

# TOWN OF PARADISE VALLEY

## CELL SERVICE IN PARADISE VALLEY



# Agenda

- Framework
- History
- New State Statute
- Solutions
- Next Steps



# Purpose for tonight's meeting

Framework

Share information learned to date

Provide update on State legislation

Identify possible solutions

Resolve process questions and degree of Planning Commission discretion

Hear public feedback

Hear Town Council and Planning Commission feedback



# Framework

## Problem

- Poor cell phone coverage in Paradise Valley

## Reason

- Lack of cellular infrastructure

## Solution

- Increase or improve cell phone infrastructure without sacrificing aesthetics



# History

January 2014 Quality of Life Initiative

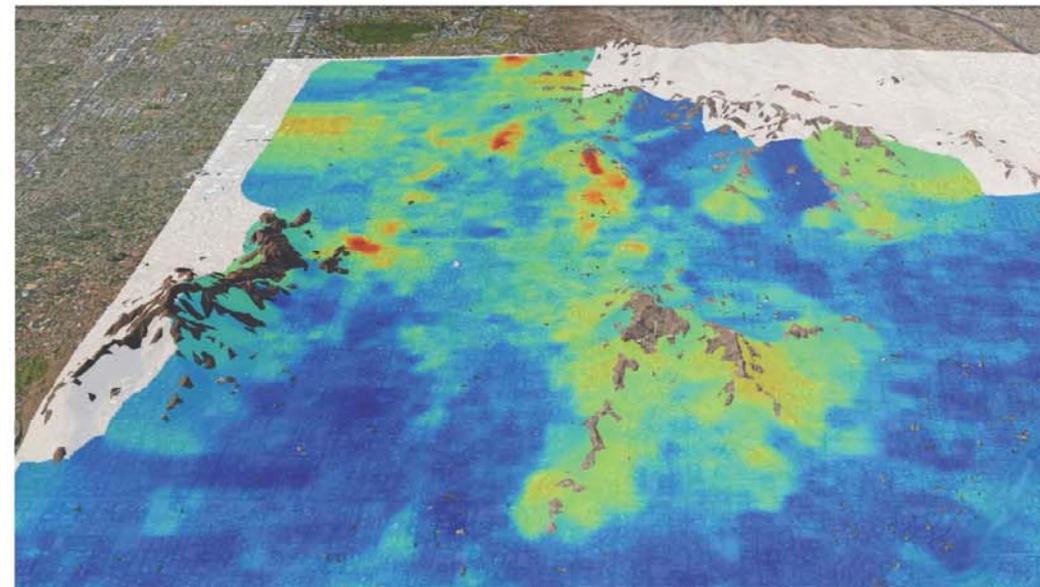
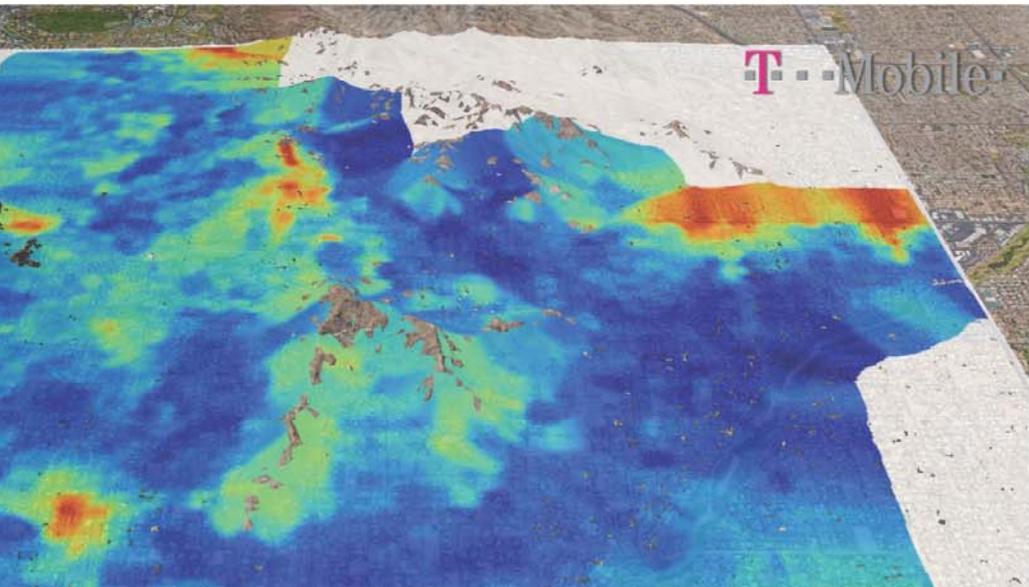
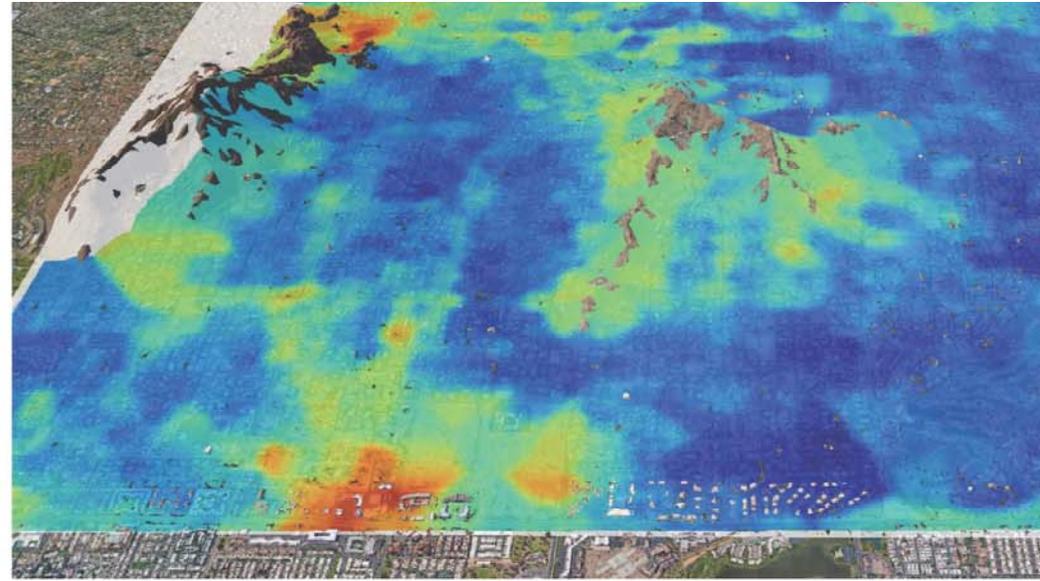
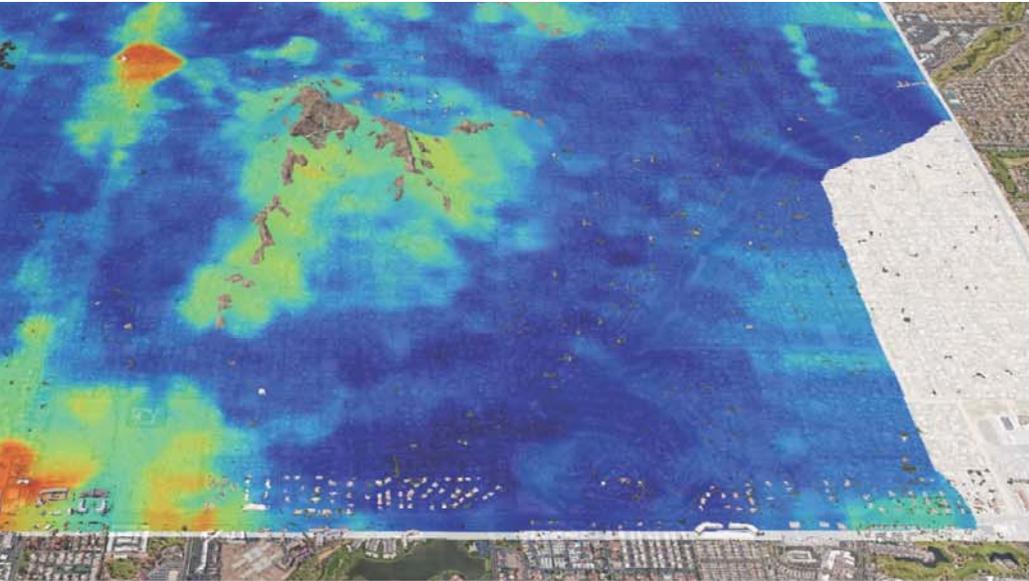
Mayor and Manager met with stakeholders

