

# **VEUs Aren't Boring: Why They Matter and How to Put them to Work**

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**Fleet Manager City of Tempe, AZ**

## **Ever ask yourself...**

How do I catch up with workload?

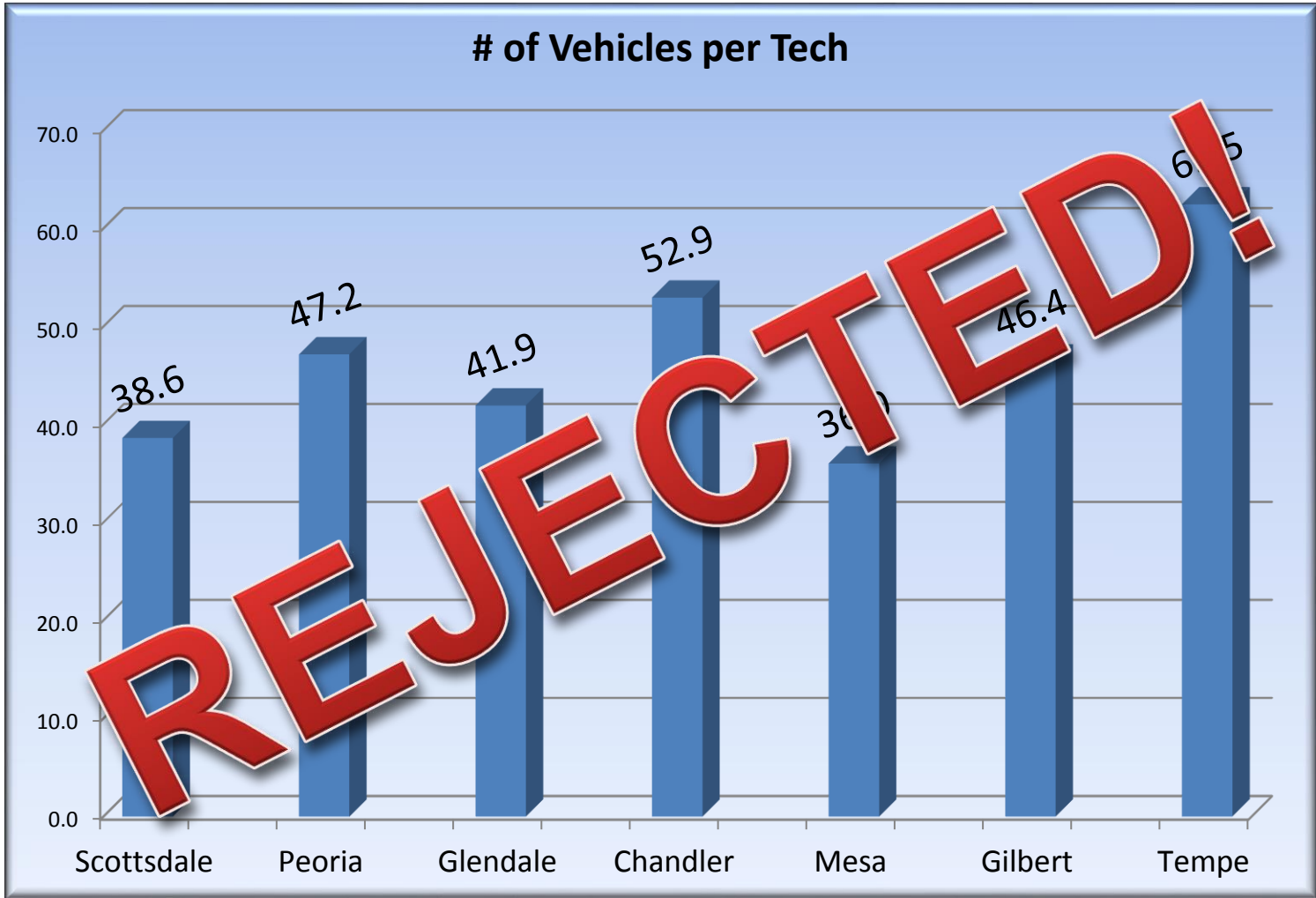
Is my staffing level correct?

