

THE TERRITORIAL ENGINEER AND ARIZONA'S FIRST HIGHWAY SYSTEM

The Twenty-Fifth Legislative Assembly of the Arizona Territory created the Office of Territorial Engineer on March 18, 1909, placing all Territorial road and bridge construction and maintenance under the supervision of a Territorial Engineer who was required to be "a practical competent civil engineer", and to hold that office for two years from the date of his appointment, or until the appointment of his successor.

At a salary of \$3,000, together with a \$2,500 appropriation for office expenses, the Territorial Engineer was directed to set up a formal Territorial highway system, design and supervise the construction of all new Territorial roads and bridges, to aid the Board of Control in the selection and designation of Territorial highways, and to provide engineering support to the County Road Superintendents.

Territorial Governor Joseph Henry Kibby appointed James Bell Girand as Territorial Engineer on April 1, 1909. Girand served in that position until February 12, 1912, when Arizona gained statehood, at which time he was redesignated as State Engineer. He served in that capacity for 22 working days until March 14, 1912, when he was succeeded by Lamar Cobb.

The State Engineers continued the development of the state highway system established by Girand until 1927, serving two-year terms except for the 1922 to 1924 period, when the department was reorganized.

F.R. Goodman served as State Engineer until April of 1924, when replaced by W.C. Lefebvre. Lefebvre filled the position for the remainder of that year under C.M. Zander, who was appointed Director of the Arizona Highway Department.

W.C. Lefebvre held the Office of State Engineer from 1924 to 1927, when the office was replaced by the creation of the Arizona Highway Department, under the leadership of the State Highway Engineer, overseen by the newly-created State Highway Commission.

Following this page is a brief biography of James Bell Girand, pages from the State Engineers' biennial reports listing the engineering staff of the State Engineer's Office from 1914 through 1927, and biographies of several key civil engineers and other professionals who contributed to the development of Route 66.

James Bell Girand
First and Only Arizona Territorial Engineer
First Arizona State Engineer

- Born in Austin, Texas , on May 20, 1873.
- Graduated high school in 1888 at the age of 15.
- Completed three years in civil engineering at Texas A&M, leaving college in his senior year to take a surveying job with Moore County, Texas.
- At age 18 was appointed Moore County Surveyor. Three years later, he accepted a job with the Oldham Land District as chief engineer.
- In 1895, he left the District and worked as a field engineer for several railroads for ten years, and became certified as a Deputy Surveyor by the Office of the Surveyor General of Arizona.
- In 1900, Girand moved from Texas to Williams, Arizona, where he procured a contract to survey 10 sections of land near the Grand Canyon.
- In 1901, Girand accepted a job with the City of Williams as City Engineer.
- While in Williams, Girand was appointed assistant chief engineer of the Santa Fe and Grand Canyon Railway supervising construction of 45 miles of railway from Williams to the South Rim of the Grand Canyon.
- On February 10, 1907, Girand's firm of Haggot-Girand-Smith received a contract to transport miners from the new town of Warren to the Copper Queen mine. The firm selected the route, constructed the roadbed, laid rails and installed the necessary electrical equipment. The Warren-Bisbee streetcar line was dedicated on March 11, 1908, and was described as one of the most sinuous and steep streetcar grades in the United States, with grades up to 7 percent.
- On April 1, 1909, Governor Joseph Kibby appointed James Bell Girand as Arizona's first Territorial Engineer, tasked with linking all fourteen county seats and the larger towns with a network of graded roads. His initial staff consisted of a clerk, an office engineer, and a draftsman.
- When Arizona was admitted to statehood on February 12, 1912, Girand was designated State Engineer, and served in that capacity until March 14, 1912, when he was succeeded by Lamarr Cobb.
- When the Arizona Section of ASCE was established in 1925, J.B. Girand was elected Vice-President, and as President in 1929.

State of Arizona

OFFICE OF State Engineer PHOENIX

June 30, 1914.

To His Excellency, George W. P. Hunt, Governor,
To The Honorable Board of Control,

George W. P. Hunt, Chairman,

J. C. Callaghan, State Auditor and Member,

Charles R. Osborn, Secretary and Citizen Member.