- Verizon, AT&T, Ghost Networks, Engineering Wireless Services, Ulti-Mobile, Coal Creek, 5thGenWireless

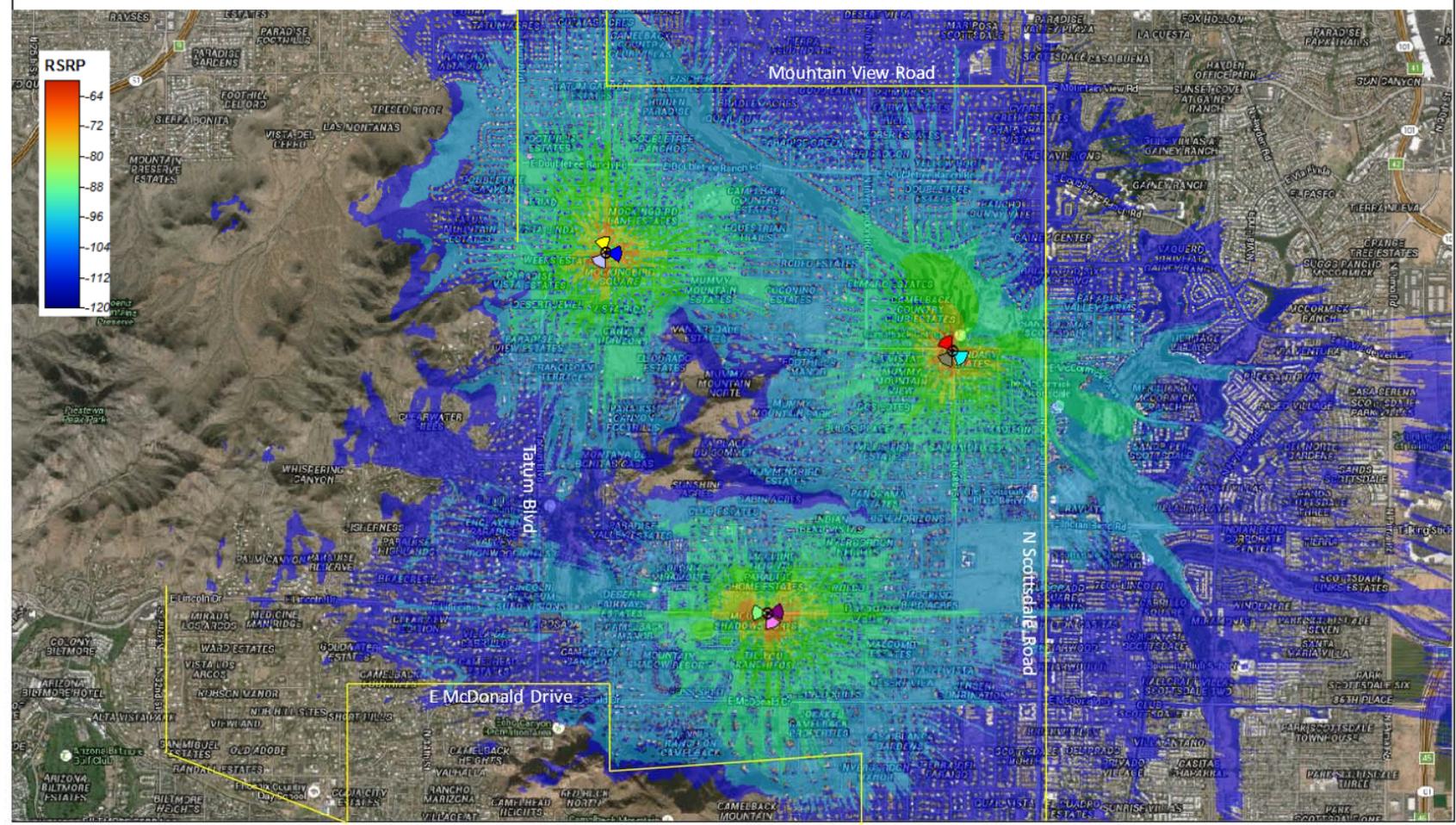
Ghost Networks provided greatest level of detail of frequencies and coverages

