

# Architectural Services Best Practices

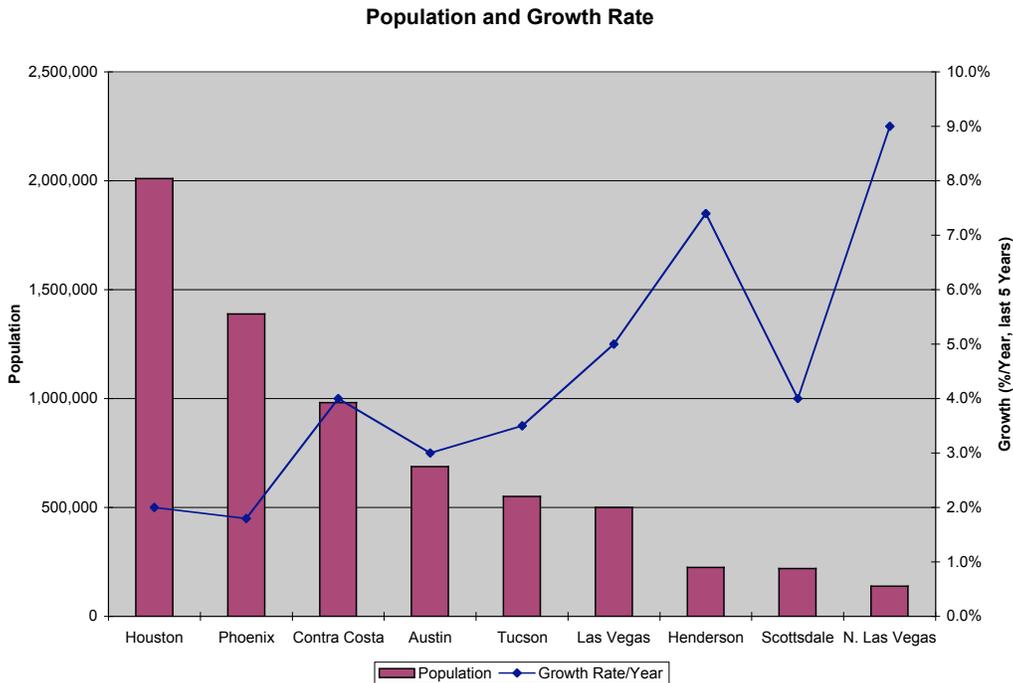
## Executive Summary

### *Participating Organizations*

This report is sponsored by the Office of Architectural Services of the City of Las Vegas as part of a larger assessment of that organization by the APQC Consulting Group.

In addition to the sponsor, there were eight other participating jurisdictions: the Cities of Austin and Houston, Texas, Contra Costa County, California, the Cities of Henderson and North Las Vegas, Nevada <sup>1</sup> and three Arizona cities: Phoenix, Scottsdale and Tucson. We thank them for their time and effort in completing the survey and answering questions to validate the data. We hope this report creates value to compensate them for their efforts.

The following three charts show basic demographic information. The estimated 2004 population growth is based on the current population times the average growth rate for the last five years.

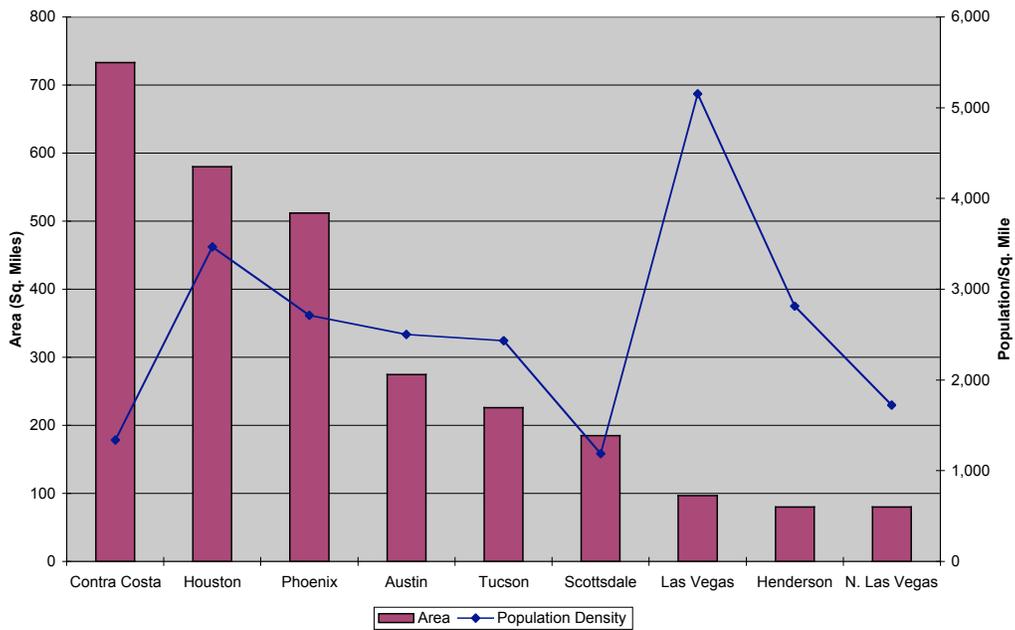


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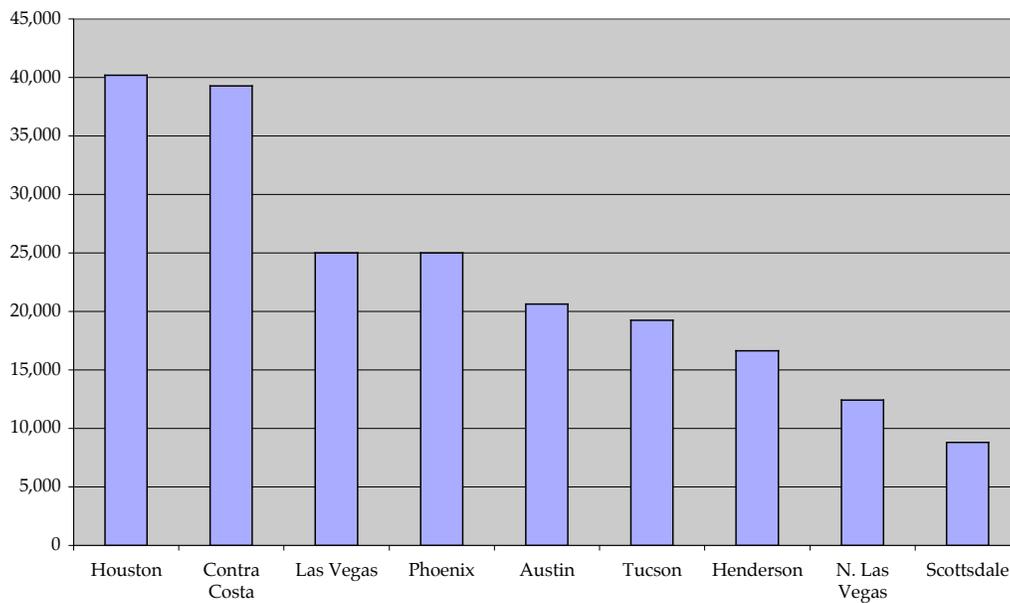
<sup>1</sup> The Cities of Las Vegas, Henderson and North Las Vegas are incorporated cities within Clark County, Nevada. The majority of the casinos on The Strip (from Sahara Ave. south to the airport) are in the unincorporated portion of Clark County.

