



**Road Race  
Measurement Seminar  
Vancouver, British Columbia  
October 17 and 18, 2015**

# Program



- First Session
  - introduction of participants
  - general principles of measurement
  - simple calculation exercises
  - layout of a calibration course

# Program



- Second Session
  - introduction to the Jones Counter
  - mount counters to bicycles
  - calibrating the bike
  - riding the bike
  - SPR Shortest Possible Route
  - supplementary tips
  - layout test course

# Program



- Third Session
  - participants measure the test course and do calculations
  - instructor helps with calculations when needed
  - discussion of things to be covered in last session

# Program

- Fourth Session
  - designing the map
  - documenting splits
  - completing the forms
  - AC Road On-Line Application
  - software
  - topics of interest that were raised in the three previous sessions
  - the final exam!!!

# Program

- First Session

- introduction of participants
- general principles of measurement
- simple calculation exercises
- layout of a calibration course

- Course Material

- IAAF/AIMS “The Measurement of Road Race Courses” our bible
- Presentation slides

# Course Certification

- Course certification and sanctioning are different. Course certification specifically references the distance and change in elevation of a course while sanctioning refers to the standards and rules which will be upheld during an event. Sanctions must be renewed annually.
- Course Certification is a process by which a course is measured according to international standards and the measurement data is reviewed by a recognized certifier. Once the data is verified and accepted, a certificate with a course ID number is sent to the measurer, who then forwards a copy to the race director.

# Certification Process

- In order for a course to be certified, it must be measured using the Calibrated Bicycle Method and an application made using the on-line system.
- John Lofranco is the Coordinator for Road Running at Athletics Canada and is responsible for the on-line certification process.
- The following information must be submitted:
  - Details and description of the measurement and measurement sheet
  - Bicycle Calibration Data Sheet and Calibration Course Certificate
  - Map of the course
  - Optionally data on Measured Splits
- Bernie Conway, Canada's certifier, will review the submission and issue a certificate.



# Equipment Needed

- Jones counter
  - Available at: <http://www.jonescounter.com/>
  - counts/revolution  $260/11 = 23.636363\dots$
- Bicycle
  - road bike is preferred
  - disk brakes require special treatment
  - high pressure or even solid tires
- Steel tape
  - 30 m or longer is best, but a 15 m tape will do

# Equipment Needed



- Spring scale (optional)
- Thermometer to measure steel tape temperature
- Notebook (preferably waterproof) and pencils
- Calculator
- Lumber crayon or chalk
- Nails and hammer
- Spray paint and spray chalk

# Equipment Needed



- Masking or duct tape
- Bike tools and spare tube
- Reflective vest and bike helmet
- Nice to have
  - laptop computer
  - measuring wheel for locating splits not for the calibration course
  - handheld GPS

# Step by Step

- Layout an accurate calibration course
  - straight, flat and at least 300 metres long
- Calibrate your bike
  - at least four calibration rides
  - calculate the counts per km including the short course prevention factor (SCPF) of 1.001
- Preview the course
  - ride or drive the course so you are familiar with the turns and difficult areas
  - if necessary do a rough measurement first

# Step by Step

- Measure the course
  - a minimum of two complete measurement rides following the shortest possible route (SPR)
  - record intermediate points and splits on both rides
- Recalibrate your bike
  - four calibration rides and SCPF of 1.001
  - determine constant for the day as the average or the larger of the pre and post calibrations
  - if in doubt use the larger constant

# Step by Step

- Determine the measured course length
  - calculate the distance for each ride using the constant for the day
  - the measurements can not differ by more than 0.08% or a third measurement will be required
  - the proper length is the smallest measurement
- Make final adjustments to the course
  - adjust the start, finish or turnaround to get the exact distance needed
  - adjust all splits and record their location

# Step by Step

- Draw a course map
  - must contain sufficient detail to allow anyone to set up the course accurately
  - must contain details of the start, finish, turnarounds and other critical areas
  - must record areas where runners must be constrained; e.g. to the curb lane
- Complete the course application using the on-line system

# Student Exercise #1

- You have laid out a 400 m calibration course and ride the calibration course four times with counter readings as follows.

Ride	Start	End
1	13,200	17,951
2	17,951	22,701
3	22,701	27,450
4	27,450	32,200

- Calculate the working constant



# Student Exercise #1

- Answer 11,887

	<b>Start</b>	<b>End</b>	<b>Elapsed</b>
1	13,200	17,951	4,751
2	17,951	22,701	4,750
3	22,701	27,450	4,749
4	27,450	32,200	4,750
<b>Total</b>			19,000

- $19,000/4 = 4,750$  average counts per ride
- $4,750/0.4 = 11,875$  counts per km
- $11,875 * 1.001 = 11,887$  counts per km with SCPF

# Student Exercise #2

- Your counter reads 76,300, what will it read after exactly 5 km?
  - $76,300 + 5 * 11,887 = 135,735$
  - your five digit counter will read 35,735
- You begin riding at 86,530 and stop at 12,563, what distance has been covered?
  - $112,563 - 86,530 = 26,033$
  - $26,033 / 11,887 = 2.1900 \text{ km}$

# Student Exercise #3

- You begin your ride at 36,100 counts and ride approximately 4 km and when you reach the end of your ride your counter is reading 83,520.

What was the exact distance?

$$- 83,520 - 36,100 = 47,420 \text{ counts}$$

$$- 47,420 * 11,887 = 3.9892 \text{ km}$$

# The Calibration Course

- A calibration course is an accurately measured base line used to calibrate the bicycle.
- The effectiveness of the calibrated bicycle method of measurement depends on good calibration procedure, which demands quick access from the calibration course to the race course and vice-versa. Calibrations are best used when “fresh”, before conditions can change much.

# The Calibration Course

- Where?
  - straight, paved, level and lightly travelled where you can safely ride in both directions
  - near the course or near your home?
- How long?
  - must be at least 300 metres
  - longer is better, but if it is a one use calibration 300 m is great
  - if you are setting up one that you will use frequently, 500 m is preferred

# The Calibration Course

- The standard method of measurement is to use a steel tape. Any accurate steel tape is okay, but non-steel, like fibreglass are not acceptable.
- Steel tape marked 20C, 50N means that it is accurate at 20°C with a tension of 50 Newtons (about 11 lb force)
- Electronic distance measurement (EDM) can achieve greater accuracy, but the extra accuracy is not needed.

# The Calibration Course

- Mark the end points
  - your wheel must be able to touch the end points and they must be in direct line
  - use a nail driven into the pavement or another permanent object like a sewer or manhole cover
  - keep in mind that you will want to be able to identify it later
- Measure the course
  - you must measure it at least twice, once in each direction and use the average measurement

# The Calibration Course

- Measure the course
  - determine and use the tapes true zero point which may not be where you expect it to be
  - place tape on the pavement and mark with a pencil or pen at the end of each tape length
  - count the tape lengths by numbering the tape straighten and pull the tape with about 11 pounds force or as marked on the tape



# The Calibration Course

- Ride the course to check that you used the correct number of lengths
  - if using a familiar bike you should know the approximate calibration constant, but if not
  - Divide the counts for the full calibration course and divide by the counts for one tape length to get the number of tape lengths

# The Calibration Course

- Correct the distance for temperature
  - use the average length from two measurements
  - $\text{length} * (1 + 0.0000116 * (T - 20))$
  - e.g. at 10°C a 500 m measurement would be
  - $500 * (1 + 0.0000116 * (10 - 20)) = 499.942 \text{ m}$
- Adjust one end point to make the distance an exact number of meters, eg. 500.000 m
- Permanently mark the end points with a PK nail and washer

# The Calibration Course

- Certify the calibration course
  - draw a map of the course layout showing precisely where the end points are -- another measurer may want to use it [example map]
  - complete the on-line application for calibration course and include the Steel Taping Data Sheet
  - in theory, if the course is only going to be used once you can omit the map, but the steel taping data sheet is still needed and you still have to pay the certification fee (\$15.00)

# Practice Calibration Course

- Set up 2 new Calibration Courses on the bike path on the south side of Northern, east of Carolina.
- Meet at Northern and Carolina.
- Work in pairs; one pair on each side of the path
- There is an existing calibration course here, but we will set up our demonstration courses starting at Carolina (about 1 block east of the east end of the existing course).

# Program



- Second Session
  - introduction to the Jones Counter
  - mount counters to bicycles
  - calibrating the bike
  - riding the bike
  - SPR Shortest Possible Route
  - supplementary tips
  - layout test course

# Riding the Bike

- don't worry about a bit of wobble
- avoid hard braking with front wheel
- do not swerve to avoid pot holes or puddles - slow down or walk the bike through
- walking will add about 1% to the counts
- don't back up too much
- freeze the front wheel / avoid backlash!!!
- don't check your tire pressure between calibrations

# Calibrating the Bike

- To calibrate the bicycle, follow these nine points:
  1. Check the condition of your bicycle's tires. They should be firmly inflated. You should ride the bicycle for several minutes just before beginning to calibrate. This will ensure that the tires are at air temperature and reduce the variation in the counts recorded in your series of calibration rides. Do not calibrate immediately after taking the bicycle out of a vehicle.