- Noted quickest and cheapest solution is three 60' macro towers that could accommodate all four carriers





# Design – RSRP/1900MHz/MIMO 2x2/60 W/5MHz/50ft



**Ghost Networks, LLC**  
 61 Columbia – Suite 200  
 Aliso Viejo, CA 92656  
 Phone: 866-GHOST-61  
[www.ghostnetworks.net](http://www.ghostnetworks.net)

paradise valley AZ

Project Name and Address  
**Paradise Valley**  
 Citywide Wireless Coverage  
 Improvement Project  
 Paradise Valley, Arizona

No.	Revision / Issue	Date

Designer: KNM  
 Date: 5/30/16  
 Scale: NTS

D1

# History

Ghost Networks provided greatest level of detail of frequencies and coverages

- Noted quickest and cheapest solution is three 60' macro towers that could accommodate all four carriers

November 2016 Manager presented to Planning Commission

- Plan to bring back comparison chart in February with help from Ken Clark (EWS)
- Never presented due to focus on State legislation



Option	Coverage Area	Pole Height	Aesthetic	RF/Distance	Co-location	Cost
Triangle Pole (Macro) Antennas (aka – Lattice tower)	1-2 miles, good coverage & building penetration. These are typically higher power and above clutter.	60'+	Poor	RF drops quickly. RF mitigated by height, distance and obstructions	All carriers welcome however each carrier gets a different height which affect coverage.	~\$300,000/Pole Monopole is least expensive option
Mono Palm, Eucalyptus, Pine, Flagpole/ Macro	1-2 miles	45'+	Attempted camouflage	RF drops quickly. RF mitigated by height, distance and obstructions	Multi-carrier solution, can be limited by camo. Carriers on diff heights	\$400,000-\$600,000;
Crown O-DAS in Faux Cactus	400', poor building penetration. Requires many nodes to cover PV	20-30'. Can be placed in higher nodes.	Excellent	Power mitigates RF distance. RF drops quickly. RF mitigated by height, distance and obstructions	All carriers welcome. EWS feel its unlikely more carriers will join.	~\$30,000-\$50,000/node
Roof Mount Macro Site	½ mile	~24' since max roof height in PV unless permitted in SUP	Excellent	RF drops quickly. RF mitigated by height, distance and obstructions	Limited. Depends on strength and size of roof.	Varies, ~\$100,000
Traffic Light, light pole or stand- alone pole (aka small cell when micro)	400'-600' Requires approximately 30-50 nodes to cover PV	30-50'	Decent if put antenna and radio in cylinder. Even better if cylinder matches diameter of pole.	RF drops quickly. RF mitigated by height, distance and obstructions	Generally a single carrier solution. One per pole	\$30,00-\$80,000 per pole
Strand Mount Micro	400'	Height of existing cable strand	Not camouflaged but small and discreet	RF drops quickly. RF mitigated by height, distance and obstructions	?	\$10,000 per box

## History

January 2017 Representative  
Weninger introduced HB 2365

- Preempted cities and town's ability to regulate small cell antennae in the right of way
- Council developed policy priority sheet to guide negotiations



# Small Cell Policy Priorities

## Manage Right-of-Way Locations

- The ability to manage where and how much space the infrastructure will take

## Manage New Poles

- The ability to limit the placement of new poles in order to facilitate small cell infrastructure

## Manage Pole Configuration

- Height, size, and aesthetics

## Administration and Permit Process

- Control who reviews and how much time is allowed. Master License Agreements, Indemnification

## Fees



# New State Law – Rights of Way

- Applies to “activities of a wireless provider in the right-of-way”
  - Current laws regarding private property unchanged
- Municipality **must approve** small wireless facilities on new poles or modification of existing utility poles, ***including light poles and traffic signals***, unless:
  - Height exceeds greater of 10’ higher than an existing pole (max 50’) or 40’
  - Fails to comply with municipal requirements related to ***objective design standards and reasonable stealth and concealment requirements***
  - Fails to comply with ***undergrounding requirements*** that prohibit installation or modification of poles without prior approval
    - Municipality MUST have a review process to address such requests
- Macro cell monopoles subject to zoning requirements



# New State Law - Small Cells

- Small cell bill doesn't limit ROW use to "utilities"
  - Cell carriers – direct access to ROW
  - Modify zoning ordinance
    - Account for new mandated uses
    - Allow applications by wireless providers
  - **Develop "objective design standards and reasonable stealth and concealment requirements" for new poles, pole attachments, and collocations**
  - Develop quick SUP or other process for new (concealed) poles in ROW
- Equipment Size
  - 6 cu.ft. on pole
  - 28 cu.ft. on ground
  - Unless stealth, concealment and undergrounding standards