# Architectural Services Best Practices

Area and Population Density



Population Growth 2004 (estimated)



# Architectural Services Best Practices

## **Overview**

While the focus of the study was to identify “best” practices, the study lacked the level of detail (i.e., costs, quality and effectiveness metrics) necessary to declare superior overall performance and declare a “winner.” What can be said though is that while superior performance in all areas may be lacking in some organizations, they may still utilize multiple “best” practices.

We will avoid being judgmental; we will provide the data in tables and graphs, plus a narrative to highlight key data, but will let the reader draw his or her own conclusions.

There were, however, reasonable performance metrics to gauge superior performance, such as: timeliness of completing park and fire station projects, the level of litigation and arbitration, and project manager workloads (dollars and number of projects managed). These will be highlighted in the report.

The organizations participating range from jurisdictions that have separate architectural service groups and three that have combined architectural and engineering services (including non-architectural services for roadways, water treatment and waste water plants): Austin, North Las Vegas and Scottsdale.

Of all the jurisdictions, Houston has a very unique model with an organization composed of both city employees and outsourced consultants forming a unified organizational structure.

## **Findings and Observations**

Key findings and observations from the data supplied by the participants:

- Given the diversity of organization structures, populations served and many different practices, the overall results indicate there is no one “right” way
- Houston’s use of outsourced consultants, rather than employees, in an integrated organization appears to be unique and would appear to provide flexibility while maintaining project control
- Staff assignments for most organizations are project or organization based rather than Project Manager based
- Team rotation opportunities exist in six of the nine organizations
- Making decisions based on staffing ratios and project workloads (\$ value or number of projects/Project Manager) is dangerous without understanding both the numerator and denominator of the ratio
- While licenses in three organizations are not required, most Project Managers have licenses
- Houston, Phoenix and Scottsdale have Landscape Architects designated as Project Managers
- Five of the nine organizations have multiple types/grades of Project Managers
- Performing architectural design in-house is the exception not the rule
- Not having in-house design does not preclude the use of “prototype” designs

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- Using “prototype” designs seems to shorten the design phase for organizations using them (at least for Fire Stations)
- Construction management seems to be geographically influenced: Arizona cities generally do not contract out while Texas cities do
- Only two organizations, Las Vegas and Contra Costa, do not have project program-scope and funding-budget clearly defined before the Design phase
- Only Las Vegas has elected members/officials who get involved in deciding aesthetic design issues
- Review boards do not seem to work well for the two organizations that use them: Scottsdale and Tucson
- Project delivery of Design-Bid-Build was the predominant method for seven of the organizations. Phoenix and Tucson rely heavily on Construction Management @ Risk
- Based on the reported time for the Bidding Phase for fire stations and parks (i.e.. 10 to 20 acre parks), the variety of decision criteria and decision-makers does not appear to have a significant impact on the duration of this phase
- Most organizations assign responsibility to one Project Manager for the entire project, from funding through final construction payment
- All but two organizations charge building permit fees to projects
- Several contract terms are used infrequently: damages for late consultant completion, early construction completion incentives, no payment for unknown subsurface conditions and fixed number of bad weather days
- 10% is the most common contingency reserve
- Most organizations experience construction change orders at 6% or less of original construction contracts
- Wide variations exist in calculating design errors and omissions and in assessing liquidated damages
- Only two of the seven organizations reporting on fire stations had completions times of less than 20 months; most reported park completions in the 25 to 30 month range
- Most organizations use design standards, standard project procedures and have electronic/intranet access to data and files
- A variety of software is used to manage projects
- Project shortening practices are not widespread, with Austin and Phoenix citing at least two methods each
- Monthly reporting of schedules and status are the most common frequency

## ***Study Methodology***

The method of conducting the project consisted of several key phases: development and refinement of the survey document, solicitation of participating governmental jurisdictions, electronic transmission of the survey document to potential participants, submission of completed surveys and analysis of data. This was followed by the creation of this report.

# Architectural Services Best Practices

## Findings and Observations

### *Participating Organizations*

The following table shows the title of the organization participating, the parent organization and whether or not the workgroup is dedicated to only architectural capital improvement projects. Copies of all organization charts submitted will be issued to all participants.

	Las Vegas	Austin	Contra Costa	Henderson	Houston	N. Las Vegas	Phoenix	Scottsdale	Tucson
Organization	Office of Arch. Services	Project Mgt. Div.	Capital Projects Div.	Construction Mgt. Div.	Design & Construction Div.	Engr. Services Core Group	Project Mgt. Div.	Capital Proj. Mgt. Div.	Arch. & Engr. Div.
Parent Organization	DPW	PWD	General Services Dept.	PWD	Bldg Services Dept.	PWD	Engr. & Arch Services Dept.	Municipal Services	Operations Dept.
Manage Arch. CIPs Only	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes
In-house Arch. Design	Prototype& remodels	Landscape only	Limited small-scale	No	No	No	No	No	No

As might be expected, change in organization mission and activities are common in the organizations in the study. While North Las Vegas does not currently do in-house design, they would like to add a remodeling architect in the future when budget constraints ease.

Austin formerly performed in-house architectural design, but no longer does this except for limited landscape design. Their Architectural Management Division was merged with the Engineering group in the late 1990's. The City of Las Vegas created the Office of Architectural Services several years ago as a separate section of the Engineering Integration Division within their DPW.