# Calibrating the Bike

2. At one endpoint of the calibration course slowly roll the front wheel forward through to the count at which you will begin the calibration ride. This will ensure that the spoke of the wheel is driving the finger of the counter. Lock the front wheel with the brake and place the axle directly over the endpoint of the calibration course. Record the counter reading. Sight down lining up your handlebar with the front axle and the nail. Always do it with the same sight line.

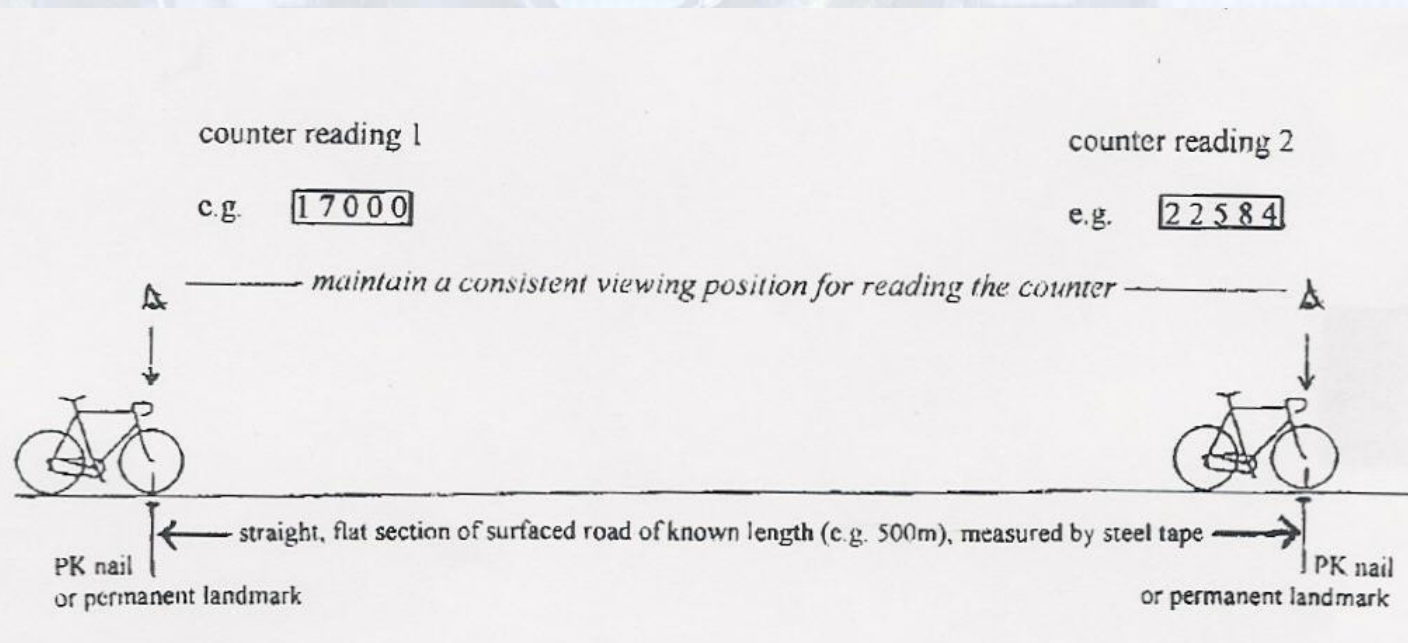


# Calibrating the Bike

3. Ride the bicycle over the calibration course in as straight a line as possible and with the same weight and equipment on the bicycle as will be used during the measurement of the road race course. A calibration ride should be one non-stop ride. Try to maintain a constant riding posture. Changing your position will change the pressure on the front tire and affect the calibration readings.

# Calibrating the Bike

4. Stop the bicycle just before reaching the other endpoint of the calibration course and roll it slowly forward until the axle of the front wheel is directly over the endpoint. Lock the front wheel and record the counter reading.



# Calibrating the Bike

5. With the front wheel still locked by the brake, turn the bicycle around and place the axle of the front wheel directly over the endpoint of the calibration course. After you have repositioned the bike and before you start the next calibration ride check that there has been no change to the counter reading recorded at the end of your previous ride.
6. Repeat steps 3, 4 and 5 until you have made a total of four calibration rides (two in each direction).

# Calibrating the Bike

7. For each ride, subtract the counter reading taken at the start of the ride from that at the end. Compare the four rides. If the number of counts on any ride is very different to the number of counts on other rides, discard that ride and undertake an additional ride until four reasonably consistent rides are obtained.
8. Calculate the average number of counts.
9. Divide the average by the calibration course length and multiply by 1.001 (SCPF).

# Pre and Post Calibration

- The bike must be calibrated before and after the measurement
- Both calibrations must be within 24 hours
- Best to calibrate just before measuring and immediately after measuring
- Use the “Working Constant” from the pre-calibration during the measurement
- Adjust for the “Final Constant” after the post-calibration

# Final Constant

- The final constant is either the average of the pre and post-calibration constants or the larger of the two
- Use the average if the temperature conditions during the measurement are representative of the average temperature during the calibrations, otherwise use the larger.

Pre calibration		Start measurement		End measurement		Post calibration		Constant for the day
Time	Temperature	Time	Temperature	Time	Temperature	Time	Temperature	
5:00 AM	5	5:30 AM	5	12:00 PM	12	12:00 PM	12	Average
5:00 AM	5	5:30 AM	5	12:00 PM	12	5:00 PM	18	Larger
5:00 AM	20	5:30 AM	20	12:00 PM	14	12:00 PM	14	Average
5:00 AM	20	5:30 AM	20	12:00 PM	14	5:00 PM	18	Larger

# Bike Calculations

- Here is the example we used earlier

	<b>Start</b>	<b>End</b>	<b>Elapsed</b>
1	13,200	17,951	4,751
2	17,951	22,701	4,750
3	22,701	27,450	4,749
4	27,450	32,200	4,750
<b>Total</b>			19,000

- Athletics Canada provides a spreadsheet

# Short Course Prevention Factor

- When calibrating our bike we multiplied by the SCPF of 1.001
- This factor means that if we were absolutely perfect in our measurement the course would be long by 1 m per km
- But since we are not perfect and conditions are variable, eg. temperature, the SCPF means that the course, in the vast majority of measurements, will NOT BE SHORT.



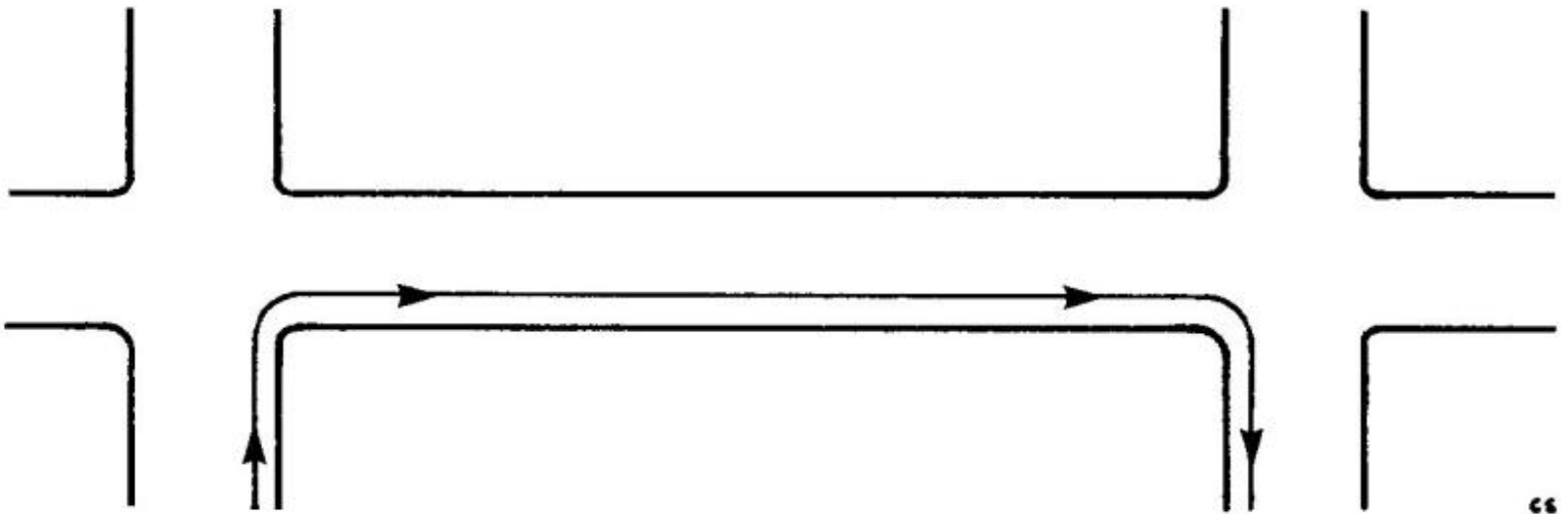
# Shortest Possible Route (SPR)

- The object is to guarantee that all runners run at least the stated distance
- The SCPF (0.1%) is added to ensure that all the mistakes and inaccuracies do not produce a short course.
- Measure 30 cm from the edge of the road
- Consider the following examples