# New State Law - Macro Cells

- Height
  - State statute defines it as over 40' or exceed 10' in height above tallest existing pole
- Pole Diameter
  - State statute has a maximum diameter of 40 inches.
- Spacing
  - State statute prohibits Town from setting minimum spacing requirements
  - Current ordinance requires spacing of 200' between PWSF and any residential structure. May be waived
  - Finding PWSF macro sites on SUP sites difficult given 200' rule
  - Modify to reflect more typical municipal standards. E.g. "fall zone"



# New State Law - Fees

- Annual license for ROW limited to \$50/pole/year
- Application fee limited to \$750
- Consolidated application limited to \$100 for first 25; \$50 for each thereafter
- Rezoning application fee limited to \$1,000 (macro cell in ROW)



# New State Law – Mandatory Timelines

## Small Cell

- Time to review application for completeness: 20 days
  - Deemed complete if no municipal response by date
- Time to approve or deny application: 75 days
  - Deemed approved if no municipal response by date
- Applicant has 180 days to construct after approval and permit

## Macro Cell

- Time to review application for completeness: 30 days
  - Deemed complete if no municipal response by date
- Time to approve or deny application: 150 days
  - Deemed approved if no municipal response by date



# Key Question

- The Town must rewrite the Zoning Code Chapter on Personal Wireless Service Facilities (PWSF) to comply with the new state law
- In crafting ***objective design standards and reasonable stealth and concealment requirements***, does the Planning Commission and Council have any specific standards they want incorporated?



# Staff Suggested Objective Design Standards

- New Small Cell
  - Faux Cactus no taller than 24 feet.
    - Equipment must be underground; or
    - Process for approve concealment less than entirely underground
      - E.g. Apply to PC with concealment plan
  - Other designs must apply
- Existing Small Cell
  - Traffic signal or light pole mount
    - No taller than 40'
    - All equip on pole in an 18" cylinder
    - Match pole color
    - Ground equipment buried or process



# Staff Suggested Objective Design Standards

- New Macros Cells
  - Stealth and concealment required
  - Height limited to max building height permitted by code or SUP
  - Height limit may be adjusted by Council through application
  - Equipment buried underground or apply for alternative concealment

# Current code dispute

- 2007 interpretation: height may be balanced by aesthetics at discretion of Planning Commission
- Some have expressed disagreement with interpretation
- Town Attorney: *“Although the provisions of Section 1204(5) of the Zoning Ordinance might be read so as to support granting to the Planning Commission the authority to approve the installation of a stand-alone monopole that is taller than structures on a particular SUP property (typically a disguised or camouflaged monopole), the Town Attorney does not see such an interpretation as the best or recommended interpretation. However, such an interpretation was apparently made at one point in the past such that a stand-alone monopalm application was submitted to the Planning Commission for review.”*



# Solutions

- Review options
- Key questions
- Discussion



# Key Questions

- If Town policy makers could choose, would they rather see a small cell system or a macro system?
- Would policy makers prefer a bright line on cell tower heights or Planning Commission discretion on heights versus aesthetics?
  - How should Section 1204(5) be interpreted?
- Would policy makers prefer Planning Commission have discretion to work with applicant on a site specific solution?
  - Design and concealment standards must be in place first



