REPORT

ON THE

POSSIBILITY OF ESTABLISHING A

MONORAIL

NETWORK SYSTEM

IN

MAINE

PREPARED BY

THE MAINE DEPARTMENT OF TRANSPORTATION

AUGUSTA, MAINE

MARCH, 1974

APPR. 11

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
STATE OFFICE BUILDING AUGUSTA, MAINE 04330

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ROGER L. MALLAR
Commissioner

March 15, 1974

TO THE GOVERNOR AND MEMBERS OF THE 106th LEGISLATURE
OF THE STATE OF MAINE:

Pursuant to Joint Order SP 701 of the 106th Legislature, I hereby present the Department of Transportation's Report on the Possibility of Establishing a Monorail Network System in Maine, dated March, 1974.

Respectfully submitted,

Roger L. Mallar, Commissioner
Maine Department of Transportation

MAINE DEPARTMENT OF TRANSPORTATION

REPORT

to the

SPECIAL SESSION

OF THE

106TH MAINE LEGISLATURE

on the

POSSIBILITY OF ESTABLISHING A MONORAIL NETWORK SYSTEM IN MAINE

INTRODUCTION

The Department of Transportation has been directed by the 106th Maine Legislature to study the possibility of establishing a monorail network system to service the passenger needs of the State. It has been recognized that the concept of monorail has been considered in other parts of the nation and Maine is in need of considering alternative systems of transportation to accommodate passenger travel demands.

Specific funds were not provided for this study, therefore, the study effort was restricted to a review of the published work of others in examining monorail systems.

This Report summarizes the findings and recommendations of the Department of Transportation resulting from this study.

BACKGROUND

A monorail is defined as a single rail serving as a track for a wheeled carriage, truck, etc. Specifically, a single rail mounted on trestles constituting the track for cars that usually sit straddlewise over it or hang suspended from it.

Monorails have been constructed in several locations throughout the world for the primary purpose of transporting people. Generally they have been constructed in highly developed urban areas and in other densely populated areas such as major airports, world fairs, and major recreational areas such as Disneyland. Essentially all existing installations are relatively short, ranging in length from less than a mile to approximately ten miles. The most extensive monorail system known was a proposed 43 mile system in Los Angeles, California.

In 1901 the famous Wuppertal Monorail was built in Germany. This 9.3 mile line has carried over one billion passengers profitably and accident free as far as derailment and structural failure are concerned.

Tokyo, Japan has an 8.2 mile monorail line which connects the center of the city and Tokyo International Airport. Service on this line was initiated in September 1964.

The Seattle World's Fair constructed 1.2 miles of monorail in 1962 serving their fair grounds.

A 2 1/2 mile monorail system exists at Disneyland in Anaheim, California. This basic recreational system which provides transportation within Disneyland employs smaller trains than those generally found for city transportation systems.

Braniff International Airlines has installed a $2 million parking lot--air terminal monorail system at Love Field in Dallas, Texas. It consists of a three minute, 4,000 foot ride to the air terminal building from the parking lot.

As can be seen each of these systems are relatively short, the longest being the 9.3 Wuppertal System in Germany.

COSTS

The following is a Table which summarizes the known costs for constructing certain monorail systems. It should be noted that these costs figures reflect original costs (generally 10 years ago) and undoubtedly would be at least doubled today due to inflation.

Location	Length	Total Costs (millions)	Cost Per Mile (millions)
Seattle World's Fair	1.2 miles	$ 4.2	$3.5
Disneyland	2.5 miles	$ 3.3	$1.3
Tokyo	8.2 miles	$ 60.0	$7.3
Los Angeles	(proposed 43 miles)	$105.0	$2.4

As can be seen in this table, costs for constructing monorail systems are expensive. The cost per mile varies between $1.3 million per mile for the Disneyland system and $7.3 million per mile for the Tokyo system.

In 1963 a 43 mile monorail network system was proposed for Los Angeles, California. Two bids were received for the construction of this system. One company bid $2.5 million per mile and the low bid was $2.29 million per mile. The entire system of 43 miles would have cost approximately $105,275,000.

The Tokyo Monorail System which is located in one of the most densely populated centers of the world has had limited success. This system began in 1964 and had a carrying capacity of 71,000 persons per day. However, by 1966, the system was carrying average daily loads of only 8,223 persons and, in 1966, noted a loss of $3.4 million. By 1969 ridership on the system had increased to 11 million persons annually. Other factors contributing to the Tokyo Monorail's problems included inconveniently located stations and the scarcity of porters to carry luggage up and down stairs.

The more recent increased use of the monorail system has been attributed to the clogged condition of the express highway system between Tokyo and the airport. The President of the company which operates the Tokyo Monorail system, Mr. Akiyama, has stressed that such systems "must be built after the highway is clogged and not before".