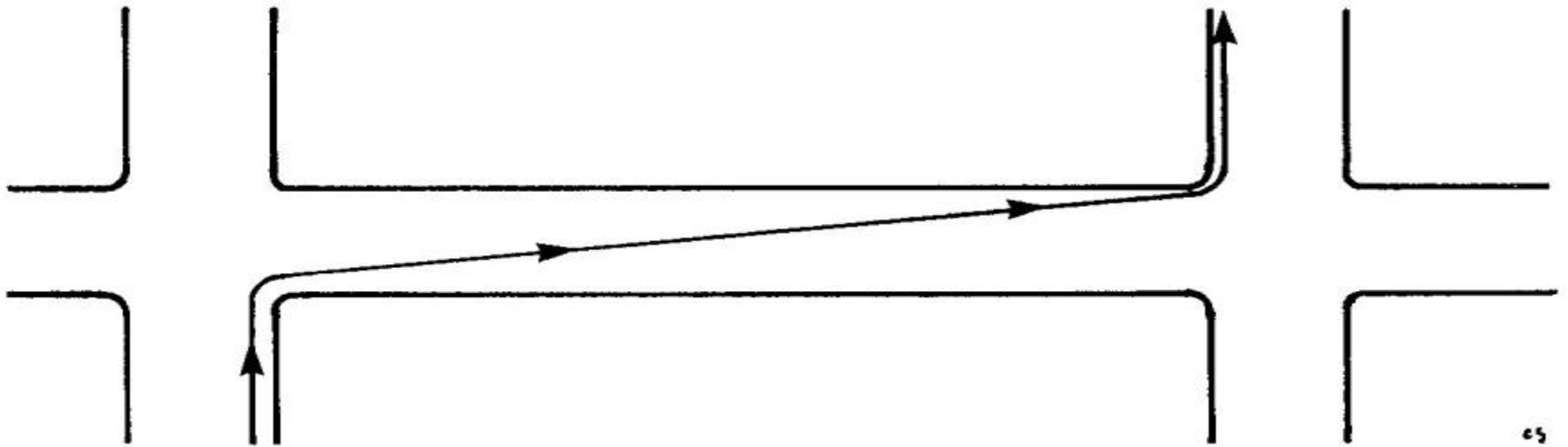
# Shortest Possible Route (SPR)

- Sometimes the route will be ignored by runners so measure the SPR where they will run:
  - cutting corners onto a gravel shoulder
  - crossing a grassy area
  - crossing a median
  - anticipate and measure the SPR
- Sometimes the sides of roads are poorly defined and you must decide whether to measure on the road itself or a dirt shoulder. It is probably best to remain on the hard road surface unless the route on the dirt is obviously shorter.

# Turns 1

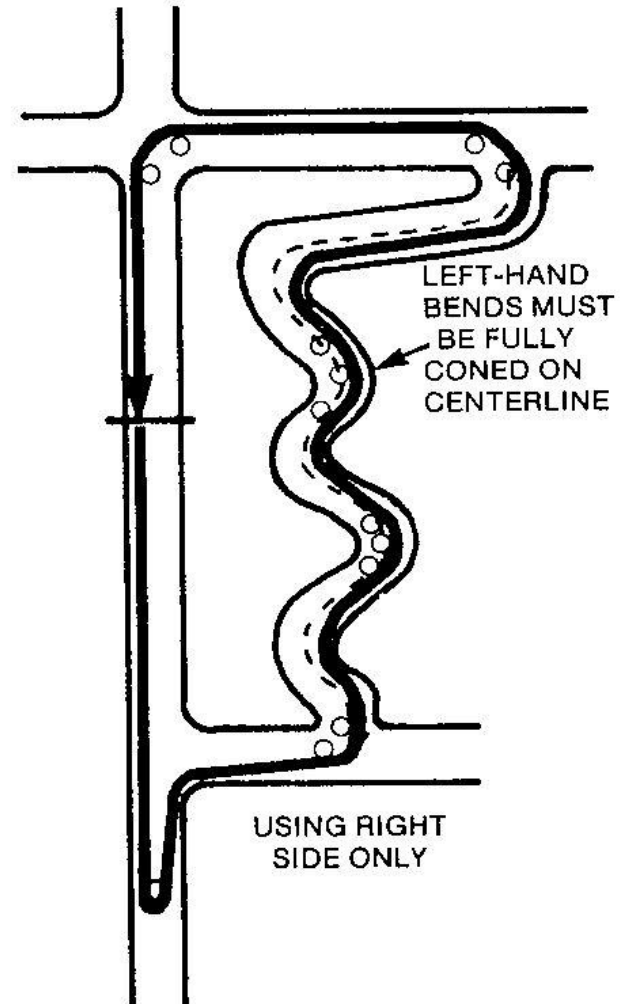
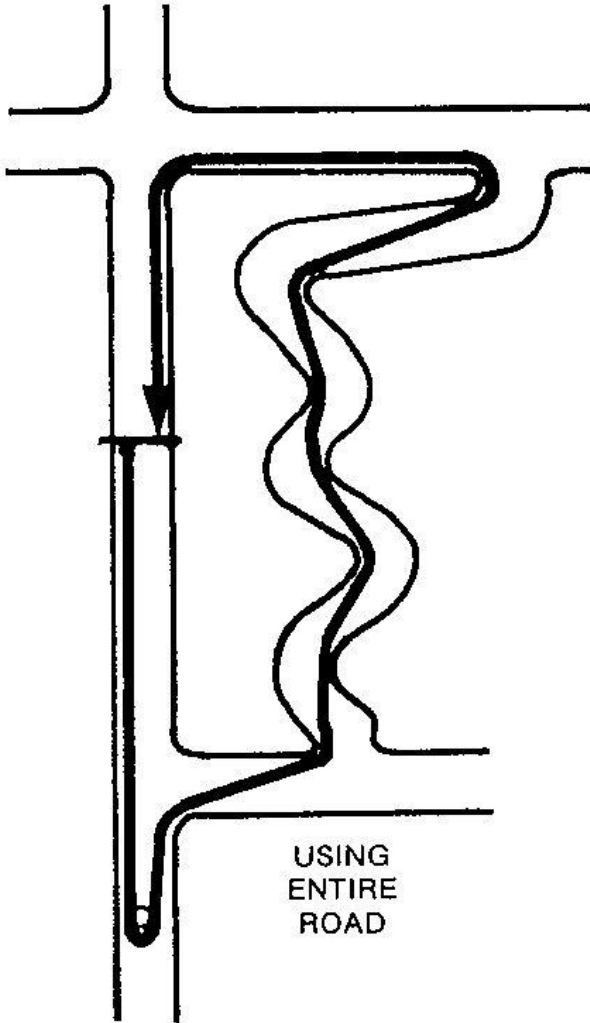