How do I prove I need more techs?

How can I tell my story?

**VEUs Aren't Boring: Why They Matter and How to Put them to Work**



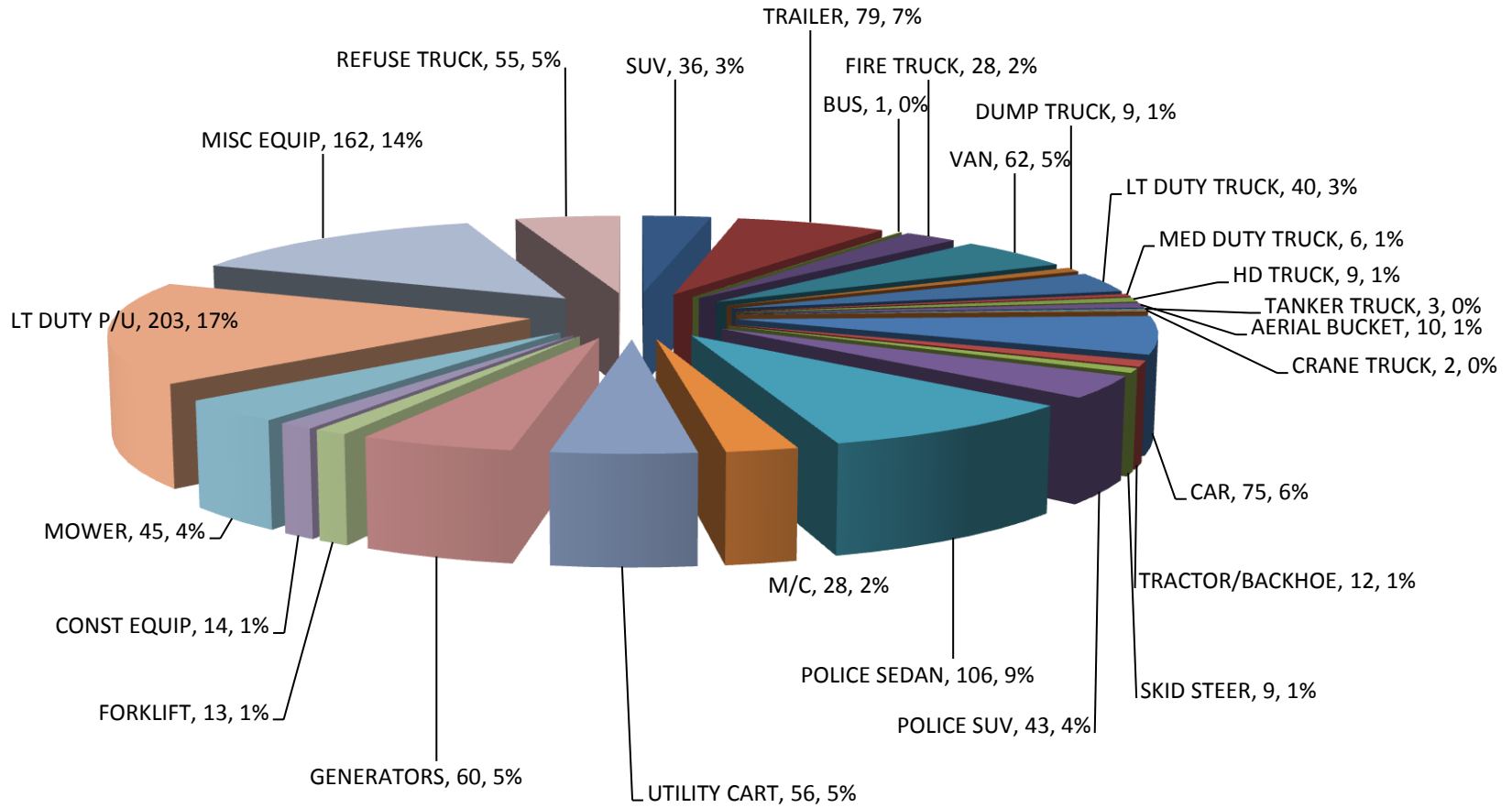


# VEHICLE EQUIVALENCY

What is it?

