

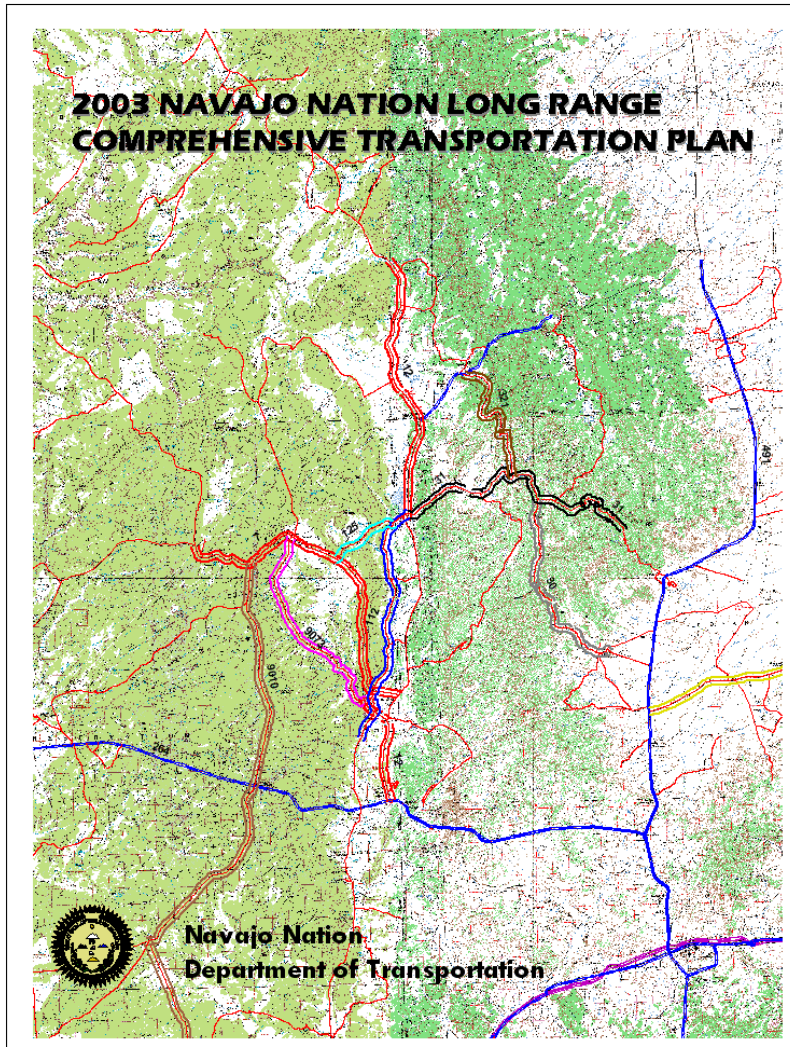
**2009 Arizona Tribal Transportation Forum
May 28, 2009**

Tribal Transportation Planning Session

**Navajo Nation
Strategies for Success and Lessons
Learned**

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Strategies for Success:

- Set goals.
- Develop planning process
- Use/develop tools, i.e., database, GIS, survey, questionnaire.
- Develop measurement for analysis, e.g., road design & pavement deficiencies, accident rating.

Lessons learned:

- Poor on implementation and monitor the plan

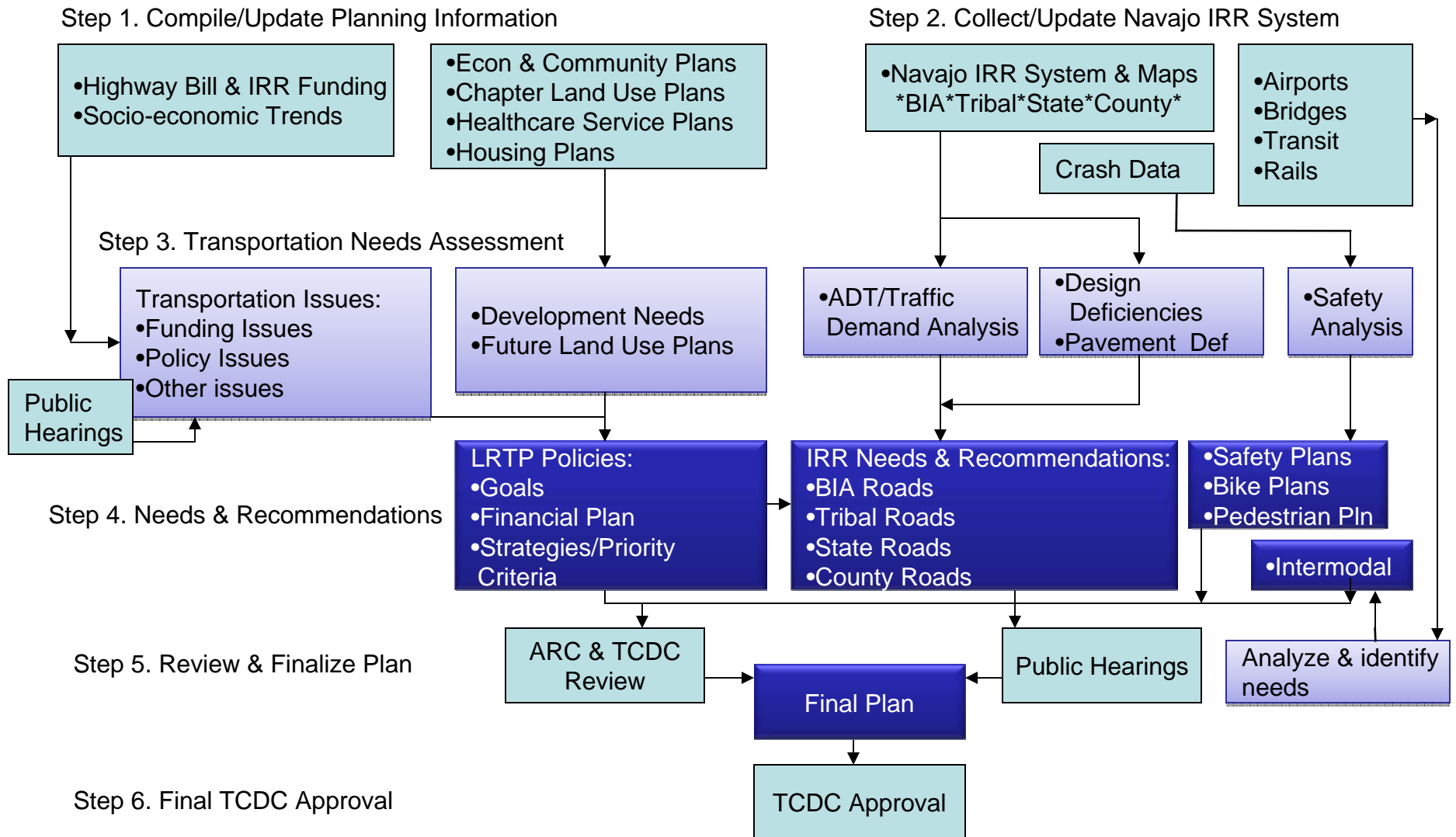
Establish Policy/Goals & Objectives:

**“To provide safe and efficient transportation system.
To reduce number of severity of traffic accidents.
To foster economic development, increase employment and quality of life of Navajo People.”**

Vision Statements

- The Navajo Nation
- Transportation Oversight Committee
- Navajo Department of Transportation
- IRR Policy

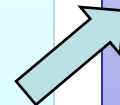
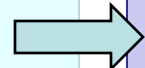
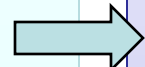
LONG RANGE TRANSPORTATION PLAN PLANNING PROCESS



Planning Process

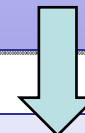
Step 1. Compile Information

- a. **Highway Bill & IRR Funding:**
Review laws and regulations to determine planning requirements and constraints.
- b. **Socio-economic Trends:**
Compile demographic data to know socio-economic factors, future population to plan for.
- c. **Development & Land Use Plans:**
Compile Economic & Community Services Plans
Healthcare Service Plans
Housing Plans
Land Use Plans