### *Staffing*

Personnel by job category in work groups are summarized in the table below. For total Licensed Professionals, see the table on page 11.

	Las Vegas	Austin	Contra Costa	Henderson	Houston	N. Las Vegas	Phoenix	Scottsdale	Tucson
Mgt.	1	5	1	2	4	2	3	2	1
Project Mgrs.	6	33	8	3	18	12	12	12	7
Designers	4				1	4		2	
Arch. Tech. & Draftsmen	1				1			1	
Construction Mgrs.	3		1		10	5		3	3
Clerical & Support	2	5	4	2	15	6	2	3	1
Other		2			1	4	13	13	
Total	17	45	14	7	50	33	30	36	12

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Only 16 of the 50 personnel reported for Houston are employees and the balance are outsourced consultants within an integrated organization, the Design & Construction Division. Houston currently has a Deputy Director position that is vacant and is being considered for deletion. Contra Costa’s headcount includes a Construction Manager consultant, who is not an employee.

The “Other” personnel shown are Phoenix (5 Construction Inspectors and 8 other licensed professionals), Scottsdale (12 Construction Inspectors and 1 other licensed professional), Houston (1 other licensed professional), Financial Support personnel in North Las Vegas, and an Environmental Specialist and Senior Planner in Austin.

Support staffs that work for Project Managers at least 80% of the time are summarized in the table below. Staff assignments were defined as follows:

- Project Manager based (assigned to Project Managers)
- Project based (assigned based on project type, size complexity and skill required)
- Organization based (vary with workloads and overall commitments)

	Las Vegas	Austin	Contra Costa	Henderson	Houston	N. Las Vegas	Phoenix	Scottsdale	Tucson
Designers	4					4		2	
Arch. Tech. & Draftsmen	1							1	
Construction Mgrs.	3				7			3	3
Clerical & Support		5	4		5	6	2		1
Other						1	5	12	
<b>Total</b>	<b>8</b>	<b>5</b>	<b>4</b>	<b>0</b>	<b>12</b>	<b>11</b>	<b>7</b>	<b>18</b>	<b>4</b>

Staff Assignments	PM based	Project based	Org. based	Org. based	Org. based	PM based	Project based	Project based	Org. based
Team Rotation Opportunity	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes

With regard to rotation opportunities, North Las Vegas rotates less experienced personnel and varies project assignments. Phoenix uses a matrix organizational structure where Project Managers, Licensed Professionals and Construction Inspectors are teamed for specific projects.

## ***Staffing Ratios and Project Workloads***

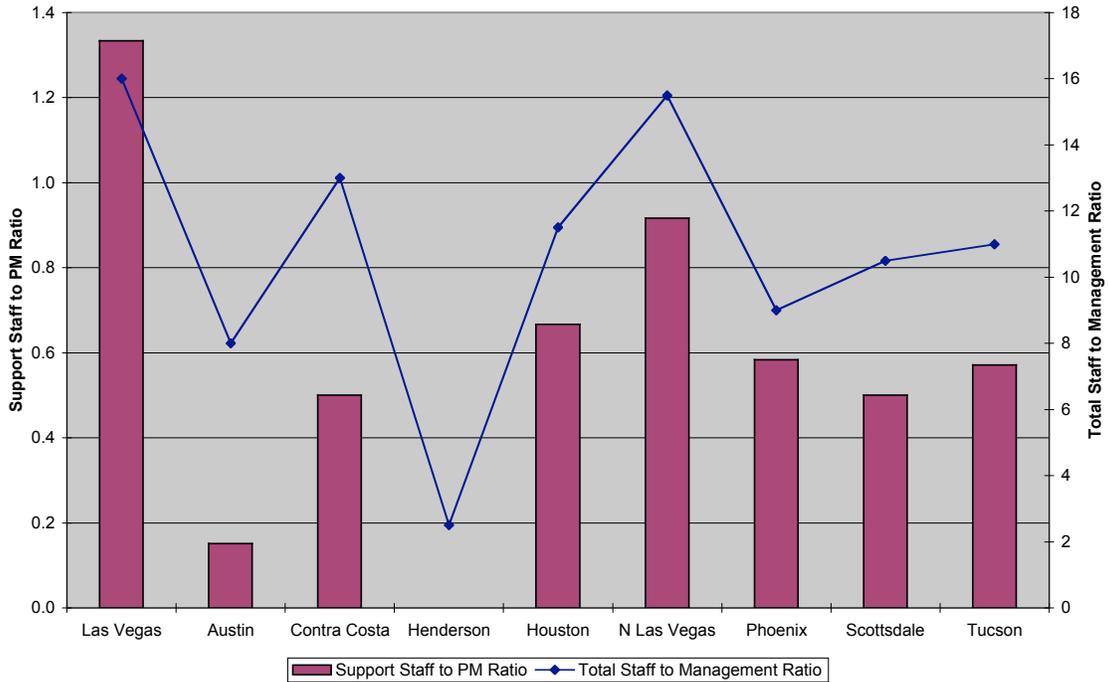
The following graph shows staffing ratios for support staffs that provided 80% of their time in support of Project Managers and the ratio of total staff to Management. Twelve Construction Inspectors for Scottsdale have been excluded in the calculation of these ratios.

These ratios are impacted by a variety of factors, such as:

- Level of design work done in-house, for example, Las Vegas versus Austin
- Project Manager based staff assignments, for example, Las Vegas and North Las Vegas versus other organizations