# Turns 2



es

# Winding Road

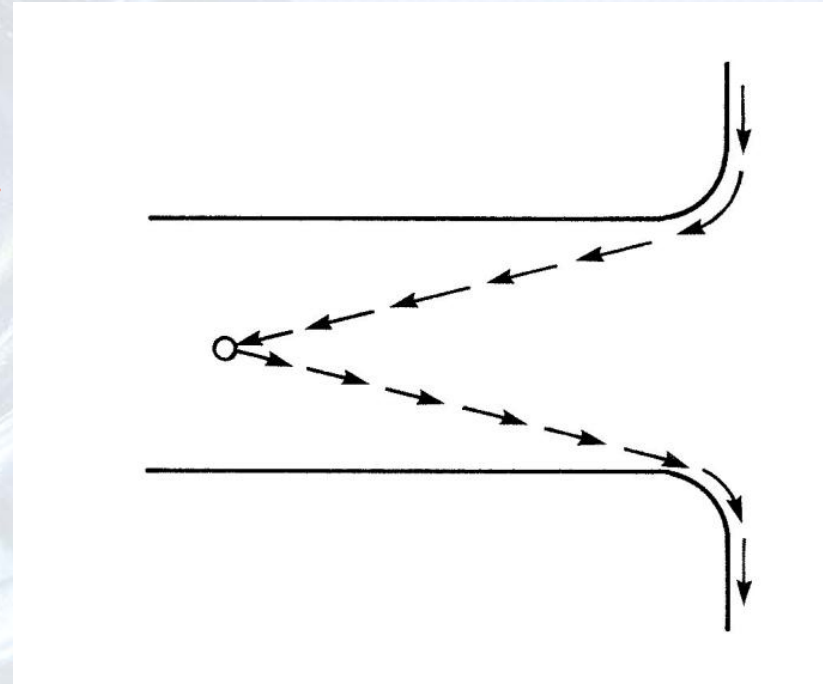


# Pictures

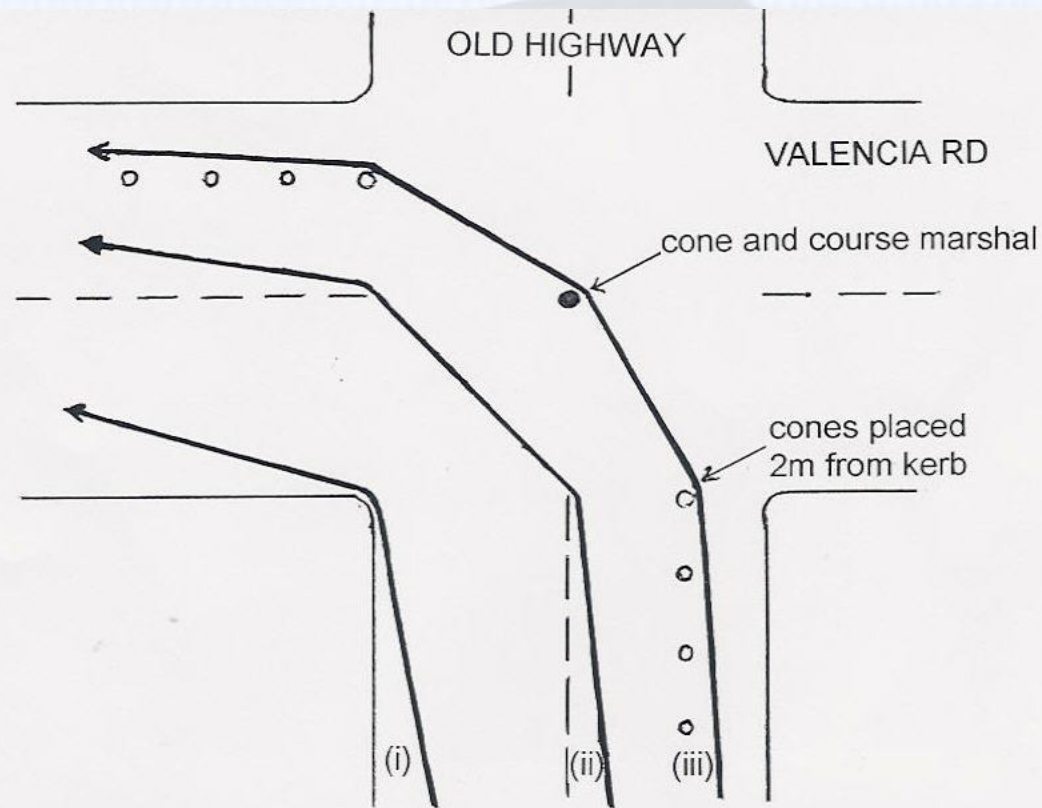


# Turnaround Points

- Most races featuring turnaround points mark these with a single cone which runners must keep always on their left or right side. The simplest way to measure such a layout is to ride up to the position of the turn, lock the front wheel, record the count, turn the bicycle around and then continue the measurement back in the other direction.



# At Intersections



Shortest possible route:

- i) Using entire road width
- ii) Using half road width but shortest possible route on intersection
- iii) keeping within 2m of kerb and keeping right of centre of intersection

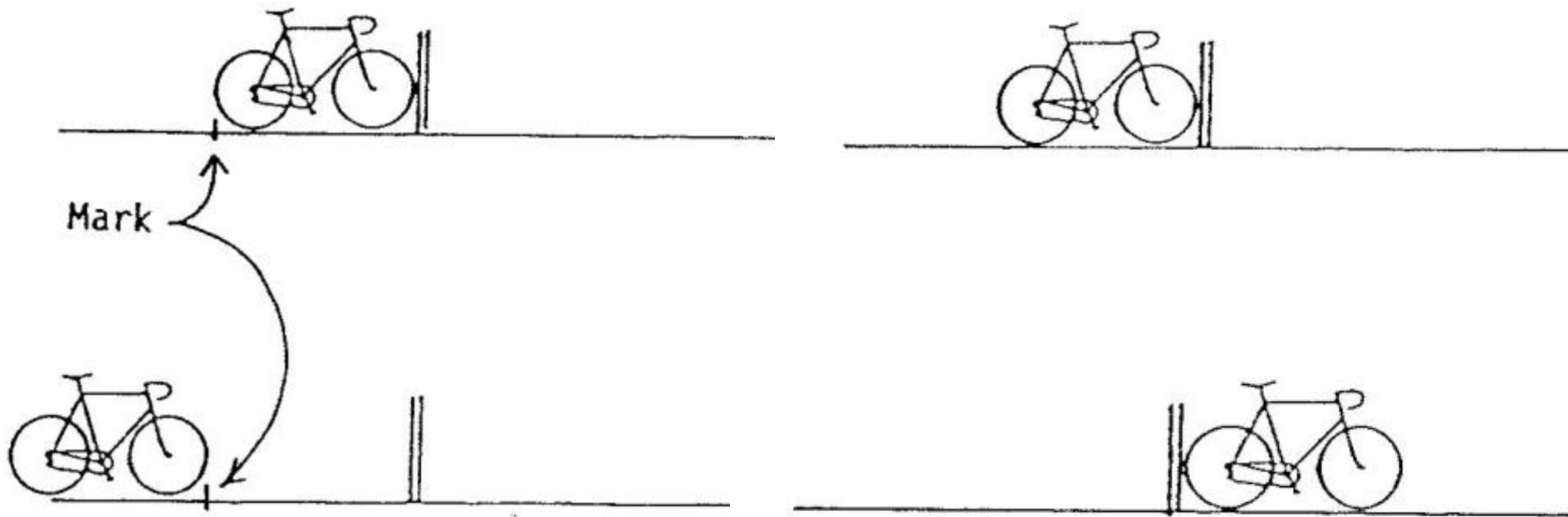
If roads are 10m wide:  
shortest

+ 7m

+ 12m



# Around Gates



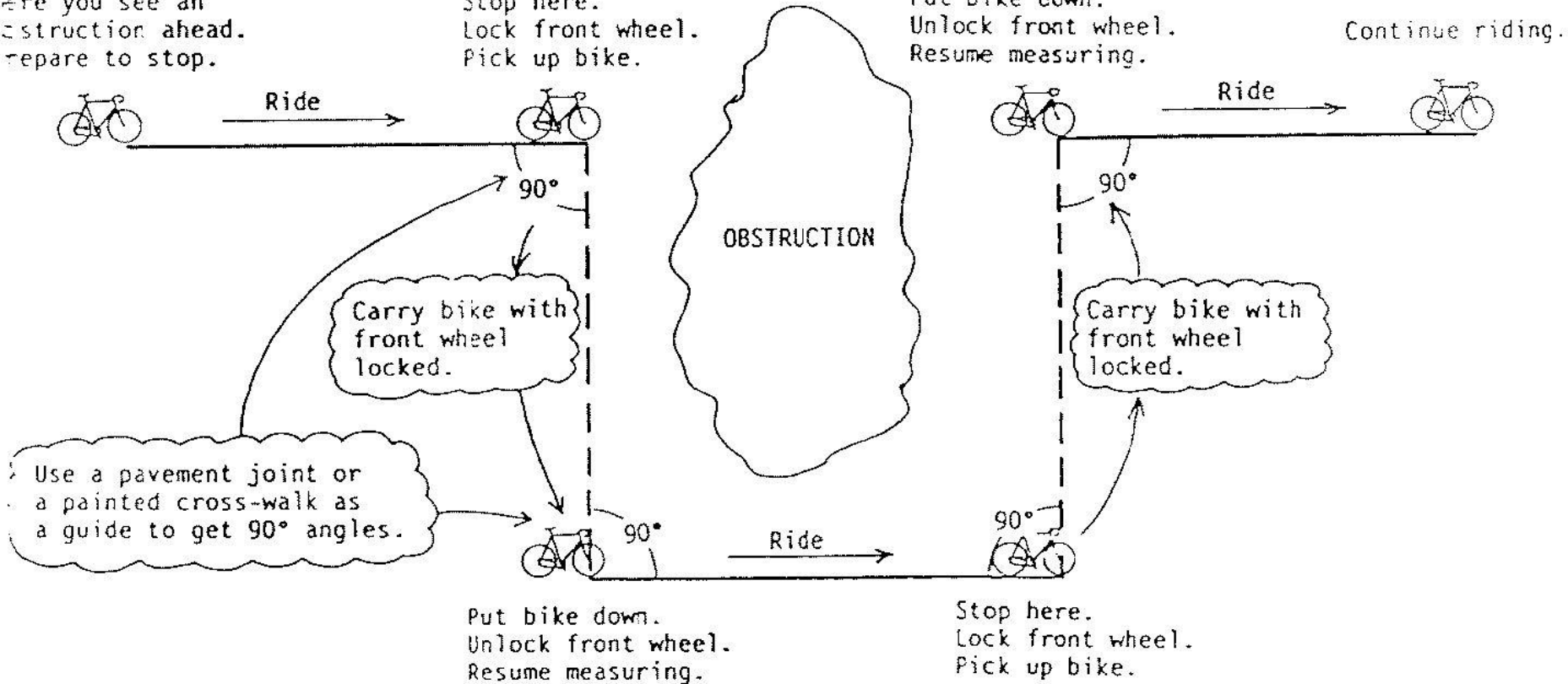
# Around Obstructions

Here you see an  
construction ahead.  
Prepare to stop.