- VEU
- MRU
- VE
- LE

# Tempe Fleet Make Up



1172 units



# VEHICLE EQUIVALENCY

The 1960's

- ICC published mechanic to fleet size ratios
- US Air Force developed staffing standards for their motor vehicle fleets
- Lewis and Marron published *Management of Vehicular Operations and Maintenance*.

**Boring!**

# VEHICLE EQUIVALENCY

- Provides a metric to analyze the maintenance requirements of a fleet regardless of size and composition.
- Benchmarks Fleet Equipment with real-time repair hours in relation to Fleet composition
- Provides a metric to compare equipment in “apples to apples” comparison.



# VEHICLE EQUIVALENCY (VE)

- One average sedan is one Vehicle Equivalency Unit

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# VEHICLE EQUIVALENCY (VE)

$$E \quad U \quad V$$

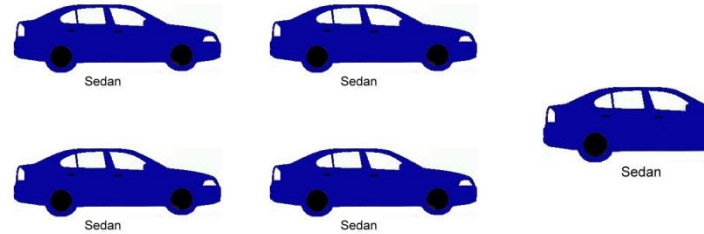
One =  Sedan

An average sedan



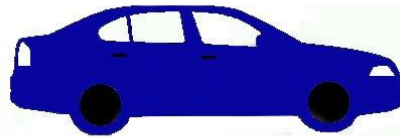
= 1 VEU (approx. 9 labor hours)

A Patrol sedan



= 4.75 VEU's (42.75 labor hours)

An average sedan



Sedan

= 1 VEU (approx. 9 labor hours)

A Police Motorcycle



Police M/C



Sedan

Sedan



Sedan



3.25 VEU's



Refuse Truck

= 18.3 VEU's (164.7 labor hours)



Sedan



Sedan



Sedan



Sedan



Sedan



Sedan



Sedan



Sedan



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Sedan



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Sedan

# VEHICLE EQUIVALENCY

## 4 STEPS TO CALCULATE YOUR VE

1. **Classify your equipment in unique classes**
2. **Assign Vehicle Equivalency to each class**
3. **Multiply VE by number of units in each class**
4. **Total the VE for all of your classes**



# VEHICLE EQUIVALENCY

Vehicle Equivalence (VE) Information for Tempe 2010				
Class Code	Class Description	Count	VE	Total VE
3.1	Compact Car	8	7.0	56.3
3.2	Midsize car	28	10.7	300.9
3.3	Fullsize car	30	8.6	258.6
4.1	PPV Marked Squads Sedan	65	43.5	2,827.1
4.2	PPV Marked Squads SUV	3	42.4	127.2
4.3	Police Unmarked Sedans	26	20.3	528.8
4.4	Police Unmarked SUV	5	20.3	101.3
4.5	Police Vans	2	38.3	76.6
4.6	Police Heavy Vans	5	37.0	184.9
4.7	Police Motorcycles	20	24.6	492.8
6	Subcompact Pickup	23	15.1	347.6
7	Light Duty Pickup	120	13.8	1,650.9
8	Medium Duty Pickup	21	15.1	316.9
9	Heavy Duty Pickup	44	22.5	988.3
10.1	Compact SUV	7	11.6	81.2
10.2	Midsize SUV	10	24.1	241.4
10.3	Fullsize SUV	5	25.4	127.0
11	Van - Passenger	12	14.9	179.1
11.1	Van - Mini Cargo	13	14.7	191.6
11.2	Van - Cargo 150	5	17.1	85.4
11.3	Van - Cargo 250	6	19.2	115.5
11.4	Van - Cargo 350	11	22.2	244.0
12	Van - Cube / Walk-in etc.	2	33.1	66.2
13.1	Dump - Single axle truck	3	75.8	227.5
13.2	Dump - Tandem axle truck	5	109.2	545.8
14.1	Light Duty Service Truck	48	32.9	1,577.9
14.2	Medium Duty Service Truck	4	46.1	184.3
14.3	Heavy Duty Service Truck	11	80.2	882.4
15	Stake truck	1	31.3	31.3
16	Light Duty Aerial	7	55.8	390.4
18	Heavy Duty Aerial	1	81.9	81.9
20	Tankers	3	55.5	166.5
22	Mobile Crane	2	70.9	141.8