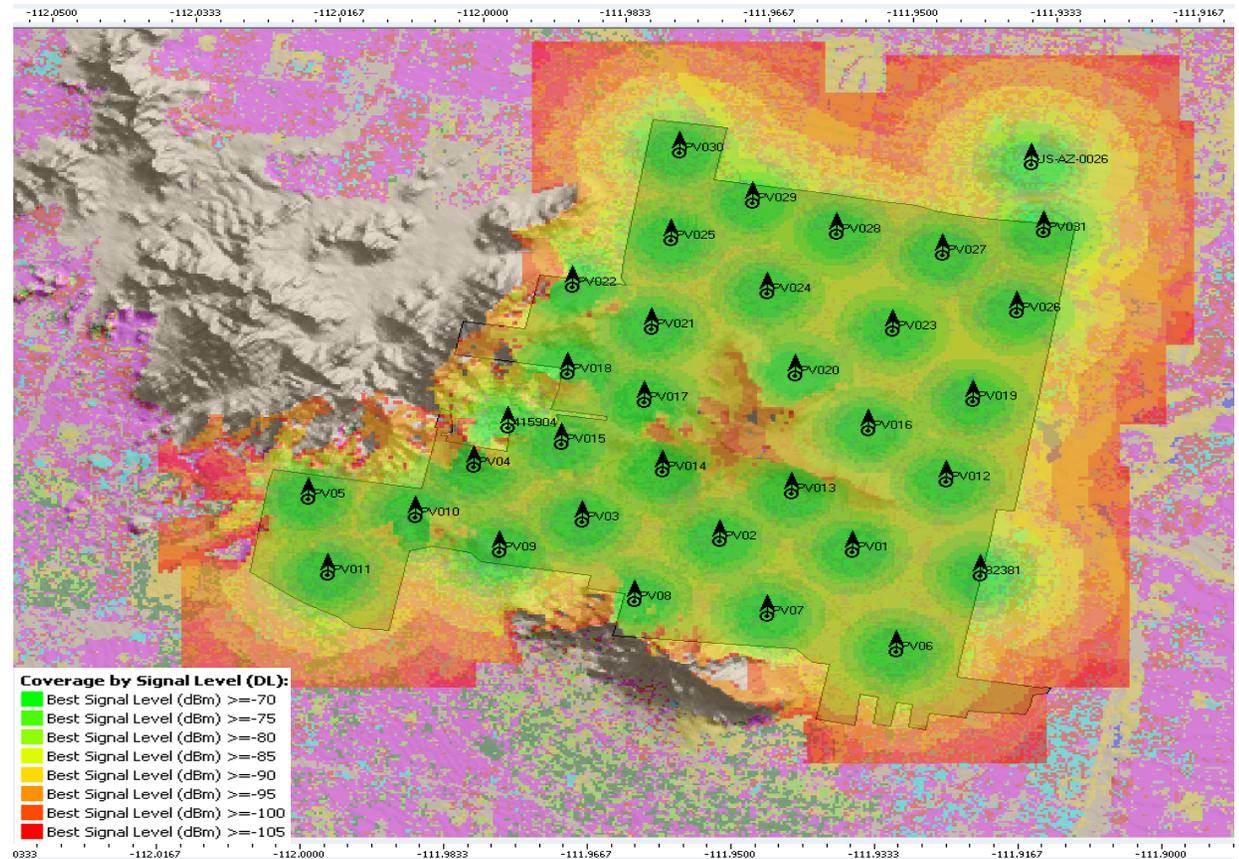
# Small Cell Considerations

- Market desires poles 30'-40'; cactus more unrealistic at that height
- PV coverage would require between 30 and 50 poles
- Would require fiber between poles
- Carriers prefer to place on existing traffic lights and street lights
  - Not prevalent in PV neighborhood
- More structure likely in ROW

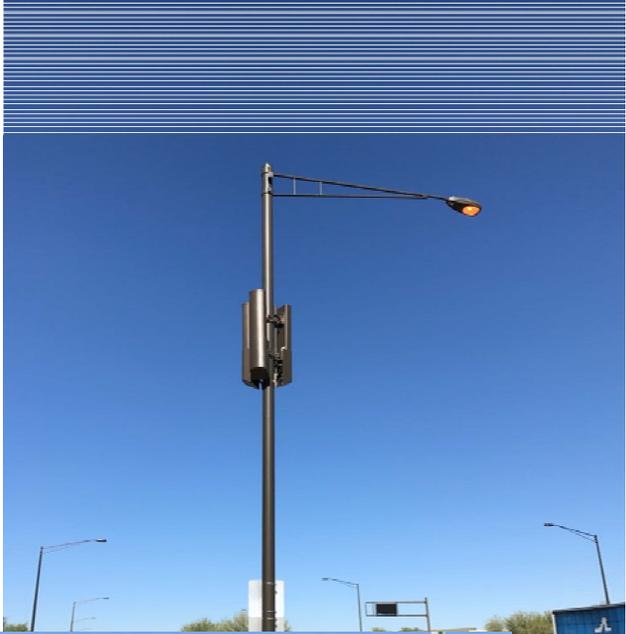


# RF Layout of Paradise Valley

- Approximately 31-35 poles requires at 35' height.
- Zayo has existing Fiber running parallel and through part of Paradise Valley.