I have the honor to submit the report covering the operations of this department since it was created by an act of the Territorial Legislature, approved March 18, 1909, to June 30, 1914.

Mr. Girand was appointed Territorial Engineer April 1, 1909, and served in that capacity until Arizona was admitted to Statehood, February 14, 1912, and as State Engineer until March 12, 1912, being succeeded by the present incumbent.

As the report of the Territorial Engineer has never been published, it has been incorporated in this report.

The Act of March 12, 1909, provided a specific tax for the purpose of raising a "State Road Tax Fund" for the years 1909-1910 and 1910-1911, which was continued in operation for the year 1911-1912 by an Act of Congress approved June 20, 1910. The Act of March 12, 1909, was repealed by the present State Road Law, approved June 20, 1912, which provided an annual running appropriation of \$250,000 that will continue in operation without further legislation until repealed.

Very respectfully,

LAMAR COBB,
State Engineer.

STATE HIGHWAY DEPARTMENT

June 30, 1914

LAMAR COBB, State Engineer

E. P. ADAMS,
Chief Clerk

T. F. NICHOLS,
Office Engineer

F. R. GOODMAN, { Apache, Coconino, Mohave,
Division Engineer } Navajo and Yavapai Counties.

J. S. BARLOW, { Greenlee, Pima and
Division Engineer } Santa Cruz Counties.

J. C. RYAN, { Cochise and
Division Engineer } Yuma Counties.

E. G. TWITCHELL, { Gila, Graham and
Division Engineer } Pinal Counties.

Office Engineer { Maricopa County.

State Highway Department

June 30, 1916

James A. French, State Engineer

J.W. Johnson, Assistant Highway Engineer

H.K.Morgans, Bridge Engineer (resigned)

Frank Hermann, Bridge Engineer

C.F.Kanen, Chief Clerk

C.M.Wells, Disbursing Clerk

STATE HIGHWAY DEPARTMENT

June 30, 1918

B. M. ATWOOD, State Engineer

R. V. LEESON, Consulting Engineer

H. B. CASSIDY,

Chief Clerk.

T. F. NICHOLS,

Office Engineer

Division Engineers

F. R. GOODMAN

J. S. BARLOW

R. C. PERKINS

STATE HIGHWAY DEPARTMENT

DECEMBER 31, 1920

THOS. MADDOCK.....	State Engineer
F. N. HOLMQUIST.....	Assistant State Engineer
W. R. INGRAM.....	Chief Clerk
W. J. JAMIESON.....	Office Engineer
C. C. SMALL.....	Chief Locating Engineer
E. A. WOLFE.....	Chief Construction Engineer
MERRILL BUTLER.....	Bridge Engineer
E. C. MOORE.....	Purchasing Agent
J. H. ALLEN.....	Superintendent of Equipment
R. M. HANSEN.....	Testing Engineer
S. R. STANFORTH.....	Traveling Auditor
T. P. JOHNSON.....	Accountant

Field Engineers

H. D. ALEXANDER	F. A. GREENE	GEORGE PORTER
JAS. BONE	H. HAGEN	J. M. SHEPHERD
J. M. BROWN	A. F. HARTER	E. O. SLATER
D. M. BUNKER	FRED HAUKE	LOGAN STILLWELL
R. A. DAVIS	A. W. JENKINS	F. G. TWITCHELL
E. C. DIETRICH	GEORGE LUKESH	A. W. VAN FLEET
I. P. FRAZIER	T. S. O'CONNELL	W. W. VAN FRANK
W. C. GOETZ	JAS. A. PARKER	W. B. WEAST
F. N. GRANT	W. B. PIPER	H. B. WRIGHT
		JOHN H. ZEITLER

General Foremen

FLOYD ALLEN	A. A. LILLARD	DALE RALSTON
C. R. BONE	T. F. McGRATH	H. W. SMITH
J. B. CHADWICK	J. W. McINTOSH	O. M. TERRY
ED. J. ENNEKING	CHAS. O'CONNER	J. P. WALTHALL
ERNEST HALL	B. J. PEARCE	G. H. WEBB
JOHN HUGHES	BEN PRICE	BERT WITCHER