Step 3. Transportation Needs Assessment

1. **Transportation Issues:**
Funding
Policy
Others
2. **Development Needs:**
Identify tribe's future development goals, needs, locations, future land use plan



Step 4. LRTP Policies

1. **Goals**
2. **Financial Plan**
3. **Strategies/Priority**

Planning Process

Step 2. Collect Transportation System Data

d. Road Systems

- BIA
- Tribal
- State
- County
- Others

e. Crash Data

f. Other Transportation Modes

- Airports
- Bridges
- Transit
- Rails

Step 3. Transportation Needs Assessment

4. ADT/Traffic Demand Forecast
5. Analyze and identify road sections with design deficiencies
6. Analyze and identify pavement deficiencies
7. Analyze crash data to identify road sections and intersections with high accident rating.
8. Review plans and identify needs for other modes

Step 4. IRR Needs & Recommendations:

1. Road Improvements
2. Safety Improvements
3. Intermodal Needs & Plans

Measurement For Analysis

Adequate Standard Characteristics				
FADT	Class	Surface Type	Min. Shoulder Width (ft)	Min. Roadway Width (ft)
N/A	1-Major Arterial	5-paved	6	66
>=400	2-Rural Minor Arterial	5-paved	6	36
<400	2-Rural Minor Arterial	5-paved	4	32
>250	4-Rural Major Collector	4/5-paved	4	32
50-250	4-Rural Major Collector	3-gravel	4	32
<50	4-Rural Major Collector	1-earth	4	32
>400	5-Rural Local	4-paved	2	28
50-400	5-Rural Local	3-gravel	2	28
<50	5-Rural Local	1-earth	2	28
>250	6;7,3	4/5-paved	N/A	50;21-38
50-250	6;7,3	3-gravel	N/A	50;21-38
<50	6;7,3	1-earth	N/A	50;21-38

TABLE 1 - ADEQUATE STANDARD CHARACTERISTICS

The cost to construct of a particular transportation facility is defined as the cost required to improve the transportation facility from its existing condition to a condition that would meet the Adequate Standard Characteristics. Table 1 presents the Adequate Standard Characteristics.

ADEQUATE STANDARD NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21		
TERRAIN***	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
FUTURE ADT used in ADS assignment	N/A	FADT>=400			FADT<400			N/A			N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BIA CLASS	1 MAJOR ARTERIAL	2 RURAL MINOR ARTERIALS			4 RURAL MAJOR COLLECTOR			5 RURAL LOCAL			6 CITY MINOR ARTERIAL	7 CITY COLLECTOR	3* CITY LOCAL	8 MOTORIZED/ NON-MOTORIZED TRAILS	9 OTHER TRANSPORTATION FACILITIES	10 AIRSTRIPS	11 Overlapping Routes						
CALCULATED VALUES																							
FUTURE SURFACE TYPE (EXISTING)	PAVED	PAVED	PAVED	FADT UNDER 50 -EARTH FADT 50-250 - GRAVEL FADT OVER 250 - PAVED			FADT UNDER 50 -EARTH FADT 50-250 - GRAVEL FADT OVER 250 - PAVED			DEPENDS ON FACILITY			N/A	N/A	N/A								
FUTURE SURFACE TYPE (PROPOSED)	PAVED	PAVED	PAVED	FADT UNDER 50 -EARTH FADT 50-250 - GRAVEL FADT OVER 250 - PAVED			FADT UNDER 50 -EARTH FADT 50-400 - GRAVEL FADT OVER 400 - PAVED			FADT UNDER 50 -EARTH FADT 50-250 - GRAVEL FADT OVER 250 - PAVED			DEPENDS ON FACILITY			N/A	N/A	N/A					
DEFAULT CURRENT ADT /DEFAULT FUTURE ADT**	must exist	ADT 100 FADT 149			ADT 50 FADT 74			ADT 50 FADT 74			ADT 50 FADT 74	ADT 50 FADT 74	ADT 25 FADT 37	ADT 20 FADT 30	N/A	N/A	N/A						
RECOMMENDED DESIGN																							
MINIMUM ROADWAY WIDTH (INCLUDING SHOULDERS)	66'	36'	32'	32'	28'			50' TOTAL PARKING 7' TURNING 12'			21' TO 38' DEPENDING ON TURNING LANES AND PARKING			DEPENDS ON FACILITY			N/A	N/A	N/A				
SHOULDER WIDTH	6' MINIMUM	6'	4'	4'	2'			N/A			N/A			N/A	N/A	N/A							
SHOULDER TYPE	PAVED	PAVED	PAVED	PAVED/GRAVEL/EARTH			N/A			N/A			N/A	N/A	N/A	N/A							
<p>* Local Class 3 roads may be earth, gravel or paved, depending on tribal customs, economics, or environmental considerations.</p> <p>** Use default future ADT for proposed roads or where impractical to acquire ADT or ADT does not exist. (See Table 2 Default ADT and Default Future ADT). Where current ADT is practical to acquire, it should be acquired and projected to a future ADT at 2 per cent per year for 20 years.</p> <p>*** (1)=Flat; (2)=Rolling; (3)=Mountainous</p>																							