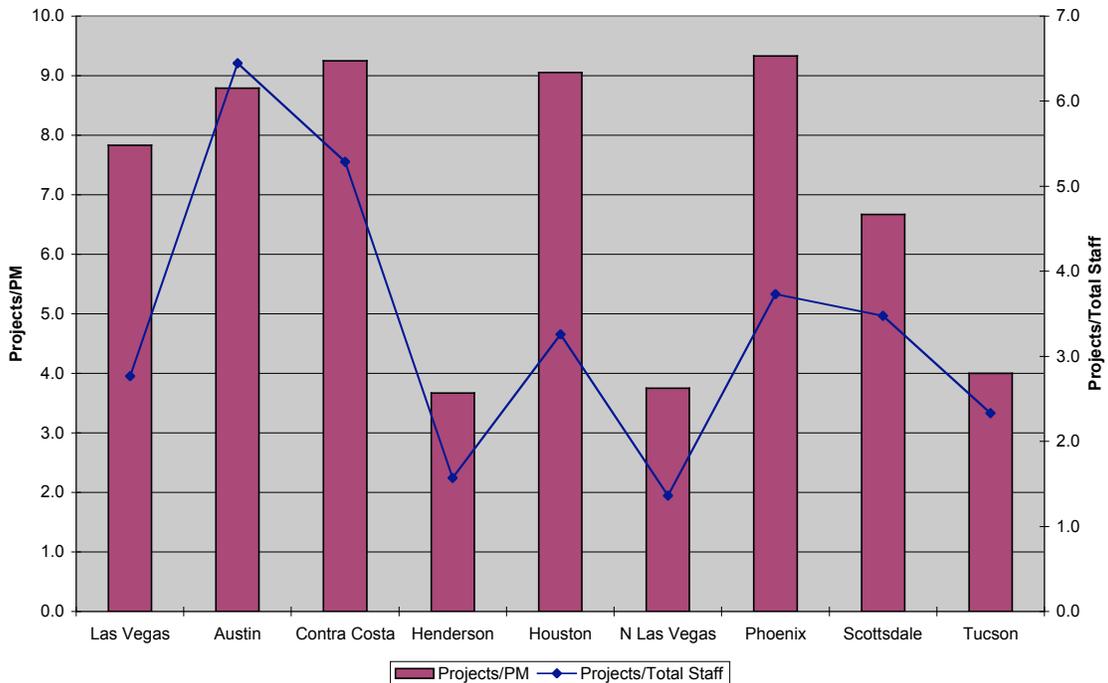
# Architectural Services Best Practices

## Staffing Ratios

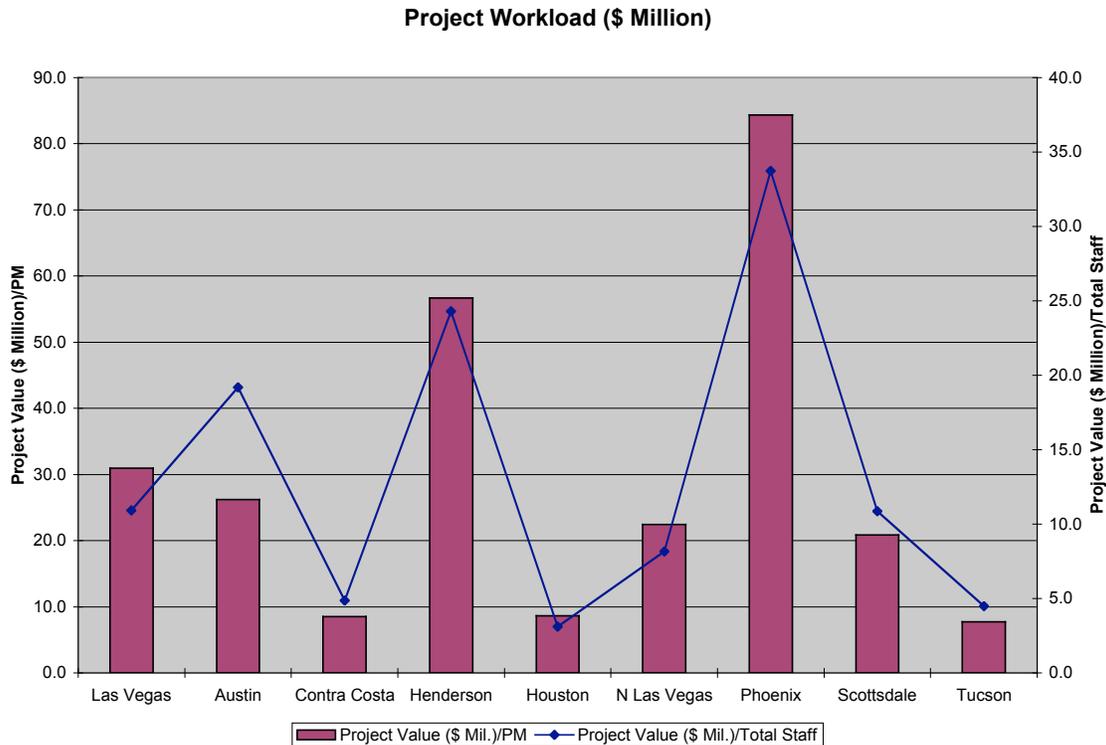


The following two charts show the workloads of organizations using the number of projects and project value for Project Managers and total staff. Here too, the twelve Construction Inspectors for Scottsdale have been excluded from the total staff data.

## Project Workload (# Projects)



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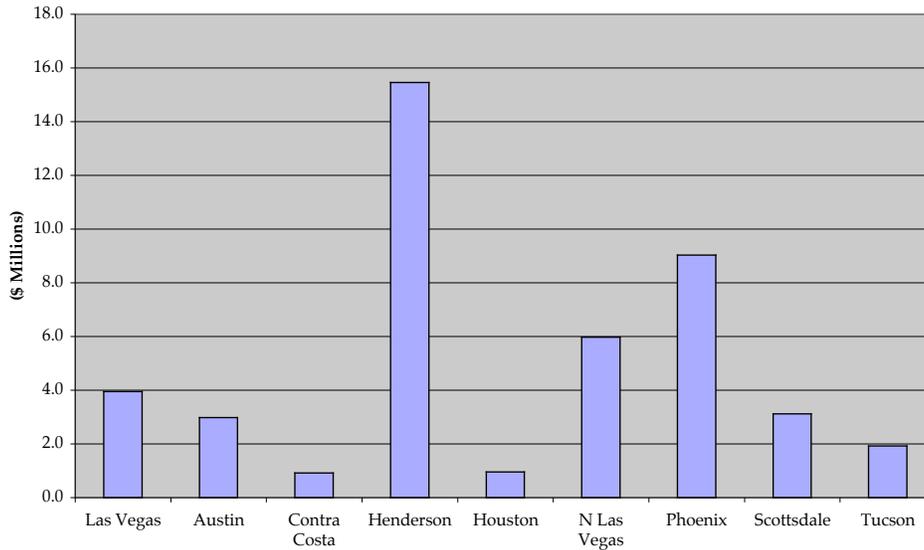
For both of the above two charts, current headcount and current project activity were used. For many organizations, current activity is lower than normal (Las Vegas and Tucson), but for others it is higher than normal (Henderson, Houston and Scottsdale).

