:

- Detailed estimates of water demand by irrigation systems, pools, appliances & fixtures for different age cohorts, sizes and locations of homes in 2016.
- Estimated inventories by age, type and capacity of indoor devices like toilets, washing machines and shower heads.

- Estimated inventories of landscapes, irrigation systems, pools and other outdoor water features, with associated estimates in the rate of transition from water-intensive landscapes to more efficient landscapes and for pool installation and removal over time.
- Simple projections of the rate of decline of water demand in single family households based on criteria like: age cohort; size of home; size of lot; geographic area; etc.

This information would be very useful for utilities/agencies that only want to do relatively simple spreadsheet-based projections of water demand or for utilities/agencies that want to use the primary research data as an input to more complicated models.

Anticipated Cost:

At approximately \$400 to \$500 per house, the cost of this project is expected to be between \$100,000 and \$250,000 depending on the size and geographic distribution of the sample chosen.

Project 2: Regional Industrial/Commercial/Institutional Water Use Study (Phase 1)

Description

A regional industrial/commercial/institutional (ICI) end-use study that would investigate water use trends in a limited number of sectors such as schools, medical facilities (focus on hospitals and clinics), and hotels/motels/resorts.

This study would attempt to provide baseline data, usage trends, and projections of future use with a focus on sector-specific metrics (e.g. hotel usage on a per-room basis or hospital usage on a per-bed or per patient visit basis).

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Anticipated Products:

The study would:

- Collect detailed information on a sample of approximately 30 – 200 schools, hospitals/clinics and hotels/motels located in participating utility areas that would be generally representative of these types of uses found in the Phoenix AMA.
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- Collect detailed information on a sample of approximately 30 – 200 schools, hospitals/clinics and hotels/motels located in participating utility areas that would be generally representative of these types of uses found in the Phoenix AMA.
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This information would then be used to prepare:

- Detailed estimates of water demand by cooling systems, specialized equipment, irrigation systems, pools, different types of appliances & fixtures for the different targeted ICI-subsectors in 2016.
- Estimated inventories by age, type and capacity of commonplace indoor water using devices AND more specialized equipment and cooling systems, with associated adoption rates for more water efficient devices over time.
- Estimated inventories of landscapes, irrigation systems, pools and other outdoor water features, with associated adoption rates from water-intensive landscapes to more efficient landscapes and for pool installation and removal over time.
- Simple projections of the rate of decline in water demand in targeted ICI-subsectors based on criteria like: age cohort; size of home; size of lot; geographic area; etc.

This information would be very useful for utilities/agencies that only want to do relatively simple spreadsheet-based projections of water demand or for utilities/agencies that want to use the primary research data as an input to more complicated models.

Anticipated Cost:

Based on the experience of the City of Phoenix in undertaking past ICI studies, it is expected that phase 1 of this study, probably focusing on schools, medical facilities, and the hospitality sector, would cost \$200,000 to \$300,000.

GUAC WMAP Funding – Potential Projects

[Draft: For Discussion Only]

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Proposed projects:

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- While the four utilities in the study group would be responsible for working with consultants to collect and analyze data, it is possible that other Phoenix Metropolitan area utilities may wish to become part of one or both projects and contribute staff time and meter data.

Water demand is declining across many if not all sectors, but the declines are occurring at different rates. The research findings will be useful for multiple utilities and agencies to estimate future demands and to be able to better plan for the reconciliation of supply and demands in the medium and long terms (5-35 years).

The research findings can also be used to help water utilities and agencies to identify sectors that could be targeted to accelerate the rate at which older inefficient devices, fixtures, or practices could be upgraded. The methods for accelerating efficiency upgrades could range from education and outreach efforts to loan guarantees and financial incentives.

Priority Research Projects

Project 1: Regional Single Family Water Use Study

Description

A regional single-family end-use study that would compare and contrast different municipalities/utilities in the Valley.

Such a study would:

- Replicate national studies done in the past to collect detailed information on indoor and outdoor use by samples of single family residences, although with a slightly different, localized approach for landscape/irrigation evaluations of single family parcels.
- Collect supplementary data specific to the Phoenix AMA (i.e. surveys and some data-logging that would add to what WSD has already done) that is currently not widely available and hard to find.
- Look at the potential impact of variables like turf removal rebates, urban design guidelines, public outreach programs and water rates on relative water use by single family homes in different utility areas.