# Small Cell Images

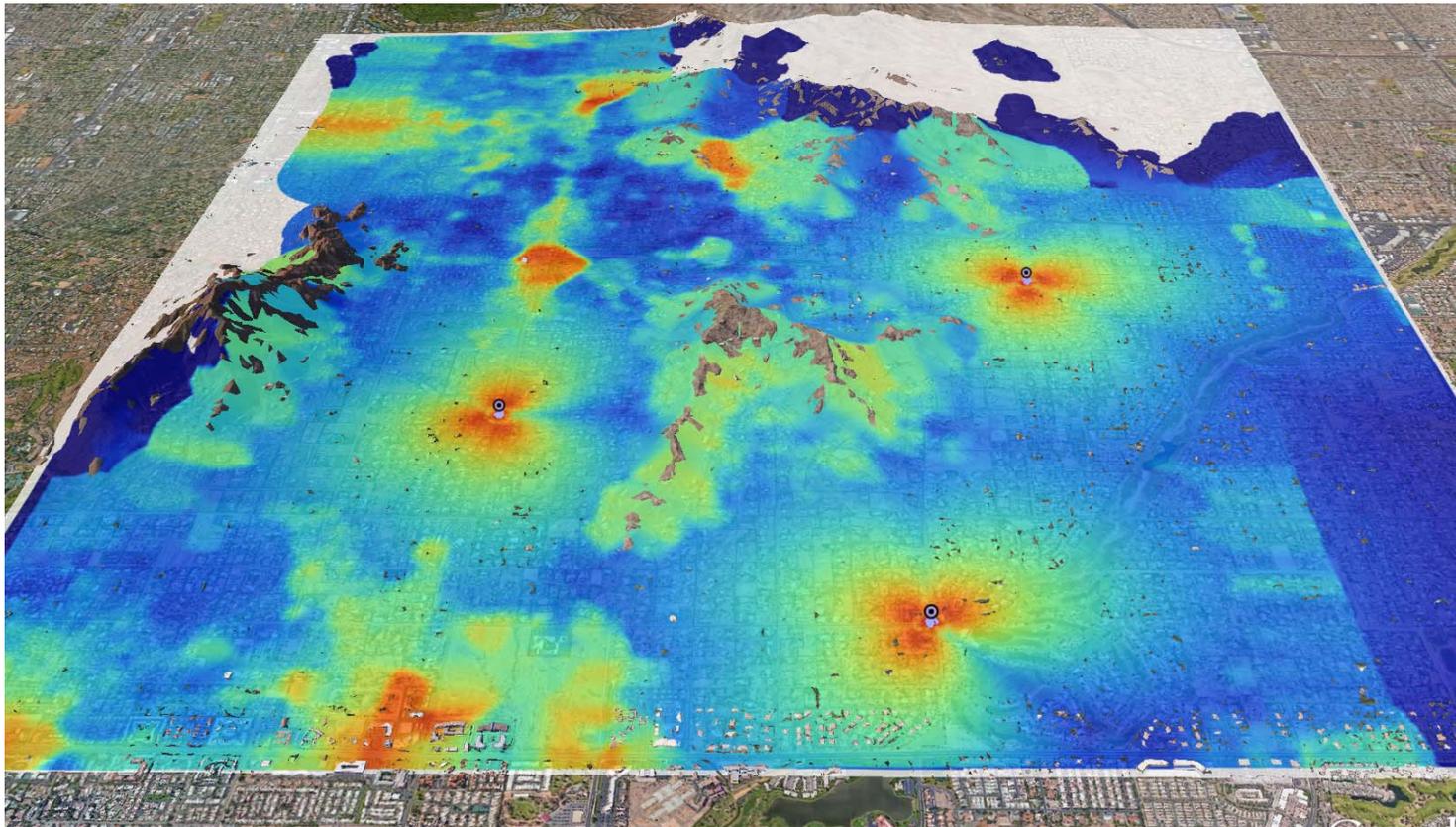


# Macro Considerations

- Fewer sites
- Aesthetic issues
- Two options brought forward to address aesthetic
  - Mono eucalyptus
  - Mountain side rocks