Other factors that influence the results shown in these two charts:

- Activity and project values for Austin, North Las Vegas and Scottsdale include engineering projects as well as architectural projects
- Large projects, particularly for smaller organizations (for example, Henderson), drive the average project values (see the next chart on page 11)
- Henderson has an \$80 million treatment plant that is approximately 50% of their budget, but only one of 11 current projects
- Scottsdale has two waste water treatment plants totaling \$110 million, representing 45% of total value, but these are only two out of 80 projects
- Phoenix has 38 governmental building projects valued at \$722 million (including one project exceeding \$500 million), or \$19 million on average. Many other smaller projects reduce the total average to \$9.0 million

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Average Project Value



## Staff Licensing and Project Manager Types and Grades

The following table summarizes:

- Project Manager licensing requirement and type of license
- Total staff professional licensing, including the number of licensed Project Managers in parenthesis

While licenses in three organizations are not required, most Project Managers have licenses.

	Las Vegas	Austin	Contra Costa	Henderson	Houston	N. Las Vegas	Phoenix	Scottsdale	Tucson
PM License Required	Yes	No	Yes	No	No	Yes	Yes, Sr. PMs	Yes	Yes
Arch	X		X				X	X	X
Engr			X			X	X	X	X
Landscape Arch.							X	X	
Public. Admin.								X	

Arch. Lic.	6 (4)	12 (9)	5 (5)	1 (1)	1		5 (4)	2 (2)	4 (4)
Engr. Lic.		12 (11)	2 (1)		5 (2)	15 (14)	7 (5)	6 (6)	2 (2)
Landscape Arch. Lic.	1 (1)				1 (1)		3 (3)	2 (2)	
Interior Design Lic.	1 (1)				1				
Other Lic.	1							2 (2)	
Total	9 (6)	24 (20)	7 (6)	1 (1)	8 (3)	15 (14)	15 (12)	12 (12)	6 (6)

Other licensed personnel include: Residential Design in Las Vegas and Construction Management in Scottsdale.

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Five of the organizations have multiple types/grades of Project Managers as follows:

Contra Costa	Houston	N. Las Vegas	Phoenix	Scottsdale
Supervising, Senior and Associate PM	Design, Construction and Senior PM	Principal, Senior and Associate Engineers	Senior PM, PM, Project Management Assistants	Senior PM and PM

The difference in levels was best described by Phoenix:

- **Senior Project Managers:** Registered professionals (Civil Engineers, Mechanical Engineer, Electrical Engineer, Architects, and Landscape Architects). These positions are range 039 positions in the City’s personnel system, the highest level of technical positions
- **Project Managers:** Have degrees, but may not yet be licensed, or may have 10 to 15 years experience in the field and may not have a degree
- **Project Management Assistants:** Have lesser years of experience and usually do not have degrees

## Workgroup Tasks

The following table summarizes the percentage of tasks done in-house by the workgroup in the study, rather than work contracted out or work done by another workgroup in another department.

	Las Vegas	Austin	Contra Costa	Henderson	Houston	N. Las Vegas	Phoenix	Scottsdale	Tucson
Project Management	100%	75%	95%	80%	3%	100%	75%	100%	100%
Develop Arch. Design	15%		10%	5%		20%	1%	1%	
Prepare Construction Drawings	10%		10%	5%	3%	25%	1%	1%	
Construction Management	85%		50%	50%		75%	75%		100%

The reported criteria for contracting to outside organizations (or done by other departments separate from the workgroup in the study) is summarized as follows:

## Project Management

- Contracted out for special projects (uncommon scale, type, complexity): Las Vegas, Contra Costa, Henderson and Austin
- Generally not contracted out: Phoenix, Tucson, North Las Vegas and Scottsdale
- Generally contracted out: Houston

## Architectural Design

- Contracted out, except for prototype, remodels and/or other limited, small-scale projects: Las Vegas and Contra Costa. Las Vegas does additional work in-house when project workload is low.
- Generally, or always, contracted out: All other organizations

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## Construction Management

- Contracted out for special projects only (uncommon scale, type, complexity) or when staff workloads are high: Las Vegas, Contra Costa, Henderson and North Las Vegas. North Las Vegas also contracts out construction management for externally funded projects.
- Generally not contracted out: Phoenix, Tucson and Scottsdale
- Generally contracted out: Houston and Austin

## Prototype Designs

All organizations use prototype designs, except Contra Costa and Houston. Only Las Vegas completes and seals in-house designs, but they only complete 70% of designs, drawings and specifications, since engineering on these projects is contracted out. Prototypes are used for:

- Fire Stations: All, except Contra Cost, Houston and Phoenix
- Park Restrooms: Las Vegas, North Las Vegas, and Phoenix
- Other facilities: Police Stations (Las Vegas and North Las Vegas), city employee work areas and concession buildings (Las Vegas), recreation centers (Henderson) and building and storage for PWD (Phoenix)

## *Project Decision Processes and Practices*

The next series of results address key project decisions:

- Only two organizations, Las Vegas and Contra Costa, do not have project program-scope and funding-budget clearly defined before the Design phase
- During the Design phase, all organizations have fixed funding-budgets that drive the amount of program that can be built
- For disagreements in design aesthetics, Contra Costa, Houston, North Las Vegas and Phoenix have client department, or facility users, decide on the design issues. Austin relies on the client as well as the Project Manager; Tucson relies on the client and design consultant, while Henderson uses their organization manager and the design consultant. Scottsdale has a review board and only Las Vegas uses elected members/officials
- For design functionality disagreements, all organizations use the same entities to decide as in aesthetics issues, except Scottsdale and Las Vegas. For these issues they use the client department, or facility users
- Two organizations reported use of review boards, Scottsdale and Tucson, but felt that this method was not an efficient and effective method of decision-making. Austin uses a Landmark Commission for historically designated buildings, but did not comment on effectiveness

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The following table summarizes the project delivery methods used. In addition to the methods shown, North Las Vegas is considering the use of Design-Build while Contra Costa is evaluating other methods. No organization used the Cost-plus-Time method.

	Las Vegas	Austin	Contra Costa	Henderson	Houston	N. Las Vegas	Phoenix	Scottsdale	Tucson
Design-Bid-Build	100%	99%	95%	100%	100%	100%	25%	99%	50%
Design-Build		1%					10%		
Performance Based Contract							5%		
Other			5%				60%	1%	50%
Other Method			Job Order Contracting				CM @ Risk	CM @ Risk	CM @ Risk

The decision makers and decision criteria for selecting both Design Consultants and Construction Managers had many similarities within an organization, but varied significantly amongst organizations. The following summarizes the information submitted by each organization. Unless it is noted, each organization uses the same process for both decisions.