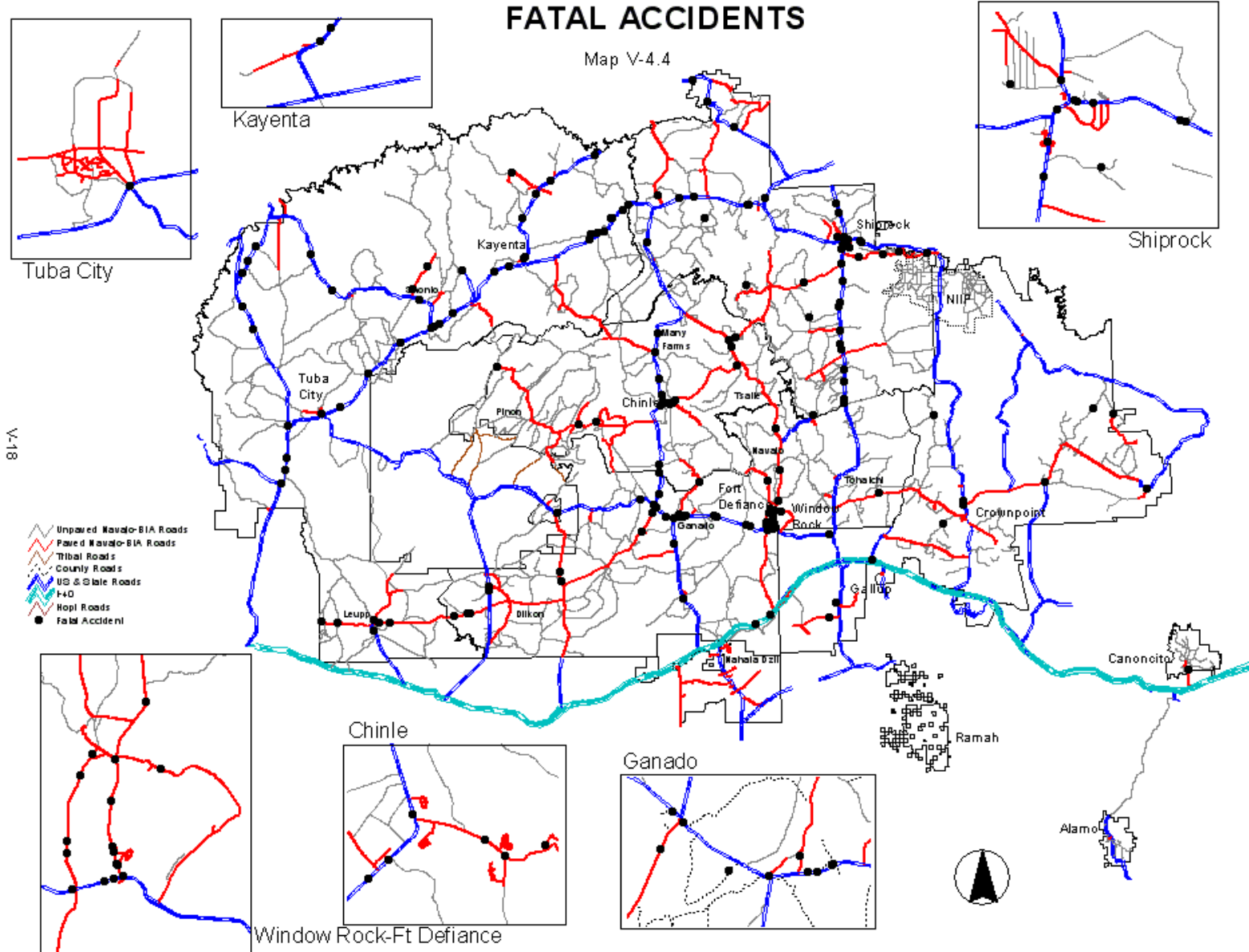
Design Deficiency & Improvement Standards				
FADT	Class	Needs Surface Type Upgrade	Needs Shoulder Widening	Needs Roadway Widening
N/A	1-Major arterial	<5-paved	<6	<66
>=400	2-Rural minor arterial	<5-paved	<6	<36
<400	2-Rural minor arterial	<5-paved	<4	<32
>250	4-Rural Major Collector	<4-paved	<4	<32
50-250	4-Rural Major Collector	<3-gravel	<4	<32
<50	4-Rural Major Collector	<1-earth	<4	<32
>400	5-Rural Local	<4-paved	<2	<28
50-400	5-Rural Local	<3-gravel	<2	<28
<50	5-Rural Local	<1-earth	<2	<28
>250	6;7,3	<5-paved	N/A	<50;<21-38
50-250	6;7,3	<3-gravel	N/A	<50;<21-38
<50	6;7,3	<1-earth	N/A	<50;<21-38