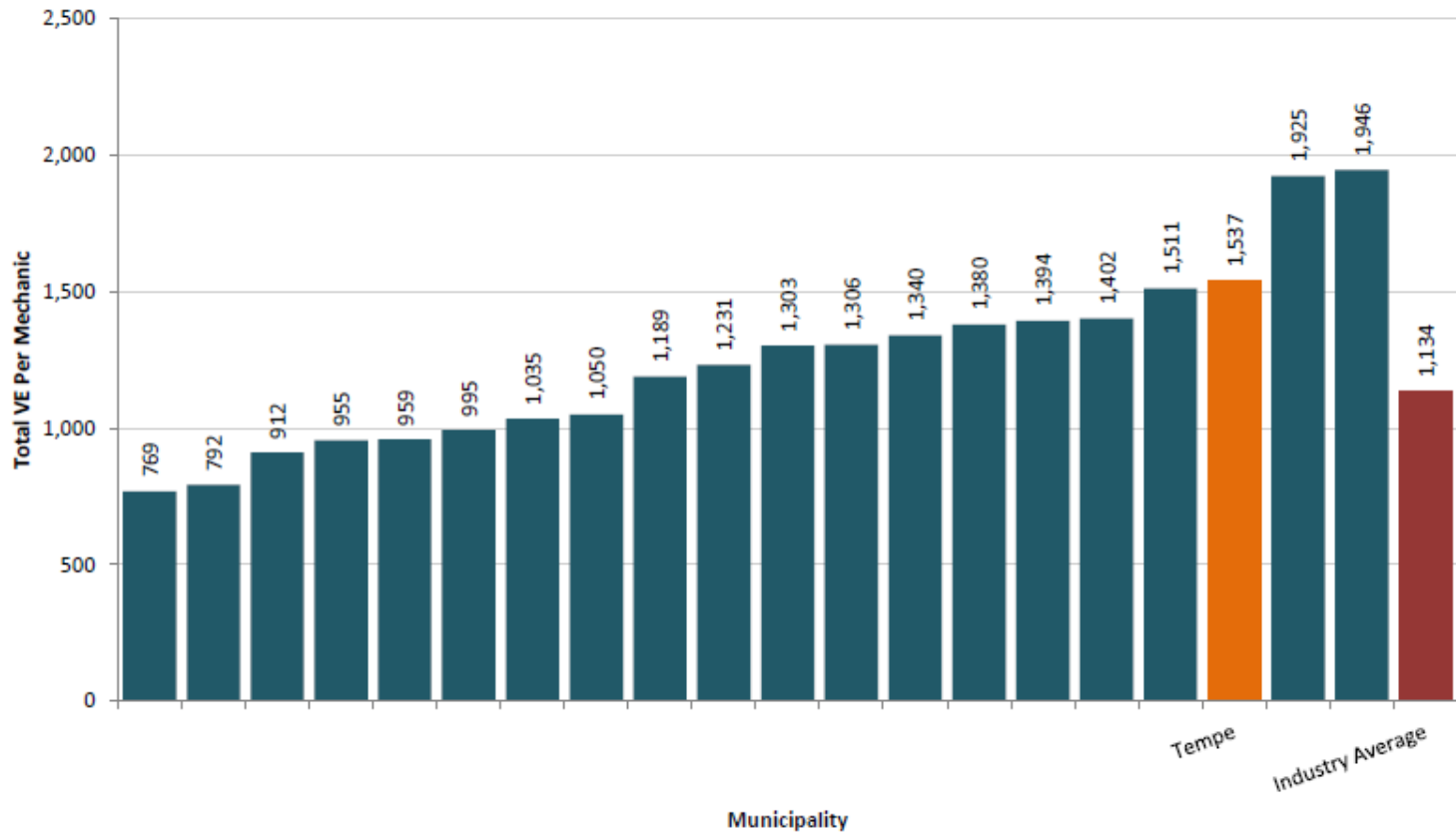
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Vehicle Equivalence (VE) Information for Tempe 2010				
Class Code	Class Description	Count	VE	Total VE
30	Ft End Loader & Backhoe	8	62.0	496.0
31	Skidsteers	4	36.9	147.7
33	Trenchers	2	54.4	108.7
38	Vib Roll/Wheel Compactor	2	24.2	48.4
39	Rod Mach/Tuggers/Tensioners	1	12.8	12.8
40	Brush Chipper	1	21.4	21.4
41	Welder	2	3.7	7.4
42	Air Compressor	3	13.1	39.4
43	ATV	6	12.8	76.9
45	Generators	26	8.2	212.2
48	Mobile aerial platform	2	10.8	21.6
49	Forklift	10	13.1	130.9
50	Motor Grader	1	71.6	71.6
51	Pressure Washer	6	10.6	63.6
53	Mowers	39	22.4	872.5
54	Sweepers	5	213.9	1,069.4
99	Misc Equipment	9	5.2	46.6
99.1	Misc Vehicle	6	60.5	363.1
99.2	Misc POE	102	14.4	1,473.7
100	Trailers	44	13.0	571.8
103.1	Fire Aerial Ladders	2	167.6	335.1
103.2	Fire Aerial Platforms	1	224.7	224.7
103.3	Fire Pumpers	12	158.4	1,900.2
103.5	Fire Support Vehicle	3	65.6	196.7
105	Vacuum Truck	1	120.9	120.9
108.1	Refuse - Front Loader	13	256.4	3,332.7
108.2	Refuse - Side Loader	14	249.9	3,498.5
108.3	Refuse - Rear Loader	12	147.7	1,771.9
-	Total	-	-	31,056.0