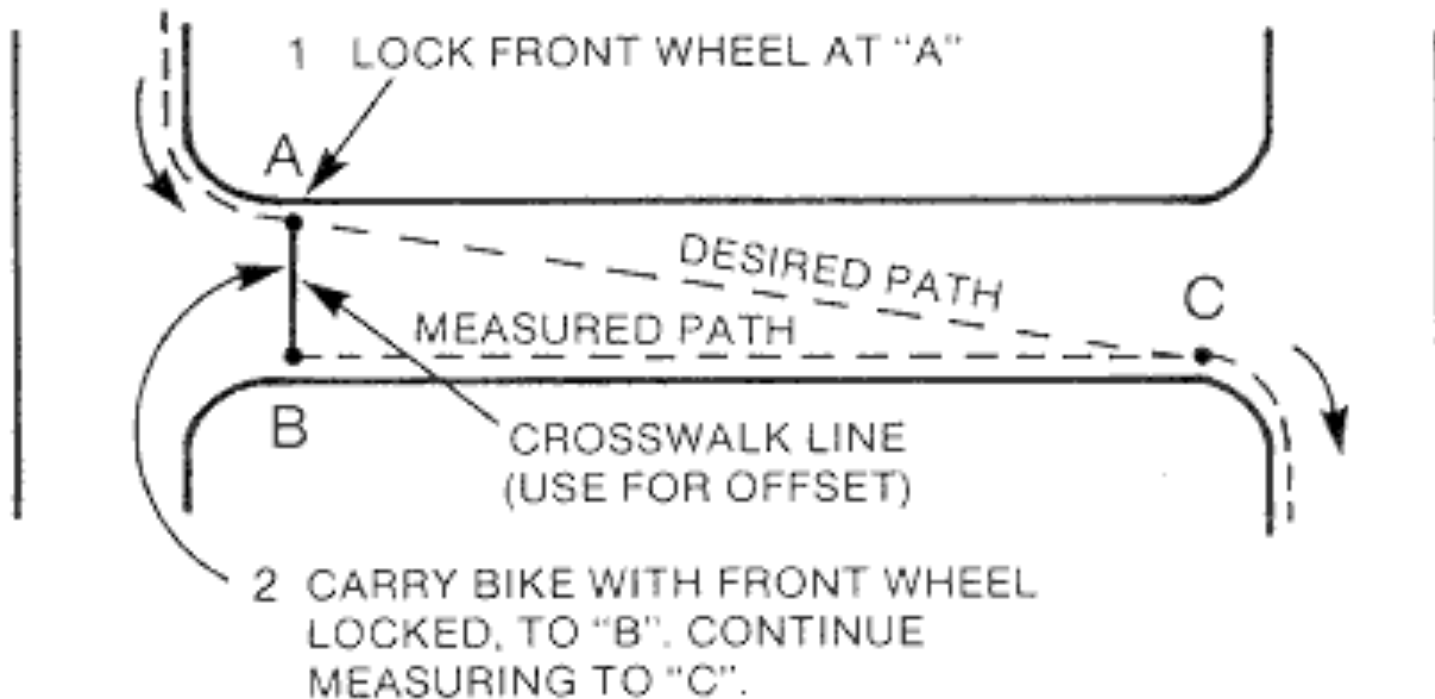
Stop here.  
Lock front wheel.  
Pick up bike.

Put bike down.  
Unlock front wheel.  
Resume measuring.

Continue riding.



# In Traffic



# Supplementary Tips

- Obstacles like parked cars
  - freeze, move perpendicular, forward, repeat
- The offset manoeuvre
  - 10 m road, 100 m block, 0.5 m error
- Two-cyclist riding
  - only the first rider marks the splits
  - both measure the same marks
  - second rider follows the SPR as he/she sees it
  - don't follow too close

# Supplementary Tips

- Setting splits
  - use a digital bike computer to determine when you are getting close to the split, but measure it with the Jones counter
  - only the first rider marks the split, others measure to his/her mark
  - use a GPS to see when to expect predetermined marks
  - mark the splits with spray chalk as most of the time they will need to be adjusted later

# Supplementary Tips



- Solid vs. pneumatic tires
  - less variation and no flats, but bad for rough surfaces
- Measuring at night
  - sometimes it's the only way to deal with traffic
  - pre-view the course to know the SPR
  - calibrate at night, not the day before
  - remember safety first
- Walking the bike
  - okay for short distances, if unavoidable - 1%
  - never on the calibration course

# Supplementary Tips



- Dirt, grass and sand
  - avoid non-paved surfaces
  - steel tape if possible
  - very firm dirt will lengthen by about 0.1%
  - grass may lengthen the course by 1%
  - sand can be more than 3%
  - calibrate on a similar surface
- Minimize temperature effects
  - choose a cloudy day
  - re-calibrate often

# Course Layout and Measurement

- Ride the course in the safest manner possible – on the right side of the road with the traffic whenever possible
- Ride from finish to start
- Ride part in the reverse direction and the rest forward, eg.
  - ride from finish to point “A”
  - ride from start to point “A”



# BC Senior Games

- Course map
- Two loops plus a short section to the start/finish
- Undefined grassy area
- Gravel path
- Measured in reverse direction
- Data sheet

# Practice Course

- You are all going to measure a 5 km road race course
- Work in pairs with one person leading to the turnaround and then the other leading
- We will all ride the route in advance and discuss how the measurement will be done
- The course has been set up and tested on Google Earth
- The measurer leading to the turn needs to calculate splits 1 and 2, and the other measurer needs to calculate splits 3, 4 and finish

# Program



- Third Session
  - participants calibrate their bikes, measure the test course and do calculations
  - instructor helps with calculations when needed
  - discussion of things to be covered in last session

# Complete the Data Sheet

- Use the AC Road spreadsheet
  - or manually if laptop not available
- Which calibration constant?
- Adjustments?
- Splits?

# Program



- Fourth Session
  - designing the map
  - documenting splits
  - completing the forms
  - AC Road On-Line Application
  - software
  - topics of interest that were raised in the three previous sessions
  - the final exam!!!

# The Map

- The course map must
  - clearly define the course so that any race director can lay out the route as you measured it and control the runners so they run the route you measured
  - without a good map mistakes can be made, if not this year perhaps years later when there is a new race director
  - the map is the single most important part of the documentation

# The Map

- Now for the requirements
  - on one letter size page (8.5 x 11) so that it can be copied to the reverse side of the certificate
  - in black and white so that detail is not lost when it is photocopied
  - does not need to be drawn to scale, in fact not to scale allows you to expand portions for clarity
  - does not need to include all the cross streets
  - should include a line representing the actual measured path (shortest possible route)

# The Map

- Now for the requirements
  - if the measured path is not the shortest possible route cones or barricades must be placed to contain the runners to the measured route and the map must indicate exactly where these barricades are located
  - details of the start, finish, turnarounds and any other important elements must be included
  - the details must show the precise location for these features measured, with a tape, from a permanent landmark (don't rely on paint)



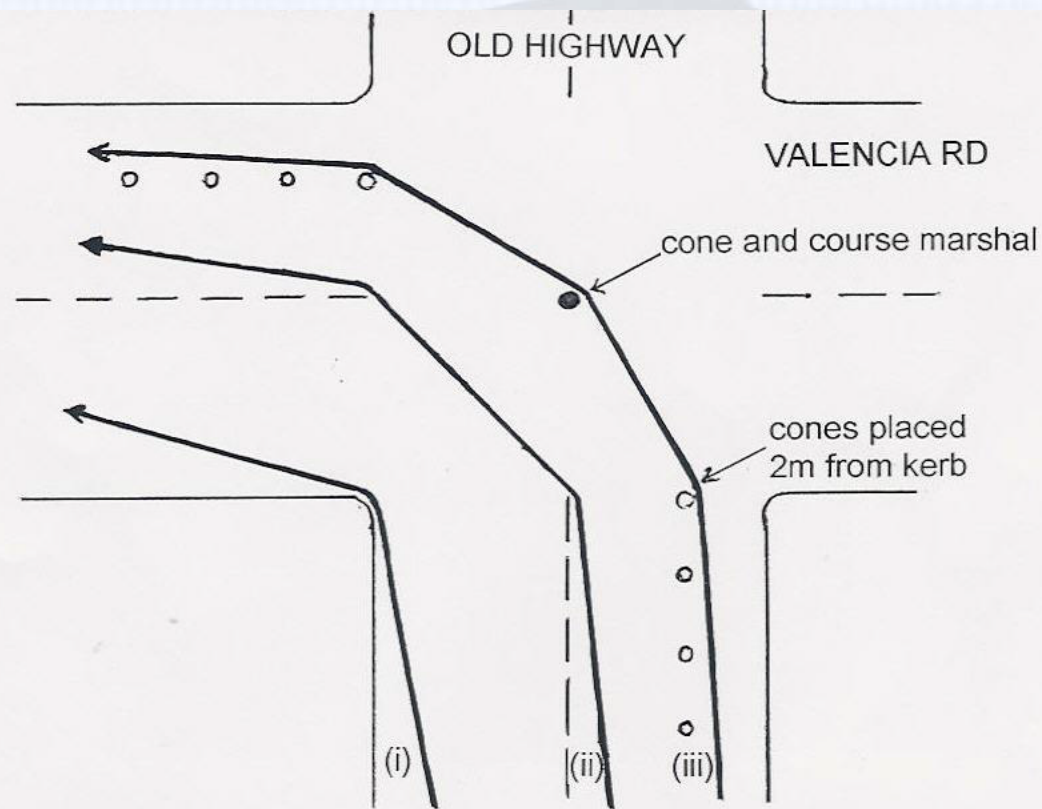
# The Map

- Now for the requirements
  - it is not necessary to show the splits on the map as it will become too cluttered, a separate description can be provided
  - clearly label all streets, roads and landmarks
  - include a notes section with any additional needed details
  - include a title block with the name of the run, its location and your name as measurer