Design Deficiencies & Improvement Needs

FADT	Class	Surface Upgrade Needs In Miles	Roadway Widening Needs In Miles	Surface Upgrade & Roadway Widening Needs in Miles
N/A	1-Major Arterial	2.9	0.9	0.3
>=400	2-Rural Minor Arterial	19.9	209.3	453.8
<400	2-Rural Minor Arterial	0	24.3	47.3
>250	4-Rural Major Collector	58.0	151.9	1203.5
50-250	4-Rural Major Collector	35.5	87.2	2219.8
<50	4-Rural Major Collector	0	1.1	0
>400	5-Rural Local	3.0	34.0	123.5
50-400	5-Rural Local	193.8	21.3	1026.5
<50	5-Rural Local	0	0	0
	6-City Minor	0	0.9	2.6
	7-City Collector	0	0	0
	8-City Local	8.8	23.5	1.8

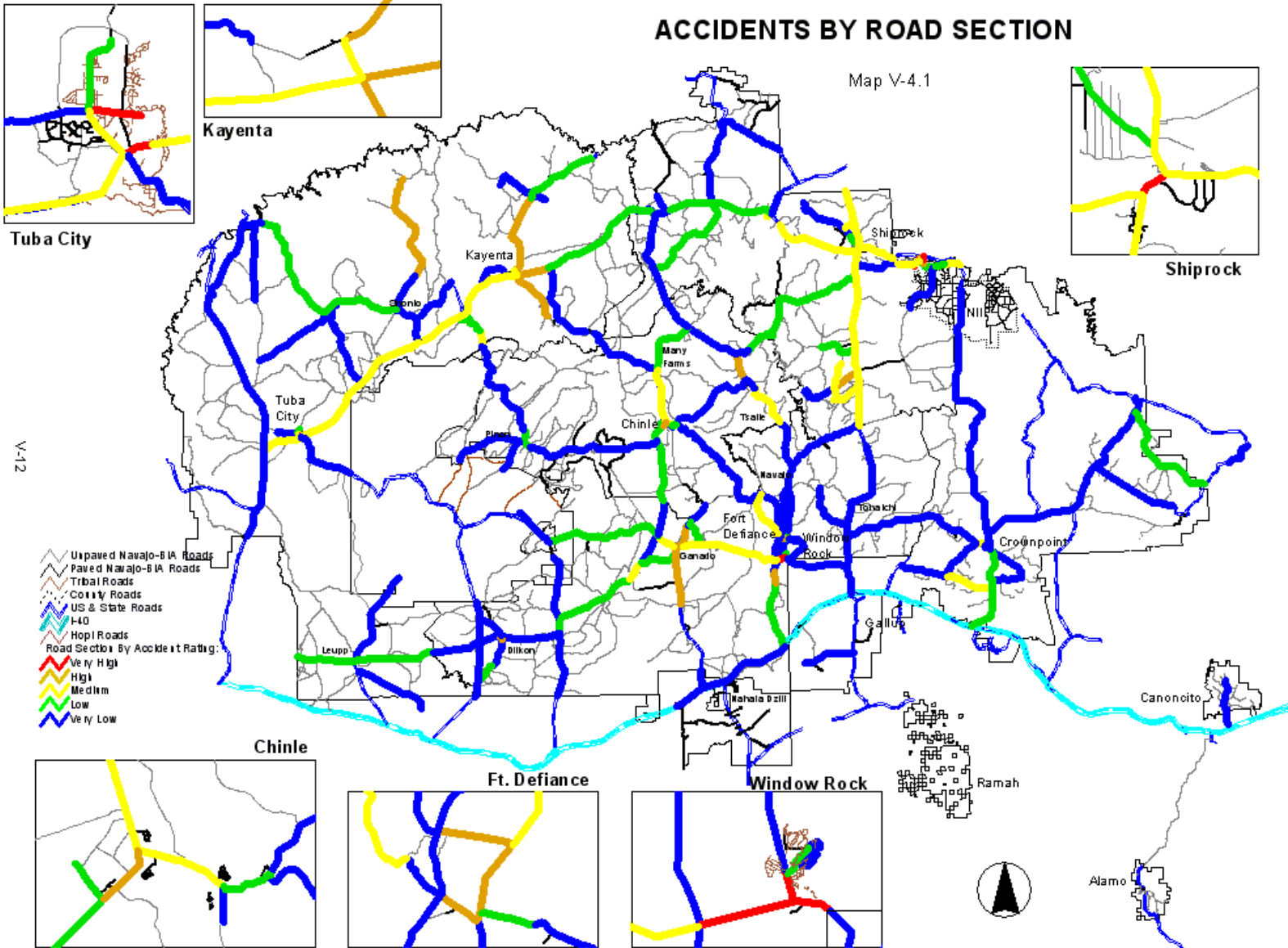