- Las Vegas: For Design, selection from pre-qualified and ranked list using Project Manager and City Management consensus; skip over consultants already doing projects for City; Project Manager negotiates contract, which is reviewed by Management and approved by City Council if over \$25,000
- Las Vegas: For Construction Management, City Management decides; Project Manager negotiates contract, which is reviewed by Management and approved by City Council if over \$25,000
- Austin: Uses a formal qualification based process to evaluate consultants, per State regulations. City has developed an Evaluation Matrix (in Excel), supported by a well-defined list of evaluation criteria. The City maintains a rotation list of qualified consultants
- Contra Costa: Selection committee; if project small, Project Manager evaluates and decides
- Henderson: RFQs sent out, evaluated, top few interviewed, then selection made
- Houston: Committee reviews RFQs submitted, followed by formal interview of all bidders; all candidates evaluated and ranked with findings sent to Mayor for selection. Building Services Department negotiates contract and submits to City Council for approval
- North Las Vegas: Evaluation based on qualifications, experience, references, sub-consultants, organizational structure and responsiveness
- Phoenix: Selection by panel composed of Engineering & Architectural Services Department, client departments and some outside stakeholders per statutory required Qualified Bidder Selection process; City Council approves all contracts. Phoenix does not contract with outside Construction Managers
- Scottsdale: Staff selection committee per statutory required Qualified Bidder Selection process. Scottsdale does not contract with outside Construction Managers
- Tucson: Decided by Architecture & Engineering Division and Procurement

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The decision makers and decision criteria for selecting Construction Contractors had less variation amongst the organizations. Responses submitted are summarized as follows:

- Las Vegas: Pre-qualified contractor list limits contractors allowed to bid, except that Federally funded projects are open to all contractors. Contract awarded by City Council, if over \$25,000, to the low bidder unless there is a withdrawal of bid, protest or responsive/responsible issue
- Austin: Awarded to the apparent low bidder. City has a Minority/Women Business Enterprise Ordinance that may affect which bidder is deemed to have provided the compliant low bid. State of Texas extended authority to municipalities to complete projects with alternative project delivery methodologies; City used this only by project specific City Council direction
- Contra Costa: Competitive low-bid responsive, responsible bidder
- Henderson: Low bid
- Houston: Lowest responsive bid; approved and awarded by City Council
- North Las Vegas: Lowest responsive, responsible bidder
- Phoenix: Uses four different methods to procure construction services, all contract awards are approved by the City Council:
  - Design-Bid-Build: Contractors are selected through an Invitation to Bid process and contracts are awarded on the basis of the lowest responsive and responsible bid
  - Using Design-Build: Successful DB team is selected either through a one-step process that is qualifications-based only, or through a two-step process using qualifications only in the first step and a Best Value approach that combines a technical proposal and price proposal in the second step
  - Construction Manager at Risk (CM@R): Successful CM@R firm chosen solely through a qualifications-based selection process
  - Job Order Contracting: Successful contractors selected solely on qualifications or through a Best Value process
- Scottsdale: Lowest responsive bidder; developing CM@ Risk projects
- Tucson: Decided by Architecture & Engineering Division and Procurement

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## *Operational Process and Practices*

### **Project Responsibility**

For all organizations, except Houston and North Las Vegas, the following summarizes the workgroup project responsibility:

- Project responsibility remains with a single Project Manager from funding through construction final payment
- The Project Manager support team remains the same for the project (based on data submitted for other questions in the survey, this team is generally not a “staff” dedicated to a single Project Manager)
- Las Vegas, Scottsdale and Tucson assign a Construction Manager, Construction Coordinator and Project Coordinator, respectively, during construction, who work directly for Project Managers at least 80% of the time

Houston uses two Project Managers, described as follows:

- One during the Design Phase and the other during the Construction Phase
- The milestone event separating their responsibility is the award of the construction contract
- Coordination of these two Project Managers begins in the Bid & Award Phase of the design. The Construction Manager and Inspector attend the Pre-bid meetings

North Las Vegas uses three Project Managers, as follows:

- CIP programming (planning, funding acquisition)
- Design (preliminary and final design, bidding)
- Construction management (contract award through 12 month warranty)
- When switching project managers, coordination is facilitated by on-going project status meetings, section leader meetings, and formal transfer meetings

### **Permits and Warranty**

With the exception of North Las Vegas and Scottsdale, all organizations charge projects with building permit fees.

Warranty issues are monitored and resolved by:

- Project Manager: Las Vegas, Contra Costa and Phoenix
- Project Manager and facility occupants: Austin
- Group maintaining facility: Houston and Tucson
- Project Manager and group maintaining facility: Henderson
- Construction Manager: North Las Vegas and Scottsdale

### **Contract Terms**

The following table summarizes responses concerning current contract conditions for all organizations. A “yes” response does not mean that the organization uses the term in all

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contracts, however. Contra Costa is considering adding “early construction completion incentives” and is prohibited by law from using “no-damage-for-delay” clauses.

	Yes		No
	Architectural Only	Architectural & Engineering	
Consultant re-designs at no cost if bid > budget	5	1	3
Liquidated or other damages for late consultant completion	1	1	7
Systems commissioning	3	2	4
Early construction completion incentive	1	1	7
No-damages-for-delay clause	1	3	5
No payment for subsurface unknown conditions	3	0	6
Liquidated damages for tardy contractor punch list/close-out documents	5	1	3
Fixed number of bad weather days per month	2	1	6
Construction schedule resource loaded	3	1	5
Construction schedule linked/labeled to the Schedule of Values	5	1	3
Binding arbitration dispute resolution	4	1	4

## Performance Measures

The following table summarizes responses to contingency reserves, professional fees, change orders and litigation/arbitration rates.