The future success of the Tokyo Monorail System is now questioned, however, because of plans to construct a new $360 million airport 35 miles east of Tokyo which will, of course, divert substantial traffic from the monorail system.

The Seattle, Washington Monorail traveling between the Seattle central business district and the world's fair site, was recently studied to gather operational, financial, and attitudinal data useful to communities considering this form of transit.

Rider reaction to the system was generally favorable.

In an opionion survey carried out in one of Seattle's outlying districts a majority of commuters indicated they would switch to monorail if it would equal or better auto time and cost performance, with time the more important consideration.

Adjacent property owners on the whole were critical, fearing monorail would depress property values.

A large majority of business proprietors favored its new look which they felt would attract people and generate increased sales. The Seattle system, which was originally planned as a temporary system, continues.

Other information regarding use of existing monorail, is not readily available. However, it is clear that demand for such service is essential to the success of monorail systems.

When monorails first came into widespread public attention years ago, they doubtlessly attracted attention because they had a modern streamline appearance, their elevated guideways were designed attractively, they were quiet in operation, and the interiors of the cars were attractive and comfortable compared with dual rail transit systems. Monorails sounded as an attractive alternative. All of these attractive features that the monorails have, however, could be offered in other systems, including dual rail and bus systems, and undoubtedly at considerably lower costs. Furthermore, more flexible public transportation can be provided through the operation of bus systems on the existing road network.

Other problems attributed to monorail systems indicate that:

1. they have a certain amount of instability and, consequently, swing and sway at high speeds on the track;
2. there are problems of safe and efficient switching;
3. they are not really "a mechanically simple vehicle" or even a true monorail and thus require several extra sets of wheels which cause virtually as much friction to overcome as a conventional four wheel vehicle;
4. they can not accelerate or decelerate faster than rail cars;
5. with their overhead structures they are costly to build;

6. monorail trains can only run on their own tracks and not on the conventional dual rail tracks that may already exist; and finally,
7. monorails generally lack the support from professionals in the transit industry.

All of these criticisms are, of course, countered by advocates of the monorail system but the advantages such as the speed in congested areas and their attractive exterior and comfortable interiors can, as researchers have pointed out, all be incorporated in a modernized railroad or bus system.

The U.S. Department of Transportation has previously researched monorail systems and has made the following comment: "several types of large car monorail systems have been proposed and a few have been built during the past several decades. Both we (U.S.-D.O.T.) and various local communities or transportation agencies have studied them closely to find out whether they offered any advantages to the user or to the operator of the system or the community over buses and rail transit systems already available. In general monorails have been shown to be technically or economically unsatisfactory. Some of the major drawbacks are their stability (that is their tendency to sway or roll) difficulties in switching, and cost of the guideway itself." The Department of Transportation goes on to say that "as replacements for the bus or rail transit in general use for commuting and other public transit services they (monorails) do not yet appear to offer sufficient advantages".

Senator Claiborne Pell concluding in a study he conducted said there was "nothing a monorail could do that a dual rail train couldn't do just as well or better". Science Digest concurred by saying "standard monorail trains running on rubber tires will probably have little to offer, most of the advantages claimed for them can usually be had by modernizing present railroads."

CONCLUSION

The excessive costs and the fact that monorail advantages can be obtained by other transportation means such as reinstituting and modernizing passenger rail service, or expansion and improvement of bus systems appear to detract from the possibilities of establishing a monorail network system in Maine, particularly between far distant points where traffic is sparse. Busses and dual rail transportation appear to be more reasonable alternatives to consider.

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D. OF R.

STATE OF MAINE

In Senate July 2, 1973

Ordered,

WHEREAS, the modern concept of monorail is being considered throughout the nation because of its inherent advantages for mass transportation; and

WHEREAS, a modern system of transportation between far distant points in Maine is badly needed to supplement existing means of travel; and

WHEREAS, the possibilities of constructing a monorail network to service the State should be studied and evaluated; now, therefore, be it

ORDERED, the House concurring, that the State Department of Transportation is authorized and directed to study the possibility of establishing a monorail network system to service the passenger needs of this State; and be it further

ORDERED, that the Department report the results of its findings and recommendations at the next special or regular session of the Legislature.

SP. 701

(DANTON)

Name: Peter W. Danton

County: York

IN SENATE CHAMBER

JUL 2 1973

READ AND PASSED

SENT DOWN FOR CONCURRENCE

HARRY N. STARBRANCH, Secretary

Ordered sent forthwith

HOUSE OF REPRESENTATIVES

READ AND PASSED

JUL 2 1973

IN CONCURRENCE

E. Louise Lincoln

CLERK