Type of Consultants to Be Utilized

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The study would:

- Collect detailed information on a sample of approximately 250-500 homes located in participating utility areas that would be generally representative of the size, type, age and cost of single family homes found in the Phoenix AMA.
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This information would then be used to estimate and project demand by providing:

- Detailed estimates of water demand by irrigation systems, pools, appliances & fixtures for different age cohorts, sizes and locations of homes in 2016.
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Anticipated Cost:

At approximately \$400 to \$500 per house, the cost of this project is expected to be between \$100,000 and \$250,000 depending on the size and geographic distribution of the sample chosen.

Project 2: Regional Industrial/Commercial/Institutional Water Use Study (Phase 1)

Description

A regional industrial/commercial/institutional (ICI) end-use study that would investigate water use trends in a limited number of sectors such as schools, medical facilities (focus on hospitals and clinics), and hotels/motels/resorts.

This study would attempt to provide baseline data, usage trends, and projections of future use with a focus on sector-specific metrics (e.g. hotel usage on a per-room basis or hospital usage on a per-bed or per patient visit basis).

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- Simple projections of the rate of decline of water demand in single family households based on criteria like: age cohort; size of home; size of lot; geographic area; etc.

This information would be very useful for utilities/agencies that only want to do relatively simple spreadsheet-based projections of water demand or for utilities/agencies that want to use the primary research data as an input to more complicated models.

Anticipated Cost:

At approximately \$400 to \$500 per house, the cost of this project is expected to be between \$100,000 and \$250,000 depending on the size and geographic distribution of the sample chosen.

Project 2: Regional Industrial/Commercial/Institutional Water Use Study (Phase 1)

Description

A regional industrial/commercial/institutional (ICI) end-use study that would investigate water use trends in a limited number of sectors such as schools, medical facilities (focus on hospitals and clinics), and hotels/motels/resorts.

This study would attempt to provide baseline data, usage trends, and projections of future use with a focus on sector-specific metrics (e.g. hotel usage on a per-room basis or hospital usage on a per-bed or per patient visit basis).

Type of Consultants to Be Utilized

Prior research efforts at the City of Phoenix and elsewhere indicate that it is challenging to find consultants with the right mix of analytical capabilities, site audit experience and research-oriented philosophy to successfully undertake water demand in ICI sectors. While many possible combinations are possible, it is highly likely that a firm with very good high-level analytical capabilities will have to be teamed together with a firm or firms that excel in undertaking site audits that produce detailed water balance calculations and inventories of equipment and practices.

Anticipated Products:

The study would:

- Collect detailed information on a sample of approximately 30 – 200 schools, hospitals/clinics and hotels/motels located in participating utility areas that would be generally representative of these types of uses found in the Phoenix AMA.
- Obtain data from water meter usage, County assessment information, aerial imagery analysis, interviews with facility managers & engineers, site audits, review of equipment/device specifications on the internet and in manuals, and interviews with product support personnel and industry experts.

This information would then be used to prepare:

- Detailed estimates of water demand by cooling systems, specialized equipment, irrigation systems, pools, different types of appliances & fixtures for the different targeted ICI-subsectors in 2016.
- Estimated inventories by age, type and capacity of commonplace indoor water using devices AND more specialized equipment and cooling systems, with associated adoption rates for more water efficient devices over time.
- Estimated inventories of landscapes, irrigation systems, pools and other outdoor water features, with associated adoption rates from water-intensive landscapes to more efficient landscapes and for pool installation and removal over time.
- Simple projections of the rate of decline in water demand in targeted ICI-subsectors based on criteria like: age cohort; size of home; size of lot; geographic area; etc.

This information would be very useful for utilities/agencies that only want to do relatively simple spreadsheet-based projections of water demand or for utilities/agencies that want to use the primary research data as an input to more complicated models.

Anticipated Cost:

Based on the experience of the City of Phoenix in undertaking past ICI studies, it is expected that phase 1 of this study, probably focusing on schools, medical facilities, and the hospitality sector, would cost \$200,000 to \$300,000.

GUAC WMAP Funding – Potential Projects

[Draft: For Discussion Only]

Background:

Proposed projects:

- Will provide data on a regional basis (i.e. be useful for the majority of the AMA)
- Will involve multiple utilities, agencies and/or research entities.