	Las Vegas	Austin	Contra Costa	Henderson	Houston	N. Las Vegas	Phoenix	Scottsdale	Tucson
Conflict and Contingency Reserve	10%	10%	10%	4%	5%	10%	1-2%	NA	10%
Professional Fees	8%	12-18%	15%	8%	12%	10%	8%	8-12%	10%
Change Orders (% of original)	6%	5%	5-10%	2-3%	5%	6%	10%	5%	3%
Litigation or Arbitration	2%	<1%	5%	5%	<1%	2%	2%	<1%	5%

Key qualifications for professional fees:

- Las Vegas: Excludes survey, geotechnical reports, special inspection and other services above a standard full service contract
- Houston: Includes only design fees, basic services 9.0% and design management fees 3.0%; table excludes design fees for additional services 6.0% and construction management fees, including inspection services 7.0%

## Design Errors and Omissions

The following items summarize the responses on design errors and omissions:

- Organizations that have no “allowance” for errors where a “value received change order” (e.g., required item not on drawing) is necessary to correct the error: Austin, North Las Vegas and Scottsdale
- Las Vegas, in contrast, generally allows 100% of errors where a “value received change order” (e.g., required item not on drawing) is necessary to correct the error; for multiple errors, a 20% of the cost of change up-charge is assessed

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- With regard to no-value received change orders, the following organizations charge the full cost of the error: Las Vegas, Austin and Scottsdale
- North Las Vegas charges 50-100% of the cost for no-value received change orders depending on the circumstances

Other methods for determining charges were:

- Contra Costa, Houston and Phoenix: No predetermined percentage; evaluated on a case by case to determine detrimental impact to project. The Phoenix assessment also determine if errors and omission exceed the “standard of care” for the local area given the complexity and time allowed for design for each project. Straightforward, simple designs have a lower threshold than more complex projects with tight design and review periods

## Liquidated Damages

Most organizations charge a “typical” daily rate per calendar day as follows:

- Henderson: Cost per half day of Project Manager and secretarial help
- Houston: \$800
- Phoenix: Based on standard tables like the AIA or Maricopa Association of Governments (MAG) rates
- Scottsdale: Standard regional schedule of approximately 0.5% of contract amount
- Tucson: \$500

Both North Las Vegas and Austin include other items in their calculations:

- North Las Vegas: Extended costs for city staff administration, consultant fees and possible loss of use or delayed use by the public and/or cost of public impacts (i.e., traffic control)
- Austin: Uses a form to calculate liquidated damages that includes hourly cost for City employees as well as outside consulting services. Additional charges include interest on money paid to the contractor as well as actual expenses and rental costs associated with the delayed completion

And, finally, contractors in Las Vegas are charged damages that generally run in the \$3,000-\$5,000 per day range, based on:

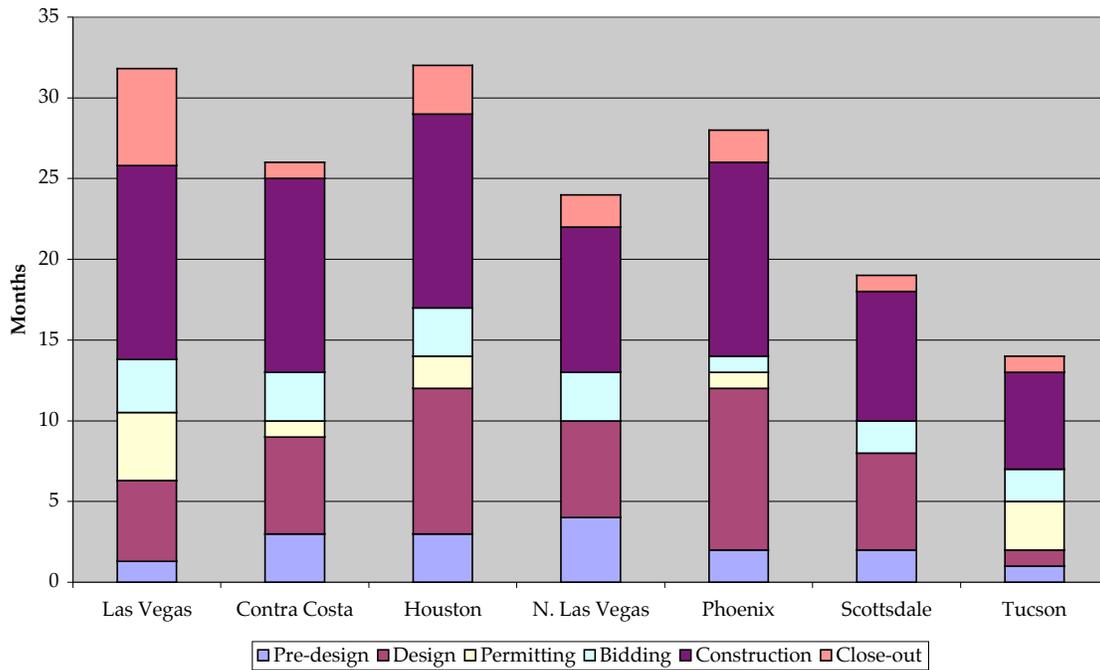
- Either, rental cost of a similar facility in the immediate area run by a non-profit organization (what a private developer’s proforma would show as the breakeven charge per day for the facility if their profit margin was zero), or
- Cost to borrow the total project funding using the city’s bond rate per day

## Monitoring of Project Schedules and Completion Timelines

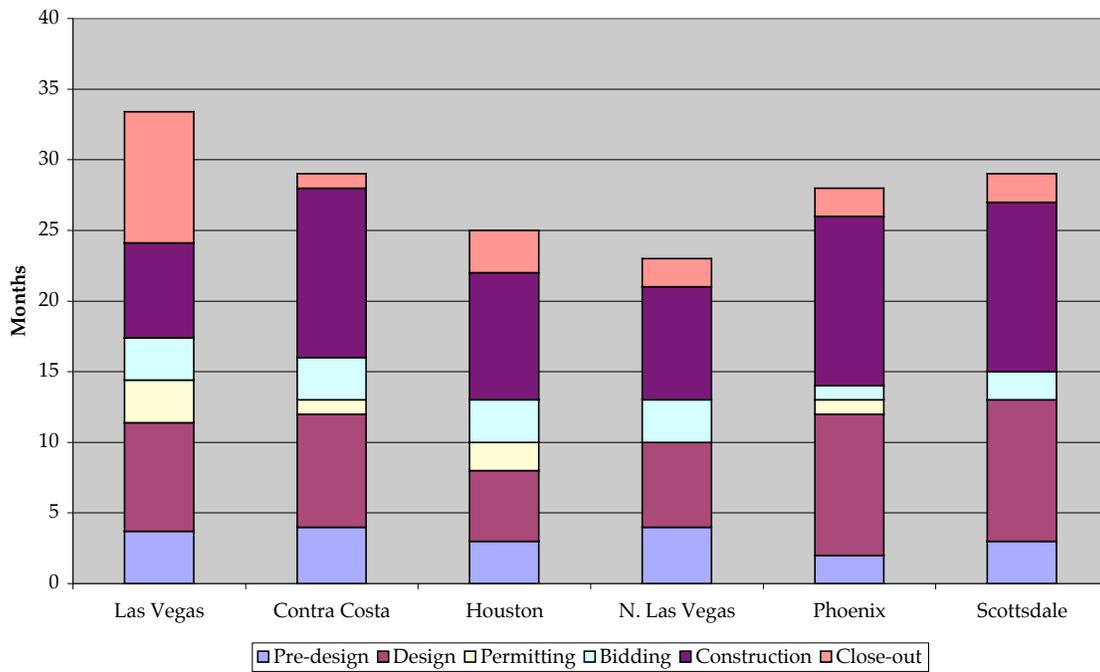
Of all the organizations, only Henderson does not monitor the duration of project phases. Austin monitors the phases, but was unable to effectively group fire and park projects to incorporate their experience in the following charts.