# Example Maps

- BC Senior Games 10 km
- UBC Fall Classic
- Longest Day 10 km

# Intersection Details and Cones



Shortest possible route:

- i) Using entire road width
- ii) Using half road width but shortest possible route on intersection
- iii) keeping within 2m of kerb and keeping right of centre of intersection

If roads are 10m wide:  
shortest

+ 7m

+ 12m

# The Splits

- Digital photographs of the splits is an effective documentation
- Locate the splits, whenever possible, to permanent landmarks
- Mark the splits with nails or paint
- GPS co-ordinates can be used:
  - during measurements set a waypoint at the split
  - after measurement adjust the waypoint in Google Earth

# Examples of Measurement



- A blow by blow example of a course measurement can be found in Appendix 3 of the manual
- Additional examples of maps can be found in Appendix 4 of the manual

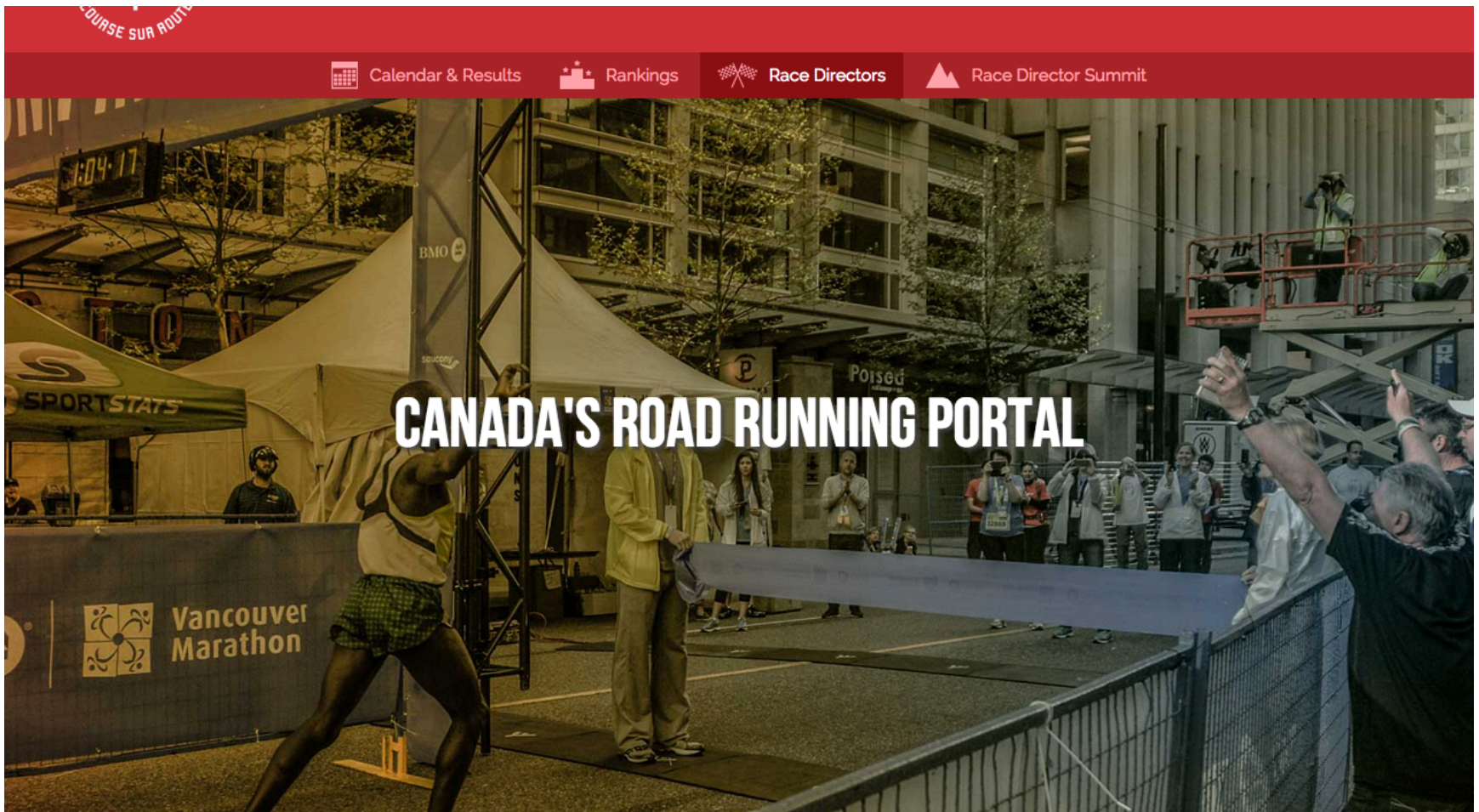
# The Forms

- Athletics Canada has developed an on-line application process which must be used
- The certification application form shown in the manual is obsolete
- Review Appendix 5 of the manual for tips on filling out the forms, but remember that we now must use the on-line form

# AC Road Course Certification: Online Form Tutorial

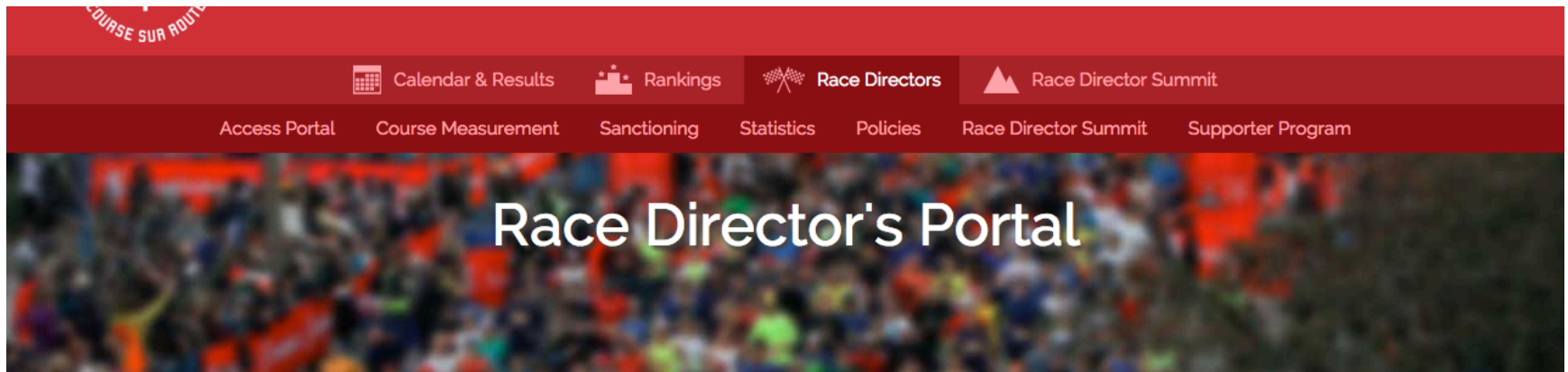


Go to [www.acroad.ca](http://www.acroad.ca) and click on Race Directors





At the Race Director's page click on Course Measurement



Our aim is to help make your event a success!



Access Portal



Statistics

Helpful links, tools and resources to



Supporter Program

Athletics Canada aims to recognise

You can also click on “read more”  
under the Course Measurement icon further down the page



## Access Portal

Login >



## Statistics

Helpful links, tools and resources to help improve your race.

[read more](#)



## Supporter Program

Athletics Canada aims to recognise and support races.

[read more](#)



## Course Measurement

Ensure your course is accurately measured, apply for certification!  
Check to see if your course has been certified and learn about becoming a course measurer.

[read more](#)



## Sanctioning and Labelling

Have your race officially recognized!  
Learn about additional benefits and services which may be available to your race.

[read more](#)

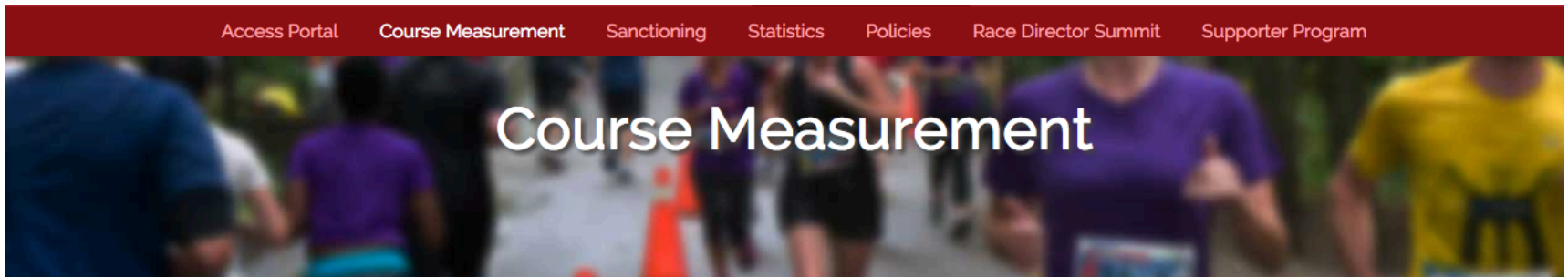


## Policies and Guidelines

Download copies of official IAAF and Athletics Canada race regulations, policies and guidelines specific to road running.