STATE HIGHWAY DEPARTMENT

JUNE 30, 1922

THOS. MADDOCK.....	State Engineer
F. N. HOLMQUIST.....	Assistant State Engineer
W. R. INGRAM.....	Chief Clerk
W. J. JAMIESON.....	Office Engineer
C. C. SMALL.....	Chief Locating Engineer
E. A. WOLFE.....	Chief Construction Engineer
F. E. ALLEN.....	Asst. Chief Construction Engineer.
MERRILL BUTLER.....	Bridge Engineer
C. F. PRICE.....	Purchasing Agent
J. H. ALLEN.....	Superintendent of Equipment
R. M. HANSEN.....	Testing Engineer
S. R. STANFORTH.....	Traveling Auditor
H. N. GRAHAM.....	Office Auditor
T. P. JOHNSON.....	Accountant
O. B. RUGGLES.....	Right-of-Way Agent

Maintenance Engineers

I. P. FRAZIER.....	Southern Division
W. C. GOETZ.....	Central Division
SHEPARD HISCOX.....	Northern Division

Field Engineers

R. E. ALLISON	L. A. HICKS	R. E. STALLINGS
J. L. BONE	A. W. JENKINS	LOGAN STILLWELL
J. M. BROWN	R. E. LAWRENCE	L. H. THOMPSON
GEO. L. BURNS	G. B. LITTLE	A. W. VAN FLEET
J. K. FOREMAN	GEO. LUKESH	W. W. VAN FRANK
F. N. GRANT	S. M. MORSE	W. B. WEAST
T. A. GREENE	T. S. O'CONNELL	G. T. WEST
HARRY HAGEN	JAS. A. PARKER	H. B. WRIGHT

Foremen

L. B. BOOTH	OSCAR LYONS	T. B. REYNOLDS
LEE BURDWELL	HARRY C. MALLOY	A. E. ROUNDTREE
L. J. BRISTOL	J. F. McDONALD	H. SALTER
GEO. DILLER	JACK MILLER	H. W. SMITH
E. J. ENNEKING	FORREST MOORE	REX SMITH
JULIUS IRION	JOHN MUNN	WM. SMITH
GEO. KELLER	FRANK MURPHY	M. E. TAYLOB
DAN KILLIAN	LUKE NEVINS	G. H. WEBB
CLYDE KNIGHT	W. W. OLIVER	JOHN WEBSTER
A. A. LILLARD		

Arizona Highway Department

DEPARTMENTAL HEADS To April, 1924.

F. R. GOODMAN, State Engineer
W. W. LANE, Assistant Engineer
C. C. SMALL, Chief Locating Engineer
W. J. JAMIESON, Office Engineer
B. M. ATWOOD, District Engineer
C. L. JENKEN, District Engineer
W. R. HUTCHINS, District Engineer
ED TEN EYCK, District Engineer
R. A. HOFFMAN, Bridge Engineer
D. E. BLAKE, Testing Engineer

S. B. JONES, Chief Clerk
J. L. DUNNE, Traveling Auditor
M. MONAHAN, Chief Accountant

GEO. V. EBERLE, Purchasing Agent
C. M. ZANDER, Superintendent of Equipment

ARIZONA HIGHWAY DEPARTMENT

PHOENIX, ARIZONA



Gentlemen:

The State Engineer has the honor of transmitting herewith the Biennial Report of the operations of the Arizona Highway Department for the fiscal years ending June 30, 1923, and June 30, 1924.

Wherever practicable additional data, of the activities of the Highway Department, has been included to extend the information to a later date for the enlightenment of both yourselves and the State Legislature.

During this biennial there have been two State Engineers. Mr. F. R. Goodman resigned in April, 1924, and was succeeded by myself. As we have both served under your administration, the statements herein cover the two year period without division.

Respectfully yours,

W. C. Lefebvre
State Engineer

Honorable Geo. W. P. Hunt,
Governor of Arizona.

Honorable C. M. Zander,
Director Highway Department.

Phoenix, Arizona.

