

# THE METRIC SYSTEM IS COMING

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There were, at last count, 82 countries throughout the world using the more logical and consistent metric system. These countries account for more than 80% of the world's population and represent 60% of the world's gross national product. Not included are Canada and the United States which still adhere to the old system of feet and inches or feet and decimals of a foot. Economic pressures in world markets are

One has just to consider numbers like 43,560 sq. ft. and 5,280 ft. replacing numbers like 10 sq. chains and 80 chains to appreciate the problems and additional work this conversion created for the land surveyor. These problems were serious considering logarithms were still in general use. The conversion was made, nevertheless, because industry required this change.

Land surveyors now faced with another

United States will, in all probability, be less expensive due to the fact that companies which manufacture these instruments will not have to produce instruments for two different units of measure. Another advantage is that the system utilizes logically the decimal system of measurement.

The main disadvantages in conversion to the metric system will be the necessity for

Some basic SI units are as follows:

Unit	Name of Unit	Symbol
Length	meter	m
Mass	kilogram	kg
Time	second	s
Electric Current	ampere	A
Temperature	kelvin	K

Some of the derived SI units are:

Unit	SI Unit	Symbol
Area	square meter	m <sup>2</sup>
Volume	cubic meter	m <sup>3</sup>
Pressure	newton per square meter	N/m <sup>2</sup>
Degree (angle)	radian	rad.

forcing both Canada and the United States to consider the adoption of the metric system, particularly in industry, to ease the difficulty of exporting our products and to maintain a competitive position within world markets. It is likely that, after consideration, Canada will adopt the metric system or to be more explicit "The New International Systems of Units (SI)."

As one can see there is a great deal more to conversion than converting a length in feet to length in meters. In preparing the foregoing list I did, however, select those units of particular interest to the land surveyor. Appendix "A" is a Table of Conversion Factors of interest to Surveyors.

#### What It Means

When compared with its predecessor the chain, our present unit of measurement, feet and tenths of a foot had disadvantages,

change, tend to think of the disadvantages rather than the advantages which may accrue from this change. If we think and work in feet and then convert to meters, the change becomes cumbersome. If one is equipped with instrumentation consistent with metric measurement, metric tapes, electronic devices which give results in meters, instruments which read in grades rather than degrees and perform computations directly in meters rather than in feet, the change does not require conversion at all. We are performing exactly the same function using a different unit of measure. It follows that there are few advantages which will accrue to the land surveyor from conversion to the Metric System.

#### Less Expensive

One advantage is that surveying instruments produced outside Canada and the

most survey firms to equip with metric instruments, tapes, new mathematical tables, metric level rods, stadia rods and other ancillary equipment. Another serious disadvantage is the problem of conversion on old plans of survey, similar to the problems we now encounter from time to time with old plans showing distances in chains.

The latter is by no means a small problem and will be a continuing problem for a number of years. Consider for a moment attempting to replace a 7 degree curve shown in feet and degrees on an old plan by a similar curve with data shown in grades and meters. Tedious and time consuming conversion is required before one can begin to establish the curve. Last but not least will be the problem of training

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#### Appendix "A"

##### Table of Conversion Factors SI Units

To Convert From	to	Multiply by
Acre	meter <sup>2</sup> (m <sup>2</sup> )	4.046856E+03
degree (angle)	radian (rad)	1.745329E-02
foot (Canadian)	meter (m)	3.048000E-01
foot (U.S. Survey)	meter (m)	3.048006E-01
hour (mean solar)	second (s)	3.600000E+03
hour (siderial)	second (s)	3.590170E+03
inch	meter (m)	2.540000E-02

#### Example

To convert 100 feet to meters:  $100 \times 3.048000 \times 10^{-1} =$   
 $100 \times .3048 = 30.48$  meters exactly

## Metric System

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ourselves and our staff to think in meters, decimeters and centimeters. This will be essentially a problem of familiarization.

### Why Change?

After studying the Government of Canada's "White Paper on Metric Conversion in Canada", prepared for the Hon. Jean-Luc Pepin, Minister of Industry, Trade and Commerce in January, 1970, I am convinced that legislation is imminent, making conversion to the metric system necessary. This legislation may be permissive or make conversion to the new system mandatory. The method by which this change is accomplished is of little importance; the effect will be that this system is imposed.

Permissive legislation would, most likely, allow the change to be gradual and on a voluntary basis. Under this legislation, change will be imposed by our clients because they themselves have been forced to adopt this system due to economic pressures.