[read more](#)

On the Course Certification page click on Manuals and Forms from the menu at left.



## Course Certification

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### Certify Your Course

Find a Measurer

Become a Measurer

Measurer Grading

Certified Courses

Seminars

FAQs

Manuals & Forms

Athletics Canada believes that every runner deserves to run on an accurately measured course. Our course certification program confirms that the advertised a race course distance has been accurately measured according to international standards and the measurement data is reviewed by an accredited certifier.

Course certification provides an opportunity to be able to conduct meaningful comparisons between different race courses for the achievement of personal best performances, as well as ensuring the fair administration of qualifying times and establishment of records. A properly measured course also helps timing companies to position timing equipment at the appropriate location.

The standards for course measurement are jointly established by the Association of International Marathons and Distance Races (AIMS) and the International Association of Athletics Federations (IAAF). The system is managed by experienced course measurers. In Canada, this service is managed under the authority of Athletics Canada.

*On-line course certification application is available at our [Manuals & Forms page](#). Contact John Lofranco [jlofranco@athletics.ca](mailto:jlofranco@athletics.ca) with questions.*

From the Manuals & Forms page click on [Online application](#)

## Course Measurement

### Manuals & Forms

[Certify Your Course](#)

[Find a Measurer](#)

[Become a Measurer](#)

[Measurer Grading](#)

[Certified Courses](#)

[Seminars](#)

[FAQs](#)

[Manuals & Forms](#)

#### The Measurement of Road Race Courses

Measurement procedures outlined in this booklet are those prescribed by IAAF/AIMS for the measurement of IAAF and AIMS races. The IAAF will only recognise times on courses measured by this system for world records, qualifying times for Championships, etc. All races wishing to apply for an IAAF Road Race Label must have been measured by an approved A or B Measurer.

[Download Booklet](#)

#### Forms:


[Online application for Certification of a Road and/or Calibration Course](#)

[Course Measurement Data Sheet \(Download\)](#)

[Steel Taping Data Sheet \(Download\)](#)

[Bicycle Calibration Data Sheet \(Download\)](#)

You are now in the online application!  
Click the appropriate answers for a road and/or calibration course



### Application for Certification of a Road Course

Course measurers should use this form to submit their measurements to Athletics Canada for certification

1 Application Information > 2 Road Course Application > 3 Calibration of Bicycle > 4 Course Layout and Marking > 5 Calibration Course Application > 6 Payment

Are you applying for certification of \*

- a calibration course (\$15)
- a road course (\$50)

Is this an application for recertification of a previously certified course? \*

- Yes
- No

If yes, please give the reason(s) for recertification and the previous certification number.

Person in charge of measurement

Name \*

First Last

Fill out the personal information section.

Person in charge of measurement

**Name \***

John      Lofranco

First      Last

**Address \***

Suite B1-110 2445 St-Laurent Blvd.

Street Address

Address Line 2

Ottawa      Ontario

City      State / Province / Region

K1G 6C3      Canada

Postal / Zip Code      Country

**Email \***

jlofranco@athletics.ca

**Phone \***

613 - 260 - 5580

###      ###      #####

# Fill out the information for a road course

ATHLÉTISME

## Application for Certification of a Road Course

Course measurers should use this form to submit their measurements to Athletics Canada for certification

- 1 Application Information
- 2 **Road Course Application**
- 3 Calibration of Bicycle
- 4 Course Layout and Marking
- 5 Calibration Course Application
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### Road Course Application

Calibration course info follows road course info if applicable

**Course Name \***

**Distance \***

**Date of Race \***

 /  /    
MM DD YYYY

**Start of Race Location City \***


**Start of Race Location Province \***

**End of Race Location City**

## Page 2 continued

Fast 10k

**Distance \***  
10k

**Date of Race \***  
10 / 18 / 2016   
MM DD YYYY

**Start of Race Location City \***  
Montreal

**Start of Race Location Province \***  
QC

**End of Race Location City**  
|

**End of Race Location Province**  
▾

**Race Director Name \***  
John Lofranco  
First Last

**Race Director Email**  
john.lofranco@gmail.com

**Race Director Phone**  
- -  
### ### ####



## Page 3 is the bike calibration section

Information Application **Bicycle** Marking Application Payment

---

### Calibration of Bicycle

Did you calibrate the bicycle on a calibration course previously certified by the Athletics Canada? \*

Yes  
 No

If YES, indicate certification number or a copy of the certificate, and map, verifying certification of the calibration course. If NO, you must also complete an Application for Certification of a Calibration Course.

Indicate certification number here:

Copy of certificate

**SELECT FILES**

Please attach your bicycle calibration sheet

**SELECT FILES**


Did you include the factor of 1.001 in your calibration constant? \*

Yes  
 No

---

### Summary of measurements


Date of measurement

/  /  

MM DD YYYY


Red star means required, but try to fill out as much information as possible

insert an image here



How many measurements of the course were made?

Names of measurers in addition to primary measurer



**Exact length of course**

**Measurement Data \***

**SELECT FILES**

Difference between longest and shortest measurements

Which measurement was used to establish the final race course?

If there is a problem, the form will let you know!

**There was a problem with your submission.**  
Errors have been **highlighted** below.

Calibration of Bicycle

Did you calibrate the bicycle on a calibration course previously certified by the Athletics Canada? \*

Yes  
 No

If YES, indicate certification number or a copy of the certificate, and map, verifying certification of the calibration course. If NO, you must also complete an Application for Certification of a Calibration Course.

Indicate certification number here:

Copy of certificate

**SELECT FILES**

Please attach your bicycle calibration sheet


**SELECT FILES**

Did you include the factor of 1.001 in your calibration constant? \*

Yes  
 No

Summary of measurements

Date of measurement

9 / 4 / 2015 

# Don't forget to attach measurement data files

If measurement was made over several days, please indicate all dates here

How many measurements of the course were made?

Names of measurers in addition to primary measurer

Exact length of course

**Measurement Data \***

**SELECT FILES**

This field is required. Please upload a file.

Please attach the Course Measurement Data Sheet found at <http://www.acroad.ca/Directors/CourseMeasurement/Manuals/>

Difference between longest and shortest measurements

Which measurement was used to establish the final race

# Now it's attached



**How many measurements of the course were made?**

**Names of measurers in addition to primary measurer**

**Exact length of course**

**Measurement Data \***

**SELECT FILES**

 ON-2015-012-DRY Lionhead Golf Course Race 5 km.pdf   
- Completed

**This field is required. Please upload a file.**

**Difference between longest and shortest measurements**

**Which measurement was used to establish the final race course?**

# Hover over items to see more detail about what the form is asking for (Orange box on the right)

How far from the curb edge of pavement are you measure on curves?

Please answer the following questions:

	Yes	No	Not Applicable
If your course contain pairs of opposite turns (right-to-left or left-to-right) did you follow the shortest diagonal path? If NO, attach a detail of the measured path.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was the shortest diagonal path measured where the course contains pairs of opposite turns (right-to-left, left-to-right)? If YES, attach a detail of the measured path.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Does your course contain any turn-around (double-back) points? If YES, attach a detail of the measured path.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Does your course contain any winding or "S" curved sections? If YES, show by attached example, how you chose the route you measured.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Are runners to be restricted to a route longer than the shortest possible route for any portion of the race course? If YES, include details in course description.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

Please attach the following documents:

**Course Map \***  
  
No file chosen

**List of intermediate splits**

**Course description**

The course map need not be to scale but must indicate direction of north. It must be in one colour and fit on 8.5x11 paper. Descriptions of the exact positions of the start, finish, and all turn-arounds relative to permanent landmarks must be included on the map. Details of any restricted portions where cones and

## More questions from Page 4

**Course description**

**SELECT FILES**

**Measured Path**

**SELECT FILES**

**Type of course**

Loop

Out and back

Point to point

**Please specify the number of times the loop/course is to be completed**

**Straight line distance (in metres) between the Start and Finish (as the crow flies)**

---

**Altitude of Course above mean sea level (in metres)**

**Start**

**Finish**

**Type of surfaces (check all that apply)**

Curbed Streets       Uncurbed Streets/Roads

Concrete Sidewalk       Concrete/Brick Streets/Road

## Still more questions

Concrete Sidewalk       Concrete/brick Streets/Road

Paved Bike Path       Unpaved Bike Path

Single Track Trail       Graded Dirt Road

Ungraded Dirt Road       Gravel Road

Undefined Paved Surface       Undefined Dirt Surface

Undefined Grass Surface       Track (curbed or uncurbed)

What is the percentage of the course covered by each surface (e.g. 50% curbed streets, 25% Paved Bike Path, 25% Track)

If your course contains any unpaved sections, please attach a detail of the method(s) used to measure such sections.