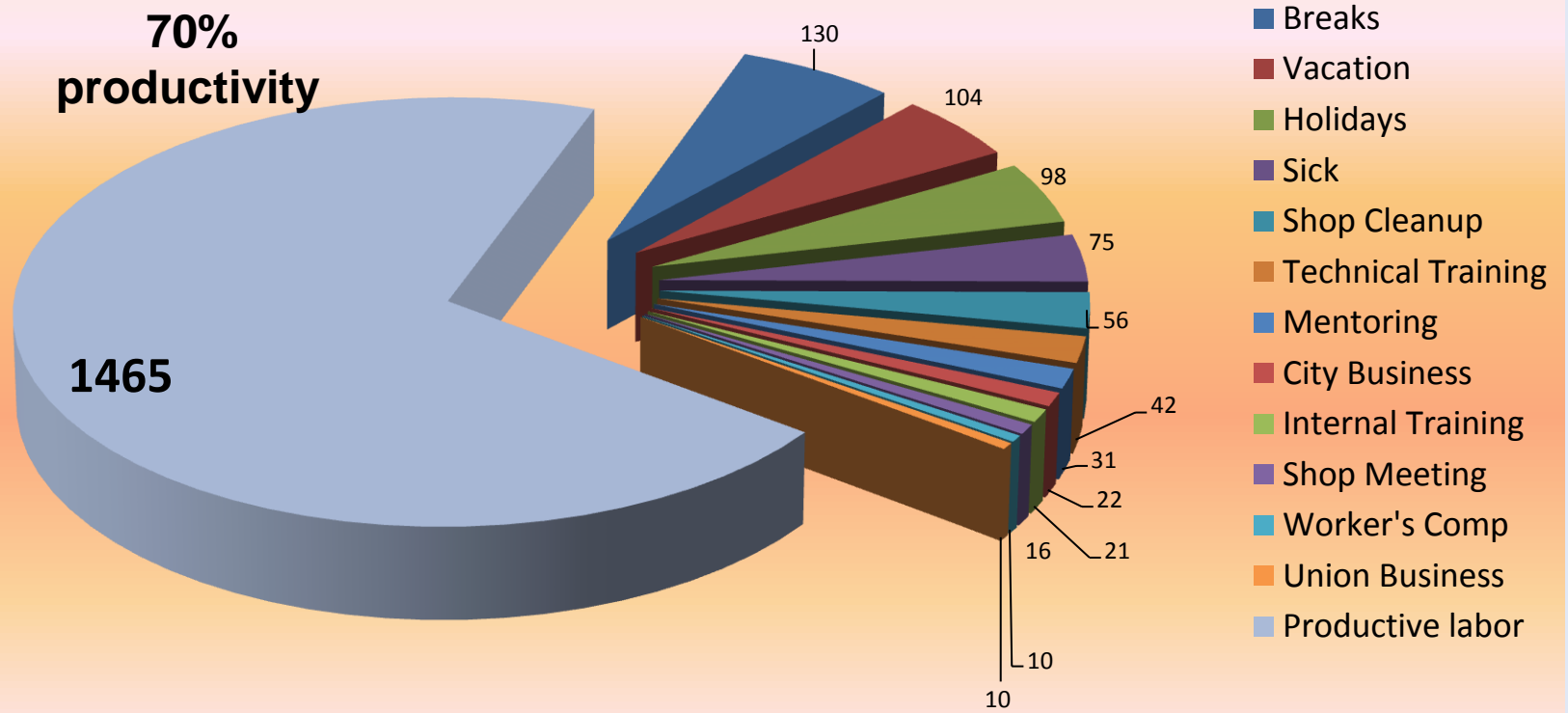
Fleet Total VE	31,056.0
Mechanic Count	20
VE Per Mechanic	1,537.4