Arizona Highway Department

DEPARTMENTAL HEADS

June 30, 1924

C. M. ZANDER, Director of Highway Department

W. C. LEFEBVRE, State Engineer

W. W. LANE, Chief Engineer

B. M. ATWOOD, District Engineer

E. M. WHITWORTH, District Engineer

T. S. O'CONNELL, District Engineer

GEORGE B. SHAFFER, Paving Engineer

R. A. HOFFMAN, Bridge Engineer

B. A. McNELLY, Testing Engineer,

C. C. SMALL, Location Engineer, (Associated)

V. A. WOOD, Chief Clerk

R. E. L. WEBB, Chief Accountant,

GEO. V. EBERLE, Purchasing Agent

C. R. JONES, Superintendent of Equipment

ARIZONA HIGHWAY DEPARTMENT

DEPARTMENTAL HEADS

July 1, 1926

W. C. LEFÈBVRE, *State Engineer*

W. W. LANE, *Chief Engineer*

C. C. SMALL, *Chief Location Engineer*

B. M. ATWOOD, *District Engineer*

T. S. O'CONNELL, *District Engineer*

GEORGE B. SHAFFER, *District Engineer*

E. M. WHITWORTH, *District Engineer*

W. R. HUTCHINS, *District Engineer*

R. A. HOFFMAN, *Bridge Engineer*

J. W. POWERS, *Testing Engineer*

V. A. WOOD, *Chief Clerk*

O. S. FRENCH, *Assistant Chief Clerk.*

A. E. STELZER, *Purchasing Agent*

C. R. JONES, *Superintendent of Equipment*

From the Arizona Section's nomination of Route 66 in
Mohave County:

- | | |
|-----------------------|--|
| • J. B. Girand | Territorial Engineer, 1909-1912 |
| • Lamar Cobb | First State Engineer, 1912-1916 |
| • Thomas Maddock | State Engineer, 1917-1922 |
| • F. R. Goodwin | State Engineer, 1923-1924 |
| • W. C. Lefebre | State Engineer, 1925-1927 |
| • J. B. Wright | Mohave County Engineer, circa 1915 |
| • O. K. Parker | Engineer for the Automobile Club of Southern California,
circa 1912 |
| • J. A. Sourwine | Designed the Old Trails Arch Bridge |
| • J. P. Kemmerer | Supervised construction of the Old Trails Arch Bridge |
| • E. Ross Householder | Mohave County Engineer circa 1925-1960 |

George W.P. Hunt, Governor

The construction and maintenance of good roads has been a political issue for decades. Governor George Wiley Paul Hunt supported good roads in his first run for governor of the new state in 1911, and his name is associated with the Hunt Highway, a road on the north side of the Gila River opposite Florence and running past Poston Butte.

Governor Hunt's enthusiasm for roads and his long tenure as governor offered him the opportunity to influence road construction in Arizona. It may be more than coincidental that the Superior-Miami road was built through the canyons of Queen Creek during his tenure and the early years of federal aid. This road greatly facilitated transportation between the capital city and Globe, where Hunt had prospered in business after arriving as a poor teenager from Missouri in 1881.

Laurence I. Hewes, Bureau of Public Roads

At least one engineer in the Bureau of Public Roads had a substantial effect on road building in Arizona. In 1921, Laurence I. Hewes opened the new Western Headquarters of the Bureau of Public Roads and acted as engineer, comptroller, expeditor, and office manager for nearly 30 years until 1950.

The office oversaw federal road building in 11 western states plus Alaska and Hawaii, including the connection of federal-aid roads to the roads of Mexico and Canada and the construction of National Forest and National Park roads.

Hewes also recruited officials from the state highway departments of western states, the Forest Service, and the Park Service, as well as land management and public roads agencies to found the Western Association of State Highway Officials.

“No one man contributed more to the development of the highways of the West than Dr. Laurence Ilsley Hewes. [His] superlative contributions in every phase of highway engineering gave great impetus to Western highway development” (FHWA 1977:490).

From:

Good Roads Everywhere A History of Road Building in Arizona

https://azdot.gov/sites/default/files/2019/07/cultural_good_roads_everywhere.pdf

R.C. (Cye) Perkins, State Highway Engineer

Cye Perkins earned his “engineering spurs” working on railroads and at mines in Missouri before moving to the Arizona Territory in 1911 where he went to work for the Highway Department (Arizona Republic 18 May 1952, Part VI:2; 5 July 1954:1).

He left to work in private companies, but returned in 1926 and worked for the department for the rest of his life, rising to the top position of State Highway Engineer in 1951. He served in the position until his death in 1954.