FATAL ACCIDENTS

Map V-4.4



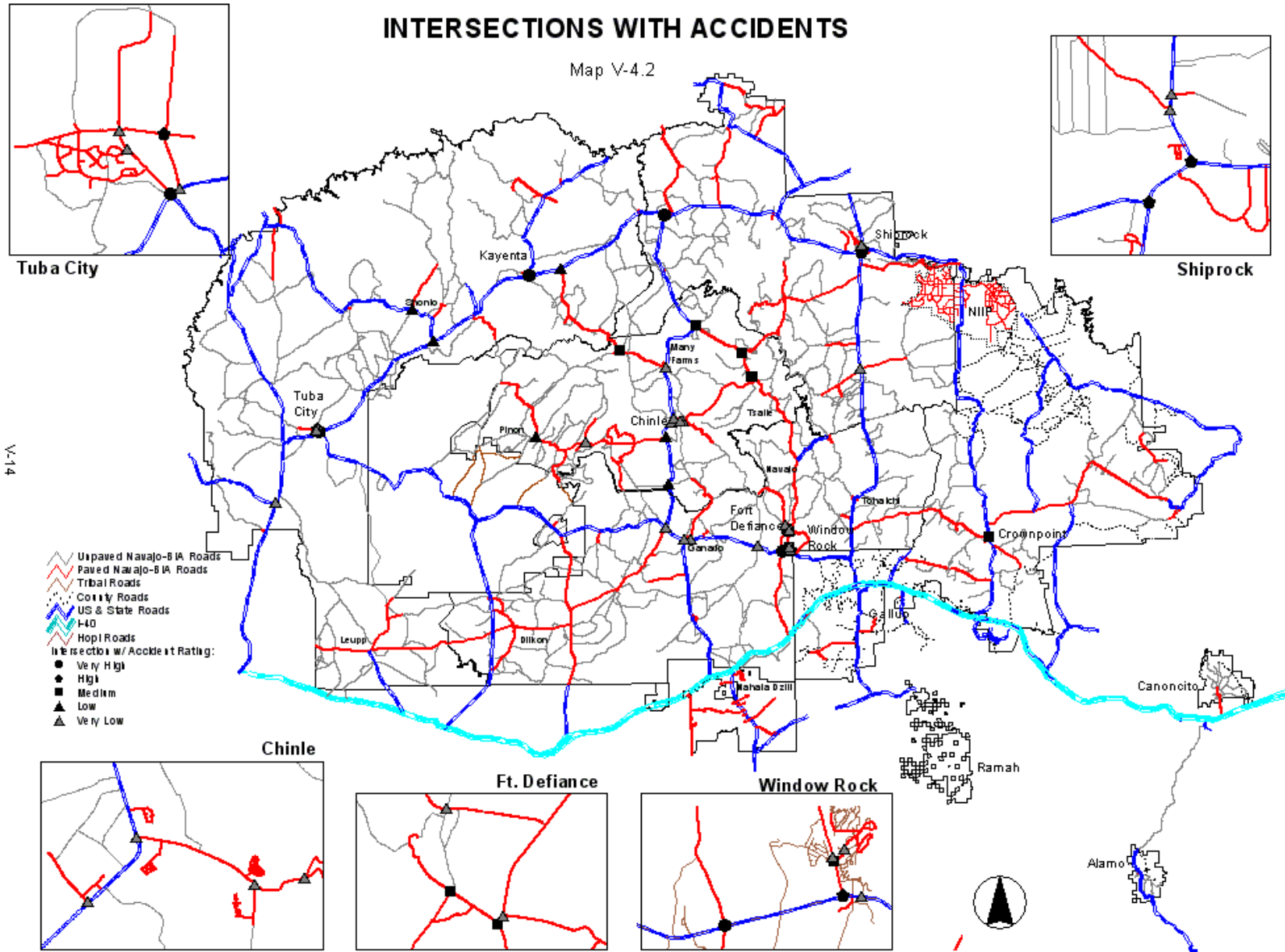
ACCIDENTS BY ROAD SECTION

Map V-4.1



INTERSECTIONS WITH ACCIDENTS

Map V-4.2



Survey

Community and Economic Development Survey

- **Project Name**
- **Development Type**
- **Project location**
- **Route Number and Milepost**
- **Proposed Construction Year**
- **Transportation Needs**

Public Hearing - Questionnaire

1. What are your concerns regarding road and bridge improvements and where are they located?
2. What are your improvement priority? ()Roads; ()Bridges; ()Transit; Maintenance; () Bike paths; ()Airport.
3. What are your improvement priority?
() To pave more dirt or gravel roads
() To improve existing paved roads
() To grade and improve drainage on dirt/gravel roads
4. What are your maintenance priority? ()Snow removal; () Pothole repair; () Blading dirt roads; () Maintenance during emergencies; () Bridge maintenance.
5. What should be the transportation improvement goals?
6. What are your major development (economic, transportation) concerns? () Cultural preservation; () Increased pollution; () Safety; () Privacy; () Others.

Lessons learned:

- **Poor on implementation and monitor the plan**

Any questions?

Thank You