**SELECT FILES**

**Measurement Rides**

	Yes	No
Did the same person ride the bicycle on both the calibration course and the race course for any given measurement?	<input type="radio"/>	<input type="radio"/>
Were both the calibration course and the race courses DRY during the calibration and measurement rides?	<input type="radio"/>	<input type="radio"/>
Did you perform both the pre-measurement and the post-measurement calibrations and the measurement of the race course in the same 24 hour period?	<input type="radio"/>	<input type="radio"/>



# Page 5 Calibration course application



## Application for Certification of a Road Course

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### Calibration Course Application

This is the description of your section break.

**Name of Calibration Course \***

**Length of calibration course (in metres) \***

**Measurement Data for Calibration Course \***

**SELECT FILES**

ON-2014-132-BDC.pdf - Completed

**Date of measurement**

/  /

MM DD YYYY

If measurement was made over several days, please indicate all dates here

Please attach the Course Measurement Data Sheet found at <http://www.acroad.ca/Directors/CourseMeasurement/Manuals/>

If you have measured over several days, make sure to include all the dates

If measurement was made over several days, please indicate all dates here

9/5/2015

City of Measurement \*

Montreal

Province \*

QC

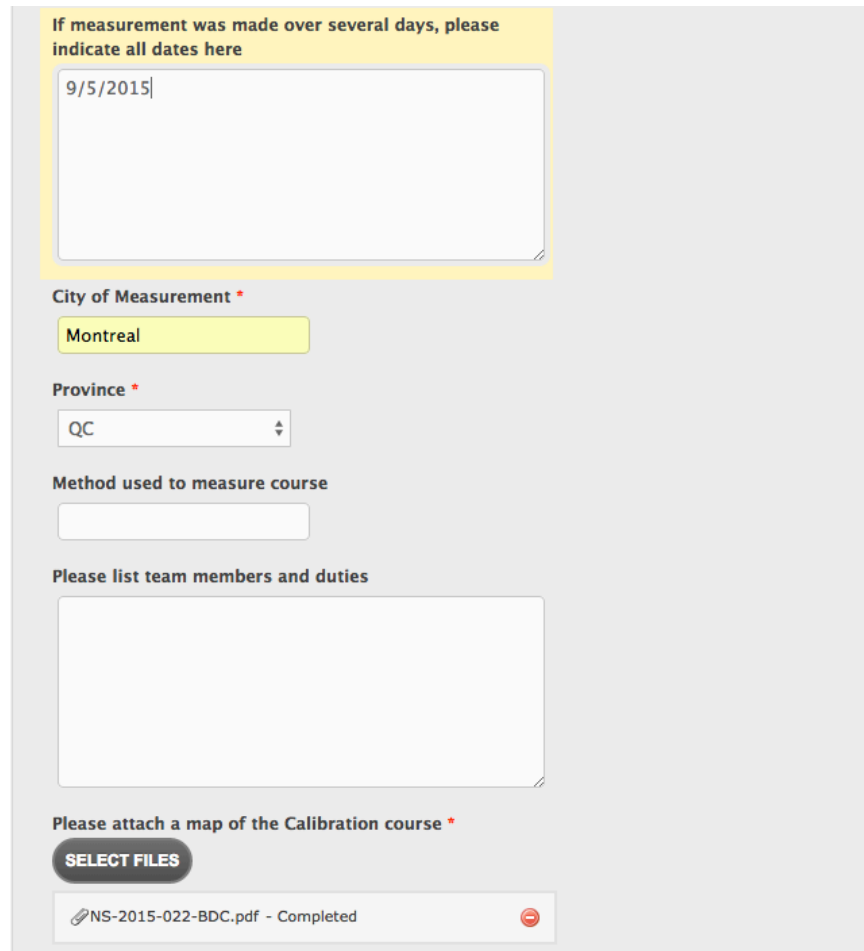
Method used to measure course

Please list team members and duties

Please attach a map of the Calibration course \*

SELECT FILES

NS-2015-022-BDC.pdf - Completed



## More questions page 5

Was the course measured by Electronic Distance Meter?

Yes  
 No

If yes, please attach EDM Procedures Sheet

**SELECT FILES**

If yes, please attach original field notes

**SELECT FILES**

Was the course measured by steel tape

Yes  
 No

If yes, please attach steel tape data sheet

**SELECT FILES**

How much tension was applied to the tape while measuring?

How was the tension maintained?

Was the tape free of any kinks, crimps or splices?

Yes  
 No

Please describe any kinks, crimps or splices

---

Circle Check

Now you are ready to submit (button at the bottom of the page)

How much tension was applied to the tape while measuring?

How was the tension maintained?

Was the tape free of any kinks, crimps or splices?

Yes

No

Please describe any kinks, crimps or splices

---

Bicycle Check

(A) Counts for a full calibration course

(B) Counts for one tape length

Number of full tape lengths (A/B)

---

Thank you for completing the application for certification of a road/calibration course. Please click submit to pay. We will confirm receipt with you within one business day.

[Previous](#)

Powered by [MachForm](#)

Problem! The field must be a number. The form will tell you what is wrong.

**ATHLÉTISME**

### Application for Certification of a Road Course

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- 6 Payment

**There was a problem with your submission.**  
Errors have been **highlighted** below.

**Calibration Course Application**  
This is the description of your section break.

**Name of Calibration Course \***

**Length of calibration course (in metres) \***

This field must be a number.

**Measurement Data for Calibration Course \***

**SELECT FILES**

ON-2014-132-BDC.pdf (822.05 KB)

**Date of measurement**

 /  /

Make sure you get to this page and pay or your application is not complete!

**Performance Canada**

### Your order summary

Descriptions	Amount
<a href="#">a calibration course (\$15)</a> Item price: \$15.00 Quantity: 1	\$15.00
<a href="#">a road course (\$50)</a> Item price: \$50.00 Quantity: 1	\$50.00
<b>Item total</b>	<b>\$65.00</b>
	<b>Total \$65.00 CAD</b>

**PayPal** Purchase Protection  
on eligible purchases | [See details](#)  
Shop around the world with confidence

### Review your information

▼ **Welcome back, John!** [Not John?](#) **PayPal**

Complete your purchase using the details from your last payment, or [make changes](#).

**Payment method** [Change](#)

CIBC Bank Account x-xx30  
PayPal will use Visa XXXX-XXXX-XXXX-XX85 to fund this transaction if your bank does not have enough funds.

**Email address**  
john.lofranco@gmail.com

**PayPal password**

**Pay**

[Forgot your password?](#)

**Note to seller** [Add](#)

► **Don't have a PayPal account?**  
(Optional) Join PayPal for faster future checkout

[Site Feedback \(-\)](#)  
PayPal. The safer, easier way to pay. For more information, read our [User Agreement](#) and [Privacy Policy](#).

Questions/Help with the form:  
email John Lofranco  
[jlofranco@athletics.ca](mailto:jlofranco@athletics.ca) or call  
613-260-5580 x3314



# Attached files

- Certificate of calibration course or certificate number or application
- Bike calibration sheets (use the AC Road spreadsheet as modified)
- Data sheet
- Map
- List of splits (additional data sheet)
- Course description (include measurement details)
- Measured path
- Details of how unpaved section were measured



# Attached file Calibration

- Steel tape data sheet (use the AC Road spreadsheet)
- Map (required)
- Other files if using an electronic distance measurement

# Software

- For map creation I use Adobe Illustrator
- I use PowerPoint to create my split records, but it becomes a very large file - Adobe Acrobat or free equivalents will create a compact pdf file that is easy to e-mail
- I use Excel for my data analysis
- For route layout Google Earth
- GPS co-ordinates I use Google Earth and Garmin Base Camp

# Questions?



# The Assignment

- Complete data forms for the calibration course and the test route
  - draw a map of the course
    - keep is simple and unequivocal
    - show a detail of the start, finish and turnaround
    - add explanatory notes
    - remember everything should be here to allow exact course set up
  - complete forms, but don't complete on-line
    - calibration course
    - bike calibration and course data sheet

# Contacts

- Submit the assignment to me:
  - Paul Adams  
20313 98A Avenue,  
Langley, BC  
V1M 0A6
  - [ptbadams@gmail.com](mailto:ptbadams@gmail.com)
  - 604 888-4614
  - or my cell at 604 220-2892

# References

- Athletic Canada – Course Measurement
  - [www.acroad.ca/Directors/CourseMeasurement](http://www.acroad.ca/Directors/CourseMeasurement)
- USATF - Road Running Technical Council
  - <http://www.rrtc.net/>
- Measurement News Forum
  - <http://measure.infopop.cc/eve>

# Certification

- For certification of a road race complete the on-line application at:
  - <http://www.acroad.ca/Directors/CourseMeasurement/Certify/>
- Canada's National Certifier
  - Mr. Bernie Conway  
67 Southwood Crescent,  
London, Ontario  
N5J 1S8
  - [measurer@rogers.com](mailto:measurer@rogers.com) or (519) 641-6889