One of his earliest major projects was serving as chief engineer for construction of Maricopa County’s first paved road system, which involved a network of 327 miles of concrete highways. Another major assignment was building Gillespie dam and bridge.

One of his most challenging jobs was building Navajo Bridge at Marble Canyon, 467 feet above the Colorado River.

He also was in charge of construction of U.S. Highway 60 between Globe and Springerville, through the Salt River Canyon, and also helped plan and build improvements of the highway through rugged terrain west of Globe to Superior.

From:

Good Roads Everywhere A History of Road Building in Arizona

https://azdot.gov/sites/default/files/2019/07/cultural_good_roads_everywhere.pdf

Charles C. Small, Civil Engineer

The creation of the Arizona state highway system can be credited to often nameless staff members, but two highway department employees stand out for their contributions. One was Charles Churchill (C.C.) Small, a civil engineer who had begun his career as a railroad location engineer in Massachusetts.

At the time, there were few professionals trained in the new science of highway construction, and many highway engineers came from the railroads. He joined the State Engineer's Office in 1919 as chief location engineer.

When Small joined the department, the state boasted about 1,000 miles of highways, most in the two roads established as Territorial Highways in 1909.

During the 13 years Small worked for the department, the state highway mileage doubled, and he oversaw several major construction projects including the building of the third state highway, which is the route that became U.S. Highway 66.

Small also directed the modernization of the old Territorial Highway from Phoenix to Duncan (later U.S. Highway 70), and the route from Nogales to Flagstaff over Yarnell Hill (later designated U.S. Highway 89).

After Small had been named chief deputy state engineer, he initiated the construction of the final section of U.S. Highway 60 from Globe to Show Low, including the bridge over the daunting Salt River Canyon.

A junior member of his staff remembered Small as "the guy who ran the place. State engineers came and went [but] he was the one who had the say."

From:

Good Roads Everywhere A History of Road Building in Arizona

https://azdot.gov/sites/default/files/2019/07/cultural_good_roads_everywhere.pdf

(See Monument to C.C. Small on next page)

Remembering the “Father of Arizona Highways”

<https://azdot.gov/blog-article/remembering-father-arizona-highways>



Fred M. Guirey, Landscape Architect

Another roadside memorial monument recalls the first landscape engineer in the Arizona State Highway Department. The plaque at the Oak Creek overlook honors the man who designed it, Fred. M. Guirey.

Trained as an architect, Guirey led the department in highway beautification efforts during the 1930s. Guirey took his first job with the department as a college student in 1930, helping to design the scenic route from Jacob Lake to the North Rim of the Grand Canyon.

Guirey worked as a draftsman for the Arizona State Highway Department for two years, from 1933 to 1935, and then as the landscape engineer for the department from 1935 to 1942, he built carefully planned roadside viewpoints, often using native materials.

He also argued in favor of using native plant species along highways, and contributed to the design of the innovative Miracle Mile on State Route 77 in Tucson. After his years with the Arizona State Highway Department, Guirey worked as a consulting engineer in Phoenix.

For more than 25 years, beginning in 1953, he served as an original member and chair of the Maricopa County Parks and Recreation Commission, tripling the acreage in county park system.

But Guirey is most remembered for his pioneering work on roadside improvement, and the plaque on the viewpoint overlooking Oak Creek Canyon remembers Guirey as the “Father of our Roadside Rests” (Arizona Highways January 1994; Arizona Republic 5 November 1978:B-11).

From:

Good Roads Everywhere A History of Road Building in Arizona

https://azdot.gov/sites/default/files/2019/07/cultural_good_roads_everywhere.pdf

The Fred M. Guirey Viewpoint

1908-1984

Father of our roadside rests

Arizona State Highway Department

<https://openbenches.org/bench/10382>

Noted Phoenix architect got his start with Highway Department

<https://azdot.gov/blog-article/noted-phoenix-architect-got-his-start-highway-department>

Fred M. Guirey, FAIA, A Talent for Transparency

https://modernphoenix.net/guirey/images/FredGuirey_ModernPhoenix.pdf

Fred M. Guirey, Wikipedia

https://en.wikipedia.org/wiki/Fred_M._Guirey