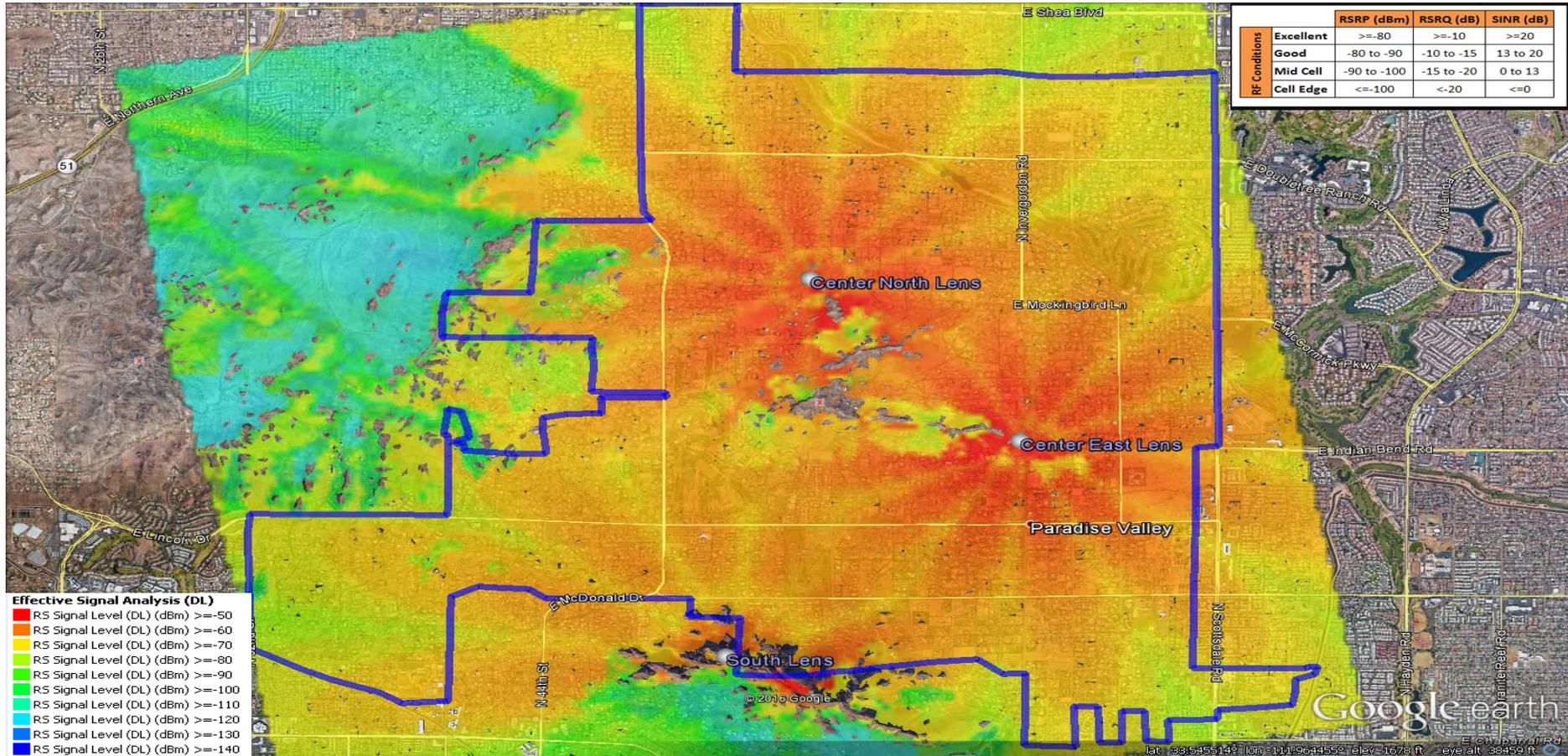
# Macro Cell Tower Solution



# Mono-Eucalyptus, Palm, Pine

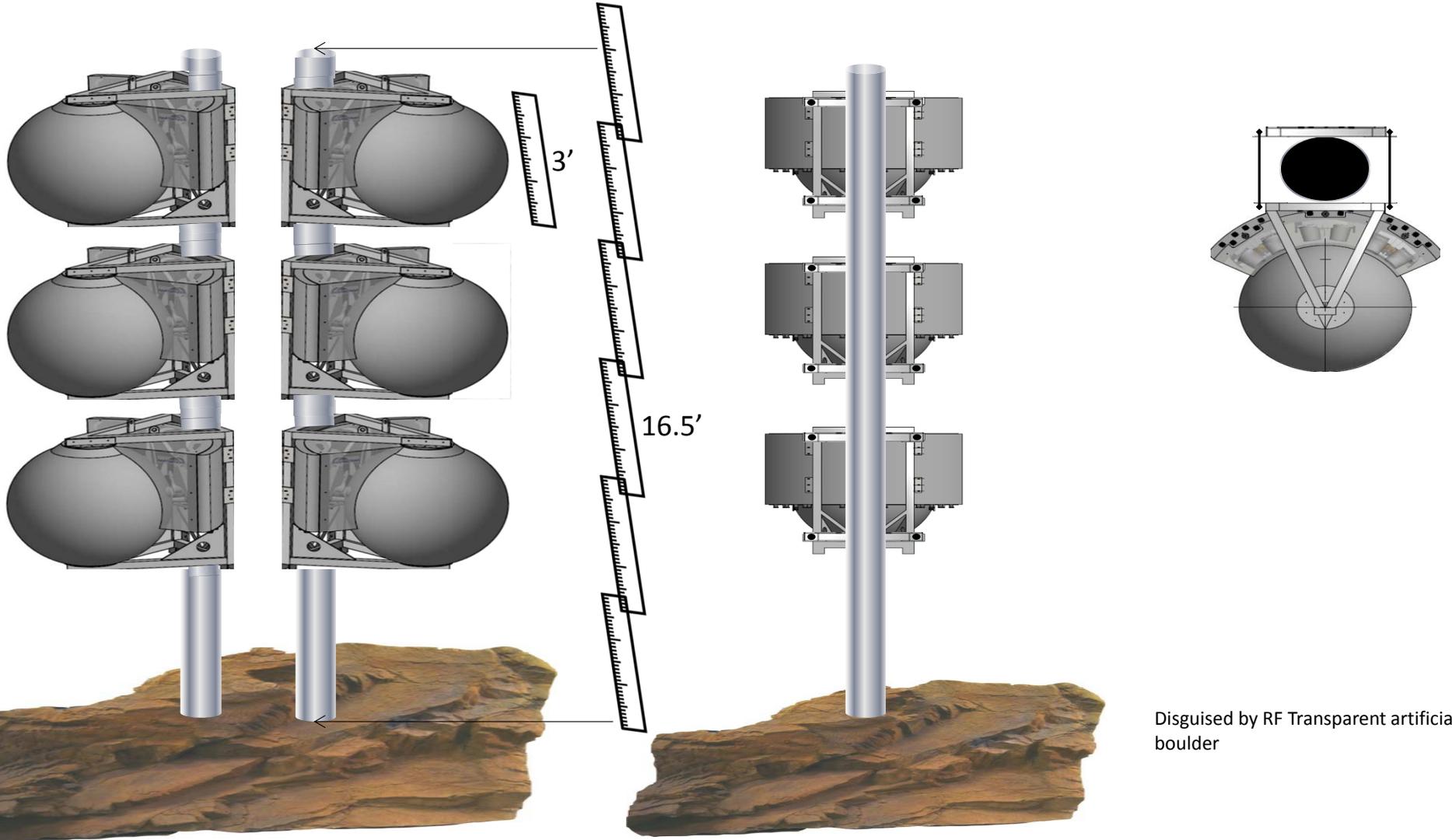


# Paradise Valley Multi Beam Solution



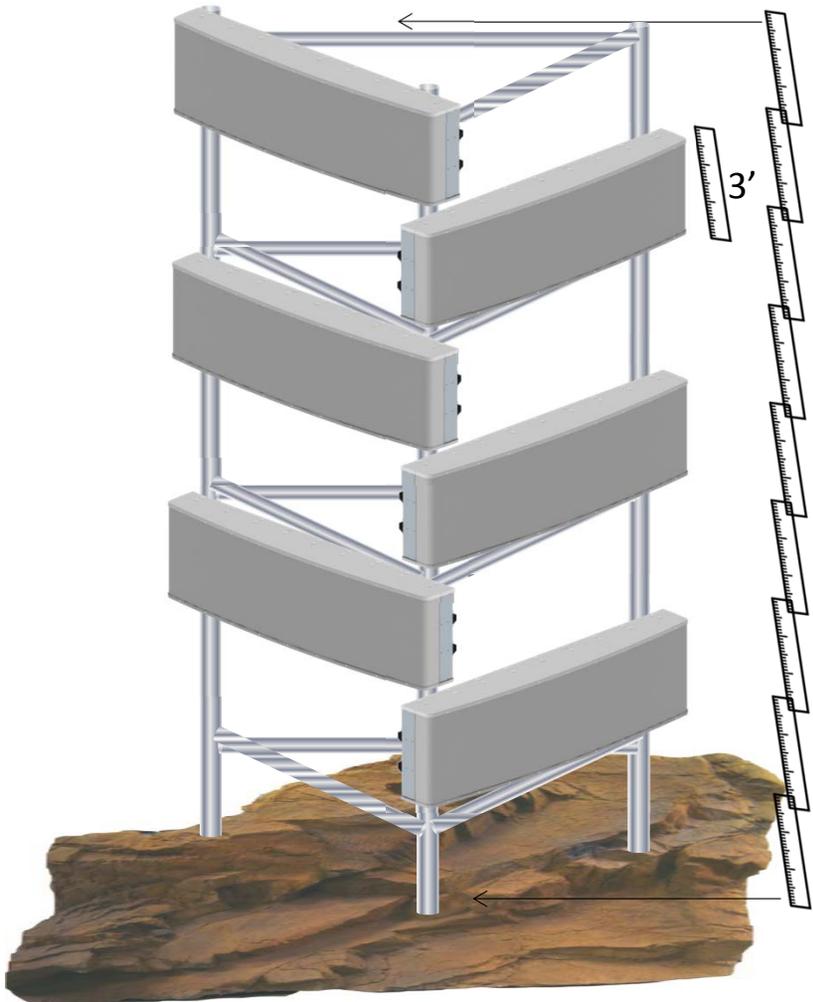
American Tower - Proprietary & Confidential