### Action To Take

We should anticipate this conversion by enacting by-laws allowing the inclusion of metric data on plans of legal surveys. We should initiate action now to have changes made in the various acts and regulations giving the metric system legal status, on plans of legal and control surveys.

I am not advocating complete conversion, at this time, but I am suggesting that surveyors be encouraged to show metric data on their plans in addition to feet and tenths of a foot. Plans of legal surveys which are fully integrated into the Ontario Co-ordinate System should show tables of co-ordinates in both feet and meters for all monuments established in that survey. In this way, the surveys we are performing at present will not require conversion at a future date.

## Secretary's Page

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- (b) Accommodation — Hotel or Motel (receipt)
- (c) Meals — day rate \$12 or \$15 — except when paid by host.
- (d) Telephone, telegraph, etc. at cost.
- (e) Miscellaneous —
  - (1) registration — receipt
  - (2) tips — \$3.00 per day
  - (3) entertainment (?)

It was resolved that the memorandum of S. G. Hancock re expenses for Delegates and Wives be accepted with the insertion of automobile per mile .15¢, meals \$15.00 per day per person and entertainment \$15.00 per day.

### Printing of Certificates of Authorization

Council resolved that the Secretary have the Association's Certificates of Authorization to practise surveying designed in a form similar to the Citation form and that the existing typed certificates be replaced thereby.

## Report of Geodetic Sciences Committee

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of the University of Toronto, with a cross-appointment to Erindale College to develop a surveying program within the earth sciences at the College.

The committee continues to study curriculum content with the college and with prominent surveyors at the national level.

Survey law holds a significant position in the earlier years of the interim program. The committee is aware of the fact that an appropriate legal course of studies is not available in Ontario. It is desirous of developing one with the full co-operation of the other provincial associations, as it is believed that a broad-based course of the principles of law applied to survey does not have provincial bounds.

It is expected that Dr. Gracie will be working on the final curriculum during the fall school term and at that time we should have recommendations on the development of the legal subjects.

## Summary of Association Brief

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held monthly meetings, interviewed recognized leaders and specialists in survey education in many countries of the world, and established a sub-committee of Ontario specialists in Geodesy, Photogrammetry and Cartography.

The committee at present is involved in a study group with the guidance of Dr. J. Tuzo Wilson, Principal of Erindale College, which includes others within the engineering, physics and law departments of the University of Toronto. Without prejudging the results of these studies, it appears that serious consideration is being given to re-orienting our university educational program from engineering to the earth sciences.

This is a step which appears to be endorsed by the other provincial associations across Canada as well as the leaders in the geodetic sciences in many countries. If this is to be the pattern for the future needs of the profession and the public, Ontario could again be taking the lead in this particular field.

## Law & Surveying

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plan have been sold. The portion of the street that we are now dealing with is a dead-end section of a street that has never been opened or used by the public or by the owners within the subdivision. The owners of the original subdivision who own the adjacent land are now incorporating this portion of the street in a new plan of subdivision and this portion of the street will become parts of lots on the new plan.

Who owns the fee in the street?

A. In the absence of proof of non-dedication it would appear to be the law that upon registration of a plan of subdivision all streets are dedicated by the owner to the municipality concerned and that such dedication is irrevocable upon the sale of a lot on the plan and the fee in the street is held by the municipality. (See Re: Westwood Addition, Hamilton (1945) O.R. 257; Boland v. Baker and North York Township et al (1953) 2 D.L.R. 455).

In order to answer the question it is therefore necessary to consider whether or not sufficient indication has been provided as to the non-dedication of the portion of the street being a dead-end. Provided that it is clearly shown on the plan with respect to the portion of the street concerned that the fee was not dedicated as a public highway and the same notation was made in the owner's certificate on the plan, it would appear that this would be more than sufficient to take it out of the general rule that on registration of a plan of subdivision the fee in the street vests in the municipality. There is no case directly on this point but it would be very difficult to expect a court to give any other interpretation. It follows that the original subdivider has the fee in the portion of the street concerned and he would be able to deal with it as he sees fit.

## FROM THE MAIL BAG

Dear Sir:

I wonder if anyone else has noticed the major fallacy in the Government White Paper on the Metric System?

It (the Paper) goes to great lengths to rationalize the adoption of **one** system, it goes on page after page setting forth the merits and reasons why the country should adopt one procedure.

But the White Paper itself is Bi-lingual!

Yours truly,  
K. McLean, O.L.S.