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## Fire Station Timeline



## 10-20 Acre Park Timeline

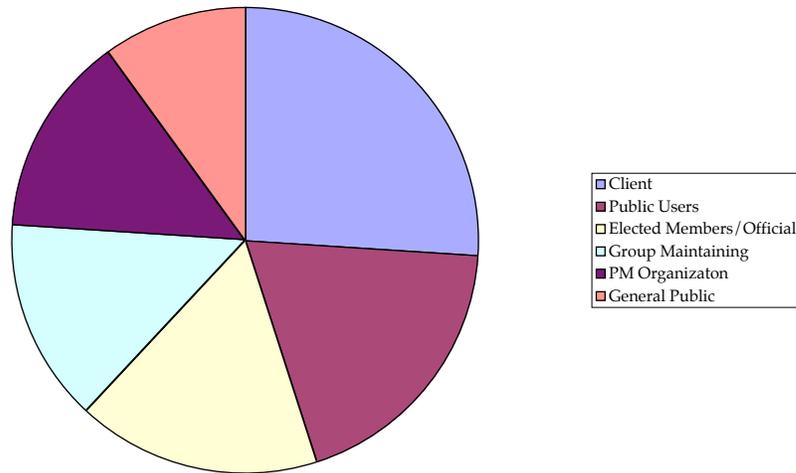


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## Completed Project Satisfaction

Responses for measuring completed project satisfaction were converted to an overall ranking of importance (i.e., weighting of individual organization rankings). When total points are converted to a relative weighting, the following chart shows relative importance.

Project Satisfaction (Relative Weighting)



## Productivity

### Software

The following table summarizes the productivity tools used. At this time Henderson does not use or did not report using any of the tools.

	Las Vegas	Austin	Contra Costa	Henderson	Houston	N. Las Vegas	Phoenix	Scottsdale	Tucson
Budgeting Software	MS Excel	No	MS Excel, County Fin. System	No	No	MS Access, Oracle	No	No	In-house
Scheduling Software	MS Project	MS Project	MS Project, Primavera	No	Primavera	Primavera P3	MS Project	No	MS Project
Construction Mgt. Software	Primavera Expedition	No	No	No	No	Primavera Expedition	No	MS Suite	No
Project Mgt. Software	No	eCAPRIS	MS Access	No	Yes	No	PROMIS	MS Access & Project	No
Design Standards	Yes	No	Yes	-	Yes	Yes	Yes	No	Yes
Std. Project Procedures	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
Project Procedure Access	Intranet	Individual Electronic	Individual Electronic	-	Intranet	Intranet	Intranet	Individual Electronic	Individual Electronic

# Architectural Services Best Practices

Other comments regarding productivity tools:

- Austin uses eCAPRIS, a proprietary information system developed by a private sector consultant, for real-time status tracking, schedules, budgets and contracts
- Phoenix uses PROMIS (Project Management Information System), a proprietary system developed by 3D/International, for real-time project management
- Phoenix also uses design standards (probably similar to other jurisdictions) for Maricopa County, described as follows: Maricopa Association of Governments standards for sidewalks, curbs, street sections, or other civil elements. Also, provide a set of Building Standards that prescribe performance requirements such as R-values for walls and roofs, SEER ratings for HVAC equipment, and reflectivity requirements for roofs, for example

## Project Shortening Practices

In order to shorten project schedules, several organizations have used various methods as follows:

- Overlap Phases:
  - Austin and Las Vegas: Depending on the project, sometimes overlap permitting with bid/award phases
  - Phoenix: CM@R and Design-Build projects usually use phased construction to shorten schedules
  - Scottsdale: Multiple phasing and advance site preparation
- Intermediate Punch lists:
  - Austin: When a building or portion of a building can be occupied without the entire project being complete, which does not happen very often
  - Phoenix: Maybe 25% of projects use expedited processes or use partial substantial completion of individual project elements
- Other:
  - Austin: Scope of the project may be reconsidered, early completion incentives may be incorporated
  - Contra Costa: Waive certain requirements to shorten bid/award phase; utilize Job Order Contracting program
  - Houston: Work longer hours and/or weekends; increase number of workers
  - North Las Vegas: Pre-purchase long lead items

# Architectural Services Best Practices

## Reporting Frequency

The following table summarizes the updating frequency of project information:

	Las Vegas	Austin	Contra Costa	Henderson	Houston	N. Las Vegas	Phoenix	Scottsdale	Tucson
Schedules/ Completion Dates	Weekly	Monthly & Real Time	Monthly	Monthly	Weekly	Quarterly	Monthly & Real Time	Monthly	Weekly
Current Status	Weekly	Monthly & Real Time	Monthly	Monthly	Weekly	When Requested	Monthly & Real Time	Weekly	Daily
Budgets	Project Milestones/ Phases	As needed & Real Time	Every two months	Monthly	Monthly	When Requested	Monthly & Real Time	Monthly	Weekly

One final note regarding Project Manager evaluations volunteered by Austin: Project Managers are evaluated annually on three main criteria – “Schedule”, “Budget”, “Quality”. “Schedule” measures whether the Project Manager met schedules established at the beginning of the fiscal year. “Budget” measures whether a Project Manager maintained the project budget, as well as their individual work order charges. “Quality” measures customer satisfaction and M/WBE compliance issue.