# 3' Lens Multi-beam/Multi Tenant Antennas for Paradise Valley



Disguised by RF Transparent artificial boulder

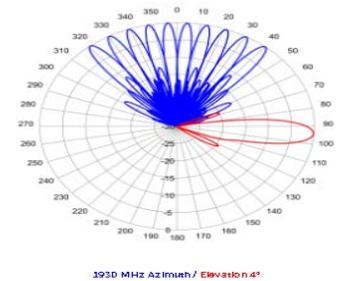
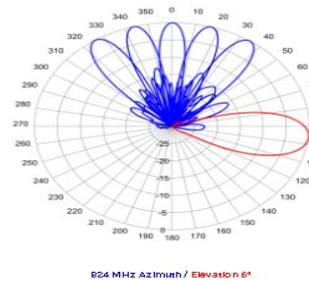
# 3'x7' Panel Multi-beam/Multi Tenant Antennas for Paradise Valley



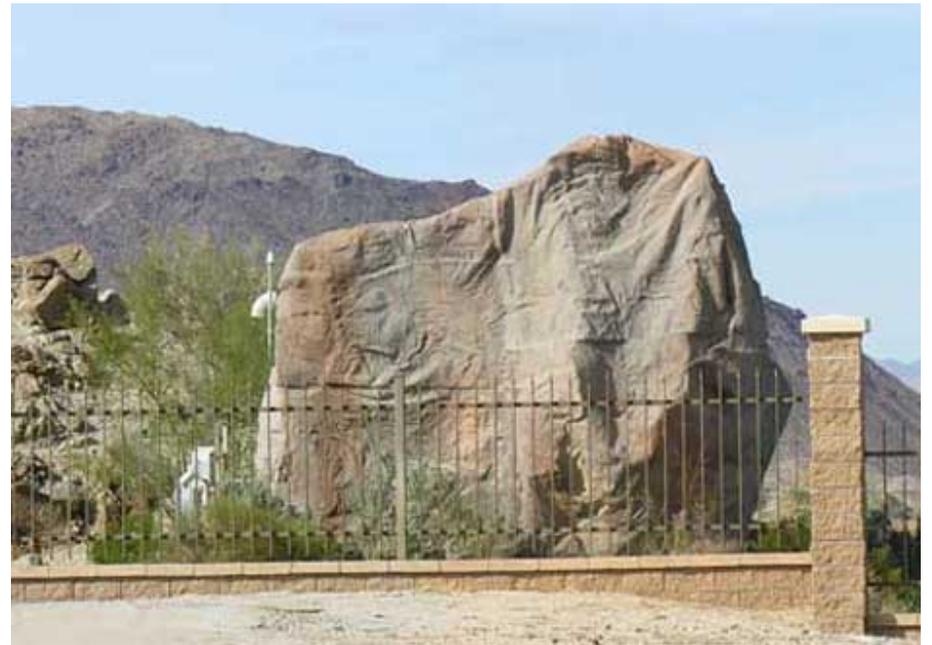
25'

Disguised by RF Transparent artificial boulder

- Five low band beams optimized for maximum throughput over frequency bands (698-896 MHz); Ten high band beams optimized for maximum throughput over frequency bands (1710-2360 MHz)
- Three foot (1.0 m), single panel, fifteen beam design without mount changes
- Dual +/- 45° cross-polarization for each beam pair
- Separate beams support 5 low band and 10 high-band sub-sectors
- Simultaneous High Band PCS 1900 MHz, AWS 1710/2360, WCS 2300 MHz, and Low Band LTE 700 MHz, SMR 850 MHz and Cellular 850 Coverage.
- Enables efficient evolution of wireless networks.
- Increases site capacity through high order sectorization.
- Avoid carrier-adds and building of new capacity sites.
- Boosts data throughput by lowering interference.
- Patented beam shaping technology maximizes coverage
- Optimized beam crossover and spacing for maximum throughput
- 7-16 DIN Female or 4.3-10 connector options



# Multi-Beam Solution



# Market Driven or Town Facilitated?

Both

- Carriers have right to apply for permit
- Must have a code that manages permit requests consistent with law
- Market drive = code rewriting



# Market Driven or Town Facilitated?

- If Town facilitates solution, does it relieve market pressure to build more towers?
  - Use of ROW to locate sites
  - Use of Town owned property to locate sites
  - Working with specific SUP's in strategic locations to locate sites



# What are other communities doing?

- Very few have the aesthetic issues of Paradise Valley
- State law was more an issue over control of the ROW.
- Most OK with placing on existing poles and have an extensive inventory of them
- Equipment in ROW is larger concern
- Recruitment of carriers varies



# Recommendations

## Planning Commission: focus on rewriting Zoning Code with an SOD from Council

- SOD – Right of Way vs. private land requirements (e.g. SUP)
- SOD – must comply with state and federal laws
- SOD – macro cell bright line on heights or discretion to PC/Council if aesthetics addressed?
- SOD – Any opinion on 200' radius. Seems irrelevant and perhaps no longer enforceable
- SOD –aesthetic set in code (Aesthetics consistent or better than AZ Municipalities Telecomm Group Design Standards)

## Council: focus on Town Facilitated Solutions

- Pursue ATS Multi-Beam type solution
- Pursue macro cell site solution at strategic locations
- Other solutions or combo



# Public Input



# Questions