Representatives of:

- The City of Chandler, Central Arizona Project, City of Gilbert, City of Glendale, City of Phoenix and Salt River Project met to discuss possible research projects that would assist both the individual organizations and the region.
- Two priority projects were identified:
 - o A regional single family water use study
 - o First phase of a regional industrial/commercial/institutional (ICI) study.
- The information provided by these studies would:
 - o Identify baseline conditions including specific water end uses (e.g. clothes washer use; landscape irrigation use; cooling tower use)
 - o Estimate adoption rates of more water efficient devices and practices, and
 - o Project future demand for both existing and new (future) customers.
- While the four utilities in the study group would be responsible for working with consultants to collect and analyze data, it is possible that other Phoenix Metropolitan area utilities may wish to become part of one or both projects and contribute staff time and meter data.

Water demand is declining across many if not all sectors, but the declines are occurring at different rates. The research findings will be useful for multiple utilities and agencies to estimate future demands and to be able to better plan for the reconciliation of supply and demands in the medium and long terms (5-35 years).

The research findings can also be used to help water utilities and agencies to identify sectors that could be targeted to accelerate the rate at which older inefficient devices, fixtures, or practices could be upgraded. The methods for accelerating efficiency upgrades could range from education and outreach efforts to loan guarantees and financial incentives.

Priority Research Projects

Project 1: Regional Single Family Water Use Study

Description

A regional single-family end-use study that would compare and contrast different municipalities/utilities in the Valley.

Such a study would:

- Replicate national studies done in the past to collect detailed information on indoor and outdoor use by samples of single family residences, although with a slightly different, localized approach for landscape/irrigation evaluations of single family parcels.
- Collect supplementary data specific to the Phoenix AMA (i.e. surveys and some data-logging that would add to what WSD has already done) that is currently not widely available and hard to find.
- Look at the potential impact of variables like turf removal rebates, urban design guidelines, public outreach programs and water rates on relative water use by single family homes in different utility areas.

Type of Consultants to Be Utilized

It is highly likely that this project would be awarded through a sole source procurement process since the firm Aquacraft has done numerous studies of this kind with a wide variety of organizations and it is unlikely that any other consulting firm would have the skills and equipment necessary to successfully implement a study of this type. Vehicles equipped with data-loggers, computers equipped with proprietary data-logging software, and staff experienced in both data-logger installation/collection and interpretation of the signatures of specific devices/practices would be required.

Anticipated Products

The study would:

- Collect detailed information on a sample of approximately 250-500 homes located in participating utility areas that would be generally representative of the size, type, age and cost of single family homes found in the Phoenix AMA.
- Obtain data from water meter usage, County assessment information, landscape analysis, detailed data-logger information on interior fixture/appliance use, mail/email surveys and perhaps even site visits/audits.

This information would then be used to estimate and project demand by providing:

- Detailed estimates of water demand by irrigation systems, pools, appliances & fixtures for different age cohorts, sizes and locations of homes in 2016.
- Estimated inventories by age, type and capacity of indoor devices like toilets, washing machines and shower heads.

- Estimated inventories of landscapes, irrigation systems, pools and other outdoor water features, with associated estimates in the rate of transition from water-intensive landscapes to more efficient landscapes and for pool installation and removal over time.
- Simple projections of the rate of decline of water demand in single family households based on criteria like: age cohort; size of home; size of lot; geographic area; etc.

This information would be very useful for utilities/agencies that only want to do relatively simple spreadsheet-based projections of water demand or for utilities/agencies that want to use the primary research data as an input to more complicated models.

Anticipated Cost:

At approximately \$400 to \$500 per house, the cost of this project is expected to be between \$100,000 and \$250,000 depending on the size and geographic distribution of the sample chosen.

Project 2: Regional Industrial/Commercial/Institutional Water Use Study (Phase 1)

Description

A regional industrial/commercial/institutional (ICI) end-use study that would investigate water use trends in a limited number of sectors such as schools, medical facilities (focus on hospitals and clinics), and hotels/motels/resorts.

This study would attempt to provide baseline data, usage trends, and projections of future use with a focus on sector-specific metrics (e.g. hotel usage on a per-room basis or hospital usage on a per-bed or per patient visit basis).

Type of Consultants to Be Utilized

Prior research efforts at the City of Phoenix and elsewhere indicate that it is challenging to find consultants with the right mix of analytical capabilities, site audit experience and research-oriented philosophy to successfully undertake water demand in ICI sectors. While many possible combinations are possible, it is highly likely that a firm with very good high-level analytical capabilities will have to be teamed together with a firm or firms that excel in undertaking site audits that produce detailed water balance calculations and inventories of equipment and practices.

Anticipated Products:

The study would:

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Anticipated Cost:

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