# VEHICLE EQUIVALENCY

**Total Vehicle Equivalence (VE) Per Mechanic by Municipality**



**Technician's annual labor hours**



## Calculating staffing requirements

**Annual hours needed (VE) / 1465 hrs. per tech = # of techs needed**

Tempe's example:

**31,056 hrs. (VE) / 1465 hrs. per tech = 21.2 technicians**

## **Tempe's 2011 success story**

- **Vacancy review board**
- **Convinced management of our need**
- **Received standing authorization to fill any vacancies for two years**

## **The Next Level of VE:**

- **Fleet age**
- **Geographical demographic**

# VEHICLE EQUIVALENCY

## The Next Level of VE:

Corrected VE For A Typical Staff Sedan					
Vehicle Age	Staff sedan VEU's	Annual labor hrs. (VEU x 9)	multiplier	Corrected VEU's	Corrected Annual hrs.
> 1 year	1	9	0.5	0.5	4.5
1 year	1	9	0.7	0.7	6.3
2-3 years	1	9	0.85	0.85	7.7
4-5 years	1	9	1	1	9
6-8 years	1	9	1.3	1.3	11.7
9+ years	1	9	1.5	1.5	13.5

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## **The Next Level of VE:**

- **Previously calculated Tempe VE = 31,056 hrs.**
- **Corrected Tempe VE = 39,303 hrs.**

## **Final Considerations:**

- **Lost time from technicians**
- **Utilization rate**
- **Fleet reduction**



# VEHICLE EQUIVALENCY

## Final Considerations:

Fleet annual labor hours				
Position	annual hrs.	# of positions	annual hrs. lost	Total Annual hrs.
Equip mech.	1465	12	500	17080
SR. Fleet mech.	1465	4	1600	4260
Service Worker II	1465	4	0	5860
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- **Lost time from technicians added to the equation**

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- Lost time from technicians added to the equation

Staffing shortage				
	Annual hrs. available	Annual hrs. needed	Annual hrs. SHORT	Technicians SHORT
1) Current fleet	27,200	39300	12100	8.3
2) Adjustment for low utilization	27,200	35250	8050	5.5
3) After reduction of 100 units	27,200	32300	5100	3.5



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## **Tempe's 2014 success story**

- **Two technicians authorized**
- **Vacancy review board**
- **Review of need in one year**

## Questions?

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